Transit Development Plan

2020-2045

Mississippi Gulf Coast

Gulf Regional Planning Commission

Coast Transit Authority

Mississippi Gulf Coast Transit Development Plan

2020-2045

This document is posted at:
https://grpc.com/mpo-programs/public-transit-planning/

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Prepared for the Gulf Regional Planning Commission, Coast Transit Authority, and Mississippi Department of Transportation by Neel-Schaffer, Inc.

This Plan was prepared as a cooperative effort of the U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Mississippi Department of Transportation (MDOT), and local governments in partial fulfillment of requirements in Title 23 USC 134 and 135, amended by the FAST Act, Sections 1201 and 1202, December 4, 2015. The contents of this document do not necessarily reflect the official views or policies of the U.S. Department of Transportation

Table of Contents

List of Tables

List of Figures

1.0 Introduction

This 2045 Transit Development Plan (TDP) serves as a guiding document for improving public transportation in the Mississippi Gulf Coast region over the next 25 years. This plan is updated every five years in coordination with the update of the region's Metropolitan Transportation Plan. It is a collaborative effort of the Coast Transit Authority and Gulf Regional Planning Commission.

The 2045 TDP includes the following elements:

- **Needs Analysis** - a detailed analysis of existing and future public transportation needs based on recent trends, a market analysis, and public and stakeholder input.
- **Plan Recommendations** - A set of recommendations are provided for CTA and GRPC to undertake over the next 25 years. These cover service, capital, technology, and marketing improvements. A detailed financial plan is also included. This was developed for the 2045 Metropolitan Transportation Plan.
- **Transit Oriented Development Strategy** - A general framework for advancing Transit Oriented Development (TOD) in the region is provided.

2.0 Existing Transit in the Region

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.

2.1 CTA Fixed Route Service

CTA operates ten bus routes along the Mississippi Gulf Coast. All bus routes operate Monday through Saturday and some bus routes also operate on Sunday. 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 2.1 shows the current bus routes and major transit hubs provided by CTA and Table 2.1 shows the frequencies of these routes.

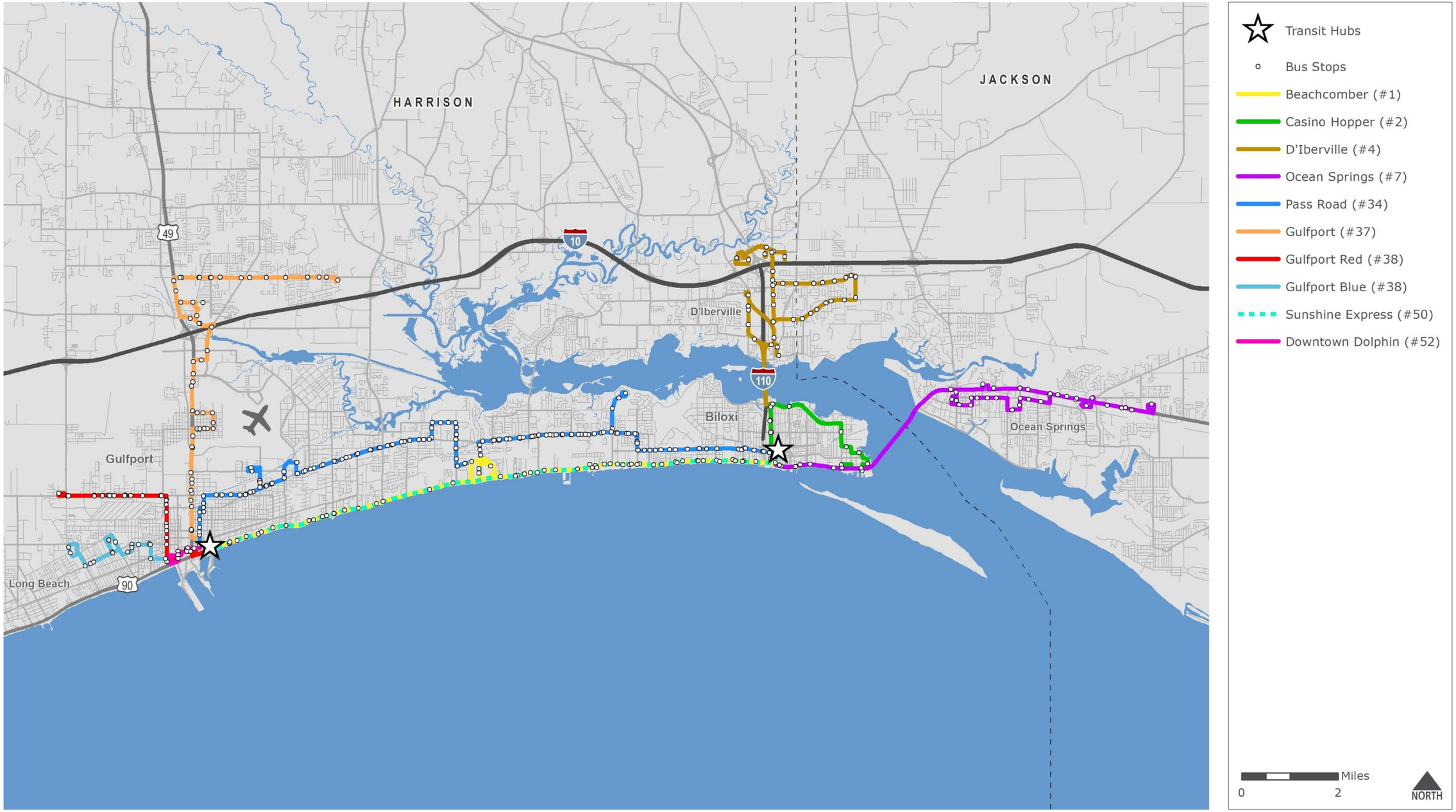
Bus fares are $1.50 for regular riders, $0.75 or free for seniors, $0.75 for people with disabilities, $0.75 for people with a Medicare Card, $1.25 for public school students, and free for children age 5 or under. There are also daily, 3-day, and 31-day pass options for riders. CTA operates with a system 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 every time they cross a fare zone.

Table 2.1: CTA Fixed Routes and Frequencies

Route	Monday-Saturday	Sunday
Beachcomber (#1)	45 minutes	No service
Casino Hopper (#2)	25 minutes	25 minutes
D'Iberville (#4)	90 minutes	90 minutes
Ocean Springs (#7)	90 minutes	No service
Pass Road (#34)	45 minutes	45 minutes
Gulfport (#37)	90 minutes	90 minutes
Gulfport Blue/Red (#38)	90 minutes	No service
Sunshine Express (#50)	60 minutes	No service
Downtown Dolphin (#52)	30 minutes	No service

Source: Coast Transit Authority

Figure 2.1: CTA Fixed Route System



Data Sources: Coast Transit Authority

Disclaimer: This map is for planning purposes only.

2.2 CTA Demand Response 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.

2.3 CTA Vanpooling 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.

2.4 Intercity Transit

The Gulf Coast is currently served by two intercity transportation providers: Greyhound and Flixbus.

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

3.0 Needs Analysis

3.1 Existing Fixed Route Performance

Key Performance Indicators

Three key performance indicators are shown for the last five years in the charts below. These indicators show a slight downward trend in ridership even before COVID-19. Furthermore, they also show a long-term slight downward trend in the level of service as measured in vehicle revenue miles and hours.

Figure 3.1: Fixed Route Ridership, FY2016-20

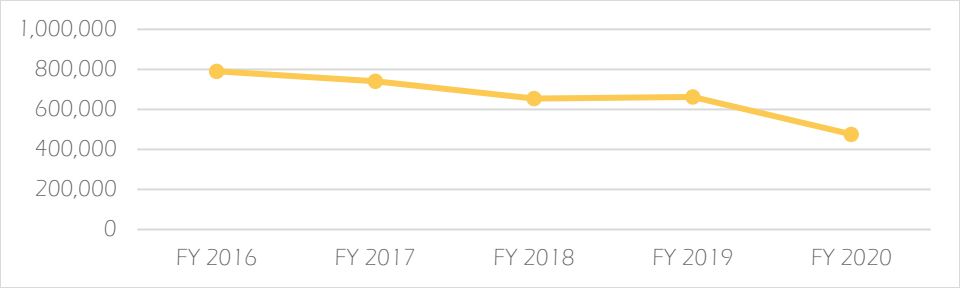


Figure 3.2: Fixed Route Vehicle Revenue Miles, FY2016-20

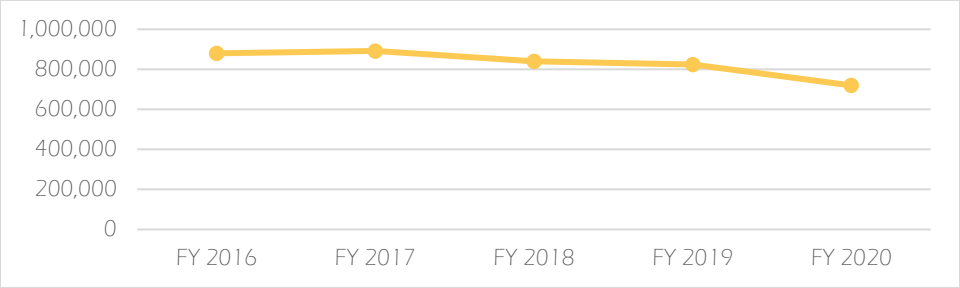
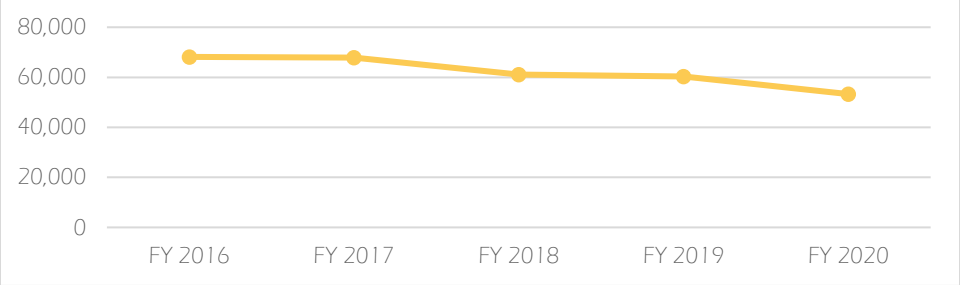


Figure 3.3: Fixed Route Vehicle Revenue Hours, FY2016-20



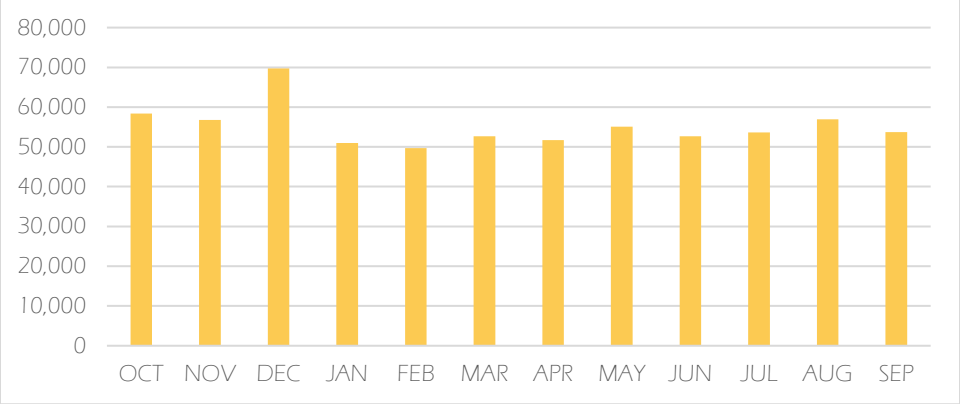
Ridership Trends

Aside from annual ridership trends, which were summarized on the previous page, it is important to consider if there are different ridership trends by month or time of day. After looking at pre-COVID data, ridership for CTA is pretty stable across the year, with a notable increase in December when special service is operated for special events.

When looking at the time of day trends, it becomes apparent ridership is consistent across the day, with several peaks. This suggests that there are many different types of riders that utilize the system.

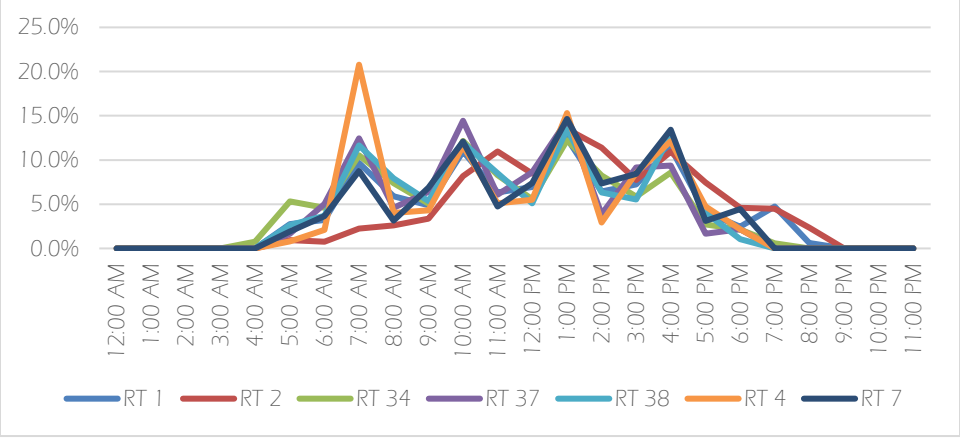
When looking at where ridership occurs, Figure 3.6 shows that the highest concentration of boardings are at the major transfer centers, near casinos, and near major shopping areas. Some apartment complexes also show up on this map.

Figure 3.4: Fixed Route Monthly Ridership, Pre-COVID



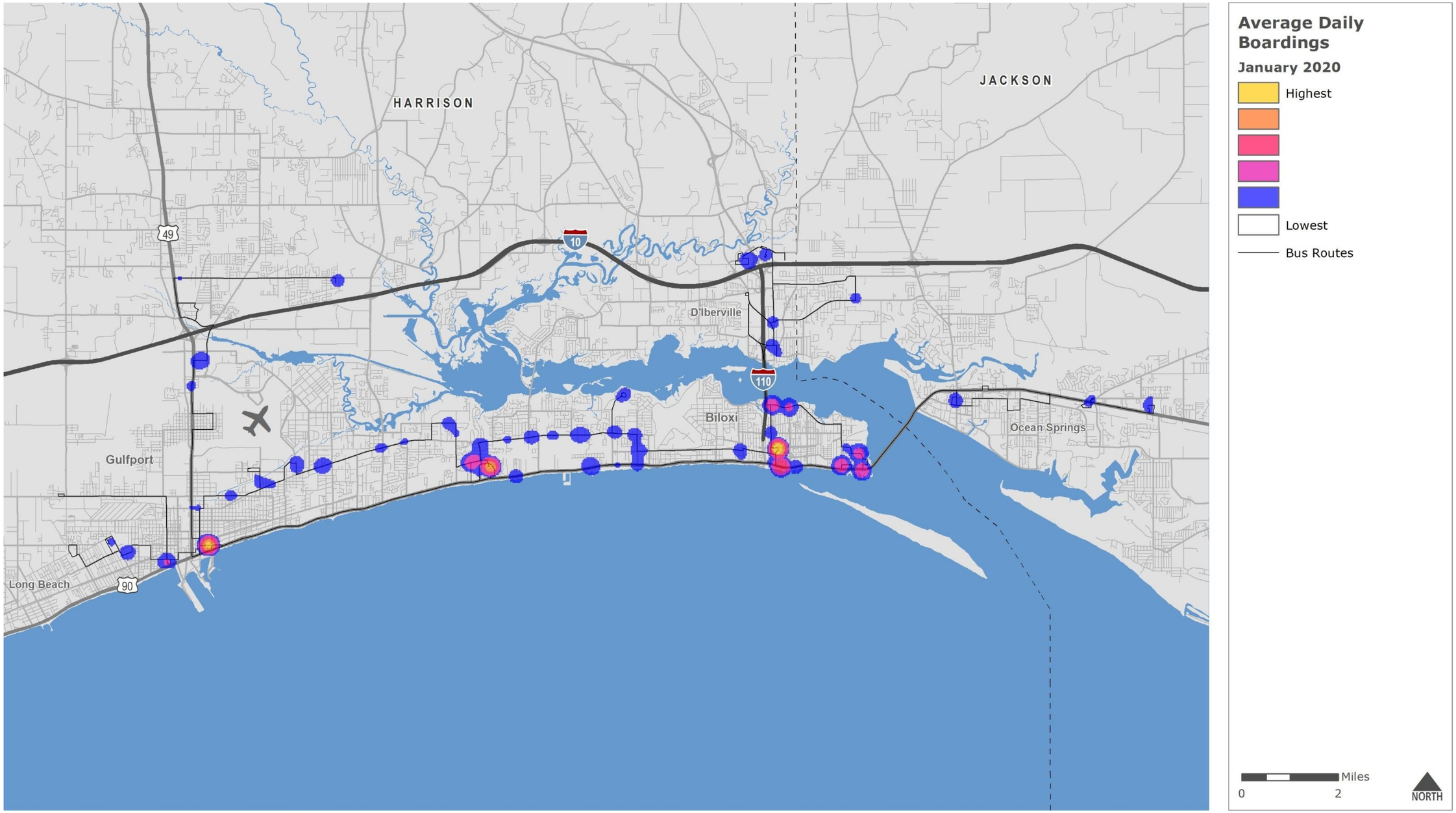
Source: NTD, FY2019

Figure 3.5: Fixed Route Hourly Ridership, Pre-COVID



Source: CTA, January 2020

Figure 3.6: Fixed Route Ridership Hotspots, Pre-COVID



Data Sources: Coast Transit Authority

Disclaimer: This map is for planning purposes only.

On-Time Performance

On-time performance is a very important metric for public transportation. If transit cannot be reliable, it will not attract riders and will be very inefficient. For CTA, a bus is considered on time if it is not early by 2 or more minutes or late by 10 or more minutes. When tracking on-time performance, CTA only monitors major timepoints.

Table 3.1 shows that overall, on-time performance is not a major issue for CTA fixed routes, with most above 90% on-time. However, the D'Iberville, Ocean Springs, and Pass Road perform the worst. When looking at on-time performance at different times of the day, a major pattern emerges: the afternoon is the worst time for most routes.

Table 3.1: Fixed Route On-Time Performance, Pre-COVID

Route	On-Time	Late	Early
Beachcomber (#1)	94%	2%	4%
Casino Hopper (#2)	96%	1%	3%
D'Iberville (#4)	86%	8%	6%
Ocean Springs (#7)	89%	8%	4%
Pass Road (#34)	87%	5%	8%
Gulfport (#37)	92%	5%	3%
Gulfport Blue/Red (#38)	95%	2%	2%
Systemwide	91%	4%	5%

Source: Coast Transit Authority, January 2020
Note: No data for Sunshine Express or Downtown Dolphin. These are new services.

Table 3.2: Fixed Route On-Time Performance by Hour of Day, Pre-COVID

Route	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM
Beachcomber (#1)	88%	93%	96%	93%	93%	93%	94%	98%	92%	93%	97%	96%	93%	97%	95%	90%
Casino Hopper (#2)	94%	97%	96%	96%	99%	95%	94%	95%	92%	97%	98%	97%	98%	98%	98%	94%
D'Iberville (#4)	92%	88%	89%	99%	94%	95%	99%	92%	83%	90%	60%	72%	72%	78%	n/a	n/a
Ocean Springs (#7)	98%	90%	94%	97%	63%	99%	91%	86%	87%	86%	76%	87%	97%	92%	n/a	n/a
Pass Road (#34)	87%	88%	90%	88%	92%	90%	84%	86%	84%	84%	87%	87%	88%	90%	81%	n/a
Gulfport (#37)	95%	95%	93%	96%	92%	91%	92%	89%	92%	94%	95%	90%	88%	89%	n/a	n/a
Gulfport Blue/Red (#38)	100%	95%	97%	99%	92%	96%	96%	94%	98%	98%	91%	96%	88%	90%	n/a	n/a
Systemwide	91%	91%	92%	94%	90%	94%	92%	90%	89%	91%	88%	89%	92%	92%	91%	93%

Source: Coast Transit Authority, January 2020
Note: No data for Sunshine Express or Downtown Dolphin. These are new services.

Route Profiles

The following pages show key information and maps for each fixed route operated by CTA. These snapshots give insight into each route and how well they stack up against each other. The maps show the major boarding activity by each route. For the newer routes (Sunshine Express and Downtown Dolphin), there is still limited data to analyze. It typically takes at least one year before a route stabilizes and can be analyzed.

Beachcomber (#1) Route Profile

Route Information

Service Characteristic	Mon-Fri	Sat	Sun
Frequency (minutes)	45 min.	45 min.	n/a
Span of Service	5:00 AM to 8:50 PM	5:00 AM to 8:50 PM	n/a

Route Performance

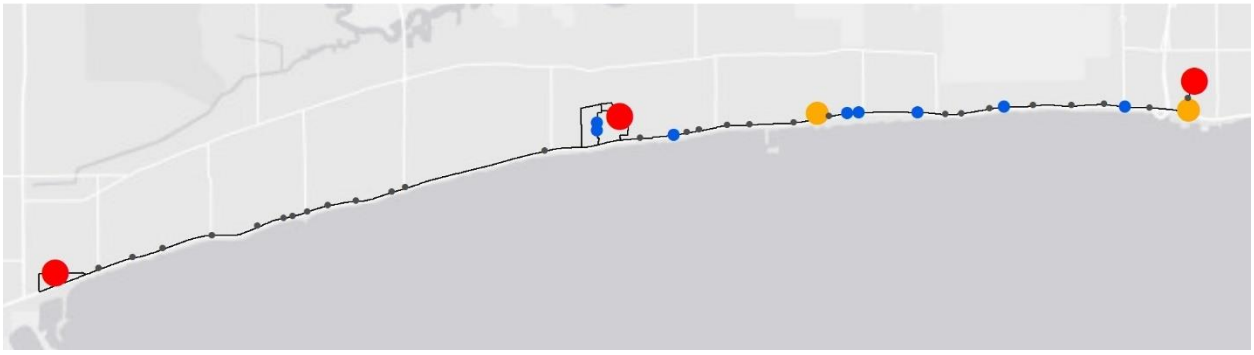
Measure	Performance
Average Daily Boardings	326
Boardings per Vehicle Hour	10.3
On-Time Performance	94%

Note: Boarding data from FY2018 and on-time data is from January 2020.

Average Daily Boardings
- <1
- 1-5
- 5-10
- 10-25
- 25-50
- 50-100

Average Daily Boardings by Stop (January 2020)

Westbound



Eastbound

Casino Hopper (#2) Route Profile

Route Information

Service Characteristic	Mon-Fri	Sat	Sun
Frequency (minutes)	20-25 min.	20-25 min.	20-25 min.
Span of Service	5:30 AM to 9:23 PM	5:30 AM to 9:23 PM	8:30 AM to 7:11 PM

Route Performance

Measure	Performance
Average Daily Boardings	400
Boardings per Vehicle Hour	14.6
On-Time Performance	96%

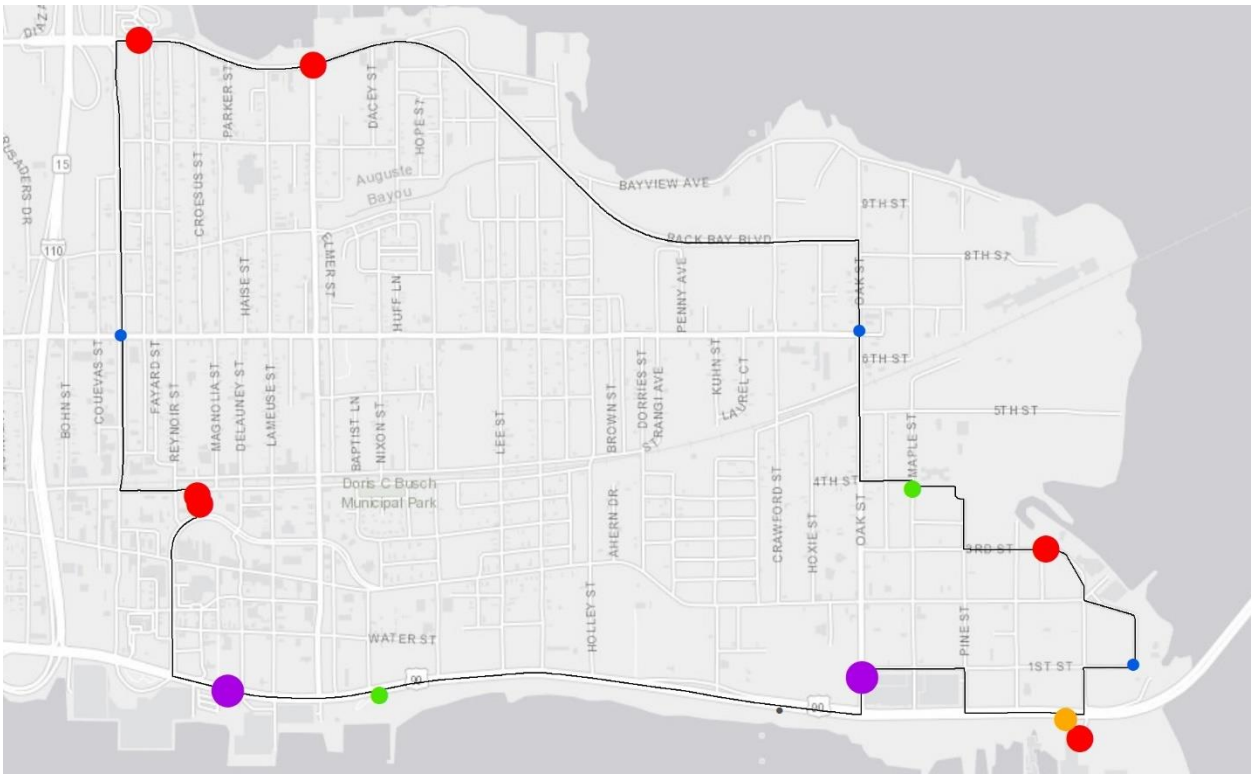
Note: Boarding data from FY2018 and on-time data is from January 2020.

Average Daily Boardings

- <1
- 1-5
- 5-10
- 10-25
- 25-50
- 50-100

Average Daily Boardings by Stop

Loop



D'Iberville (#4) Route Profile

Route Information

Service Characteristic	Mon-Fri	Sat	Sun
Frequency (minutes)	90 min.	90 min.	90 min.
Span of Service	5:30 AM to 6:45 PM	5:30 AM to 6:45 PM	7:00 AM to 5:15 PM

Route Performance

Measure	Performance
Average Daily Boardings	89
Boardings per Vehicle Hour	7.2
On-Time Performance	86%

Note: Boarding data from FY2018 and on-time data is from January 2020.

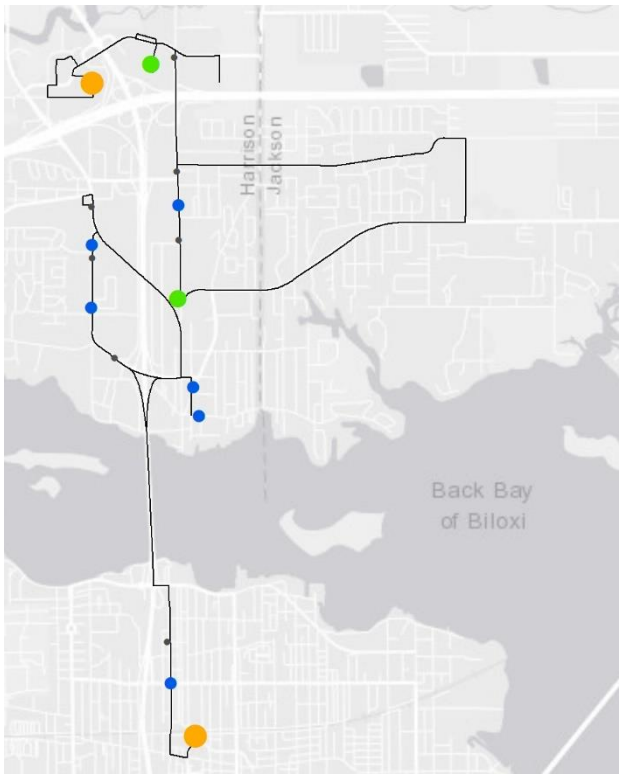
Average Daily Boardings

- <1
- 1-5
- 5-10
- 10-25
- 25-50
- 50-100

Average Daily Boardings by Stop

Northbound

Southbound



Ocean Springs (#7) Route Profile

Route Information

Service Characteristic	Mon-Fri	Sat	Sun
Frequency (minutes)	90 min.	90 min.	n/a
Span of Service	5:30 AM to 6:43 PM	8:30 AM to 6:43 PM	n/a

Route Performance

Measure	Performance
Average Daily Boardings	92
Boardings per Vehicle Hour	6.2
On-Time Performance	89%

Note: Boarding data from FY2018 and on-time data is from January 2020.

Average Daily Boardings

- <1
- 1-5
- 5-10
- 10-25
- 25-50
- 50-100

Average Daily Boardings by Stop

Westbound

Eastbound

Pass Road (#34) Route Profile

Route Information

Service Characteristic	Mon-Fri	Sat	Sun
Frequency (minutes)	45 min.	45 min.	45 min.
Span of Service	4:39 AM to 8:23 PM	4:39 AM to 8:23 PM	6:09 AM to 6:53 PM

Route Performance

Measure	Performance
Average Daily Boardings	631
Boardings per Vehicle Hour	11.4
On-Time Performance	87%

Note: Boarding data from FY2018 and on-time data is from January 2020.

Average Daily Boardings

- <1
- 1-5
- 5-10
- 10-25
- 25-50
- 50-100

Average Daily Boardings by Stop

Westbound

Eastbound

Gulfport (#37) Route Profile

Route Information

Service Characteristic	Mon-Fri	Sat	Sun
Frequency (minutes)	90 min.	90 min.	90 min.
Span of Service	5:30 AM to 6:47 PM	5:30 AM to 6:47 PM	7:00 AM to 5:17 PM

Route Performance

Measure	Performance
Average Daily Boardings	158
Boardings per Vehicle Hour	10.5
On-Time Performance	92%

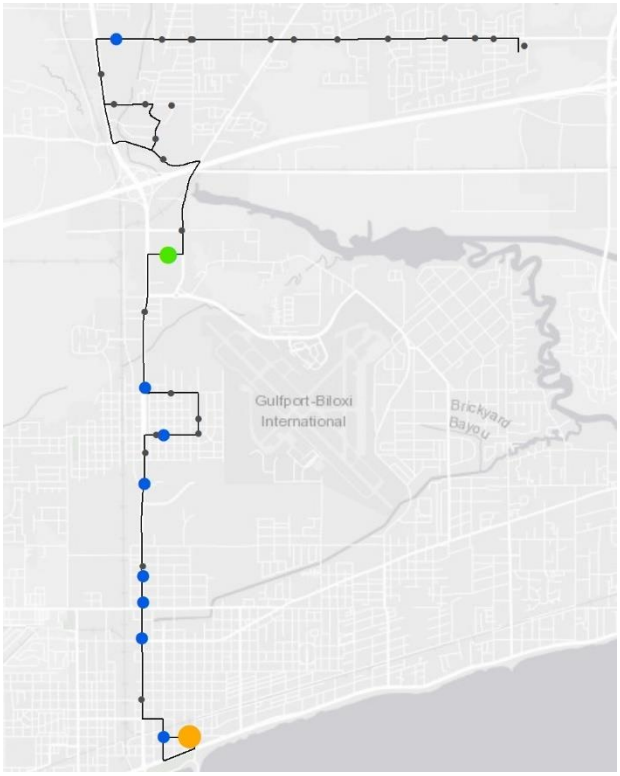
Note: Boarding data from FY2018 and on-time data is from January 2020.

Average Daily Boardings

- <1
- 1-5
- 5-10
- 10-25
- 25-50
- 50-100

Average Daily Boardings by Stop

Northbound



Southbound

Gulfport (#38) Route Profile

Route Information

Service Characteristic	Mon-Fri	Sat	Sun
Frequency (minutes)	90 min.	90 min.	n/a
Span of Service	5:30 AM to 6:52 PM	5:30 AM to 6:52 PM	n/a

Route Performance

Measure	Performance
Average Daily Boardings	278
Boardings per Vehicle Hour	8.9
On-Time Performance	95%

Note: Boarding data from FY2018 and on-time data is from January 2020.

Average Daily Boardings

- <1
- 1-5
- 5-10
- 10-25
- 25-50
- 50-100

Average Daily Boardings by Stop

Blue

Red

Sunshine Express (#50) Route Profile

Route Information

Service Characteristic	Mon-Fri	Sat	Sun
Frequency (minutes)	60 min.	60 min.	n/a
Span of Service	8:30 AM to 5:20 PM	8:30 AM to 5:20 PM	n/a

Route Performance

Measure	Performance
Average Daily Boardings	*Pre-COVID performance data not available. This a new service*
Boardings per Vehicle Hour	
On-Time Performance	

Average Daily Boardings by Stop

Westbound

Eastbound

Downtown Dolphin (#52) Route Profile

Route Information

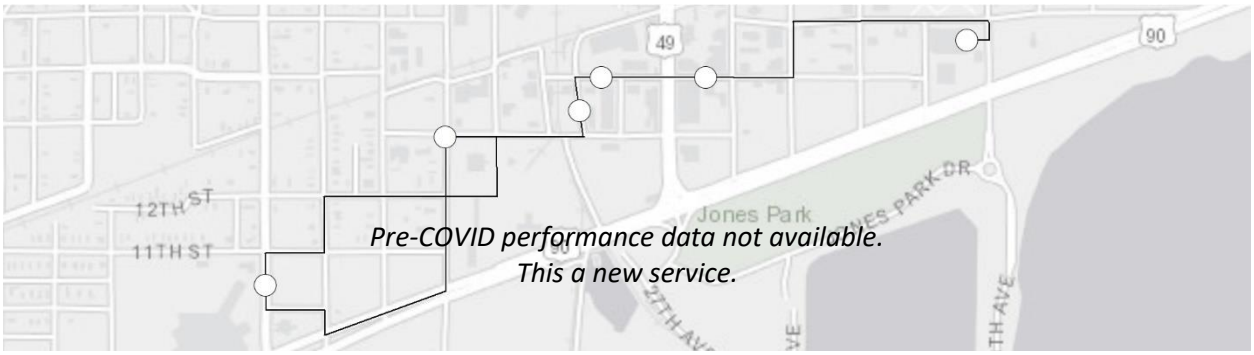
Service Characteristic	Mon-Fri	Sat	Sun
Frequency (minutes)	30 min.	30 min.	n/a
Span of Service	8:30 AM to 5:46 PM	8:30 AM to 5:46 PM	n/a

Route Performance

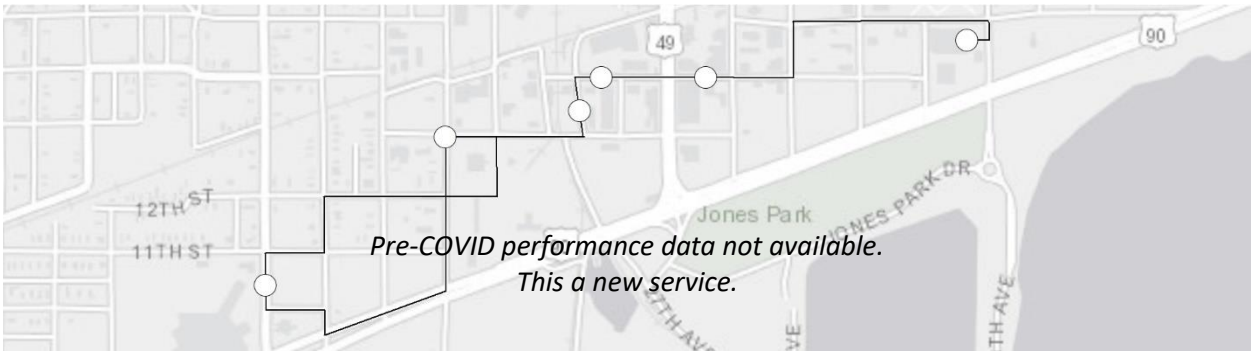
Measure	Performance
Average Daily Boardings	*Pre-COVID performance data not available. This a new service*
Boardings per Vehicle Hour	
On-Time Performance	

Average Daily Boardings by Stop

Westbound



Eastbound



Stop Amenities and Access to Stops

Stop amenities and accessibility for bicyclists and pedestrians are both a very important part of the rider experience. GRPC has conducted an inventory of stops with shelters as well as the existing sidewalks and bicycle facilities within the region. This inventory is shown on the map in Figure 3.7 and the shelter amenity is summarized in Table 3.3 and listed in detail in Table 3.4. What this inventory shows is that shelters are very limited, access for bicyclists is very limited, and access for pedestrian is somewhat limited.

Table 3.3: Stop Amenity Inventory Summary

Stops	Number	Percentage
With Shelter	85	20%
Without Shelter	330	80%
Total	415	100%

Source: Gulf Regional Planning Commission

Table 3.4: Stop Amenity Inventory

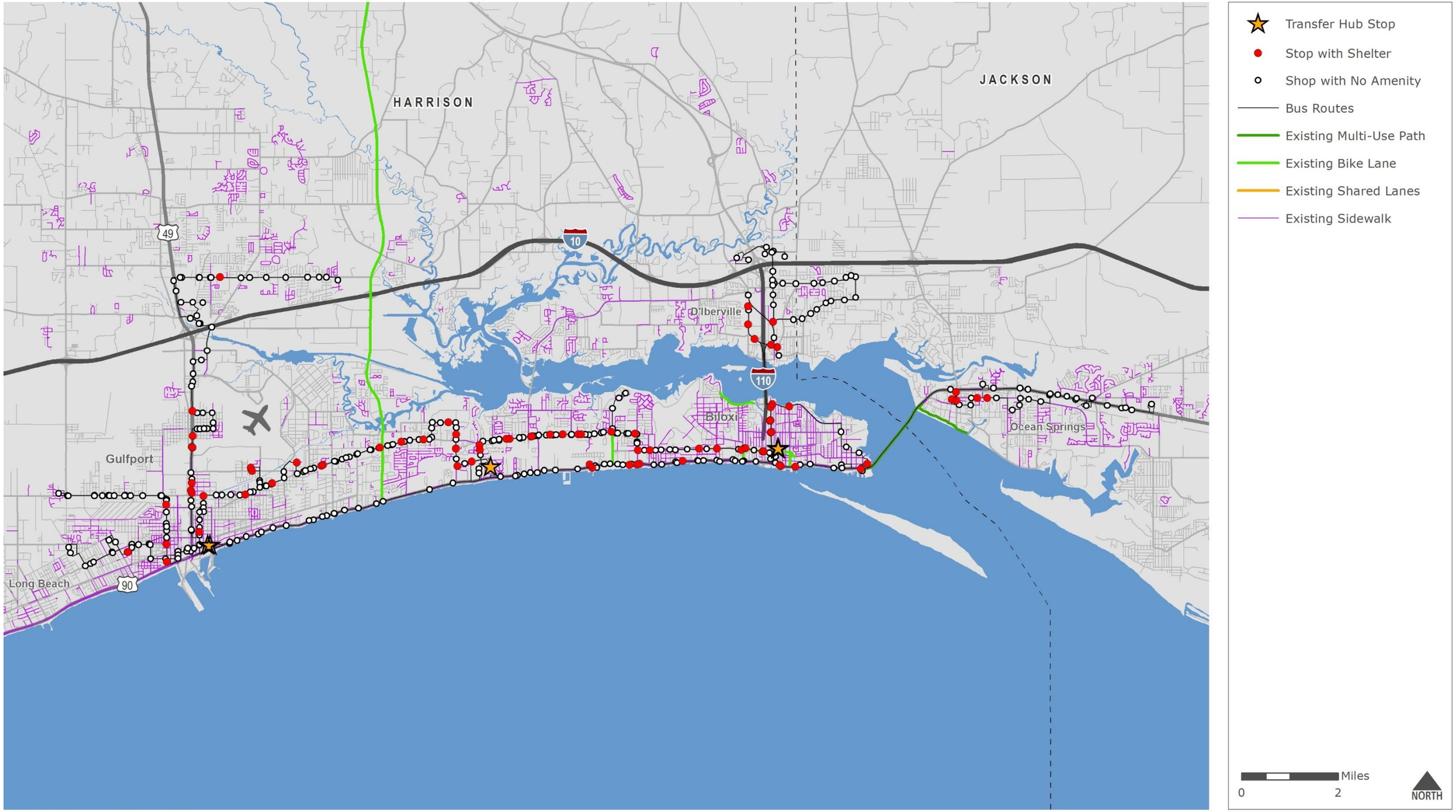
Stop Name	Amenity
1 - BILOXI TRANSIT CENTER	Transfer Hub
1 - EDGEWATER MALL	Transfer Hub
1 - GULFPORT TRANSIT CENTER	Transfer Hub
99 - BTC Layover	Transfer Hub
99 - GTC Layover	Transfer Hub
99-R BTC Layover	Transfer Hub
1 - CT SWITZER @ SUPER WALMART	Shelter
1.09 - HWY 90 @ SEASHORE OAKS	Shelter
1.14 - HWY 90 @ JUBILEE INN	Shelter
1.18 - TREASURE BAY	Shelter
1.264 - FRONTAGE ROAD @ TREASURE BAY	Shelter
1.271 - FRONTAGE ROAD @ SHAGGYS/WAFFLE HOUSE	Shelter
1.273 - FRONTAGE ROAD @ SHARKHEADS/SNAPPERS	Shelter
15 - BAYVIEW @ IMPERIAL PALACE	Shelter
2 - HOWARD @ I 110 OVERPASS	Shelter
2.01 - BEAU RIVAGE/ HARD ROCK	Shelter
2.03 - HWY 90 @ SMALL CRAFT HARBOR	Shelter
2.046 MARGARITAVILLE RESORT	Shelter
2.055 - SEAFOOD MUSEUM	Shelter

Stop Name	Amenity
2.12 - BOOMTOWN	Shelter
2.14 - CALLIVET & STRAWBERRY - SWETMAN ENTERPRISES	Shelter
2.145 - CALLIVET @ IP LOT	Shelter
2.15 - CALLIVET & DIVISION	Shelter
34.07 - VA @ EXIT SHELTER (WB)	Shelter
34.1 - IRISH HILL & WHITE	Shelter
34.11 - IRISH HILL & HUBBARD	Shelter
34.133 - PASS ROAD @ HARDY COURT	Shelter
34.145 - PASS ROAD @ DOLLAR GENERAL	Shelter
34.15 - IRISH HILL & IBERVILLE	Shelter
34.159 - DEBUYS @ HAR CO SKATE PARK	Shelter
34.166 - EISENHOWER @ HOBBY LOBBY	Shelter
34.17 - IRISH HILL & RODENBURG	Shelter
34.173 - PASS ROAD & POPPS FERRY	Shelter
34.1795 - PASS ROAD @ WEST BILOXI LIBRARY	Shelter
34.19 - PASS ROAD @ LUCKIES	Shelter
34.202 - IRISH HILL @ FOOD GIANT	Shelter
34.203 - HOWARD @ BURGER	Shelter
34.205 - HOWARD @ I 110 OVERPASS	Shelter
34.29 - WALMART MARKET	Shelter
34.31 - PASS ROAD @ OREILLY AUTO PARTS	Shelter
34.33 - PASS ROAD @ ANDREW APTS	Shelter
34.35 - PASS ROAD @ Popps Ferry Rd	Shelter
34.38 - PASS ROAD & MACARTHUR	Shelter
34.39 - PASS ROAD @ DONAL SNYDER	Shelter
34.42 - EISENHOWER @ RAINTREE	Shelter
34.46 - CT SWITZER @ GULF COAST MEDICAL	Shelter
34.5 - DEBUYS @ CTA	Shelter
34.53 - SWITZER @ JEFF DAVIS COLLEGE	Shelter
34.6 - PASS ROAD & PINE WLMT MARKET WB	Shelter
34.63 - PASS ROAD @ BANCORP	Shelter
34.68 - PASS ROAD @ GULF MIST APTS	Shelter
34.73 - JODY NELSON DR APARTMENTS	Shelter

Stop Name	Amenity
34.76 - PASS ROAD & GULF	Shelter
34.81 - 34TH ST @ SANDERSON VILLAGE	Shelter
34.82 - 35TH ST @ CANDLEWOOD VILLAS	Shelter
34.86 - PASS ROAD & 28TH ST {GRPC}	Shelter
34.91 - 22ND AVE & 28TH ST	Shelter
34.97 - 23RD AVE @ HARCO COURTHOUSE	Shelter
37.08 - HWY 49 @ O'REILLY AUTO PARTS	Shelter
37.09 - HWY 49 & 31ST ST	Shelter
37.13 - HWY 49 & ARKANSAS {SARALAND}	Shelter
37.14 - HWY 49 & MLK	Shelter
37.25 - HWY 49 @ VALUE PLACE	Shelter
37.74 HWY 49 & ARKANSAS	Shelter
37.8 - Dedeaux Rd & OG Comm Ctr	Shelter
37.96 - HWY 49 & 29TH ST	Shelter
38.09 - 33RD AVE @ ISLAND VIEW	Shelter
38.14 - MEMORIAL HOSPITAL WB	Shelter
38.27 - MEMORIAL HOSPITAL EB	Shelter
38.77 - 33RD AVE & ARLINGTON SQ APTS	Shelter
38.8 - 33RD AVE & 15TH ST	Shelter
4.02 - Rodriguez & Kangaroo	Shelter
4.03 - D Iberville Transit Center	Shelter
4.07 - WALMART MARKET	Shelter
4.385 - AUTOMALL @ TIMBER GROVE	Shelter
4.41 - AUTOMALL PARKWAY @ CITY HALL	Shelter
4.43 - AUTOMALL PARKWAY @ SUBURBAN MOTEL	Shelter
7.11 - WASHINGTON @ VISITOR CENTER	Shelter
7.12 - WASHINGTON @ VILLA MARIA	Shelter
7.13 -SAMARITAN HOUSE	Shelter
7.16 - GOVERNMENT @ MARY O'KEEFE CENTER	Shelter
7.17 - GOVERNMENT @ YMCA	Shelter
95 -WB Hard Rock / Rue Magnolia	Shelter
96 - CALLIVET & SWETMAN ENTERPRIISES	Shelter
97 - DIVISION & CALLIVET	Shelter

Source: Gulf Regional Planning Commission

Figure 3.7: Bus Stop Amenities and Multimodal Access



Data Sources: Coast Transit Authority

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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.

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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.

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- **In Southeast** – Areas outside of the Southeast were excluded due to lower funding levels and poorer public perception of transit in the Southeast
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- **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 3.5 shows the resulting five peer areas identified. It should be noted that Mobile Bay includes Baldwin County and its urbanized area.

Table 3.5: 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)

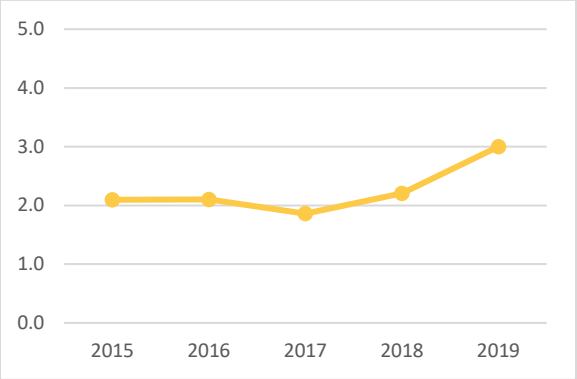
Table 3.6: Peer Fixed Route Systems, 2019

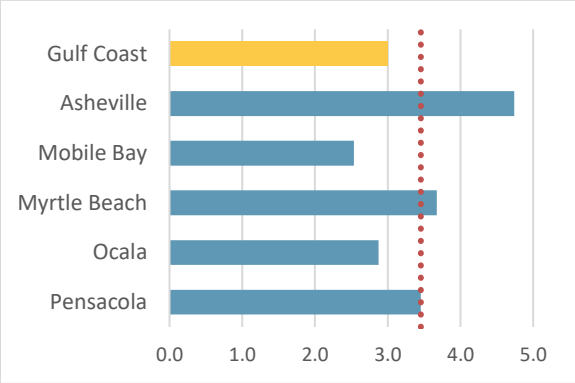
Indicator	Asheville	Mobile Bay	Myrtle Beach	Ocala	Pensacola-Fort Walton	Peer Average	Gulf Coast
General System Statistics							
Urbanized Area Population	294,536	396,018	250,568	167,213	569,480	250,568	274,100
Urbanized Area Square Miles	267	282	194	112	370	194	218
Urbanized Area Population Density	1,102	1,404	1,290	1,489	1,541	1,290	1,255
Vehicles Operated in Maximum Service	23	20	13	7	46	22	17
Vehicle Revenue Miles	23	1,003,561	920,749	480,893	1,968,136	1,153,821	823,576
Vehicle Revenue Hours	1,395,765	79,264	42,305	32,036	136,656	77,571	60,320
Boardings	97,592	84,9876	543,725	377,825	1,497,605	2,023,410	661,992
Fare Revenue	2,080,214	$625,221	$417,126	$251,115	$1,467,154	659,112	$636,755
Annual Operating Expense	$534,944	$7,350,340	$4,881,750	$2,344,377	$11,061,441	6,972,403	$4,619,81
Level of Service							
Vehicle Revenue Miles per Capita	4.7	2.5	3.7	2.9	3.5	3.5	3.0
Vehicle Revenue Hours per Capita	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Productivity							
Boardings per Revenue Mile	1.5	0.8	0.6	0.8	0.8	0.9	0.8
Boardings per Revenue Hour	21.3	10.7	12.9	11.8	11.0	13.5	11.0
Boardings per Capita	7.1	2.1	2.2	2.3	2.6	3.3	2.4
Cost Efficiency							
Operating Expense per Vehicle Revenue	$6.61	$7.32	$5.30	$4.88	$5.62	$5.95	$5.61
Operating Expense per Vehicle Revenue	$94.52	$92.73	$115.39	$73.18	$80.94	$91.35	$76.59
Operating Expense per Boarding	$4.43	$8.65	$8.98	$6.20	$7.39	$7.13	$6.98
Farebox							
Average Fare	$0.26	$0.74	$0.77	$0.66	$0.98	$0.68	$0.96
Farebox Recovery Rate	5.8%	8.5%	8.5%	10.7%	13.3%	9.4%	13.8%

Source: National Transit Database

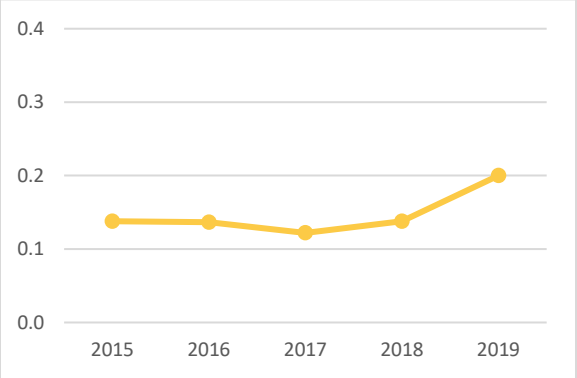
Level of Service Indicators

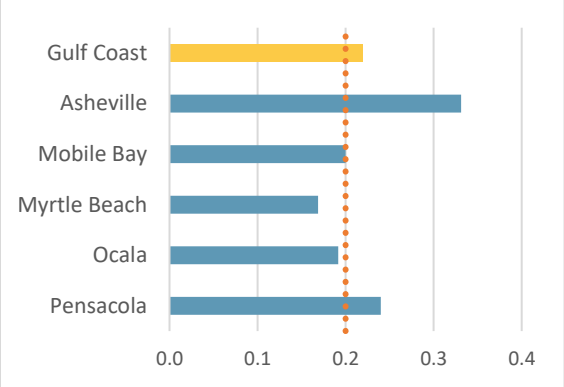
Vehicle Revenue Miles per Capita





Vehicle Revenue Hours per Capita

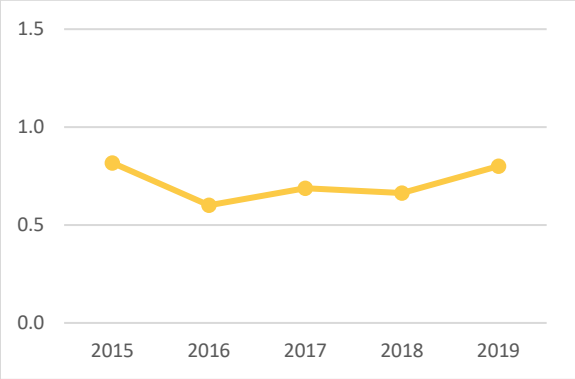


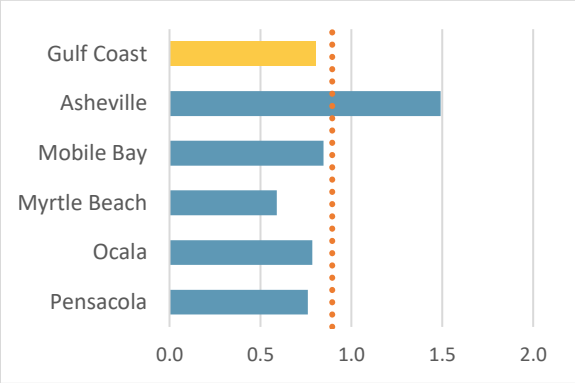


Peer Average

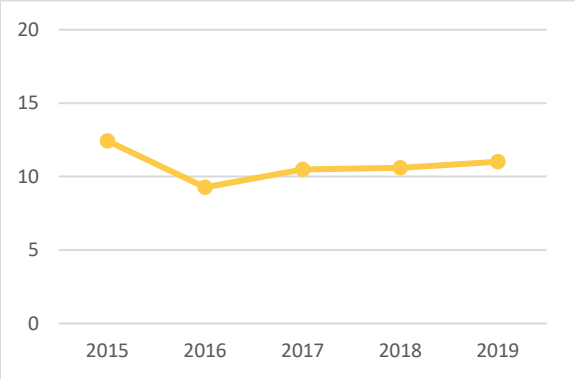
Productivity Indicators

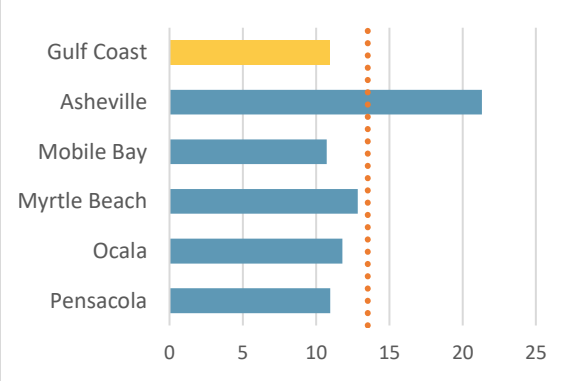
Boardings per Revenue Mile



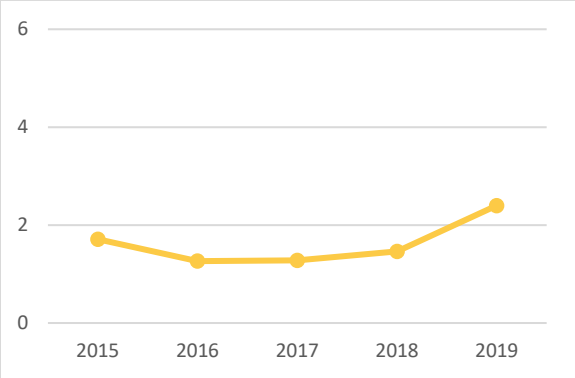


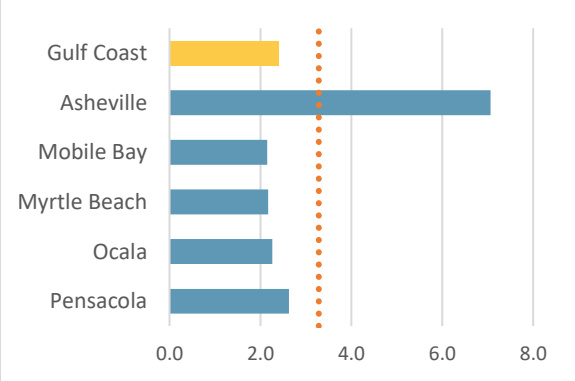
Boardings per Revenue Hour





Boardings per Capita

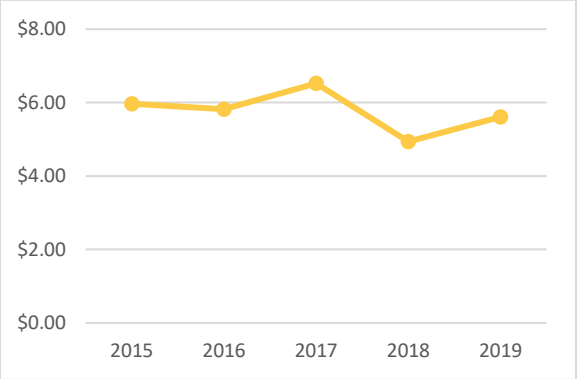


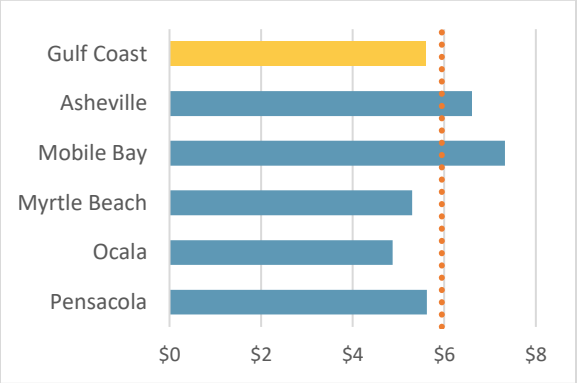


Peer Average

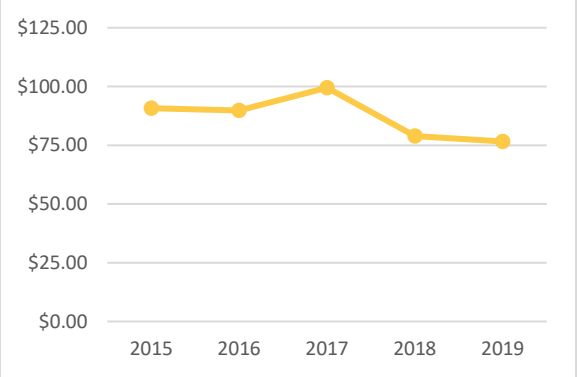
Cost Efficiency Indicators

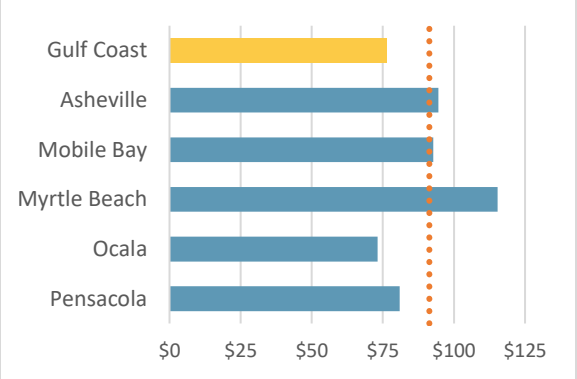
Operating Expense per Vehicle Revenue Mile



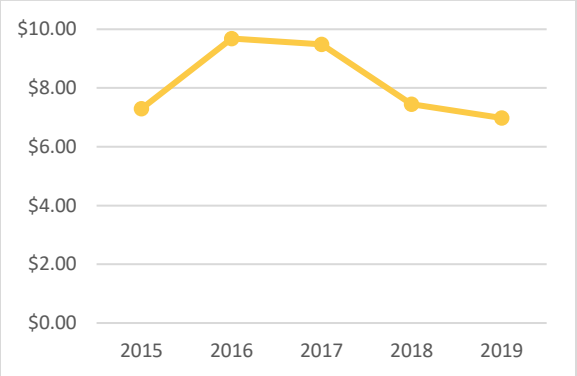


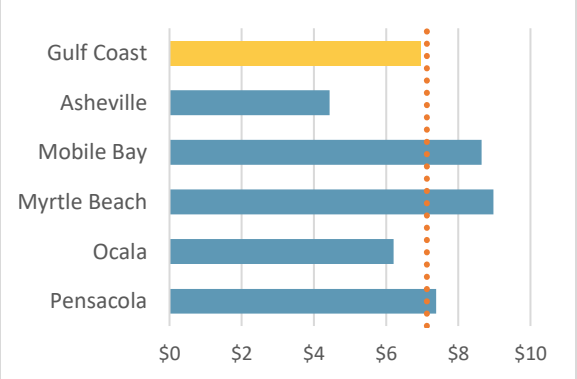
Operating Expense per Vehicle Revenue Hour





Operating Expense per Passenger Trip

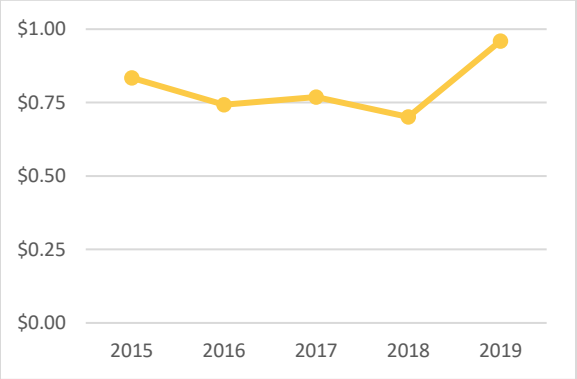


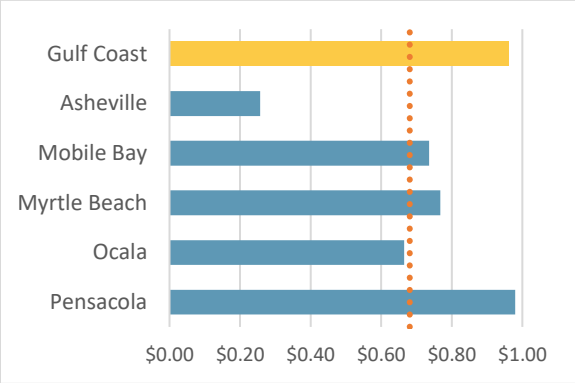


Peer Average

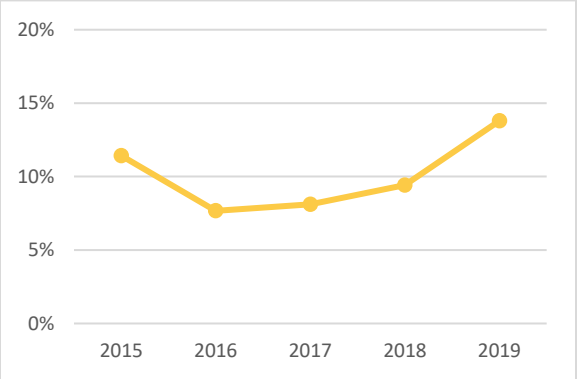
Farebox Indicators

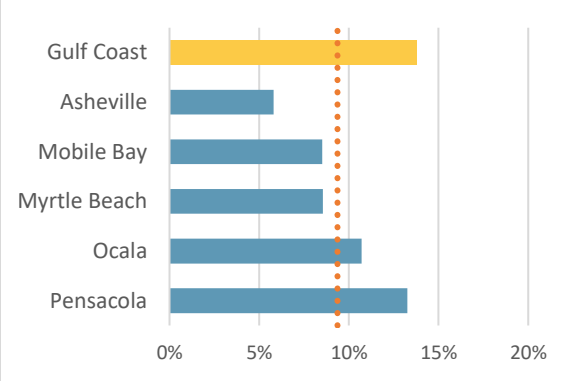
Average Fare





Farebox Recovery Rate





Peer Average

Fixed Route Peer Comparison Analysis

The charts on the previous pages provide 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."

3.2 Existing Demand Response Performance

Key Performance Indicators

Three key performance indicators are shown for the last five years in the charts below. These indicators show stable ridership before COVID-19. However, they do show a long-term slight downward trend in the level of service as measured in vehicle revenue miles and hours, even before COVID-19.

Figure 3.8: Demand Response Ridership, FY2016-20

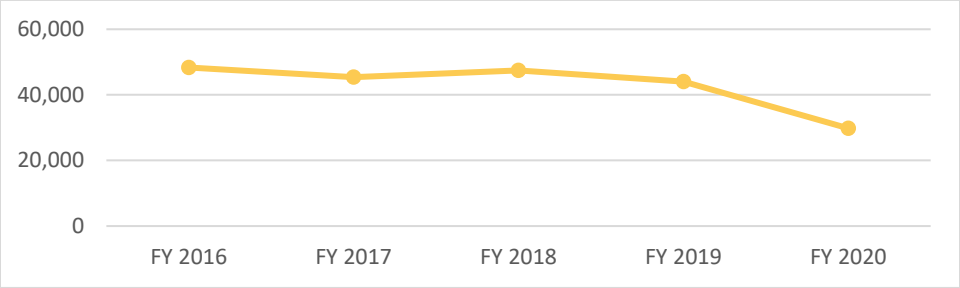


Figure 3.9: Demand Response Vehicle Revenue Miles, FY2016-20

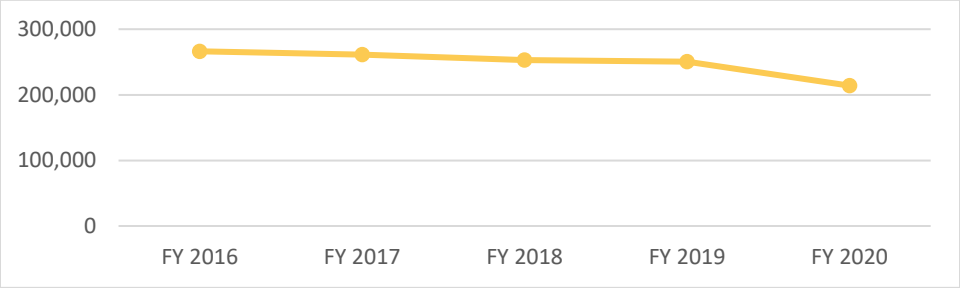


Figure 3.10: Demand Response Vehicle Revenue Hours, FY2016-20

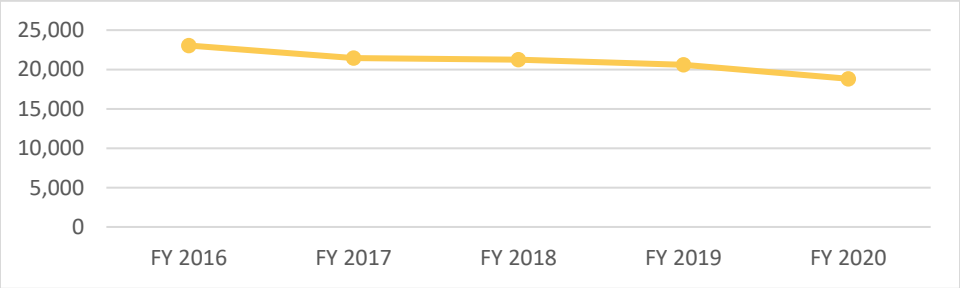
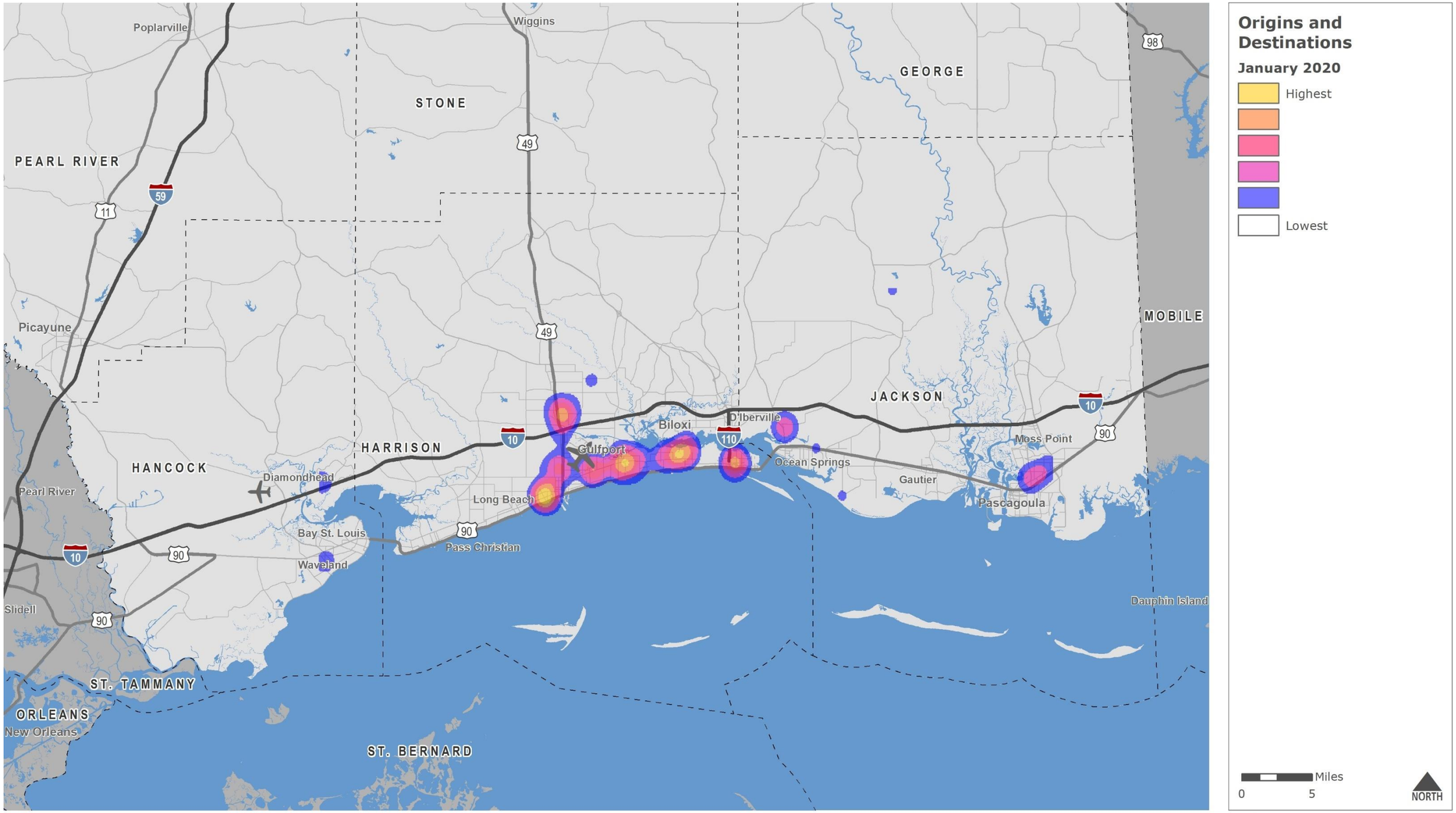


Figure 3.11: Demand Response Ridership Hotspots, Pre-COVID



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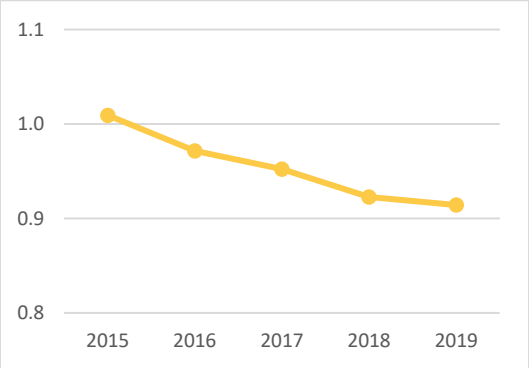
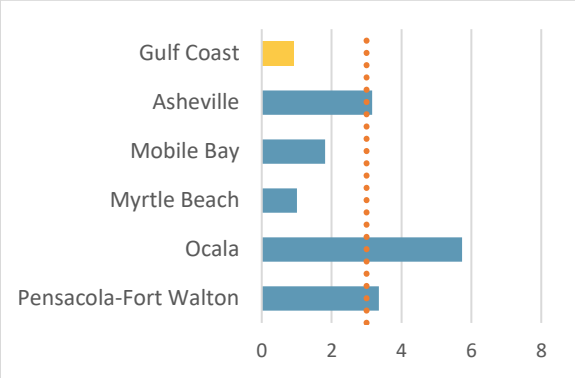
Vehicles Operated in Maximum	32	25	10	43	63	35	15
Vehicle Revenue Miles	929,934	716,910	251,967	959,312	1,909,421	953,509	250,588
Vehicle Revenue Hours	51,342	47,570	14,273	62,812	129,443	61,088	20,592
Boardings	118,787	88,149	16,338	103,097	188,644	103,003	43,990
Fare Revenue	$853,503	$205,127	$45,332	$132,462	$807,792	408,843	$29,424
Annual Operating Expense	$2,912,603	$2,838,582	$1,060,370	$3,162,213	$5,700,112	3,134,776	$1,465,80
Level of Service							
Vehicle Revenue Miles per Capita	3.2	1.8	1.0	5.7	3.4	3.0	0.9
Vehicle Revenue Hours per Capita	0.2	0.1	0.1	0.4	0.2	0	0.1
Productivity							
Boardings per Revenue Mile	0.1	0.1	0.1	0.1	0.1	0	0.2
Boardings per Revenue Hour	2.3	1.9	1.1	1.6	1.5	2.0	2.1
Boardings per Capita	0.4	0.2	0.1	0.6	0.3	0	0.2
Cost Efficiency							
Operating Expense per Vehicle	$3.13	$3.96	$4.21	$3.30	$2.99	$3.52	$5.85
Operating Expense per Vehicle	$56.73	$59.67	$74.29	$50.34	$44.04	$57.01	$71.18
Operating Expense per Boarding	$24.52	$32.20	$64.90	$30.67	$30.22	$36.50	$33.32
Farebox							
Average Fare	$7.19	$2.33	$2.77	$1.28	$4.28	$3.57	$0.67
Farebox Recovery Rate	29.3%	7.2%	4.3%	4.2%	14.2%	11.8%	2.0%

Source: National Transit Database

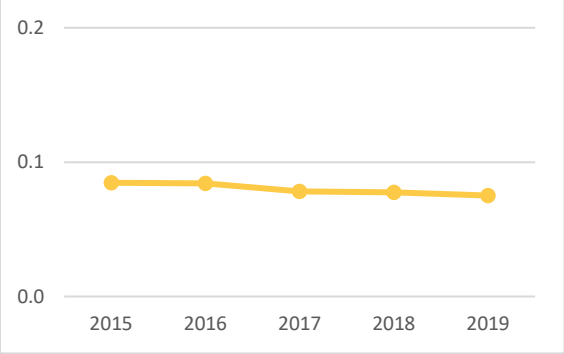
Level of Service Indicators

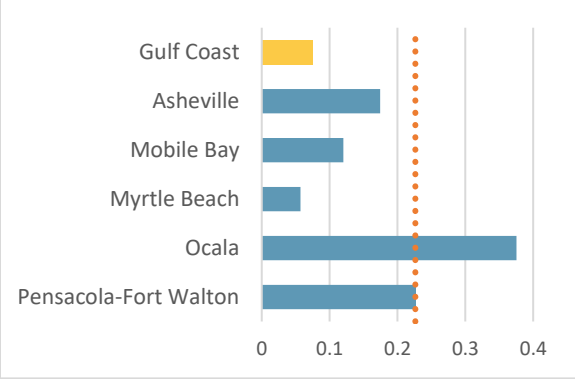
Vehicle Revenue Miles per Capita





Vehicle Revenue Hours per Capita

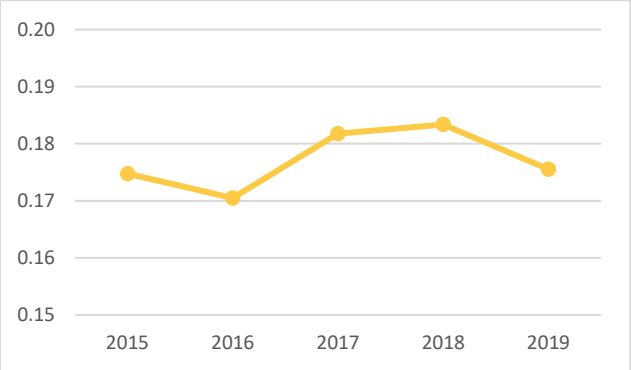


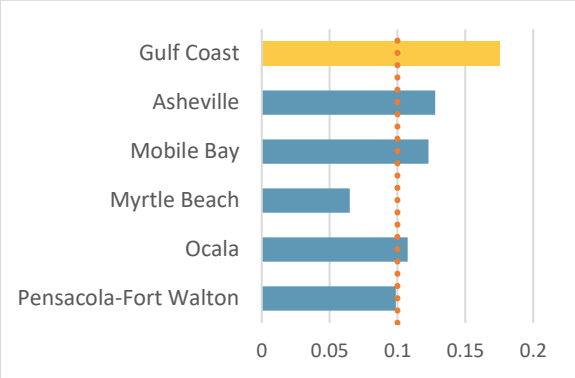


Peer Average

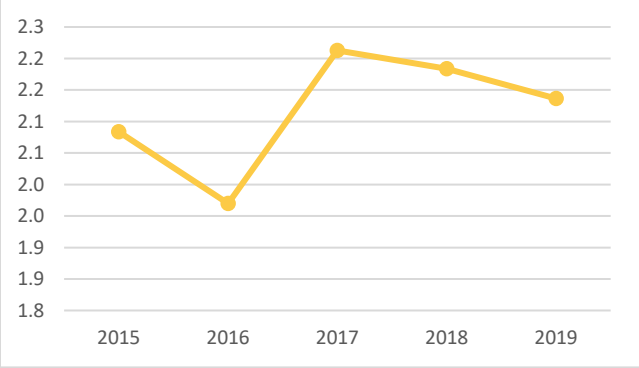
Productivity Indicators

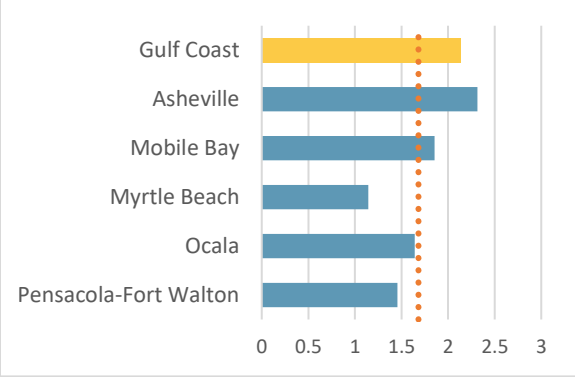
Boardings per Revenue Mile



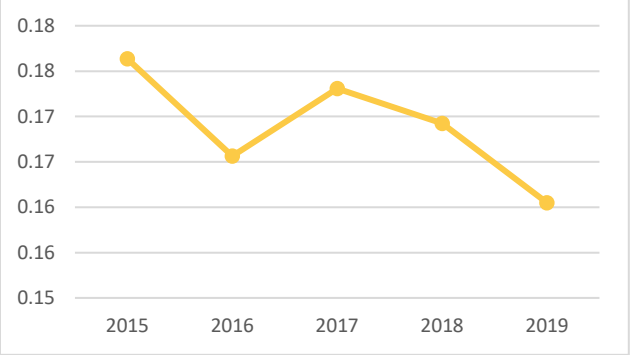


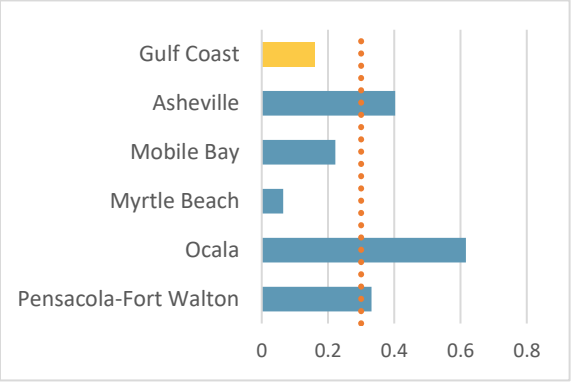
Boardings per Revenue Hour





Boardings per Capita

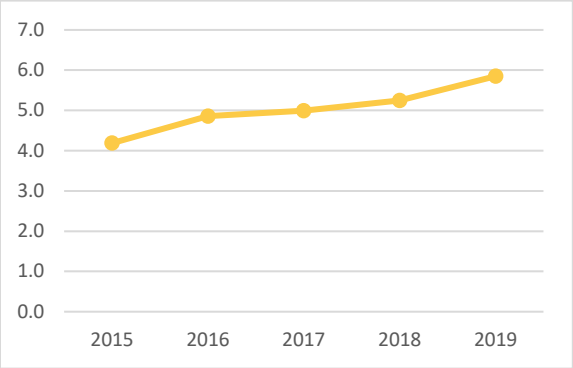


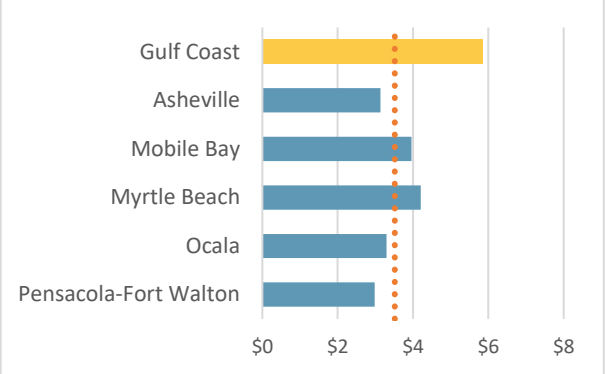


Peer Average

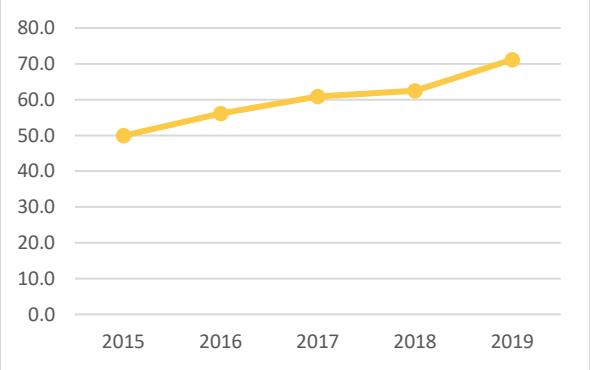
Cost Efficiency Indicators

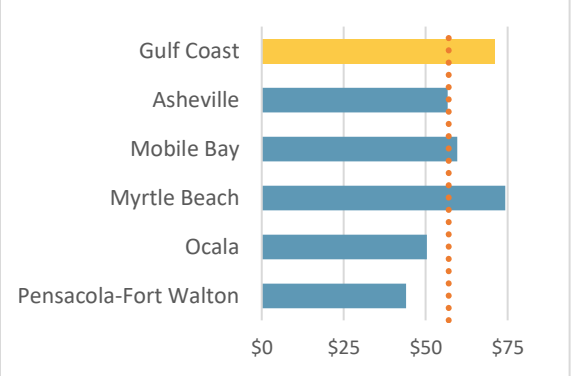
Operating Expense per Vehicle Revenue Mile



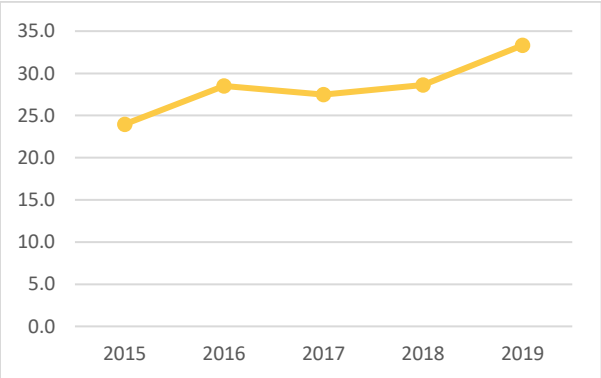


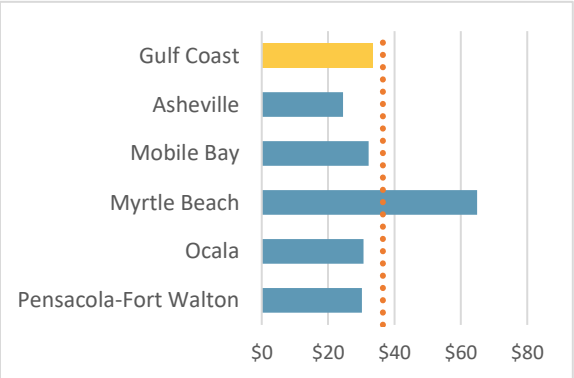
Operating Expense per Vehicle Revenue Hour





Operating Expense per Passenger Trip

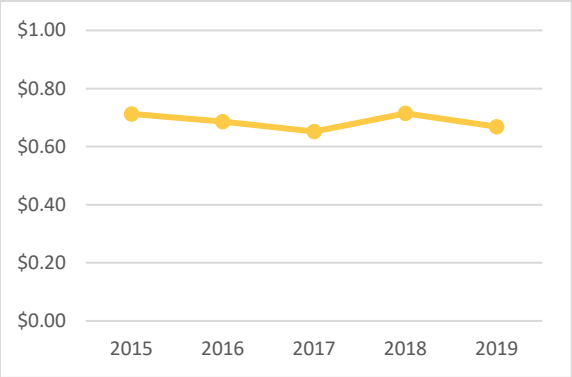


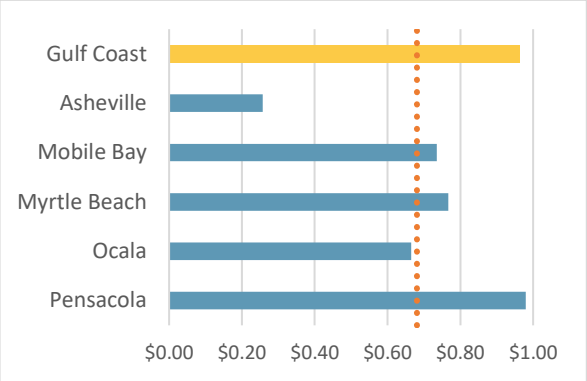


Peer Average

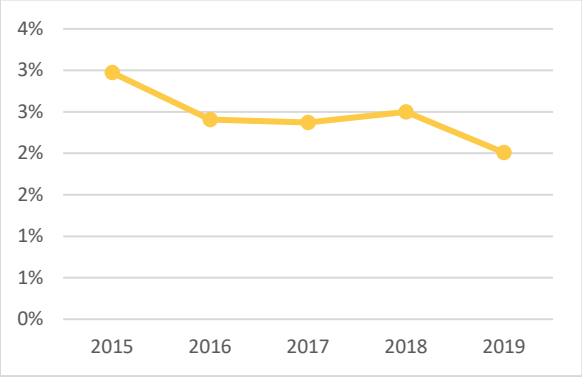
Farebox Indicators

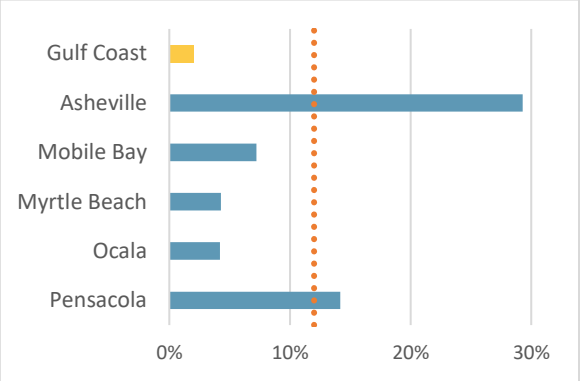
Average Fare





Farebox Recovery Rate





Peer Average

Peer Comparison Analysis

The tables on the previous pages provide relevant transit operations information for paratransit services operating in the selected peer regions. The following trends can be gleaned from this information:

Transit System Size

- CTA provides less demand service than most peers. It provides service comparable to the Myrtle Beach region.

Productivity

- CTA's productivity is in line with peers, performing slightly above the average.
- CTA's boardings per capita are below the peer average.

Cost Efficiency

- CTA's operating cost per mile and per vehicle is slightly higher relative to peers.
- CTA's operating cost per boarding is below peers.

Farebox recovery

- CTA's average fare is the lowest of the peer group, falling almost $3.00 below the peer average.
- CTA's farebox recovery rate, or the share of operating costs covered by fares, is also the lowest of the peer group.

Overall, CTA operates a smaller system than peers but at about average productivity. The cost efficiency is slightly higher than peers and its farebox recovery is well below that of peers.

3.3 Existing Vanpooling Performance

Key Performance Indicators

Three key performance indicators are shown for the last five years in the charts below. These indicators show stable ridership before COVID-19. However, they do show a long-term slight downward trend in the level of service as measured in vehicle revenue miles and hours, even before COVID-19.

Figure 3.12: Vanpooling Ridership, FY2016-20

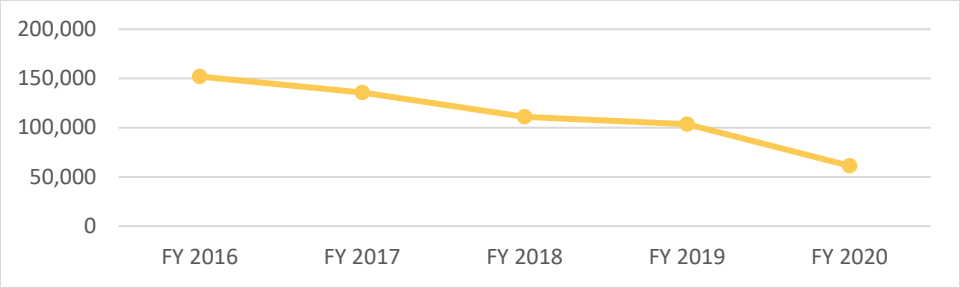


Figure 3.13: Vanpooling Vehicle Revenue Miles, FY2016-20

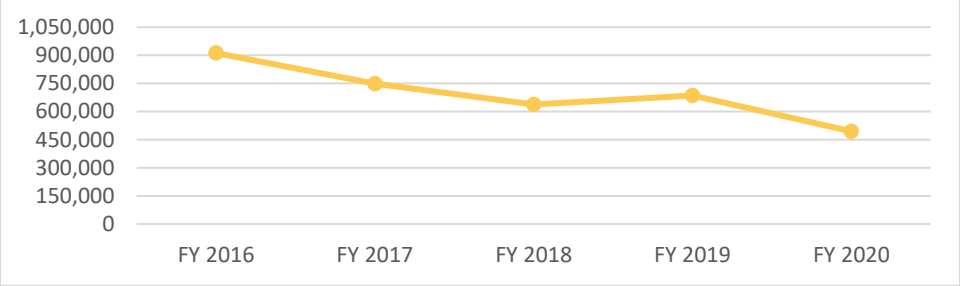
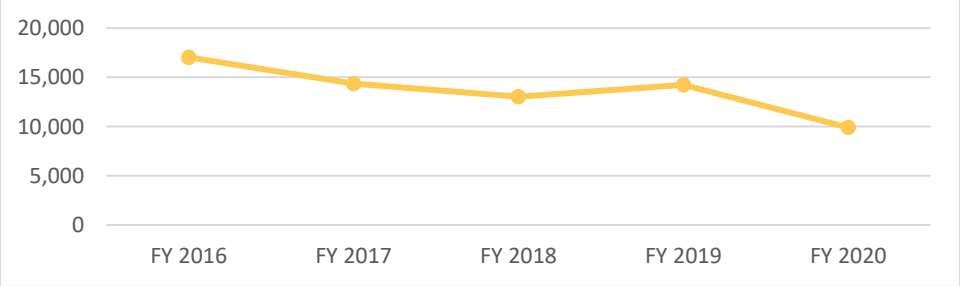


Figure 3.14: Vanpooling Vehicle Revenue Hours, FY2016-20



3.4 Existing Market and Gap Analysis

Transit Demand Analysis

Methodology

The regional demand analysis uses a GIS-based approach to identify the level of transit service supported throughout the Mississippi Gulf Coast. There are a number of factors that can be analyzed to evaluate and predict transit demand in an area. Given the availability of data, 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 3.9 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.

Figures 3.15-3.17 illustrate the results of this analysis and the distribution of transit demand throughout the region. Based upon these maps, there are several areas within the Mississippi Gulf Coast 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 3.9: 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 3.18 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 3.19 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.

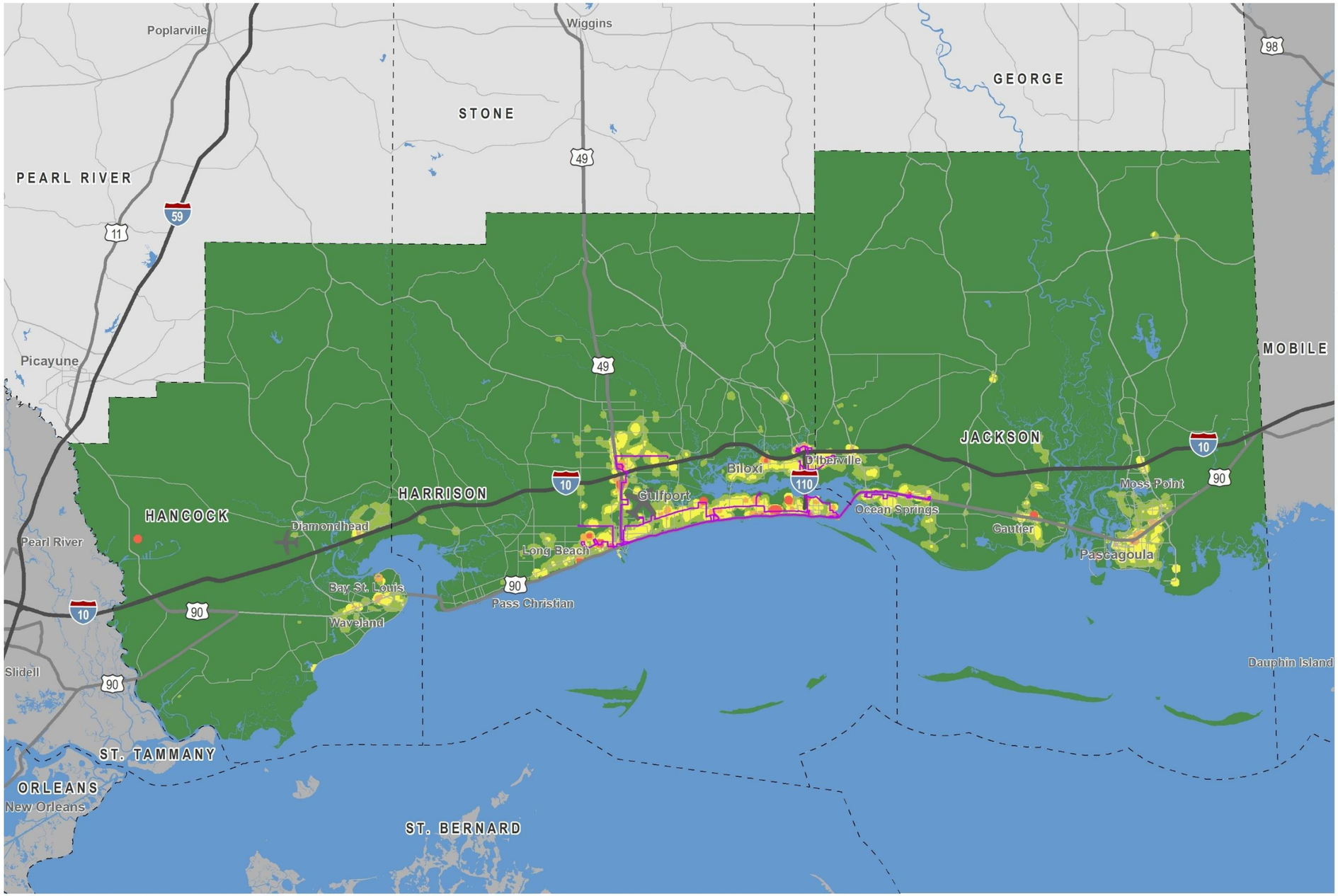
Figure 3.20 shows the concentration of households that include people with disabilities. These households rely on transit because of physical or mental limitations. The highest concentrations for households including people with disabilities is very similar to the concentration of low-income households but is slightly more expansive - spreading into more suburban areas.

Figure 3.21 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.

Travel Flows

In addition to identifying the concentration of high demand areas, travel flows should also be considered when assessing transit demand. Travel flows, which represent the "route" between trip origins and destinations, can help determine where transit should prioritize direct service or easy connections. Figure 3.22 shows travel flows between Traffic Analysis Districts in the region, for all trip purposes (e.g. work, shopping, school, etc.) and modes of transportation (driving, carpooling, transit, etc.).

Figure 3.15: Regional Transit Demand Analysis



Transit Demand

Transit Frequency Supported

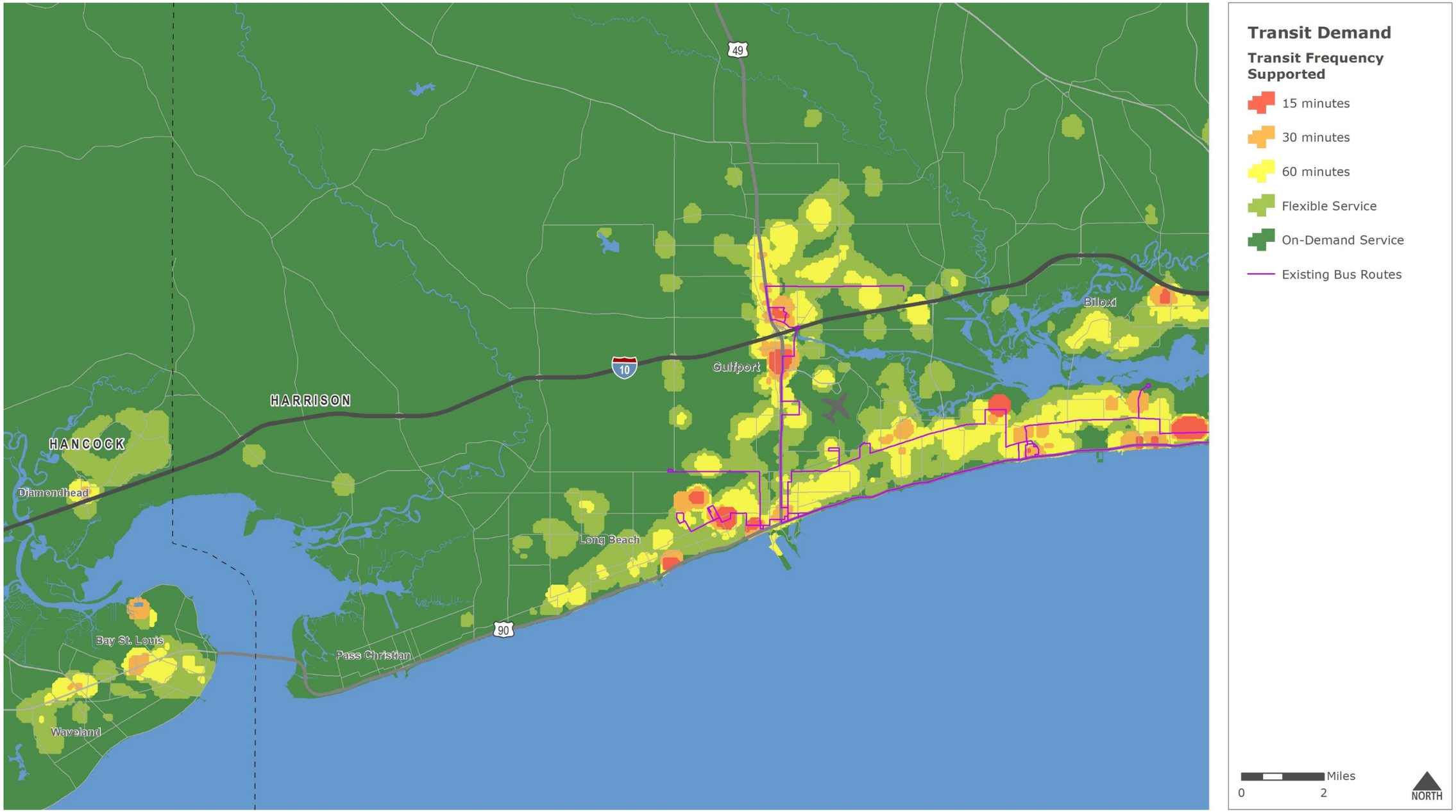
- 15 minutes
- 30 minutes
- 60 minutes
- Flexible Service
- On-Demand Service
- Existing Bus Routes

Miles
0 5
NORTH

Data Sources: Neel-Schaffer

Disclaimer: This map is for planning purposes only.

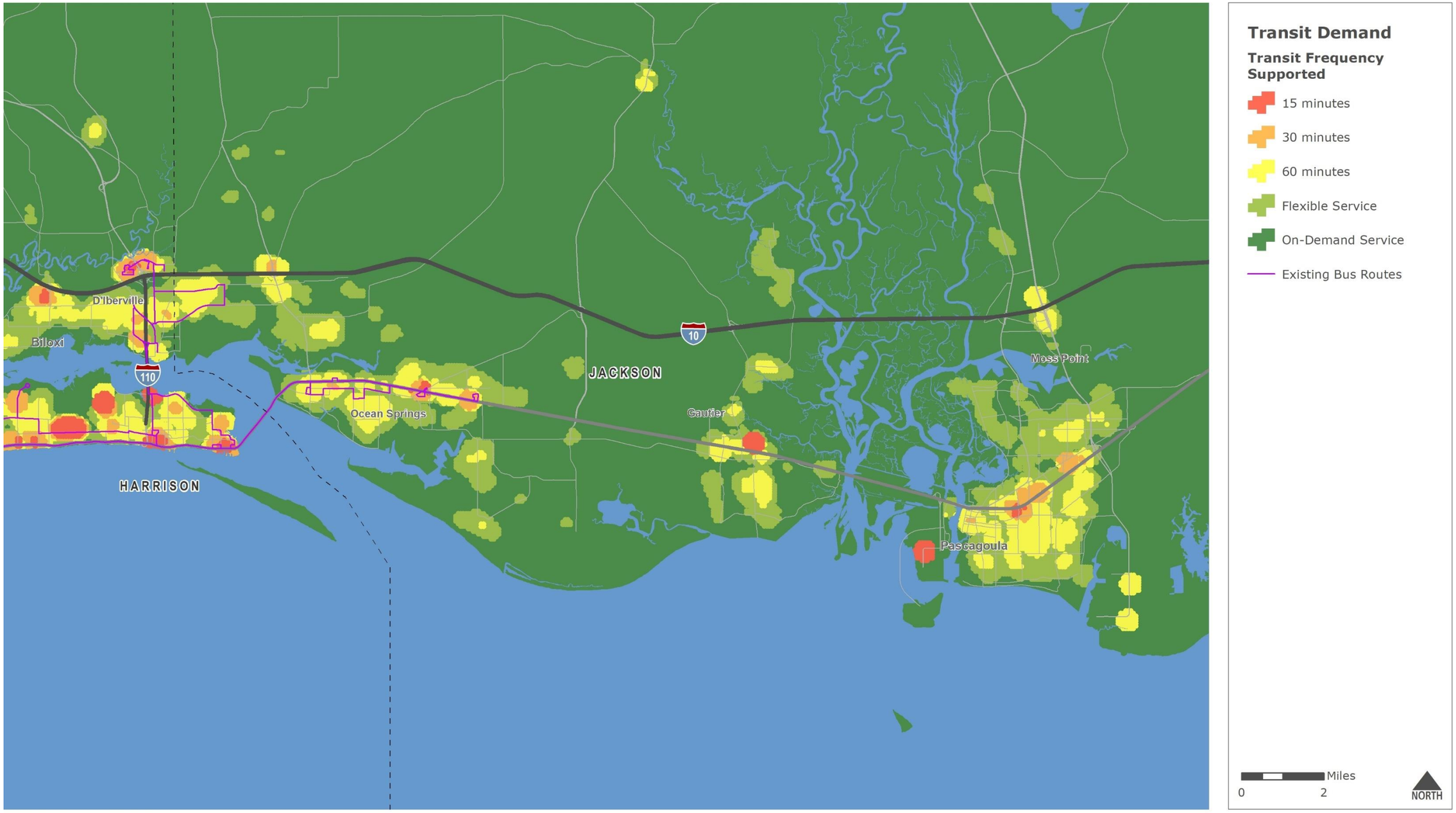
Figure 3.16 (zoom west): Regional Transit Demand Analysis



Data Sources: Neel-Schaffer

Disclaimer: This map is for planning purposes only.

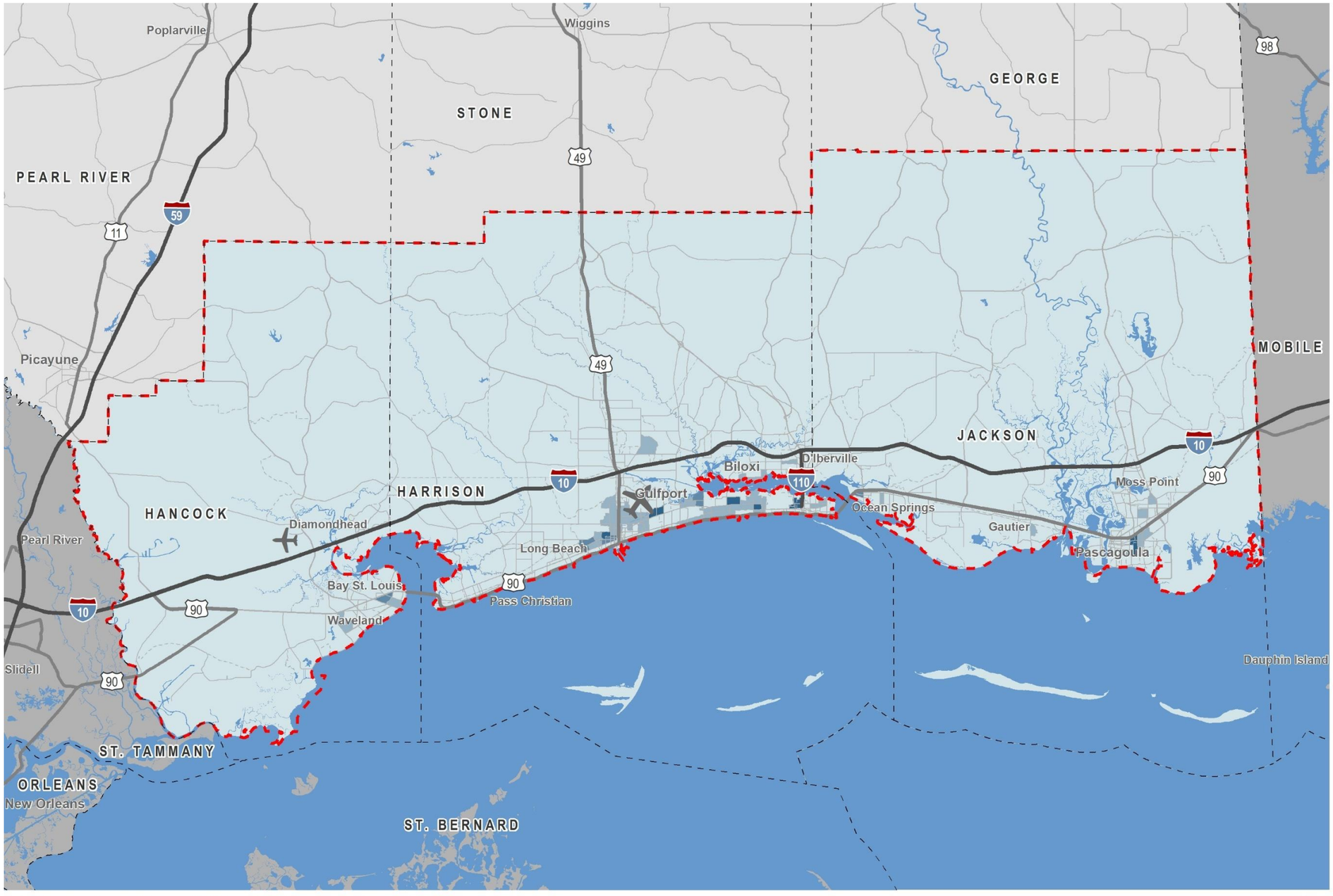
Figure 3.17 (zoom east): Regional Transit Demand Analysis



Data Sources: Neel-Schaffer

Disclaimer: This map is for planning purposes only.

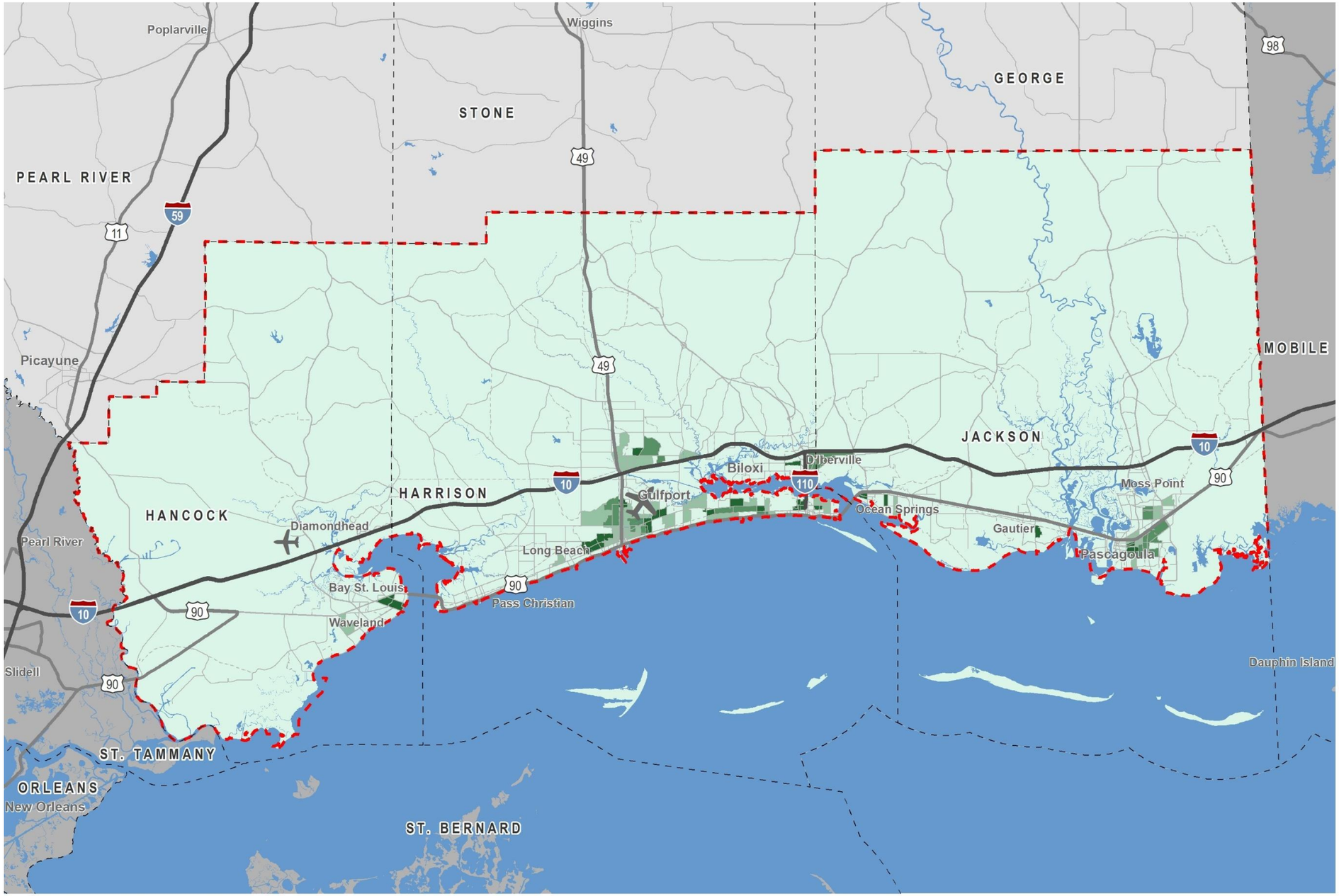
Figure 3.18: Concentration of Households with No Vehicle



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

Disclaimer: This map is for planning purposes only.

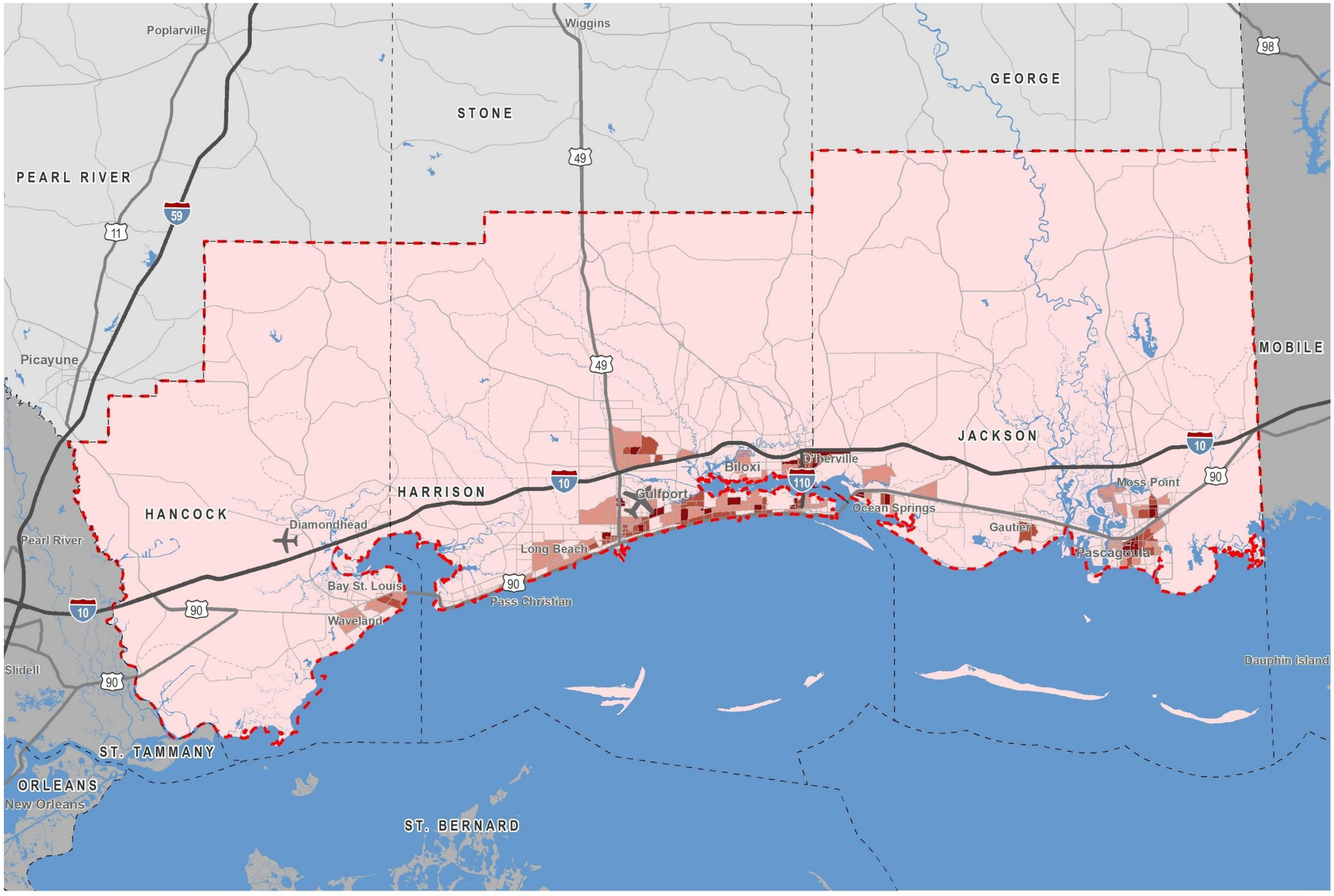
Figure 3.19: Concentration of Low-Income Households



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

Disclaimer: This map is for planning purposes only.

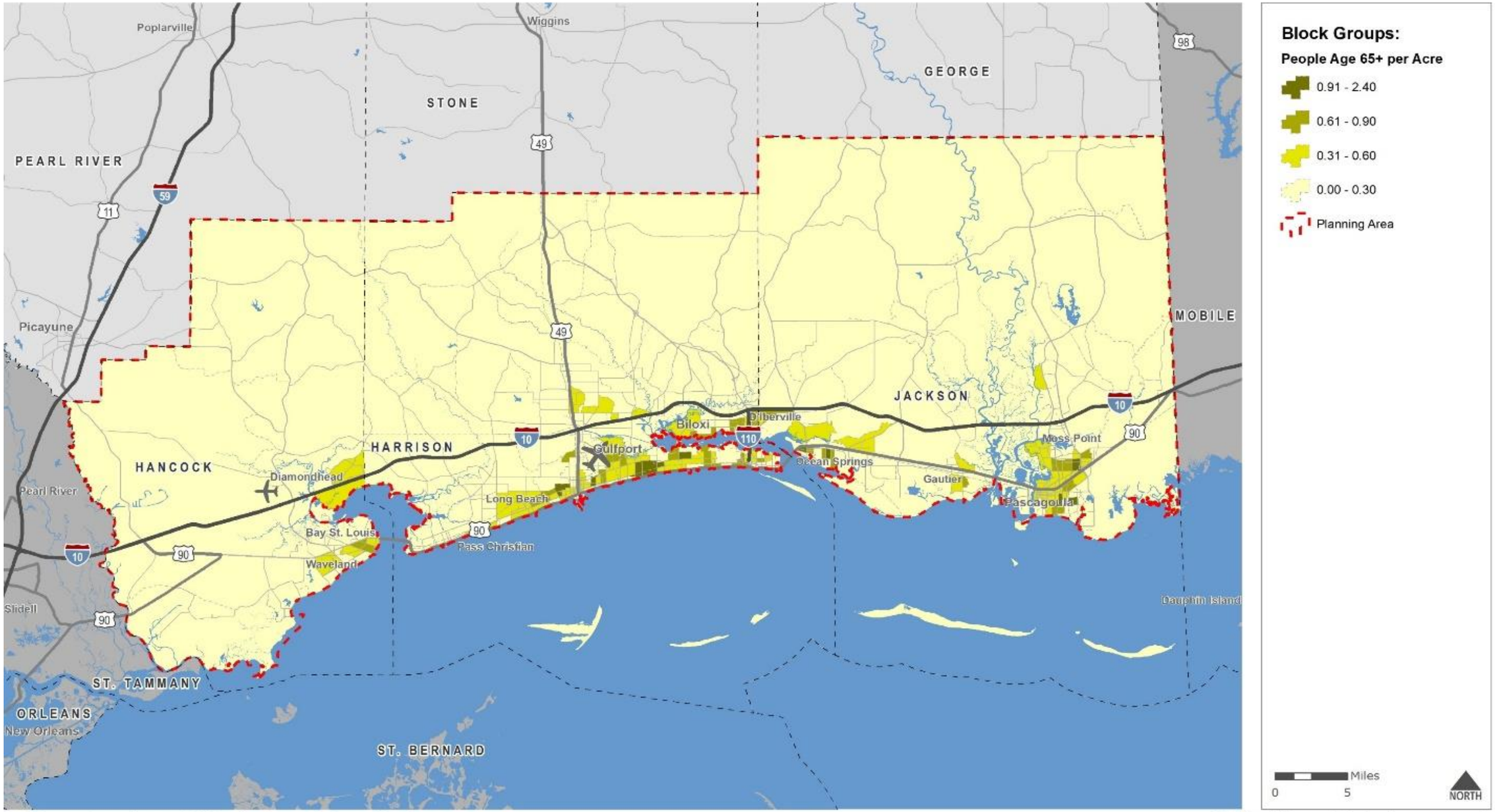
Figure 3.20: Concentrations of People with Disabilities



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

Disclaimer: This map is for planning purposes only.

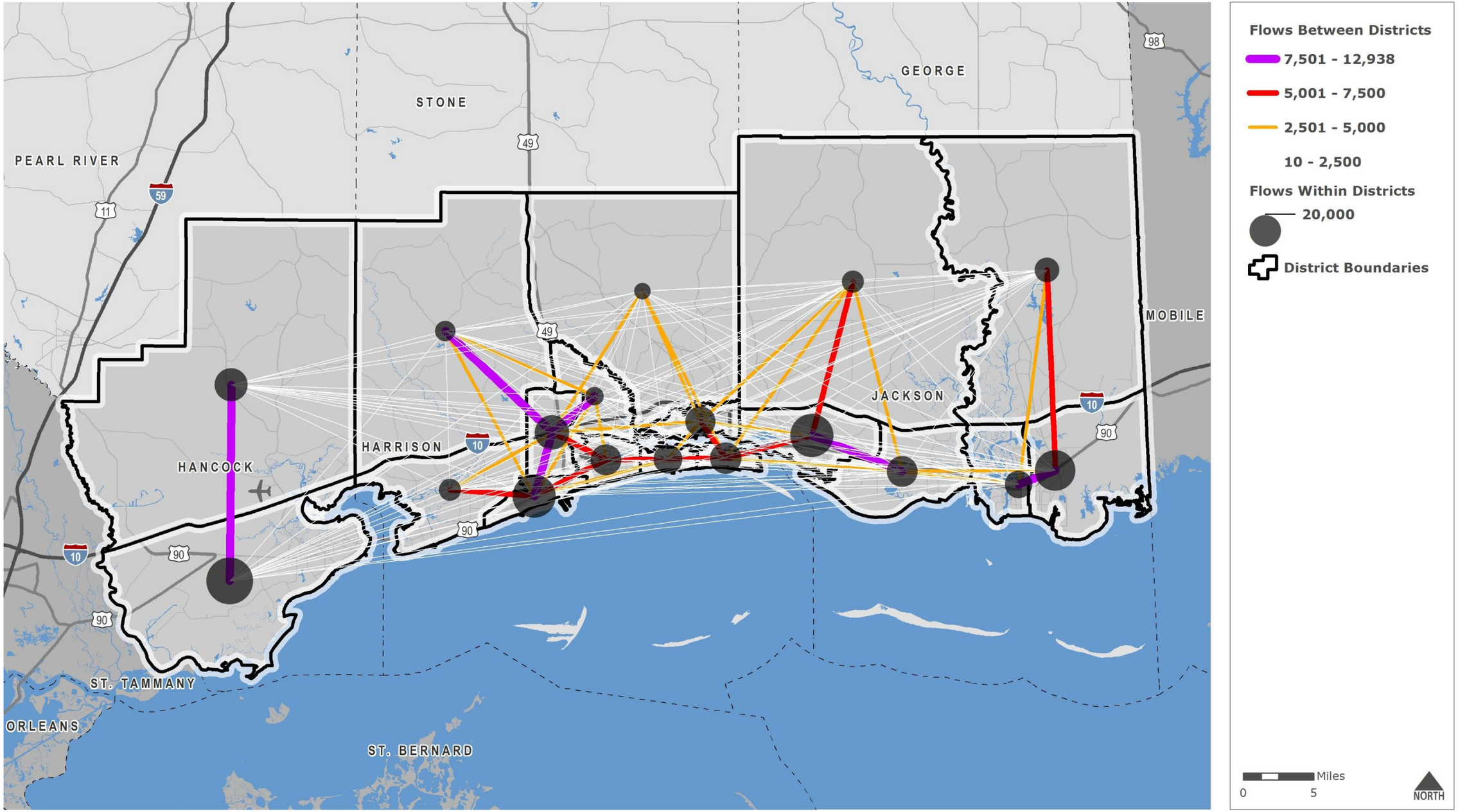
Figure 3.21: Concentrations of Senior Population



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

Disclaimer: This map is for planning purposes only.

Figure 3.22: Regional Travel Flows by District



Data Sources: Neel-Schaffer

Disclaimer: This map is for planning purposes only.

Gaps

Based on existing demand and travel flows, the existing transit system provided by Coast Transit Authority (CTA) covers many of the needs in the central part of the region and provides service in a hub-and-spoke system that mirrors overall travel flows in the region. However, the following high-level unmet needs still emerge:

- There is a high unmet need for fixed route public transit in the Pascagoula/Moss Point area. Travel flows suggest the highest need is for locally-oriented service, but there is also a need for connections to the core of the region (Biloxi/Gulfport).
- There is some unmet need for fixed route public transit in the Bay St. Louis area. Travel flows suggest that this is primarily for locally-oriented service, with little demand for connections to the core of the region (Biloxi/Gulfport).
- There are also other areas without fixed route transit service that could support some level of fixed route service. These areas include: northern Orange Grove, Long Beach, Gautier, and the Pass Road corridor.
- For regional transit service, the highest demand parallels the US 90 corridor from Long Beach to Pascagoula.

3.5 Planning for the Future

Future conditions must also be considered when planning for transit. This section considers forecasted growth in the region, existing plans and studies for transit, trends that affect transit, and the input gathered from the public and stakeholders.

Growth Areas

Figure 3.23 highlights areas forecasted to experience high rates of population and/or employment growth over the next 25 years. The following areas stand out for increased growth:

Bay St. Louis,

Along US-90 in Harrison County and in Ocean Springs

northern Gulfport,

Biloxi and D'Iberville along I-10 and I-110,

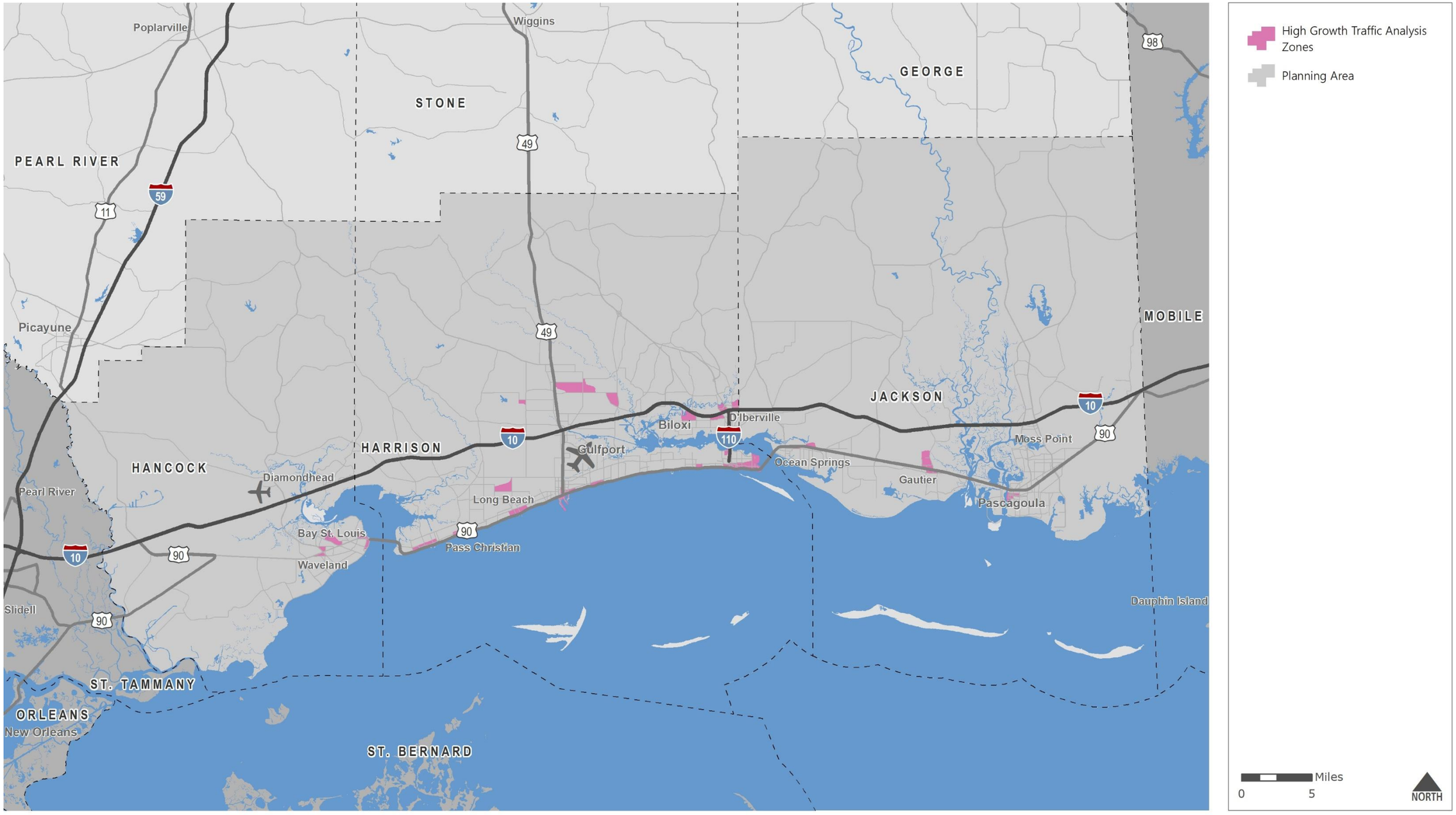
Downtown Biloxi,

Gautier by US-90,

and downtown Pascagoula by US-90.

These areas of higher forecasted growth are likely to experience a higher demand for transit. Areas that already have fixed route service like Biloxi may be able to support increased service. However, many of the higher forecasted growth areas lack fixed route service. Figure 3.23 suggests that there will be increased future demand for transit along the US-90 corridor from Bay St. Louis to Pascagoula.

Figure 3.23: Future High Growth Areas



Data Sources: Neel-Schaffer

Disclaimer: This map is for planning purposes only.

Existing Plans and Studies

Coordinated Public Human Service Transportation Plan (2016)

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.

The East West Multimodal Corridor Plan

This project is a proposed new 12.6-mile parkway that would parallel an existing railroad corridor between Gulfport and Biloxi. It is envisioned as a multimodal corridor, including a new shared use path and rapid transit, as well as a catalyst for new development in targeted areas.

The purpose of this project is to:

- provide an interconnected multimodal corridor to accommodate automobiles, transit, bicycles, pedestrians and light rail (future)
- grow economic development opportunities by supporting community revitalization and attracting new opportunities
- improve Harrison County emergency/disaster response and recovery operations
- improve mobility and access to employment, education, and healthcare.

Planners envision this project addressing the needs to:

- disperse traffic congestion with interconnected roadway network
- support regional economic development; sustain area population and job growth
- improve safety and emergency response operations.

Restoration of Gulf Coast Passenger Rail

There are plans to restore passenger rail service between New Orleans and Mobile along the former Sunset Limited Amtrak route. This service could begin operation in 2022 with local stops in Bay St. Louis, Gulfport, Biloxi, and Pascagoula.

Emerging Trends

Resiliency

In the context of this plan, "resilience" is the ability of transportation systems to withstand or recover from extreme or changing conditions and continue to provide reliable mobility and accessibility. The impacts of weather, natural disasters, disease, or man-made events need to be considered in resiliency.

Pandemic Planning and Response

The COVID-19 pandemic has shown both the difficulty of operating transit during a pandemic and the importance of continuing service for frontline workers and others who need lifeline services. CTA should reflect on its successes and challenges during the COVID-19 pandemic and create a plan for how to continue providing safe service and timely communication for drivers and passengers in the event of another pandemic.

Emergency Evacuation

The Mississippi Gulf Coast is susceptible to weather events and natural disasters like floods, hurricanes, high winds, and temperature extremes. Ensuring resiliency for transit involves understanding hazards and identifying mitigation strategies. CTA should consider how to strengthen their services to supply service through critical events, or how to communicate with passengers in the event that providing transit is unsafe.

Resiliency aims to provide as much service and the safest service possible during adverse conditions. While physical resiliency is critical, extreme events also decrease ridership, especially among tourists and visitors. A resilient system also considers diverse funding sources in the event that fare revenue decreases.

Microtransit

Microtransit is an evolving service that uses the technology of real-time booking and programming to provide shared transportation with highly flexible routes. The definition of microtransit and the types of service broadly vary, but most are similar in expanding the reach of transit and providing first and last mile connections. The technological elements of real-time and flexible booking often appeal to riders who wish to book rides on short-notice and spend little time waiting for service.

While many microtransit services are privately run, partnering with them rather than competing could be a great way to help riders complete the first or last mile connection, especially in a large region like the Mississippi Gulf Coast that has many low density areas.

Mobility as a Service (MaaS)

Mobility as a Service (MaaS) has several definitions, but is most commonly understood as the integration of mobility options, both public and private, into one digital platform. This allows a user to plan, schedule, and pay for different mobility options in one location. These mobility options usually have public transit as the backbone but can include bikesharing, scooter sharing, carsharing, microtransit, or Transportation Network Companies (TNCs) like Uber or Lyft.

The increasingly diverse transportation options allow people to have more choice in how they want to travel. While in the past people may have consistently taken one mode, they are more likely now to choose different modes based on the price, time, and the passenger's comfort. MaaS benefits passengers by allowing them to see their different options in one place and select the mode best suited for them.

Not only can MaaS help passengers choose the best mode, but it can help link modes to create the best transportation option. Each mode has its advantage (i.e. coverage, frequency, speed), and linking modes can help a passenger take benefit from the best of each mode. In recent years, some transit agencies have been working with MaaS partners to fill in first or last mile gaps.

MaaS is a concept that differs for various providers, but the following elements of MaaS are most relevant to CTA: planning and tracking, payment, and integration.

Electric and Alternative Fuels for Transit Fleets

There has been growing interest and investment in alternative fuel vehicle technologies in recent years, especially for electric vehicles. This renewed interest has also included the transit and freight industries.

Alternative Fuel Vehicles (AFVs) are defined as vehicles that are substantially non-petroleum, yielding high-energy security and environmental benefits. Projections for the increase of AFVs vary and depend on federal policies and corporate initiatives, ranging from a projection of 7 percent of electric vehicles comprising the American

In the United States, electric buses are becoming more common as transit agencies pursue long-term operations and maintenance savings. Electric buses also have the environmental and rider benefits of less air and noise pollution. While increasing the electric bus fleet has many challenges, upfront costs (including infrastructure for charging) are anticipated to go down and utilization is likely to become more widespread. By 2030, it is anticipated that between 25 percent and 60 percent of new transit vehicles purchased will be electric.[1]

Connected and Autonomous Vehicles (CAV)

Today, most newer vehicles have some elements of both connected and autonomous vehicle technologies. These technologies are advancing rapidly and becoming more common. Connected vehicles use various communication technologies to exchange information with others like cars and roadside infrastructure. Autonomous vehicles are different in that the operation of the vehicle occurs with limited, if any, direct driver input.

CAV technology has the potential to drastically reduce the cost of operating transit in environments that are safe for autonomous transit. For many agencies, labor is their highest operating expense. While not all routes may be appropriate for autonomous transit, there may be opportunities to create dedicated lanes and infrastructure for autonomous transit and other vehicles. Even with some lines operating autonomously, costs can be lowered, and these savings can be used to increase and improve service.

From a reliability standpoint, connected vehicle technology can also improve on-time performance and travel times through applications like Transit Signal Priority (TSP) and dynamic dispatching. TSP is an application that provides priority to transit at signalized intersections and along arterial corridors. Dispatching and scheduling could be improved with dynamic, real-time information that more effectively and efficiently matches resources to demand.

Even with the potential improvements to transit operations, transit ridership could decrease if transportation network companies (e.g. Uber/Lyft) become competitively priced. This could be possible if autonomy allows these private transportation providers to eliminate drivers and reduce their operating costs.

Changing Demographics and Travel Behavior

People are Driving Less

Except for people over age 65, all age groups are making fewer trips per day. There are many factors driving this trend, including less face-to-face socializing, online shopping, and working from home. It is unclear how this will affect transit. Some possibilities to consider are: an increase in delivery vehicles on local streets that compete with transit for shoulder and road space; a decrease in ridership if people are

[1] https://www.reuters.com/article/us-transportation-buses-electric-analysi/u-s-transit-agencies-cautious-on-electric-buses-despite-bold-forecasts-idUSKBN1E60GS

travelling less; or, alternatively, an increase in ridership if people are travelling less overall and so choose to have less vehicles per household.

Aging Population

The population aged 65 or older will grow rapidly over the next 25 years, nearly doubling from 2012 to 2050.[2] This growth will increase the demand for alternatives to driving, especially for public transportation for people with limited mobility or disabilities.

[2] https://www.census.gov/data/tables/2017/demo/popproj/2017-summary-tables.html

3.6 Public and Stakeholder Input

Input was gathered in spring 2019 from regional stakeholders and the public while the Gulf Regional Planning Commission was undergoing its long-range plan updates. The project team engaged with over 250 people across the region to learn their transportation priorities and ideas for improvements in the region. The input gathered was used to identify key needs and potential projects.

Table 3.10: Outreach Statistics

Activity	County	People Engaged	Totals
Stakeholder Meetings	Hancock	14	54
	Harrison	25	
	Jackson	15	
Public Meetings	Hancock	16	70
	Harrison	20	
	Jackson	34	
Online Surveys			131
Total			**255**

Stakeholder Engagement

A stakeholder meeting was held in each county to hear input from stakeholders representing a variety of fields such as local government, major industries, or community organizations.

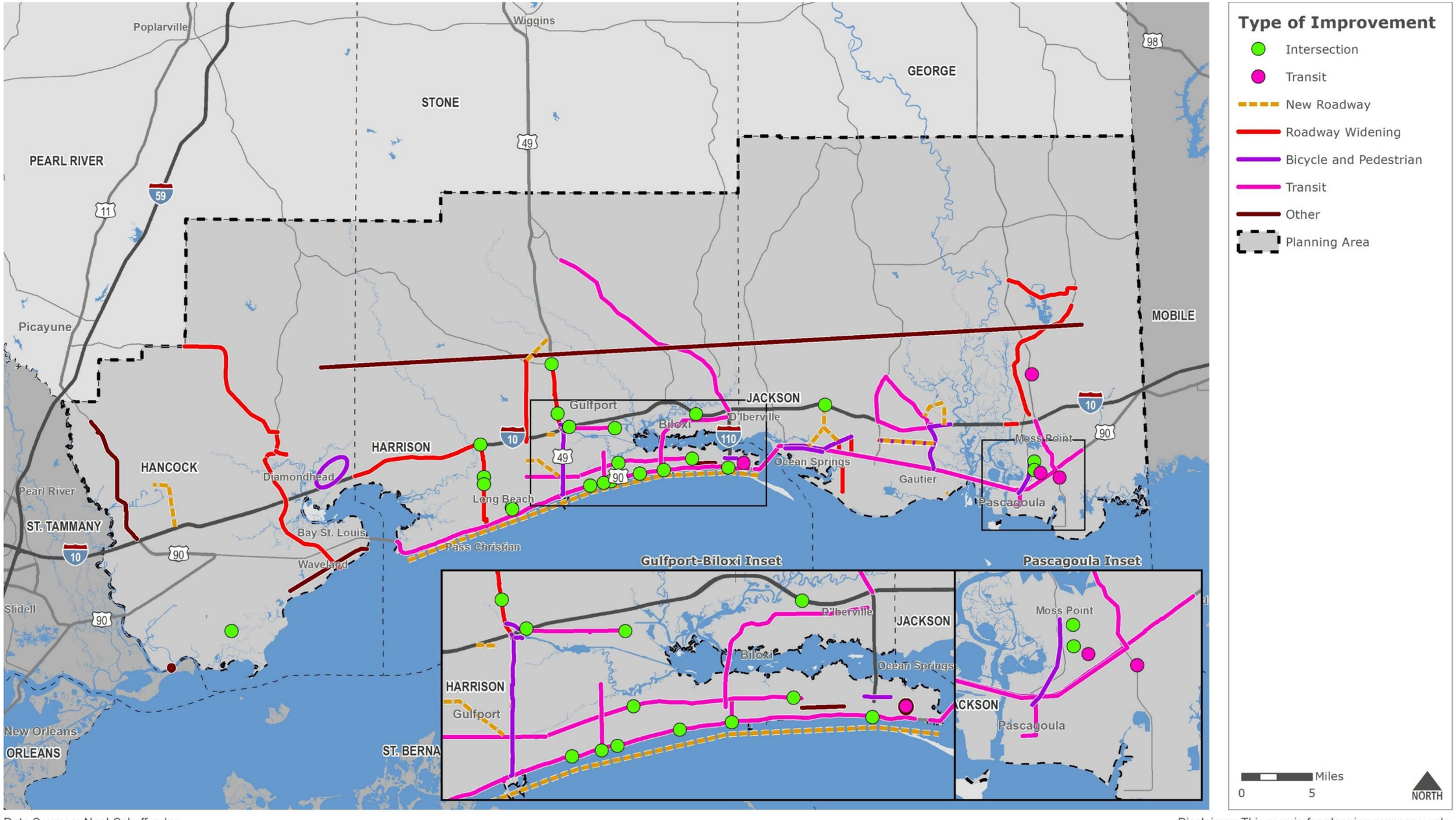
> Fifteen stakeholders attended the meeting in Jackson County held on March 12, 2019 from 1 P.M. to 3 P.M. at the Jackson County Administration Building in Pascagoula.
>
> Fourteen stakeholders attended the meeting in Hancock County held at the Bay St. Louis Community Hall on March 13, 2019 from 4 P.M.to 6 P.M.
>
> Twenty-five stakeholders attended the meeting in Harrison County held on March 14, 2019 from 1 P.M. to 3 P.M. at the Innovation Center in Biloxi.

Attendees participated in two mapping activities and one poll. Attendees also participated in digital poll that asked six questions about transportation priorities and concerns and two mapping activities.

Members of the MPO's policy and technical committees were also consulted at their regular meetings.

At the meetings, stakeholders were asked to draw their ideas for transportation improvement on a map. Figure 3.24 displays this input. Transit, shown in pink, was one of the most popular modes mentioned. Participants would like to see increased regional transit spanning Harrison and Jackson counties, especially along the US-90 corridor.

Figure 3.24: Big Ideas for Transportation Improvement from Stakeholders



Data Sources: Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

Public Engagement

A public meeting was held in all three counties to gather input from the community.

Thirty-four people attended the meeting In Jackson County held on March 12, 2019 from 4 P.M. to 6 P.M. at the Jackson County Administration Building in Pascagoula.

Sixteen people attended the meeting in Hancock County held at the Bay St. Louis Community Hall on March 13, 2019 from 4 P.M. to 6 P.M.

Twenty people attended the meeting in Harrison County held on March 14, 2019 from 4 P.M. to 6 P.M. at the MPO Office at 1635 Popp's Ferry Road in Biloxi.

Attendees ranked transportation priorities, designed a transportation budget, and mapped their big ideas for improving transportation.

A survey was available at the in-person meetings and also online from March 21 to May 2, 2019. During that period, thirty people answered the survey at the meetings and 131 people answered the survey online. Of the 161 total people who answered the survey, two-thirds identified as general public and one-third as a stakeholder. The survey questions mirrored the activities at the public meetings. Results from the meetings and surveys are displayed below.

Public Priorities Exercise

Participants were asked to independently rank six transportation priorities from 1 to 5, with 1 being least important and 5 being most important. Transit was ranked as a medium priority.

Figure 3.25 Average Priority Ranking

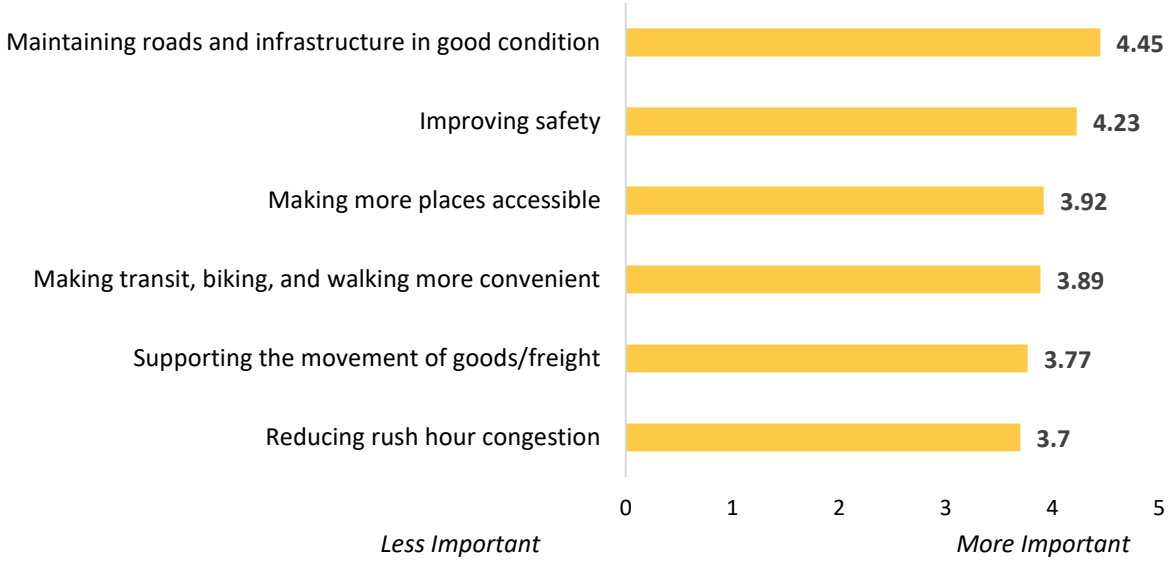


Table 3.11: Votes per Transportation Priority

Priority	1 – Least Important	2	3	4	5 – Most Important
Maintaining roads and infrastructure in good condition	1	1	3	12	97
Improving safety	1	4	6	18	81
Making more places accessible	1	10	12	22	67
Making transit, biking, and walking more convenient	1	11	10	26	65
Supporting the movement of goods/freight	1	8	12	37	52
Reducing rush hour congestion	2	16	11	30	60

Public Budget Allocation Exercise

Participants were asked to imagine they had $100 to spend on transportation projects and to allocate their money in increments of $10 among nine different categories. Transit was on the lower end of budget priorities.

Figure 3.26: Budget Allocation Results

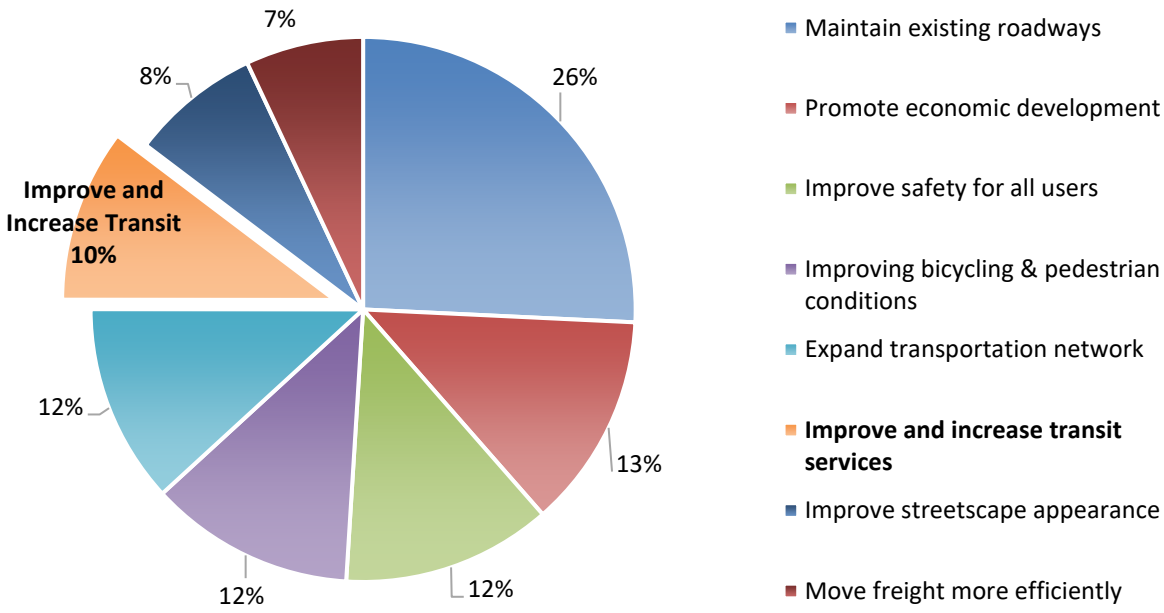


Table 3.12: Budget Allocation Responses

Priority	$ Allocated	% Allocated
Maintain existing roadways (pavement, bridges, signage, striping)	3,786	26%
Promote economic development (develop mixed-use hubs, promote revitalization & new investment)	1,880	13%
Improve safety for all users (redesign dangerous areas, biking/walking protections)	1,830	12%
Improve bicycling & pedestrian conditions (sidewalks, bike lanes, crosswalks, walking paths)	1,793	12%
Expand transportation network (add new roads and bridges or widen/extend existing ones)	1,738	12%
Improve and increase transit services (bus services, vans, new options)	1,513	10%
Improve streetscape appearance (plants and trees, lighting, artwork, road pavers, seating)	1,132	8%
Move freight more efficiently (heavy trucks, ports, railroads, air, waterways)	1,028	7%

Big Ideas Exercise

Respondents were also asked in an open-ended question to provide their big ideas for improving transportation. Two-thirds of survey respondents answered this question. The answers mentioning transit are provided in Table 3.13.

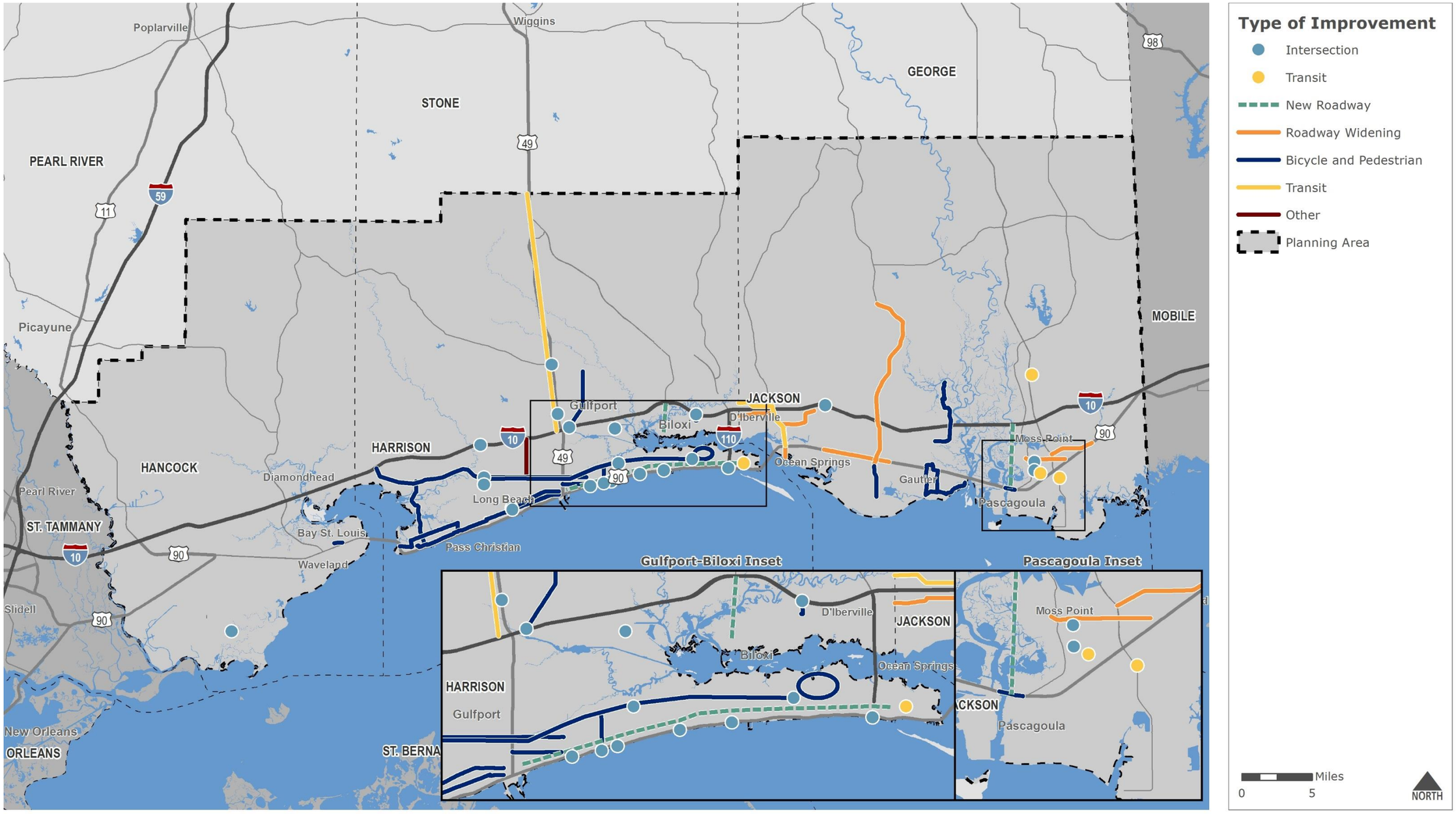
Figure 3.27 maps these ideas. Three transit projects stand out:

- Transit service along US-49
- Transit connecting between Ocean Springs and D'Iberville
- Transit stops in Pascagoula

Table 3.13: Ideas for Transit Improvements

Idea	Times Mentioned
Increase service (more routes, more stops, greater frequency)	10
Create Pascagoula + Jackson County fixed routes and transit that crosses county lines	10
Add intercity rail to New Orleans, Baton Rouge, Mobile, and Jacksonville	7
Add Amtrak through Bay St. Louis	4
Improve accessibility for riders with disabilities (trolleys are difficult for walkers and wheelchairs)	4
Improve the routes	2
Connect transit to Uber and Lyft	2
Increase transit accessibility for low-income populations	1
Create an hourly bus along MS 11	1
Add Bus Rapid Transit	1
Expand transit service beyond Biloxi and Gulfport	1
Improve transit along US 49 and US 90	1
Create rapid transit to Hattiesburg and Jackson	1
Add transit along Seaway Road to connect to social services	1
Make transit more affordable	1
Improve on-time performance	1
Reduce congestion caused by pullout bays	1
Increase accessibility to jobs and shopping	1
Make transit more enjoyable	1

Figure 3.27: Big Ideas from Public Meeting



Data Sources: Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

4.0 Plan Recommendations

4.1 Service Expansion Recommendations

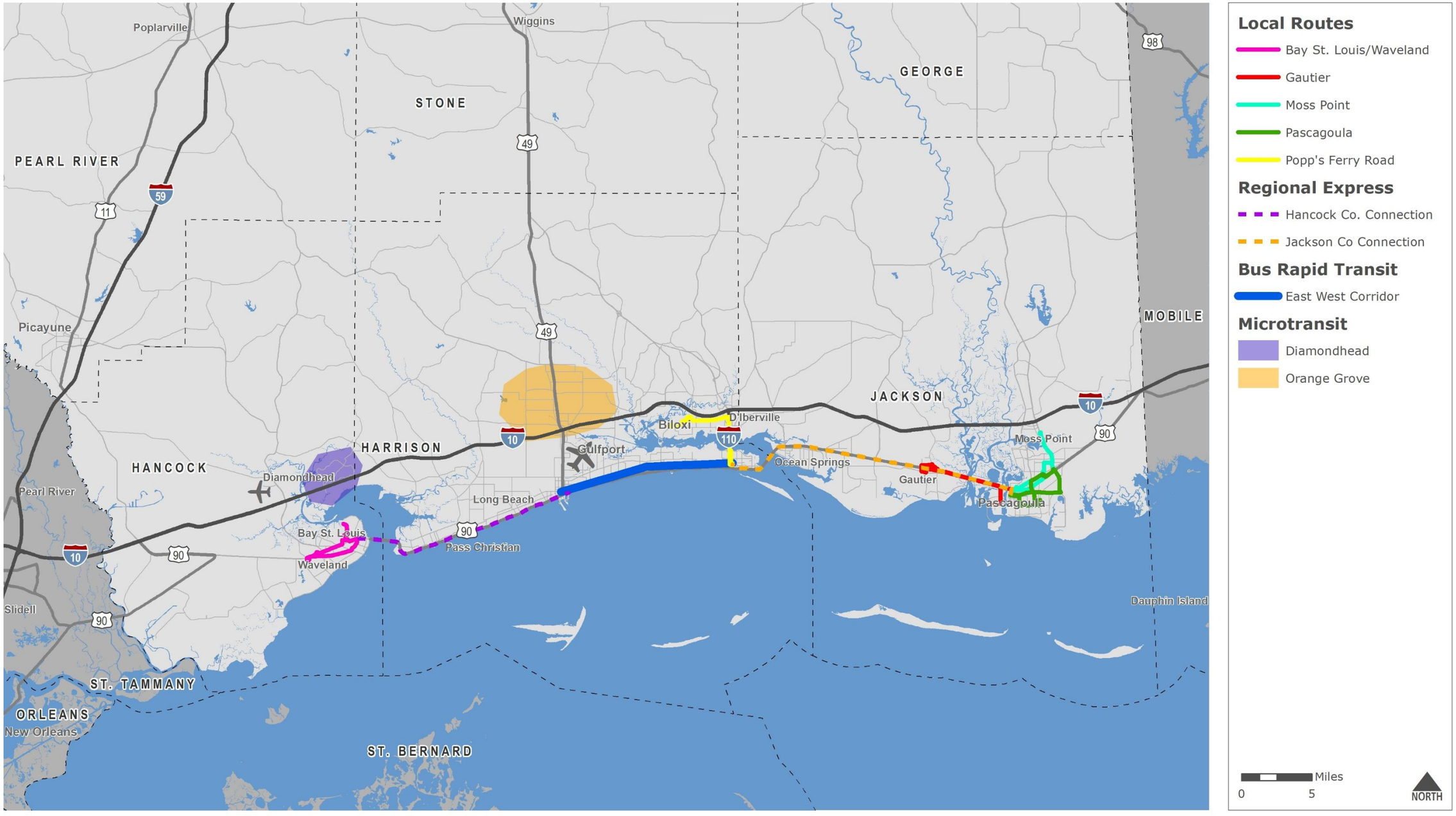
Based on the Needs Analysis, a set of service recommendations were developed. These are high-level or conceptual recommendations at this stage in the planning process. Planners can select which recommendations to advance at any given point in time and should develop a more detailed service plan, such as where the stops will be located and the running times and schedule.

Table 4.1 summarizes the service recommendations and the conceptual routes are shown in Figure 4.1.

Table 4.1: Service Expansion Concepts

Recommendation	Monday-Saturday		Sunday	
	Span of Service	Frequency	Span of Service	Frequency
Local Routes				
Popp's Ferry Rd	5:30 AM to 7:30 PM	90 min.	No Service	
Moss Point	5:30 AM to 7:30 PM	60 min.	No Service	
Pascagoula	5:30 AM to 7:30 PM	60 min.	No Service	
Gautier	5:30 AM to 7:30 PM	90 min.	No Service	
Bay St. Louis/Waveland	5:30 AM to 7:30 PM	60 min.	No Service	
Regional Express Routes				
Hancock Co. Connection	5:30 AM to 7:30 PM	60 min.	No Service	
Jackson Co. Connection	5:30 AM to 7:30 PM	90 min.	No Service	
Bus Rapid Transit Routes				
East West Corridor	5:30 AM to 9:30 PM	20 min.	5:30 AM to 9:30 PM	20 min.
Microtransit Pilot Progams				
Orange Grove	5:30 AM to 7:30 PM	n/a	No Service	
Diamondhead	5:30 AM to 7:30 PM	n/a	No Service	

Figure 4.1: Service Expansion Concepts



Data Sources: Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

Implementation Costs

Table 4.2 shows the costs associated with each recommendation. These order of magnitude costs were developed using the following cost assumptions:

- **Fixed-Route Service Cost Assumptions** —The annual operating costs for each fixed-route service improvement is calculated by multiplying the additional revenue hours for the improvement by the fixed-route operating cost per revenue hour. The 2020 operating cost per revenue hour is calculated by inflating the operating cost per revenue hour from the 2019 NTD by 3 percent annually, the assumed operating cost annual inflation rate.
    - **Operating Cost per Revenue Hour - $78.81 in 2020**
- **Paratransit Service Cost Assumptions** —CTA is required to provide complementary ADA service for extended fixed route service hours or within ¾-mile of new fixed-route service with the exception of flex or express routes. However, because CTA already operates demand response service for people with disabilities in its entire service area, it is not assumed that paratransit costs will increase.
- **Microtransit Cost Assumptions -** The annual cost of a microtransit pilot is assumed to be the same as operating a local fixed route. This assumption is made because the purpose of the pilot is to test how effective microtransit can be with the same budget. It should be able to service a larger area and allowing it the same budget will give an "apples-to-apples" comparison.

Table 4.2: Operating Costs for Service Recommendations

Recommendation	Annual Operating Cost (2020$)
Local Routes	
Popp's Ferry Rd	$350,000
Moss Point	$350,000
Pascagoula	$350,000
Gautier	$350,000
Bay St. Louis/Waveland	$350,000
Regional Express Routes	
Hancock Co. Connection	$150,000
Jackson Co. Connection	$150,000
Bus Rapid Transit Routes	
East West Corridor	$2,000,000
Microtransit Pilot Progams	
Orange Grove	$350,000
Diamondhead	$350,000

4.2 Capital Recommendations

- **Transition to a Fully Electric Fleet** - CTA has already invested in electric buses but its fleet is still a mixture of traditional and alternative fuel vehicles. As CTA continues to replace vehicles and expand its fleet, it should prioritize electric vehicles. Costs may be higher, so there will be tradeoffs to consider, but a long-term transition to a fully electric fleet is a goal of this plan. This will also mean investing in electric infrastructure, such as charging stations, and maintenance training.
- **Increase Stop Amenities** - Currently, about 20% of stops have a shelter. However, to improve the rider experience for existing riders and attract new riders, increased investment in shelters and benches will be required. CTA should update its stop amenity inventory, identify which locations have ridership patterns that warrant shelters/benches, and develop a Capital Improvement Plan for installing these shelters. In some instances, it may be necessary to slightly relocate existing stops and/or work with local governments or private property owners to secure appropriate permissions for installing stop amenities.
- **Improve Bike/Ped Access to Stops** - All transit riders are pedestrians or bicyclists at some point in their transit trip. CTA should work with GRPC and local governments to expand bicycle and pedestrian infrastructure and provide a safer, more comfortable environment for pedestrians and bicyclists near transit stops.
- **Advance the East West Corridor Project** - This project has long been a regional priority. In order to advance the Bus Rapid Transit line component, the roadway and bike/ped component must also be implemented. CTA should work with GRPC to prioritize advancing this project.

4.3 Technology Recommendations

- **Advance Transit Signal Priority Program** - CTA and GRPC have already begun implementing Transit Signal Priority (TSP) at key intersection signals in the region. They should continue these efforts as congestion and slow speeds for transit vehicles limit the effectiveness of CTA's services.
- **Move Towards Mobility as a Service (MaaS)** - Mobile trip planning, booking, and payment can be done by CTA alone. However, the focus of the MaaS concept is to use these technologies to integrate transit services with other mobility providers. The benefit of integrating CTA services with other providers are to simplify the rider experience and increase ridership. Specific recommendations that fall under the MaaS umbrella include:
    - Share CTA's GTFS information with Google so that people can use Google Maps to plan their transit trips.
    - Display real-time bus arrival times at major stops.
    - Consider switching mobile platforms to an app that allows for trip planning, bus tracking, and fare payment.
    - Explore relationships with other partners in the region, such as bikeshare programs, Uber/Lyft, tourist destinations, and Enterprise for vanpool coordination.

4.4 Marketing Recommendations

- **Rebrand Routes and Services** - The naming convention for the fixed route and other services provided by CTA should be simplified and made consistent. Fixed route service is especially confusing to people not already familiar with the service. Some routes reference cities while others reference roads and the #38 route appears to function as two separate routes. CTA should work with CRPC to create a new branding scheme for all services that is easily understood by the non-riding public. Then, implementing and marketing these changes will be crucial to their success.
- **Enhance Public Information** - The schedules available online are static and not easily understood by the public. CTA has already invested in the RouteShout app, but it should revamp all of its schedule related information to be as simple and easy to understand as possible. This may be timed to coordinate with a Rebranding of routes and services. The website could also be improved in some areas.
- **Share GTFS data with Google and Others -** Currently, you cannot plan a transit trip on Google Maps or other third-party apps because CTA's GTFS (General Transit Feed Specification) data is not publicly available. This information can be exported from scheduling software and can be reviewed by staff or a third-party GTFS cleaning software to ensure its accuracy and reliability before sharing.

4.5 Financial Plan

This section begins by describing federal funding sources available by type. The second section forecasts the formula funding to 2045 to provide a fiscally constrained revenue source. In the last section, CTA costs are forecasted to 2045 to stay within these fiscal constraints.

Funding Sources

Federal Formula Funding Sources

There are many federal funding sources for public transit. Most of these sources are programs funded by the Federal Transit Administration (FTA) and administered by the State.

Urbanized Area Formula Grants (Section 5307)

Overview: This formula-based funding program provides funds for capital and operating assistance for transit service in urbanized areas with populations greater than 50,000 and for transportation-related planning.

As part of the *Coronavirus Aid, Relief, and Economic Security (CARES) Act*, FTA allocated $22.7 billion to recipients of urbanized area formula funds. Funding is provided at a 100-percent federal share, with no local match required, and will be available to support capital, operating, and other expenses generally eligible under those programs to prevent, prepare for, and respond to COVID-19.

Eligible Activities: Funds can be used for planning, engineering, design and evaluation of transit projects and other technical transportation-related studies; capital investments in bus and bus-related activities such as replacement of buses, overhaul of buses, rebuilding of buses, crime prevention and security equipment and construction of maintenance and passenger facilities; computer hardware/software; and operating assistance in urbanized areas under 200,000 in population or with 100 or fewer fixed-route buses operating in peak hours. Activities eligible under the former Job Access and Reverse Commute (JARC) program, which provided services to low-income individuals to access jobs, are now eligible under the Urbanized Area Formula program.

Federal Share: 80 percent for capital projects, 50 percent for operating assistance, and 80 percent for ADA non-fixed route paratransit service.

Enhanced Mobility of Seniors and Individuals with Disabilities (Section 5310)

Overview: Grants are made by the State to private non-profit organizations (and certain public bodies) to increase the mobility of seniors and persons with disabilities. The former New Freedom program (Section 5317) is folded into this program.

Eligible Activities: Projects must be included in a coordinated human service transportation plan. Funds can be used for buses and vans; wheelchair lifts, ramps, and securement devices; transit-related information technology systems; mobility management programs; acquisition of transportation services

under a contract, lease, or other arrangement; travel training; volunteer driver programs; building an accessible path to a bus stop; and incremental cost of providing same day service or door-to-door service.

Federal Share: 80 percent for capital projects, 50 percent for operating assistance.

Rural Area Formula Grants (Section 5311)

Overview: This formula-based funding program provides administration, capital, planning, and operating assistance to support public transportation in rural areas, defined as areas with fewer than 50,000 residents.

Eligible Activities: Planning, capital, operating, job access and reverse commute projects, and the acquisition of public transportation services. Activities eligible under the former JARC program, which provided services to low-income individuals to access jobs, are now eligible under the Rural Area Formula program.

Federal Share: 80 percent for capital projects, 50 percent for operating assistance, and 80 percent for ADA non-fixed route paratransit service.

State of Good Repair Grants Program (Section 5337)

Overview: Theis program provides capital assistance for maintenance, replacement, and rehabilitation projects of high-intensity fixed guideway and bus systems to help transit agencies maintain assets in a state of good repair. Additionally, SGR grants are eligible for developing and

Eligible Activities: Capital projects for rolling stock, signals and communications, power equipment, passenger stations and terminals, security equipment, track, maintenance facilities and equipment, operational support, and Implementing transit asset management plans.

Federal Share: 80 percent for capital projects.

Bus and Bus Facilities Formula Grants (Section 5339a)

Overview: This program provides funds to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities.

Eligible Activities: Capital projects to replace, rehabilitate and purchase buses, vans, and related equipment, and to construct bus-related facilities, including technological changes or innovations to modify low or no emission vehicles or facilities.

Federal Share: 80 percent for capital projects.

Other FTA Grants

The FTA has several other funding sources that each address specific issues. Most of these are more limited in funding and are competitive programs, meaning that applicants must compete for funding based on the merits of their project. Table 4.3 identifies grants most applicable to the needs of CTA; more information can be found at transit.dot/grants.

Table 4.3: FTA Grant Opportunities

Title	Description
Accelerating Innovative Mobility (AIM)	Funds innovative approaches to improve financing, system design, and service
Capital Investment Grants- 5309	Funds transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and bus rapid transit
Expedited Project Delivery Pilot Program- Section 3005(b)	Funds expedited new fixed guideway capital projects, small starts projects, or core capacity improvement projects. These projects must utilize public-private partnership or be operated and maintained by employees of an existing public transportation provider
Integrated Mobility Innovation	Funds projects that demonstrate innovative and effective practices, partnerships and technologies to enhance public transportation effectiveness, increase efficiency, expand quality, promote safety and improve the traveler experience.
Pilot Program for Transit-Oriented Development Planning – Section 20005(b)	Funds new fixed guideway or core capacity transit capital investments in local communities to integrate land use and transportation planning. Comprehensive planning funded through the program must examine ways to improve economic development and ridership, foster multimodal connectivity and accessibility, improve transit access for pedestrian and bicycle traffic, engage the private sector, identify infrastructure needs, and enable mixed-use development near transit stations.

Other USDOT Federal Funding Sources

Better Utilizing Investments to Leverage Development (BUILD): *Funds road, rail, transit, and port projects that achieve national objectives and are difficult to support through traditional DOT programs Funding for: multimodal passenger rail and bus station; replacing at-grade rail crossings with grade-separated rail crossings; transit signal prioritization; electric buses; renovating rural transit center*

Surface Transportation Block Grant Program (STBG): Provides funding that may be used by states and localities for a wide range of projects to preserve and improve the conditions and performance of surface transportation, including highway, transit, intercity bus, bicycle and pedestrian projects.

National Highway Performance Program (NHPP): Funds may only be used for the construction of a public transportation project that supports progress toward the achievement of national performance goals for improving infrastructure condition, safety, mobility, or freight movement on the NHS and which is eligible for assistance under chapter 53 of title 49, if: the project is in the same corridor as, and in proximity to, a fully access-controlled NHS route; the construction is more cost-effective (as determined by a benefit-cost analysis) than a NHS improvement; and the project will reduce delays or produce travel time savings on the NHS, as well as improve regional traffic flow. Local match requirement varies.

State and Local Funding Sources

Gasoline and Vehicle Taxes and Fees

State transportation revenues come from motor fuel taxes and fees and vehicles taxes and fees. The gasoline excise tax in particular is the state's largest funding source for roadway projects.

Property, Sales, and Income Taxes

Taxation contributes the most revenue to local governments in the United States. Property taxes, sales taxes, and income taxes are the most common and biggest sources of local government tax revenue. Taxes may be levied by states, counties, municipalities, or other authorities.

User Fees

User fees are fees collected from those who utilize a service or facility. The fees are collected to pay for the cost of a facility, finance the cost of operations, and/or generate revenue for other uses. User fees are commonly charged for public parks, water and sewer services, transit systems, and solid waste facilities. The theory behind the user fee is that those who directly benefit from these public services pay for the costs.

Special Assessments

Special assessment is a method of generating funds for public improvements, whereby the cost of a public improvement is collected from those who directly benefit from the improvement. In some instances, new streets are financed by special assessment. The owners of property located adjacent to the new streets are assessed a portion of the cost of the new streets, based on the amount of frontage they own along the new streets.

Special assessments have also been used to generate funds for general improvements within special districts, such as central business districts. These assessments may be paid over a period of time rather than as a lump sum payment.

Impact Fees

New developments create increased traffic volumes on the streets around them. Development impact fees are a way of attempting to place a portion of the burden of funding improvements on developers who are creating or adding to the need for improvements.

Bond Issues

Property tax and sales tax funds can be used on a pay-as-you-go basis, or the revenues from them can be used to pay off general obligation or revenue bonds. These bonds are issued by local governments upon approval of the voting public.

Forecasting Available Funds

Forecasts were developed for the four major federal transit programs that are utilized by transit providers in the region (Section 5307, Section 5339, Section 5339c, and Section 5310).

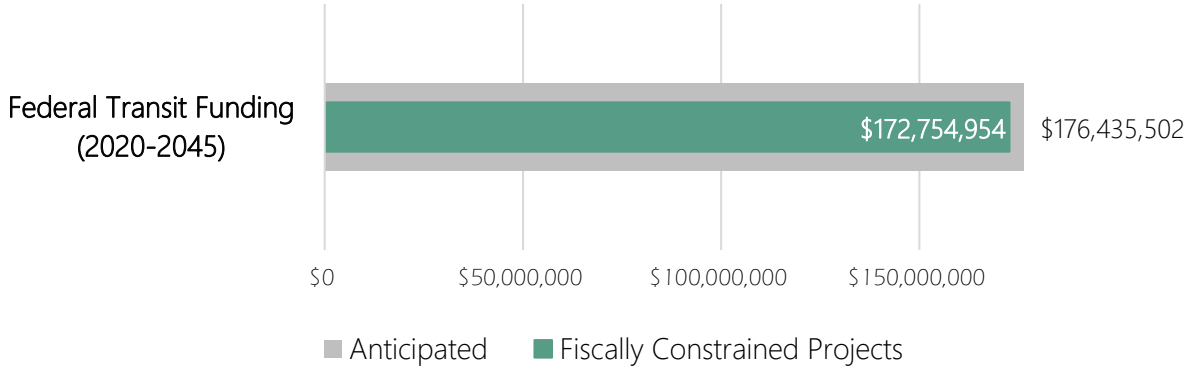
The following assumptions are utilized:

- The region will receive 100 percent of annual Sections 5307, 5339, and 5310 funding allocated to the Gulfport Urbanized Area and 100 percent of annual Section 5307 funding allocated to the Pascagoula Urbanized Area.
- The region will continue to apply for and receive competitive funding through Section 5339c. This has historically amounted to an annual average of $1,750,000 and is assumed to continue at similar amounts.
- The region will receive 100 percent of one-time funds from the 2020 CARES Act allocated to the Gulfport and Pascagoula Urbanized Areas.
- Federal funding for these programs is inflated one (1.0) percent annually. This is consistent with long-term annual increases in FTA program funding.

Based on these assumptions, the following levels of federal funding for public transit in the MPO can be expected through 2045:

- Stage 1 (2020-2025) - $44,420,030 for operating and capital projects (Includes CARES Act funding)
- Stage 2 (2026-2035) - $62,726,448 for operating and capital projects
- Stage 3 (2036-2045) - $69,289,023 for operating and capital projects

Figure 4.2: Fiscally Constrained Transit Projects (Federal Funding Only)



Fiscally Constrained Financial Plan

Table 4.4 lists operation, preventative maintenance, and capital costs forecasted for years 2020-2045. Operating and preventative maintenance, and capital costs for transit were taken from the TIP for years 2020-2024. The 2024 costs were forecasted into the future by inflating one (1) percent annually.

Annual capital costs for 2020-2024 were taken from the TIP. Future capital costs were estimated by analyzing the ratio of average costs to average Vehicle Revenue Miles (VRM) since 2013. This ratio was then applied to current VRM to estimate current costs and forecast into the future at an annual inflation rate of one (1) percent from 2019 dollars. Annual capital costs and VRM data came from the National Transit Database.

- This fiscally constrained plan does not include funding for recommendations made in Section 4.1-4.3. Funding for those recommendations would need to be secured from applying for the grants listed above or from other sources.

Table 4.4: Fiscally Constrained CTA Expenses, 2020-2045

Project ID	Description	Type	Sponsor	Fiscal Year	Total Cost (YOE)	Federal Cost (YOE)
CT-1	Section 5307 10/01/19-9/30/20	●	CTA	2020	$4,800,000	$2,400,000
CT-2	Section 5307 or 5310 Preventative Maintenance	●	CTA	2020	$1,700,000	$1,360,000
CT-3	Section 5307 Marketing/Planning	●	CTA	2020	$300,000	$240,000
CT-4	Section 5307 Computer Equipment	●	CTA	2020	$25,000	$20,000
CT-5	Section 5307 Shop Equipment	●	CTA	2020	$20,000	$16,000
CT-6	Section 5307 ADA Operating Expense	●	CTA	2020	$370,000	$296,000
CT-7	Section 5307 Transit Enhancements	●	CTA	2020	$175,000	$140,000
CT-8	Section 5307 Facility Rehab & Renovations	●	CTA	2020	$250,000	$200,000
CT-9	Section 5307 Purchase Office Equipment	●	CTA	2020	$20,000	$16,000
CT-10	Section 5307 Purchase Farebox Equipment	●	CTA	2020	$50,000	$40,000
CT-11	Section 5307 Purchase Communication Equipment	●	CTA	2020	$100,000	$80,000
CT-12	Section 5339 Purchase Revenue Vehicles	●	CTA	2020	$1,000,000	$800,000
CT-13	Section 5307 Purchase Support Vehicles	●	CTA	2020	$45,000	$36,000
CT-14	Section 5307 JARC Purchased Transportation	●	CTA	2020	$365,000	$365,000
CT-15	Section 5307 Mobility Manager	●	CTA	2020	$60,000	$48,000
CT-16	Section 5307 Operating Assistance 10/01/20-9/30/21	●	CTA	2021	$5,100,000	$2,550,000
CT-17	Section 5307 or 5310 Preventative Maintenance	●	CTA	2021	$1,800,000	$1,440,000
CT-18	Section 5307 Marketing/Planning	●	CTA	2021	$300,000	$240,000
CT-19	Section 5307 Computer Equipment	●	CTA	2021	$25,000	$20,000
CT-20	Section 5307 Shop Equipment	●	CTA	2021	$20,000	$16,000
CT-21	Section 5307 ADA Operating Expense	●	CTA	2021	$390,000	$312,000
CT-22	Section 5307 Transit Enhancements	●	CTA	2021	$100,000	$80,000
CT-23	Section 5307 Facility Rehab & Renovations	●	CTA	2021	$250,000	$200,000
CT-24	Section 5307 Purchase Office Equipment	●	CTA	2021	$20,000	$16,000
CT-25	Section 5307 Purchase Farebox Equipment	●	CTA	2021	$50,000	$40,000
CT-26	Section 5307 Purchase Communication Equipment	●	CTA	2021	$100,000	$80,000
CT-27	Section 5307, 5339 a/b/c, CARES ACT Purchase Revenue Vehicles and Bus Equipment	●	CTA	2021	$1,965,000	$1,572,000
CT-28	Section 5307 Purchase Support Vehicles	●	CTA	2021	$45,000	$36,000
CT-29	Section 5307 JARC Purchased Transportation	●	CTA	2021	$375,000	$375,000
CT-30	Section 5307 Mobility Manager	●	CTA	2021	$60,000	$48,000
CT-31	Section 5307 10/01/21-9/30/22	●	CTA	2022	$5,400,000	$2,700,000
CT-32	Section 5307 or 5310 Preventative Maintenance	●	CTA	2022	$1,900,000	$1,520,000
CT-33	Section 5307 Marketing/Planning	●	CTA	2022	$300,000	$240,000

Project ID	Description	Type	Sponsor	Fiscal Year	Total Cost (YOE)	Federal Cost (YOE)
CT-34	Section 5307 Computer Equipment	●	CTA	2022	$25,000	$20,000
CT-35	Section 5307 Shop Equipment	●	CTA	2022	$20,000	$16,000
CT-36	Section 5307 ADA Operating Expense	●	CTA	2022	$390,000	$312,000
CT-37	Section 5307 Transit Enhancements	●	CTA	2022	$100,000	$80,000
CT-38	Section 5307 Facility Rehab & Renovations	●	CTA	2022	$250,000	$200,000
CT-39	Section 5307 Purchase Office Equipment	●	CTA	2022	$20,000	$16,000
CT-40	Section 5307 Purchase Farebox Equipment	●	CTA	2022	$50,000	$40,000
CT-41	Section 5307 Purchase Communication Equipment	●	CTA	2022	$100,000	$80,000
CT-42	Section 5307, 5339 a/b/c Purchase Revenue Vehicles	●	CTA	2022	$1,000,000	$800,000
CT-43	Section 5307 Purchase Support Vehicles	●	CTA	2022	$45,000	$36,000
CT-44	Section 5307 JARC Purchased Transportation	●	CTA	2022	$375,000	$375,000
CT-45	Section 5307 Mobility Manager	●	CTA	2022	$60,000	$48,000
CT-46	Section 5307 10/01/22-9/30/23	●	CTA	2023	$5,600,000	$2,800,000
CT-47	Section 5307 or 5310 Preventative Maintenance	●	CTA	2023	$2,000,000	$1,600,000
CT-48	Section 5307 Marketing/Planning	●	CTA	2023	$300,000	$240,000
CT-49	Section 5307 Computer Equipment	●	CTA	2023	$25,000	$20,000
CT-50	Section 5307 Shop Equipment	●	CTA	2023	$20,000	$16,000
CT-51	Section 5307 ADA Operating Expense	●	CTA	2023	$390,000	$312,000
CT-52	Section 5307 Transit Enhancements	●	CTA	2023	$100,000	$80,000
CT-53	Section 5307 Facility Rehab & Renovations	●	CTA	2023	$250,000	$200,000
CT-54	Section 5307 Purchase Office Equipment	●	CTA	2023	$20,000	$16,000
CT-55	Section 5307 Purchase Farebox Equipment	●	CTA	2023	$50,000	$40,000
CT-56	Section 5307 Purchase Communication Equipment	●	CTA	2023	$100,000	$80,000
CT-57	Section 5307, 5339 a/b/c Purchase Revenue Vehicles	●	CTA	2023	$1,000,000	$800,000
CT-58	Section 5307 Purchase Support Vehicles	●	CTA	2023	$45,000	$36,000
CT-59	Section 5307 JARC Purchased Transportation	●	CTA	2023	$375,000	$375,000
CT-60	Section 5307 Mobility Manager	●	CTA	2023	$60,000	$48,000
CT-61	Section 5307 10/01/23-9/30/24	●	CTA	2024	$5,700,000	$2,850,000
CT-62	Section 5307 or 5310 Preventative Maintenance	●	CTA	2024	$2,100,000	$1,680,000
CT-63	Section 5307 Marketing/Planning	●	CTA	2024	$300,000	$240,000
CT-64	Section 5307 Computer Equipment	●	CTA	2024	$25,000	$20,000
CT-65	Section 5307 Shop Equipment	●	CTA	2024	$20,000	$16,000
CT-66	Section 5307 ADA Operating Expense	●	CTA	2024	$390,000	$312,000
CT-67	Section 5307 Transit Enhancements	●	CTA	2024	$100,000	$80,000

Project ID	Description	Type	Sponsor	Fiscal Year	Total Cost (YOE)	Federal Cost (YOE)
CT-68	Section 5307 Facility Rehab & Renovations	Capital	CTA	2024	$250,000	$200,000
CT-69	Section 5307 Purchase Office Equipment	Capital	CTA	2024	$20,000	$16,000
CT-70	Section 5307 Purchase Farebox Equipment	Capital	CTA	2024	$50,000	$40,000
CT-71	Section 5307 Purchase Communication Equipment	Capital	CTA	2024	$100,000	$80,000
CT-72	Section 5307, 5339 a/b/c Purchase Revenue Vehicles	Capital	CTA	2024	$1,000,000	$800,000
CT-73	Section 5307 Purchase Support Vehicles	Capital	CTA	2024	$45,000	$36,000
CT-74	Section 5307 JARC Purchased Transportation	Capital	CTA	2024	$375,000	$375,000
CT-75	Section 5307 Mobility Manager	Capital	CTA	2024	$60,000	$48,000
CT-76	Section 5307 Capital	Capital	CTA	2025	$1,797,000	$1,438,000
CT-77	Section 5307 Operating	Operating	CTA	2025	$5,757,000	$2,879,000
CT-78	Section 5307 Preventative Maintenance	Preventative Maintenance	CTA	2025	$2,121,000	$1,697,000
CT-79	Section 5307 Capital	Capital	CTA	2026-2035	$18,988,000	$15,190,000
CT-80	Section 5307 Operating	Operating	CTA	2026-2035	$60,833,000	$30,417,000
CT-81	Section 5307 Preventative Maintenance	Preventative Maintenance	CTA	2026-2035	$22,412,000	$17,930,000
CT-82	Section 5307 Capital	Capital	CTA	2036-2045	$20,975,000	$16,780,000
CT-83	Section 5307 Operating	Operating	CTA	2036-2045	$67,198,000	$33,599,000
CT-84	Section 5307 Preventative Maintenance	Preventative Maintenance	CTA	2036-2045	$24,757,000	$19,806,000

Note: YOE (Year of Expenditure) costs assume a 1% annual inflation rate for transit projects.

Improvement Type: Operating Capital Preventative Maintenance

5.0 Transit Oriented Development Strategy

5.1 What Is Transit-Oriented Development?

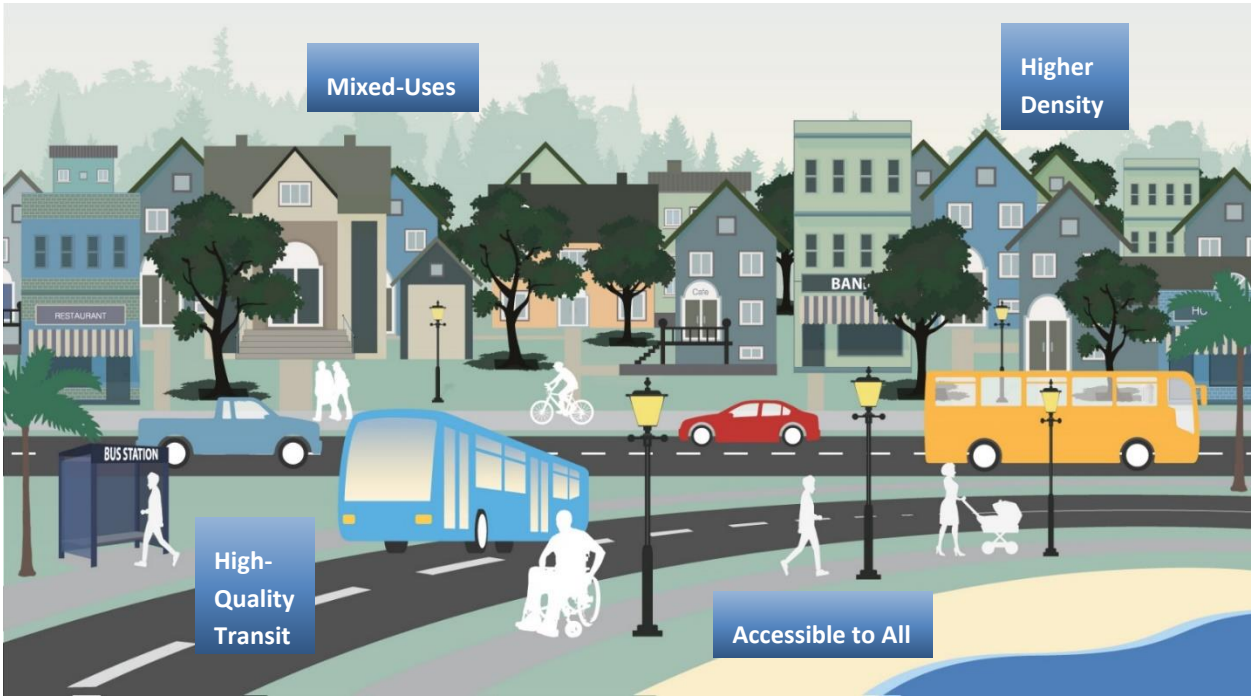
Transit-oriented development (TOD) is a strategy that concentrates mixed-use development around transit to increase accessibility to destinations, and decrease sprawl and reliance on vehicles. Although TOD can have different definitions, successful TOD generally have the following attributes:

Mixed-uses. Many traditional land use regulations separate commercial areas from residential, which increases the distance that people travel every day. A mixed-use development that concentrates work, home, schools, civic, and social destinations reduces the distances that people must travel. These concentrations of destinations can support transit.

High-quality transit access. At the heart of TOD is public transit that connects work, home, school, and play. High-quality transit provides frequent and reliable service and is accessible to a variety of people.

Accessibility for a variety of modes and users. People can be limited from vehicle ownership by income, age, or ability. As the United States is currently an auto-dominated country, the lack of a personal vehicle can limit access to key destinations. TOD allows a larger range of people to access destinations without a personal vehicle.

Density. A greater concentration of destinations grouped together supports transit, walking, and bicycling and increases the success of the TOD. If destinations are spread far apart, a vehicle may be required and the transit becomes less useful.



Benefits

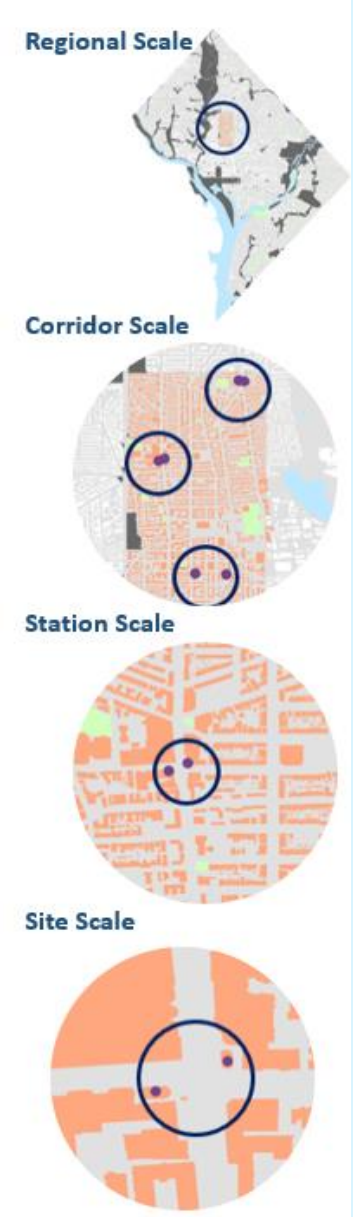
When executed well, the benefits of TOD are numerous. Key benefits include:

- **Reduced traffic congestion**. Improving the quality of transit to key destinations could shift drivers to taking transit, thus reducing vehicle congestion. By grouping destinations together, people who might have driven between places, like from their office to the store, can now walk or bike between destinations when in the TOD area. Reduced congestion helps the environment by decreasing vehicle emissions, improves the quality of life for those sitting in traffic, and supports businesses.
- **Equity**. Many American towns have a low density, meaning that a car is often necessary to reach employment, schools, and medical or social services. However, vehicle ownership can consume 15 percent of a household budget, and this cost is growing. Household expenditures on transportation grew more than any other expenditure between 2018 and 2019, increasing by 10 percent.[3] Concentrating low-income housing and destinations by TOD can help these households save money spent on vehicles, increase their access to jobs, and reduce the time spent travelling. Additionally, people who may not be able to drive such as the elderly, students, or the disabled would also have improved access to concentrated destinations.
- **Livability**. TOD goes hand-in-hand with walkability (or bikeability), giving people more time to be active outside and less time driving and sitting in traffic. Denser mixed-use communities also foster social and civic activities and deepen the social bonds of a neighborhood. Fifty percent of respondents in a 2015 Urban Land Institute survey said that walkability was a top priority when choosing where to live.[4]
- **Economic**. TOD can encourage development of new businesses, increase the traffic to existing businesses, and improve real estate values.
- **Fiscal**. TOD can increase tax revenues for a local municipality by increasing employment, housing units, and real estate values. Additionally, concentrated development rather than sprawled development can save a local government money on infrastructure and public services.

[3] Bureau of Labor Statistics. "Consumer Expenditures-2019." 2020. https://www.bls.gov/news.release/cesan.nr0.htm.

[4] Urban Land Institute. *America In 2015*. 2015. https://uli.org/wp-content/uploads/ULI-Documents/America-in-2015.pdf

Figure 5.1: Scales of TOD



A **regional** network of transit increases the access of riders to jobs, services and housing. The Washington, D.C. metro-rail has over 90 stops in the region, plus over 200 bus routes.

A transit **corridor** is strong when a diverse mix of uses are connected and accessible outside the corridor by transit, and within the corridor by biking or walking. The Columbia Heights 14th Street Corridor connects a variety of shops, apartments, schools, social services.

Stations should be surrounded by a .25-.5 mile radius of mixed and active uses. The Columbia Heights metro station has stores along 14th street with low-income and senior housing, market rate apartments, schools, and social services in the surrounding blocks.

The street design of the TOD **site** should facilitate walking and biking with active ground-floor uses. In Columbia Heights, a Target sits on top of the metro station and sidewalks and a public square increase neighborhood vitality.

Scales of TOD

Ultimately, TOD is about connections: more and faster connections between people and destinations. Thus it's important not to think of TOD as one isolated project, but rather as a network of transportation among key origins and destinations. Figure 5.1 describes four scales at which TOD occurs, using the Columbia Heights TOD in Washington, D.C. as an example. MPOs should consider the links between these scales and their particular role in transportation at each level.

Challenges

The primary challenge to a TOD is that in order to be successful, there has to be both strong development and strong transit at the site scale and the corridor scale, if not regional scale. At the corridor or regional scale, the TOD needs to be part of a network of destinations. At the station or site scale, the success of both depends on a variety of public and private actors cooperating. On the private side, businesses and developers need to have the interest and capital to locate around TOD. On the public side, zoning, density, and parking regulations have to encourage dense development. Additionally, transit needs to be high-quality in order to be more attractive than driving.

TOD flourishes when economic development and transportation access goals are intertwined. Often private developers have different goals than the government, who considers the broader public good. Public policy and financing tools tend to be weaker than private real estate, and so public actors need to consider how a TOD will maintain downstream affordability for residents and employers.

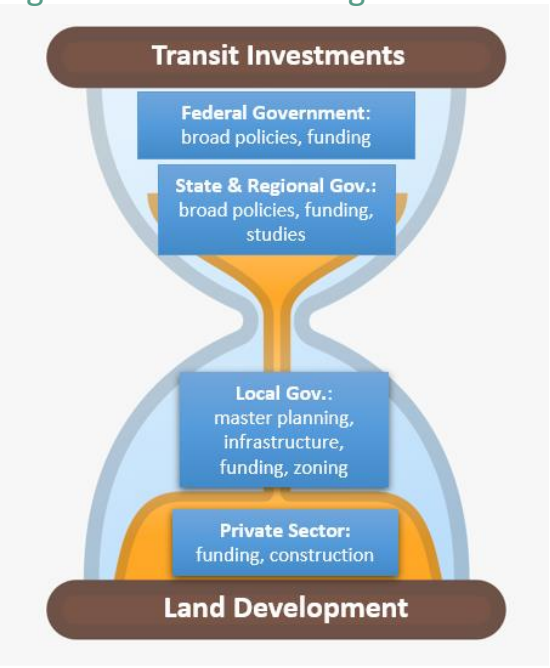
5.2 Role of the MPO in TOD

MPOs do not regulate land use and thus have limits to how they can influence TOD. However, the regional nature of an MPO makes it a uniquely effective partner in coordinating and supporting the various actors involved in creating a successful TOD. Below are ways that the MPO can support the creation and implementation of TODs.

Coordinating Actors

Figure 5.2 illustrates the different roles that various actors play in TOD. TOD is produced from the top-down policies and funding of federal, state, and regional governments and by the bottom-up funding, planning, and construction from the local government and private sector. As a regional organization, MPOs are uniquely suited to foster coordination among the various actors involved in TOD. The MPO can convene local officials and leaders of transit agencies to collaborate. The MPO also conducts regular and extensive input community engagement with stakeholders and the public to inform the MTP. These stakeholder relationships can be leveraged into discussions among industries and developers with local government to guide TOD investments. The conversations with the public can help inform the TOD planning process of public needs and concerns.

Figure 5.2: Coordinating Actors in TOD



Additionally, the MPO can help share strategies among local planning agencies and help create information sharing protocols among the different actors involved.

Technical Support

MPOs might have a wealth of technical knowledge not available to smaller planning agencies. MPOs can facilitate the planning of TODs in the first stage of selecting location for TODS, through the planning, and in applying for funding. As part of the MTP, the GRPC conducted extensive demographic and land use research to understand the existing population and land use patterns as well as future changes. This information is invaluable to a market analysis of knowing where a TOD belongs and how to design it. The MPO also collaborates with transit agencies to understand the transit availability and capabilities, which are relevant to TOD planning. The MPO might also be able to assist local agencies with GIS and mapping, data collection, market analysis, demographic and economic modelling, and grant writing.

Funding TOD

The primary capability of the MPO in funding TOD is identifying and implementing priority projects for federal transportation funding. While most federal transportation funding goes to roadway projects, the target in this case would be multimodal projects like transit, or pedestrian and bicycle projects that support the transit projects. The GRPC 2045 MTP Goal to "Provide transportation choices and good mobility for everyone (including people without a car)" would be served by these investments. These projects could be planning money for items like the station area, market studies, or implementation strategies, or they could be for transit supportive infrastructure such as local streets and pedestrian amenities.

Land Use Policy

While MPOs do not design land use policies, they can recommend policies and provide incentives to local agencies to follow such policies. Some MPOs have done this by creating Livable Community Grant programs that fund planning studies or transportation projects like sidewalks that support walkable places. For example, the Atlanta Regional Commission created a Livable Centers Initiative. This grant program, funded by federal transportation dollars, has allocated $345 million through 2050 to fund transportation projects that encourage mixed land uses at transit stations, foster public and private partnerships through sustained community dialogue, and foster various modes.[5] The Transportation Planning Board in the Washington DC Metro area created a Transportation/Land-Use Connections Program which provides technical assistance grants to support coordinated land-use and transit planning. Since its inception in 2007 the program has funded and managed 72 technical assistance programs.[6]

[5] Sam Zimbabwe and Alia Anderson. "Planning for TOD at the Regional Scale." The Center for Transit-Oriented Development. N.d. https://ctod.org/pdfs/tod204.pdf

[6] Ibid.

5.3 Regional TOD Strategy

Transportation Recommendations

The most crucial factor deciding the success of a TOD is whether the transit is high-quality. The goal should be to provide improved service to current riders and to maximize ridership potential. TODs that have been viewed as most successful, such as Orenco Station in Portland, OR the Blue Line in Charlotte, NC, provided fast, frequent and reliable transit to riders. In less successful TODs, development overshadowed the transit aspect and people still mainly used vehicles at the new development, or there was little demand for either the transit or the development. Below are five transportation components to consider supporting successful transit at the TOD:

High-Quality Transit

Transit should be accessible for all people, especially low-income and disabled populations, and convenient to use. Focus on keeping the transit:

Fast- Bus service should transport people quickly between destinations. In GRPC, several key roads become very congested. Prioritized lanes or signals, curb cuts, and paying before boarding can reduce wait time for buses.

Frequent- Buses on key TOD corridors would ideally run every 15 minutes.

Reliable- Bus service needs to be reliable enough that people can trust taking it to work. The lower the frequency, the more important reliability is to reduce wait time or the chance of missing buses.

Useful- TOD should mix uses from residential to commercial to social. This means people might need extended transit hours on nights and weekends to reach these variety of destinations. Additionally, the bus routes should connect key origins and destinations.

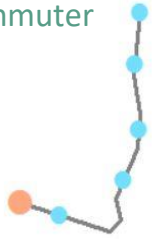
Corridor Type

TOD corridors are often organized into three types based on what type of destinations they connect: Destination Connector; Commuter; and Circulator.[7] The type of corridor influences the type of land use and transit service that would be most successful.

Activity Connectors

Activity Connector. Activity Connectors connect residential neighborhoods to a diverse mix of destinations, including employment, schools, and shops. This mix of destinations means transit is needed outside of 9 a.m.-5 p.m. Because there are many places near the transit stops that people want to access, the Activity Connector supports pedestrian and bicycle modes around stations. The figure to the right shows the Red Line in Houston which links residential neighborhoods to popular destinations like the Texas Medical Center, Rice University, the Museum District, and Downtown Houston.

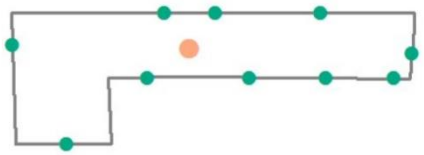
Commuter

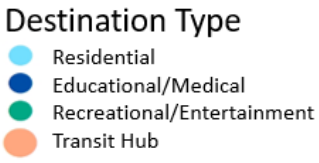


Commuter. Unlike Activity Connectors that link many destinations at various hours, Commuter Corridors typically bring employees from outlying residential neighborhoods to an employment center. Ridership is highest during the week during peak business hours. This service might require Park-and-Rides in the outlying neighborhoods and ideally provides frequent and reliable service during peak hours. The figure to the left shows the Capital Metrorail in Austin, which connects residential towns to downtown Austin.

District Circulator. District circulators link popular destinations in a smaller node, often a downtown or educational center. District circulators work well where destinations are too far to quickly walk between but too close to drive and park between. Regarding TOD, pedestrian and streetscape amenities and decreased parking requirements can improve the attraction of circulators. For TOD, the real estate surrounding the circulator must be acquirable and attractive. The figure to the right shows the Bricktown Loop of the Oklahoma City streetcar that circulates about five blocks of key downtown destinations like the Myriad

District Circulator





[7] Abigail Thorne-Lyman and Elizabeth Wampler. "Transit Corridors and TOD." N.d. The Center for Transit-Oriented Development. https://metrocouncil.org/Communities/Planning/TOD/Files/TOD-203-Transit-Corridors.aspx

Botanical Gardens, the Bricktown Riverwalk, restaurants, and Chickasaw Bricktown Ballpark.

Optimal Station Location

Stations need to be located where they will be most useful to transit riders and where there is market potential for development. TOD requires equilibrium between equitable and accessible development and what the market can support. TOD success also relies on coordinated timing between the transit investment and the real estate development. Table 5.1 lists factors to consider when deciding whether a specific location could support TOD. Smart Growth America compiled these factors to help Louisville, KY decide where to locate their BRT lines. The 2045 MTP provides much of this demographic and land use data for the Gulf Coast and can be used to help decide best locations for TOD.

Table 5.1: TOD Station Readiness Tool

TOD Readiness Variable	Measure	Variable
Development Potential 	Planning Completed to Date	Existence of Station Area/Town Center Plan
	Vacant Land	Acres of Vacant Land
	Ownership	Number of Owners/Acres of all Parcels
	Office Space	Sq Ft of Office Space
	Retail Space	Sq Ft of Retail Space
	Development Activity	Pipeline of Proposed/Planned Developments
Market Readiness 	Household Income	Median Household Income and Disposable Income
	Commercial Property Values	Average Dollar Amount of Actual Value
	Commercial Land Values	Total Dollar Amount of Commercial Values
	Home Values	Average Dollar Amount of Actual Values
	Residential Land Values	Total Dollar Amount of Home Values
	Housing Tenure	Percentage of Rentership
	Residential Rents	Average Commercial Rents- Dollar per Square Foot
	Retail Rents	Median Monthly Rent
TOD Characteristics 	Employment Density	Jobs Per Acre
	Residential Density	Population Per Acre, Household Per Acre
	Household Density	Housing Units Per Acre
	Community Amenity Access	WalkScore
	Automobile Ownership	Percentage of Households with Vehicles
	Physical Form	Percentage of Blocks =<4.0 acres
	Intersection Density	Number of Intersections per Square Mile

Source: Smart Growth America. *Transit-Oriented Development Technical Assistance: FTA Report No.0101.* Federal Transit Administration. January 2017. https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Report_No._0101.pdf, P. 14.

Multimodal Connections

Riding transit generally requires a second mode to get to and from the transit station- whether walking, biking, or driving. Thus a strong TOD needs to have multimodal connections. The MPO can collaborate with local governments and developers to support multimodal transportation through the following ways:

- **Create pedestrian and bicycle facilities**. These facilities can include continuous sidewalks, crosswalks, pedestrian lighting, wayfinding signs, bicycle lanes or paths, bicycle racks, and bikeshare programs.
- **Apply a Multimodal Level-of-Service**. A typical LOS focuses on vehicle congestion and misses opportunities to improve transit, walking, or biking. Adjusting the ways of measuring congestion and performance of an area can support multimodal transportation. The Transportation Research Board has provided some guidance on this topic.[8]
- **Develop First/Last Mile Connections**. Reaching the transit station from the origin or destination can be one of the biggest barriers to riding transit, especially in less dense areas. Strategies to help riders connecting from their origin or destination to transit can include microtransit, carpooling, demand services, ride shares, bike shares, and bicycle racks on buses.
- **Build Park-and-Rides.** Locating a park-and-ride near TOD can allow drivers coming from areas not served by transit to park and take transit to their destination. One cautionary note is to balance the distance drivers walk from parking to transit with the need to surround the TOD with active spaces, rather than parking lots.

Transportation Demand Management

Many cities that implement TOD have found that policies enacted by public and private actors can influence more people to switch from driving to riding transit. Transportation Demand Management (TDM) are strategies that shift single-occupant drivers to take other modes, to carpool, or to drive during off-peak hours.[9] While many road and transit expansion projects look to solve an imbalance of supply and demand for transportation by increasing the supply of road or transit, TDM looks to decrease demand, especially at peak hours. Some TDM strategies that could work in the GRPC include:

- **Transit subsidies**: The private and public sector can cooperate to provide transit subsidies from business located at the TOD to their employees or to residents of TOD developments.

[8] Transportation Research Board. *Multimodal Level of Service Analysis for Urban Streets*. National Cooperative Highway Research Program Report 616. 2008. https://nacto.org/wp-content/uploads/2015/04/nchrp_rpt_616_dowling.pdf

[9] Jeffrey Tumlin. *Sustainable Transportation Planning*. John Wiley and Sons. 2012.

- **Parking Cash-Out**: Businesses can pay a monthly stipend to employees who do not require a parking space and instead use transit, walk, or bike.
- **Rethinking Parking Requirements**: The city can reduce parking minimums for developments. Developers can unbundle the price of parking from rent and businesses can charge employees for monthly parking.
- **TDM Plans**: The city can require that any new developer or employer to the TOD creates a TDM plan showing their ideas to encourage employees to use transit or active transportation or to drive at off-peak times.

Land Use Recommendations

Land use policies directly influence the density, walkability, and mixed uses of an area, all which are critical to the success of a TOD. Figure 5.3 shows some best practices for urban design and land use policies for TOD. The MPO can facilitate these policies through funding planning studies, providing design guides, and facilitating meetings and information sharing among relevant actors. For example, transit agencies and railroads often have power to acquire land and right-of-way, while local governments have control over the zoning codes. The MPO can facilitate collaboration among these groups.

Figure 5.3: TOD-Supportive Land Use and Streetscape

1. **Mixed-Use**: Zoning codes should allow for a mix of uses, such as commercial on the ground floor and residential on higher floors.
2. **Density**: Zoning codes should encourage higher FAR with less setback between buildings to keep destinations closer together.
3. **Green infrastructure**: Elements like bioswales and street trees can help offset runoff and flooding that new development might cause.
4. **Accessible Design**: Curb height, crosswalks, ramps, and other features can make the area accessible to all users.
5. **Pedestrian Scale**: Lighting, signage, plants, and cross signals are designed for pedestrians- not just drivers.
6. **Small Setbacks**: Buildings are set close to the street to reduce distance walked and to promote local commerce.
7. **Strategic Parking**: Large parking lots discourage transit and active transportation. Street parking, unbundling parking costs from development, and shared parking lots can support TOD.

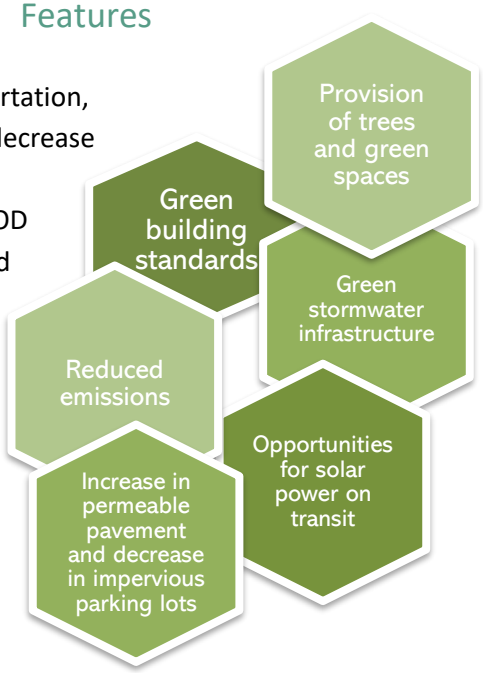
Consider Overlay Districts

Overlay districts can be effective ways to bring best-practice TOD land use and designs to an area without rewriting the entire area's zoning code. The MPO can fund or support plans that create a TOD-Supportive Overlay that could be applied to different communities across the Gulf Coast.

Implement Green Infrastructure

The 2045 MTP set the goal to "Manage the relationship of transportation, community, and environment." TOD provides the opportunity to decrease stormwater runoff and make the transportation system more resilient. Figure 5.4 names some ways that the station design of TOD and increased transit use can help decrease stormwater runoff and vehicle emissions. As a region particularly exposed to heavy rains and flooding, the Gulf Coast should consider using green designs in the station and site design and transit operation.

Figure 5.4: Green TOD Features



Source: Adapted from Puget Sound Regional Council. *Benefits of Green, Transit-Oriented Development*. 2013. https://www.psrc.org/sites/default/files/benefits_of_green_tod_east_corridor_phase_2.pdf

Rethink Parking Minimums

While some parking is necessary around TOD, the space should be as active as possible with minimal distances between homes, shops, or offices. A 2017 study found that traditional ITE Trip Generation and Parking guides overestimated the parking needed at TOD by over 60 percent.[10] Consider lower parking minimums or innovative parking strategies when designing the TOD.

Customize the TOD Site

The ultimate goal of TOD is to increase connectivity among people and destinations. When designing a TOD, consider both the area's specific needs and the area's strengths and character to attract a variety of users. Figure 5.5 provides four examples in which the space of TOD was used to serve the unique needs or personalities of its location.

[10] Reid Ewing. *Empty Spaces: Real parking needs at five TODS*. January 2017, Smart Growth America and The University of Utah. https://smartgrowthamerica.org/resources/empty-spaces-real-parking-needs-five-tods/

Figure 5.5: TOD Sites as Community Assets

- Little Rock, AR hosts events like Art Night in its River Market District. Participants can ride the streetcar along the corridor, experiencing art and dining on both sides of the Arkansas River.

Photo Source: LittleRock.com

- Farragut Square in Washington, D.C. is a central hub for metro rail and buses. The public space in the center of these transit connections has become an epicenter for food trucks that feed the many professionals working nearby.

Photo Source: The Washington Post

- The Lafitte Greenway in New Orleans, LA is an example of trail-oriented development. Besides connecting transit riders, bicyclists, and pedestrians on its path, its green space is utilized for free weekly fitness classes, family movies, and festivals.

Photo Source: LafitteGreenway.org

- Bagby Street in Houston, TX is a popular corridor with transit and bicycle facilities that used to suffer regular flooding. Since adding green infrastructure like rain gardens, street trees, and permeable paving bricks, the street has remained functional during flooding, even during hurricanes.

Photo Source: HoustonPublicMedia.org

Funding Recommendations

The MPO can help fund TOD by funding TOD supportive projects, funding planning studies, or by supporting local funding efforts. Figure 5.6 names some funding or financing sources for TOD; some are available to the MPO, but most are available to local governments.

Fund TOD Supportive Projects

Figure 5.6 names some funding or financing sources for TOD. Of these, only a few are available to the MPO or transit agency. Federal Transit Administration funding can provide capital for new transit equipment or the station, especially through the competitive 5339-c grants. Transportation Alternative funds or flex funds can be used to construct pedestrian and bicycle facilities around the transit station, like sidewalks, lighting, or multiuse paths.

Fund Planning Studies

MPO funds can also be used to fund planning studies that support TOD. These studies could look specifically at transit projects, or could also be used for scenario planning studies. In Central Florida, the MPO collaborated with local governments, business alliances, the chamber of commerce, and FDOT to look at different growth scenarios. Together these different groups envisioned the scenario they preferred, which was a more transit-supportive environment with less sprawl. This visioning built community energy and support for TOD.[11]

Support Local Funding Efforts and Implementation

The MPO can work with local governments and developers to decide which funding or financing sources are applicable and useful to them by considering the infrastructure needs of the TOD, the market potential, the environmental impacts, and the future revenue-generating sources of the TOD. Additionally, the MPO can still support local communities in acquiring funds and implementing TOD in the following ways:

Defining the goals: Whether through MTP engagement or specific TOD engagement, the MPO can define the goals of TOD relating to regional goals (i.e. reducing congestion, improving accessibility) and remind partners of these goals.

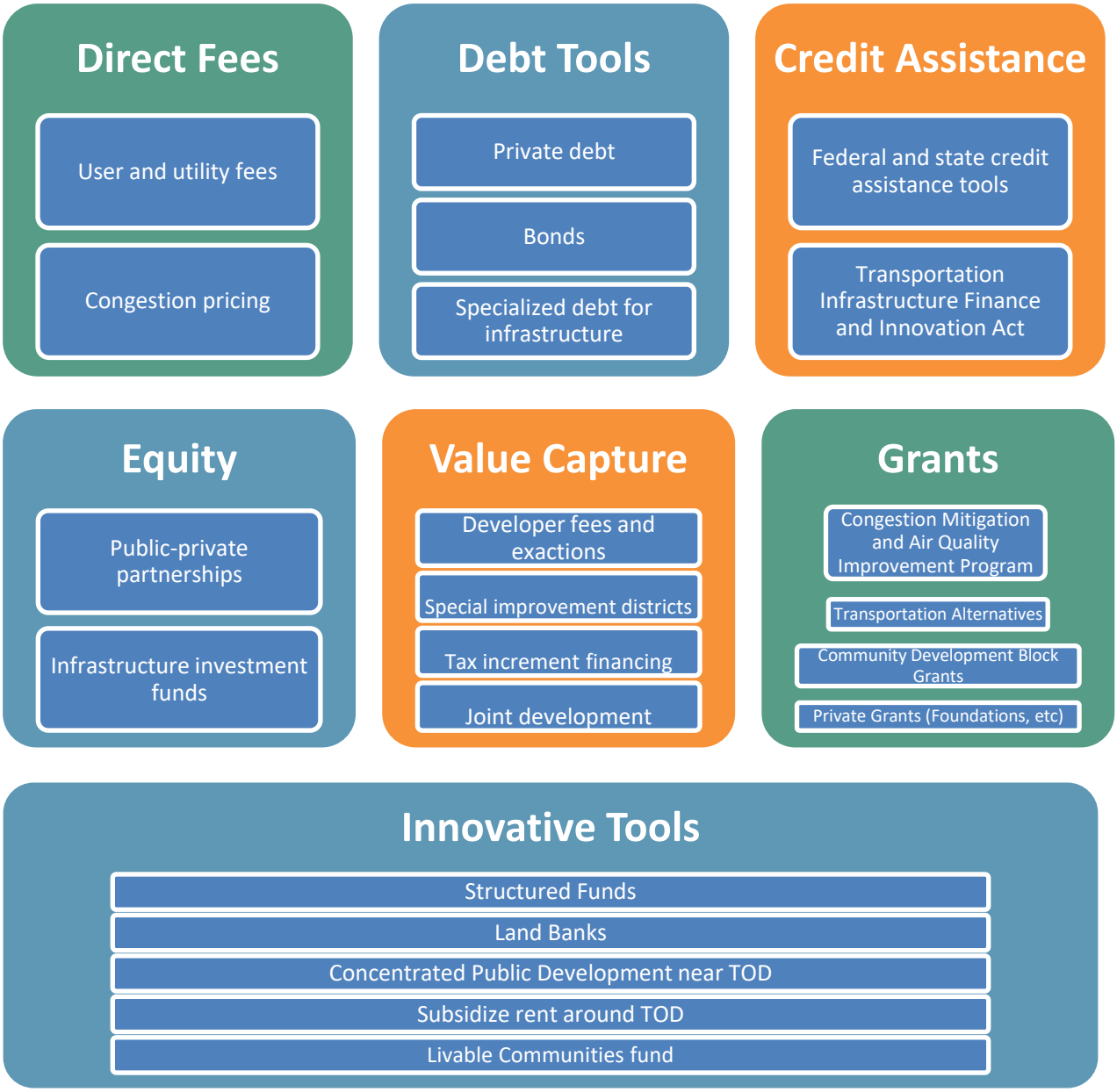
Engaging Organizations: Community groups can be powerful partners to promote TOD. Business alliances, environmental organizations, and housing activists can collaborate with the MPO in spreading the word, gathering interest, and keeping TOD on the agenda of local governments.

Staying Committed: The MPO can organize a working group among partners to create regular check-ins for progress.

[11] Dr. Colette Santasieri. *Planning for Transit-Supportive Development: A Practitioner's Guide, FTA Report No. 0055*. Federal Transit Administration. 2014. https://www.transit.dot.gov/sites/fta.dot.gov/files/FTA_Report_No._0055.pdf

Sharing information to replicate successes: The MPO can help collect data used for TOD planning and share data and lessons learned from one location with other areas.

Figure 5.6. Funding and Financing TOD



Source: Adopted from *Infrastructure Financing Options for TOD,* Environmental Protection Agency, 2013, https://www.epa.gov/sites/production/files/2014-02/documents/infrastructure_financing_options_for_transit-oriented_development.pdf