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**TO:** Stephen Benson, AICP, CNU-A  
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**FROM:** Rich Wilson, PE, AICP

**SUBJECT:** Gandy Area Transportation Study Update

**DATE:** April 13, 2023

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This technical memorandum begins with a review of the 2007 Gandy Area Transportation Study and the land use and transportation network changes that have occurred since its publication. Also included is a review of the known development proposals in the study area and an evaluation of the operating conditions at critical study area intersections with the addition of resultant traffic. The memorandum provides transportation recommendations to improve mobility and quality of life in the study area, including recommendations for streetscape improvements, bicycle and pedestrian facilities and crossings, and traffic calming measures. The memorandum concludes with a review of the available data on hurricane evacuation procedures and operations.

## 2007 Gandy Area Transportation Study

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In 2007, Tindale-Oliver & Associates prepared the Gandy Area Transportation Study for the City of Tampa. The study evaluated the redevelopment trends and associated transportation needs for the portion of the Interbay Peninsula south of Gandy Boulevard. At the time the study was conducted, several vacant and industrial properties along West Shore Boulevard were being rezoned to allow multi-family residential or mixed-use development. While these uses were more compatible with the primarily single-family residential uses in the area, there were concerns about the ability of the transportation network to accommodate the increased travel demand.

The study examined the prevailing land use and transportation conditions. Based on this review, the study focused on West Shore Boulevard and the adjacent development proposals. The evaluation considered the additional trip generation impacts from the development proposals (at the time) for:

- the Westshore Yacht Club (320 single-family units and 330 multi-family units replacing 300,000 square feet of light industrial)
- the Westshore Marina District (1,750 multi-family units, 240,000 square feet of non-residential uses, and 200 hotel rooms replacing 350,000 square feet of light industrial)
- the Georgetown Property just north of Gandy Boulevard (2,400 multi-family units replacing 700 multi-family units)
- Legacy Park (133 multi-family units)
- Casa Bella (250 multi-family units)
- Ingram & Shamrock PD (41 single-family units and 45 multi-family units)
- Richardson & Westshore PD (125 single-family units)

The additional trips were assigned to the roadway network using the Tampa Bay Regional Planning Model (TBRPM). Operational analysis was performed in Synchro for the primary signalized intersections along Gandy Boulevard that govern corridor and study area throughput: the intersections of Gandy Boulevard with West Shore Boulevard,

Manhattan Avenue, and Dale Mabry Highway. The analysis scenarios assumed the construction of committed improvements at the time, which included:

- the widening of Manhattan Avenue to four lanes from Gandy Boulevard to Euclid Avenue;
- the construction of Bridge Street between Gandy Boulevard and Tyson Avenue; and
- the reconstruction of Gandy Boulevard and associated intersection improvements at
  - West Shore Boulevard (westbound right turn),
  - Manhattan Avenue (dual eastbound, northbound, and southbound left turn lanes), and
  - Dale Mabry Highway (dual left turn lanes on all approaches).

The results of the operational analysis indicated that the committed improvements would not adequately address the anticipated growth in travel demand, with demand exceeding capacity by 54% at the West Shore Boulevard intersection, 28% at the Manhattan Avenue intersection, and 18% at the Dale Mabry Highway intersection. The evaluation contemplated the effects of the resulting congestion levels at the primary signalized intersections in contributing to neighborhood intrusion, with motorists taking advantage of the well-connected grid of neighborhood streets to bypass congested intersections. The evaluation also noted that Lois Avenue, north of Henderson Boulevard may become a more attractive route for motorists traveling from the study area to the Westshore Business District to avoid congested conditions on West Shore Boulevard; as such, the study recommended consideration of intersection improvements at the Lois Avenue and Henderson Boulevard intersection as well as strategies to improve the land use compatibility in the primarily single-family residential Lois Avenue corridor.

In resolving the operational deficiencies, the study team’s approach was to identify improvements that would distribute Gandy Area traffic across three signalized intersections along Gandy Boulevard rather than concentrating all traffic at the intersection of West Shore Boulevard and Gandy Boulevard. Understanding that the redistribution of traffic may negatively impact adjacent neighborhoods, additional strategies were developed by the study team to limit the intrusion of cut-through traffic on neighborhood streets. The following strategies were developed to address the operational deficiencies.

- Connect Tyson Avenue from West Shore Boulevard to Manhattan Avenue and signalize and provide turn lanes at Tyson Avenue’s intersections with West Shore Boulevard and Manhattan Avenue.
- Widen West Shore Boulevard to a four-lane divided section from Tyson Avenue to Fair Oaks Avenue and provide dual left turn lanes on all approaches at the Gandy Boulevard and West Shore Boulevard intersection.
- Add a second westbound left turn lane at the Gandy Boulevard and Manhattan Avenue intersection and a second southbound lane on Manhattan Avenue from Gandy Boulevard to Tyson Avenue.

With these improvements, operating conditions were improved and almost restored to existing conditions, with demand exceeding capacity by 23% at the West Shore Boulevard intersection, 17% at the Manhattan Avenue intersection, and 17% at the Dale Mabry Highway intersection. The anticipated construction cost at the time ranged from \$20 million to \$40 million. The study contemplated various funding sources for the implementation of the proposed improvements, including an updated transportation impact fee, community development district, and negotiated developer contribution.

Though the development of proposed improvements focused on the known, upcoming developments, the evaluation also contemplated future development that may occur from infill development or redevelopment of underutilized parcels. The evaluation found that throughout the study area, infill development of currently vacant land could result in 3,987 dwelling units, and redevelopment of underutilized properties could result in an additional 5,340 dwelling units. The proposed improvements identified for the known developments brought intersection operations on the Gandy Boulevard corridor closer to existing conditions; however, there was not anticipated to be any surplus capacity to accommodate further growth in travel demand. The evaluation concluded that there are no inexpensive or

otherwise expedient options to accommodate the additional infill/redevelopment and maintain adopted roadway levels of service. Potential strategies to accommodate the additional trips were discussed in the report, including construction of the Selmon Extension between the Selmon Expressway and the Gandy Bridge, widening of West Shore Boulevard and/or Lois Avenue to two-lane divided sections, and the implementation of bus rapid transit or fixed-guideway transit between the study area and the Central Business District and/or Westshore Business District.

## Changes Since the 2007 Gandy Area Transportation Study

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Since the publication of the 2007 Gandy Area Transportation Study, significant changes have impacted transportation conditions in the study area. Much of the anticipated development along West Shore Boulevard has already materialized or is in the process of being completed, significant transportation improvements have been constructed (most notably the Selmon Extension), and the growth of online retail and remote/hybrid work arrangements, accelerated by the COVID-19 pandemic, have significantly changed travel behaviors. The sections that follow highlight these changes in the study area as they relate to the transportation network, land use, and traffic characteristics.

### Land Use

Since 2007, many of the pending developments identified in the original study have been completed, including the ongoing development of the Westshore Marina District and the Westshore Yacht Club, and the completion of Legacy Park, Casa Bella, Ingram & Shamrock PD, and Richardson & Westshore PD. Additional developments not contemplated in the 2007 study have also been completed or are nearing completion along West Shore Boulevard including Cortland Westshore, The Pointe on Westshore, Harbor at Westshore, Amelia at Westshore, and the Southport neighborhood. Other significant developments not considered in the 2007 study and located outside of the West Shore Boulevard corridor include:

- MSouth at Manhattan Avenue and Ballast Point Boulevard,
- Walmart at Lois Avenue and Gandy Boulevard,
- Southtown Park and Schooner Cove (two residential developments) on Interbay Boulevard between Manhattan Avenue and Dale Mabry Highway
- Cortana behind the Home Depot at Dale Mabry Highway and Ballast Point Boulevard, and
- The Watson at McCoy Street and Trask Street.

Notably, the redevelopment of the Georgetown Apartments site, located on the western edge of West Shore Boulevard, just north of Gandy Boulevard has not yet occurred despite being considered in the 2007 study. The latest known plans include up to 550 residential units, significantly less intense than the 2,400 multi-family units previously envisioned.

According to data from the U.S. Census Bureau, between 2007 and 2021, population in the study area increased by roughly 21%, from about 29,700 residents to 35,900 residents. <sup>1</sup>

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<sup>1</sup> 2007 population estimate derived from linear interpolation of 2000 and 2010 decennial census counts, rounded to the nearest hundred. 2021 population estimate derived from 2021 American Community Survey 5-year estimates, rounded to the nearest hundred.

## Transportation Improvements

Since the previous study was published in 2007, significant transportation system improvements have been made in the study area. Noteworthy improvements include the following:

- Reconstruction of Gandy Boulevard between the Gandy Bridge and the Selmon Expressway to include new signals, a 30-foot-wide raised, landscaped median, sidewalks with brick detailing, and decorative lighting (2010).
- Implementation of several intersection improvements along the Gandy Boulevard corridor, including:
  - Gandy Boulevard & Westshore intersection: added westbound right turn (2010) and dual left turn lanes on the northbound and southbound approaches (2021)
  - Gandy Boulevard & Dale Mabry Highway intersection: added dual left turn lanes on all approaches (2010).
  - Southern Interbay Boulevard & Bayshore Boulevard intersection: signalization (2008).
- Widening of Interbay Boulevard between Manhattan Avenue and Lois Avenue to a two-lane divided roadway with westbound left turn lanes at Manhattan Avenue, Tanker Way Gate, and Landcare Lane and an eastbound right turn lane at Tanker Way Gate (2008).
- Widening (two lanes to four lanes) of Manhattan Avenue north of McElroy Avenue with the addition of dual left turns on all approaches and an eastbound right turn lane at the Manhattan Avenue & Gandy Boulevard intersection (2010).
- Access management modifications on Dale Mabry Highway south of Ballast Point Boulevard (2021).
- Construction of Bridge Street connection between Gandy Boulevard and Tyson Avenue (2018).
- Construction of a shared use path on Manhattan Avenue between Interbay Boulevard and Tyson Avenue (2011).
- Construction of the Selmon Extension, an elevated and tolled two-lane facility located in the median of Gandy Boulevard connecting the Gandy Bridge to the Selmon Expressway (2021).
- Buildout of the street grid in the southern portions of the Port Tampa neighborhood as development has pushed south toward MacDill Air Force Base (ongoing).

Additionally, several transportation improvements within the study area are programmed for construction in the City of Tampa's Capital Improvement Program (CIP) over the next five years. Those improvements include the following:

- Construction of an additional eastbound right turn lane on Interbay Boulevard at Tanker Way is funded for construction in Fiscal Year (FY) 2022. This project is intended to increase storage capacity for vehicles entering MacDill AFB and reduce blockages on eastbound Interbay Boulevard.
- Reconstruction of Interbay Boulevard between West Shore Boulevard and Bayshore Boulevard is funded in FY 2026 to provide safety, operational, and multimodal improvements in the corridor. Proposed improvements include:
  - adding a roughly 10-foot-wide trail on one side of the road and a continuous sidewalk along the other side,
  - adding a center turn lane,
  - closing portions of the open ditch drainage,
  - adding new mid-block crosswalks enhanced with Rapid Rectangular Flashing Beacons (RRFB), and
  - implementing operational improvements at major study area intersections.
- Construction of roadway improvements on Manhattan Avenue between Richardson Avenue and Interbay Boulevard is funded in FY 2022. The project also includes an extension of Richardson Avenue and is intended to provide an alternative north-south corridor for the Port Tampa neighborhood.
- Sidewalk improvements are funded for construction in FY 2023 on Ingraham Street between S Fitzgerald Street and S St. Patrick Street.



- Sidewalk improvements are funded for construction in FY 2022 on Prescott Street between S Kissimmee Street and West Shore Boulevard.
- Construction of a new roadway connection and shared use path on unimproved Tyson Avenue right-of-way and widening of Manhattan Avenue is funded in FY 2027 (as recommended in the 2007 study).

## Traffic Characteristics

As depicted in **Figure 1**, daily traffic counts on Gandy Boulevard have remained relatively steady since 2007, with a slightly decreasing trend corridor-wide. Traffic volumes on the corridor are highest on the western portion of the corridor, west of Dale Mabry Highway. East of Dale Mabry Highway, traffic volumes drop by roughly 15,000-20,000 vehicles per day. Traffic characteristics in the corridor have dramatically changed over the past several years with the opening of the Selmon Extension on April 19, 2021, the dramatic changes in travel patterns in Spring and Summer 2020 resulting from the COVID-19 pandemic, and the longer-term impacts of the rise of telecommuting and online retail.

Traffic counts were not collected on the segments of Gandy Boulevard that fall west of Dale Mabry Highway from 2017 through 2020; therefore, it is difficult to discern how each of these disruptors has individually impacted traffic volumes in the corridor. It is also worth noting that the daily traffic volumes shown for 2021 were collected in October and November of 2021, and therefore reflect the change in travel demand resulting from the presence of the Selmon Extension.

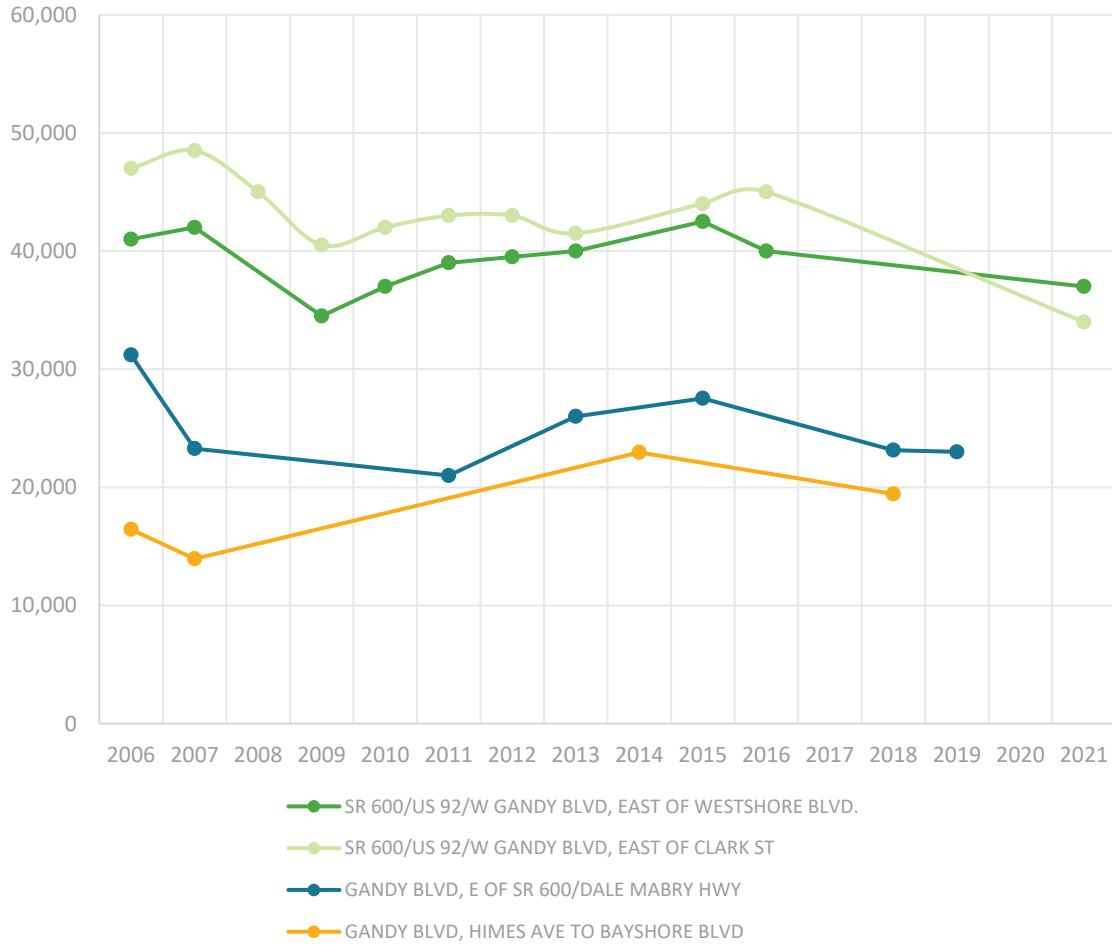


Figure 1: Gandy Boulevard Daily Traffic Volumes

Daily traffic volumes on Dale Mabry Highway for the period between 2006 and 2021 are shown in **Figure 2**. During this period, the traffic volumes on Dale Mabry Highway have been relatively steady except for an inexplicably sharp uptick in 2021 at the count station just north of the entrance to MacDill Air Force Base. It is possible that this count may be the result of an error in data collection, especially when considering the stable nature of the counts at this station in the preceding years and that such a large increase in volumes was not observed at any adjacent count stations in 2021. Traffic volumes on the corridor are highest on the northern portion of the corridor, near Gandy Boulevard. South of Interbay Boulevard, near the MacDill Air Force Base entrance, traffic volumes drop by roughly 10,000-15,000 vehicles per day.

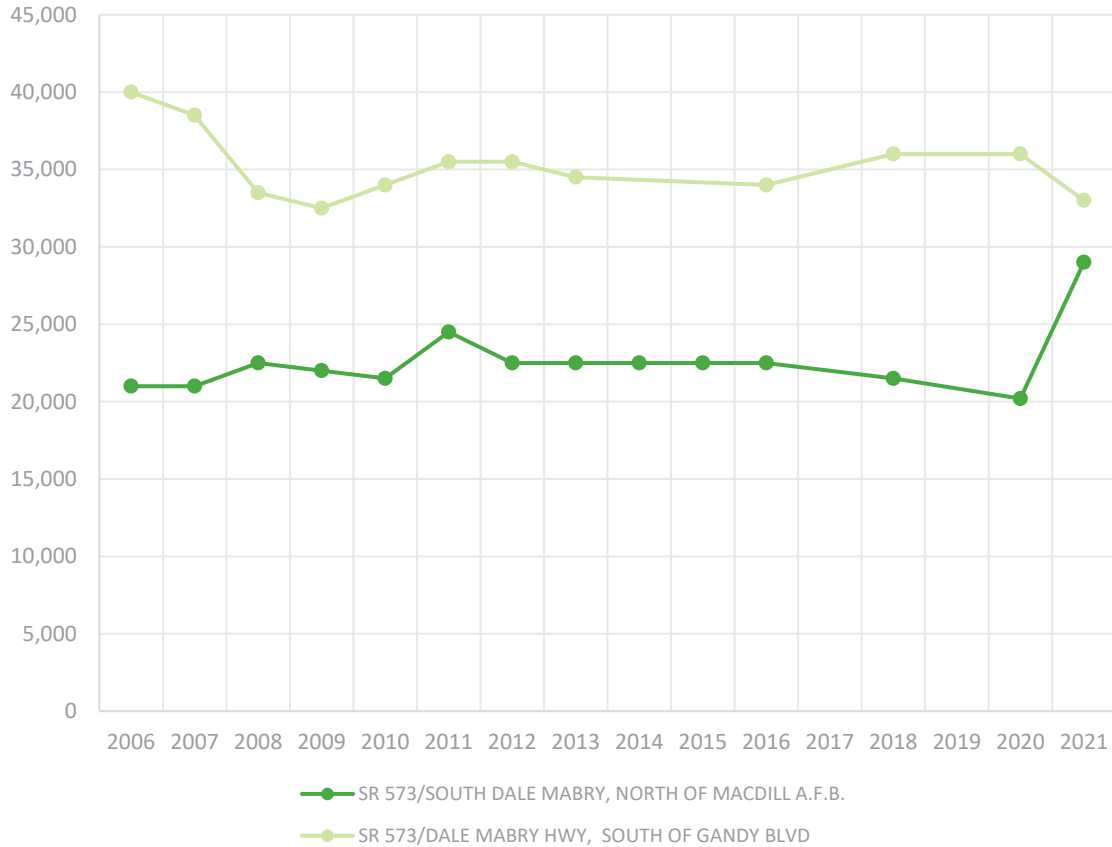


Figure 2: Dale Mabry Highway Daily Traffic Volumes

Figure 3 depicts the traffic volumes on other minor corridors within the study area between 2006 and 2021 for the years in which counts were collected. Except for the Manhattan Avenue corridor, general trends in traffic volumes on the study area roadways have been relatively flat over the observed period. In the Manhattan Avenue corridor, traffic volumes have nearly doubled at the two count stations during the observed period. This increase in traffic volumes may be attributed to the widening of Manhattan Avenue through the Gandy Boulevard intersection and up to Euclid Avenue, which was completed in 2010.

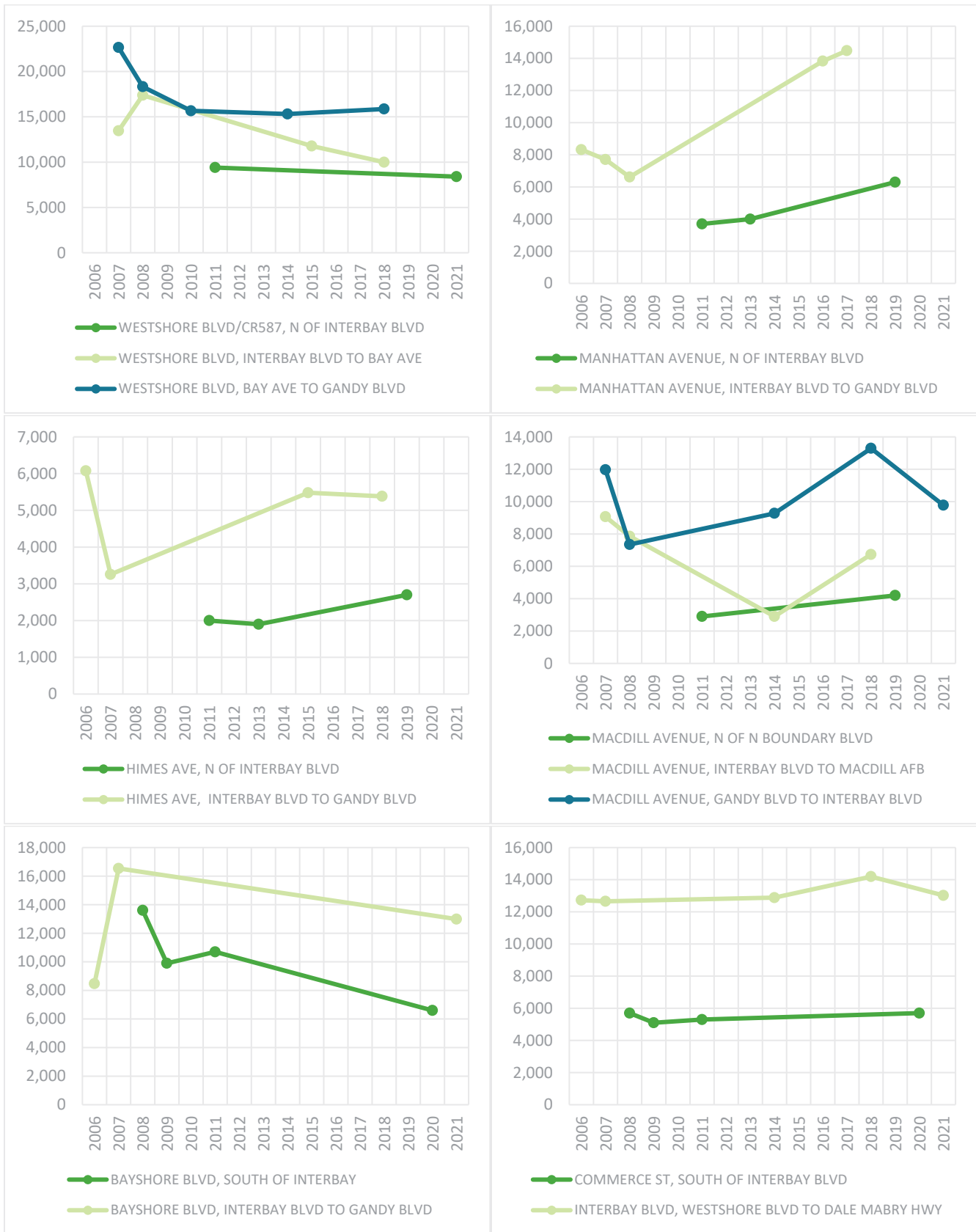


Figure 3: Minor Roadway Daily Traffic Volumes

## Known Development Proposals

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The latest development proposals were reviewed for large-scale developments within the study area. Significant developments that are either planned, under construction, or have recently been completed include the following:

- Rattlesnake Point
  - Tyson Avenue Development – Sajat Properties (5105 W Tyson Avenue): 40 townhomes, 285 multifamily units
  - Tyson Avenue Development – Woodfields (5301 W Tyson Avenue): 226 multifamily units, 5,000 square feet of retail, and 15 boat slips. Traffic Impact Study (TIS) evaluated 299 multifamily units and 1,000 SF retail.
  - Tyson-Viper – Southeastern (5411 W Tyson Avenue): 593 multifamily units, 32 townhomes, 6,000 SF restaurant in addition to existing 5,584 SF restaurant (Salt Shack) and replacing 4,480 square feet of office and 10,692 square feet of industrial.
  - MAA Westshore (5430 W Tyson Avenue): 495 multifamily units and 14,000 square feet of restaurant. TIS evaluated 650 multifamily units and 5,000 square feet of restaurant to replace the existing 47,915 square feet of industrial use and 15,617 square feet of office use.
- Interbay Residential Redevelopment (7701 Interbay Boulevard): 214 multifamily units to replace 22,198 square feet of warehousing. TIS evaluated 216 multifamily units.
- Elan South Tampa (7210 Interbay Boulevard): 350 multifamily units
- Dale Mabry Delivery Station (6604 S Dale Mabry Highway): 123,769 square-foot warehouse/distribution center (252 employees)
- Gandy Industrial Redevelopment (4130 W Gandy Boulevard): 410,000 square feet of light industrial uses, an 8,500 square-foot sit-down restaurant, two 4,000 square-foot fast-food restaurants with drive-thrus, a 10,000 SF retail plaza, a convenience store and gas station with 20 vehicle fueling positions, and a 47,415 square-foot health club.
- Hurley/Southport Community (Port Tampa): 173 single-family units
- The Watson (6603 S Trask Street): 240 multifamily units
- The Pointe on Westshore (4950 W Prescott Street): 444 multifamily units

## Operational Evaluation

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### Corridor Screening

Much of the development activity in the study area is in the western half of the Interbay Peninsula, west of Dale Mabry Highway. The trips produced by these planned developments are anticipated to impact the intersections of Gandy Boulevard & West Shore Boulevard, Gandy Boulevard & Manhattan Avenue, and Gandy Boulevard & Dale Mabry Highway most significantly. The intersections of Interbay Boulevard with West Shore Boulevard, Manhattan Avenue, and Dale Mabry Highway will also experience added traffic demand; however, the recent study and proposed recommendations along Interbay Boulevard are expected to address those needs. Therefore, the operational evaluation will focus on assessing the performance of the following intersections:

- Gandy Boulevard & West Shore Boulevard,
- Gandy Boulevard & Manhattan Avenue, and
- Gandy Boulevard & Dale Mabry Highway.

## Traffic Volume Development

Traffic counts collected on Thursday, September 16, 2021, were taken from the Tyson-Viper development transportation analysis and used as the basis for developing existing traffic volumes. These volumes were adjusted up by five percent to reflect peak season volumes based on data from the Florida Department of Transportation (FDOT). In evaluating the impacts of development activity, traffic from known developments was taken from the project traffic assignments included in the respective traffic impact studies and added to the existing volumes. Project traffic from the following developments was included in the analysis:

- Tyson Avenue Development – Sajet Properties (5105 W Tyson Avenue)
- Tyson Avenue Development – Woodfields (5301 W Tyson Avenue)
- Tyson-Viper – Southeastern (5411 W Tyson Avenue)
- MAA Westshore (5430 W Tyson Avenue)
- Interbay Residential Redevelopment (7701 Interbay Boulevard)
- Elan South Tampa (7210 Interbay Boulevard)
- Dale Mabry Delivery Station (6604 S Dale Mabry Highway)
- Gandy Industrial Redevelopment (4130 W Gandy Boulevard)
- Hurley/Southport Community (Port Tampa)
- The Watson (6603 S Trask Street)
- The Pointe on Westshore (4950 W Prescott Street)
- Westshore Marina District (Unbuilt Portion – 444 multifamily units, 55,710 square feet of commercial remaining at the time of counts)
- Westshore Yacht Club (Unbuilt Portion – 250 multifamily units remaining at the time of counts)

Project traffic for Georgetown Apartments site was also included in the analysis. The traffic analysis for the site was not available, so anticipated project traffic for the currently proposed 550 residential units was estimated using the 11<sup>th</sup> edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual and assigned based on existing traffic patterns.

The developments considered in this analysis are mapped in **Figure 4**.



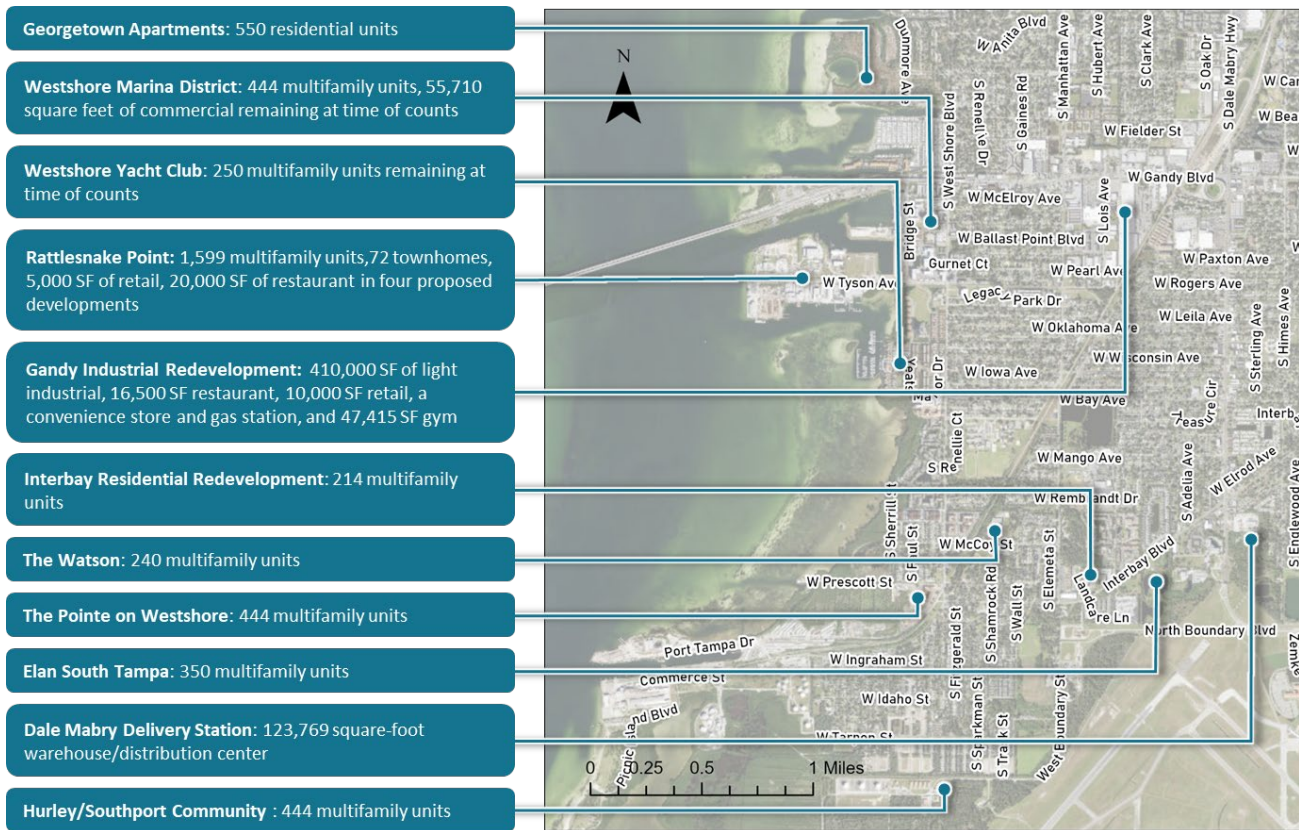


Figure 4: Development Activity Considered in the Operational Evaluation

## Evaluation

Operations at the study intersections were evaluated with the addition of traffic from anticipated developments using Capacity Analysis at Junctions (CAP-X). CAP-X is a planning-level operations tool that conducts Critical Movement Analysis to gauge the potential performance of intersections. CAP-X identifies critical movements at an intersection and assesses the anticipated demand against the capacity for those critical movements using traffic volumes and intersection geometry. The output of the analysis is a volume-to-capacity ratio (v/c). Ideally, a v/c value at or below 1.00 indicates appropriate capacity is available at an intersection. Lower v/c ratios generally correspond to more efficient intersection operations.

The operations at the subject intersections were also evaluated under a handful of scenarios to test the sensitivity of the intersection performance to diversions in traffic from West Shore Boulevard to Manhattan Avenue that will be facilitated by the City’s project to connect the corridors via the Tyson Avenue extension.

### Minimal Diversion

- Ten percent of the existing northbound through, northbound right-turn, southbound through, and westbound left-turn movements at the West Shore Boulevard & Gandy Boulevard intersection were reassigned to the Manhattan Avenue & Gandy Boulevard intersection.
- For traffic generated by the proposed Rattlesnake Point developments, 10 percent of the trips making a northbound or southbound through movement at the West Shore Boulevard & Gandy Boulevard intersection were reassigned to the Manhattan Avenue & Gandy Boulevard intersection.

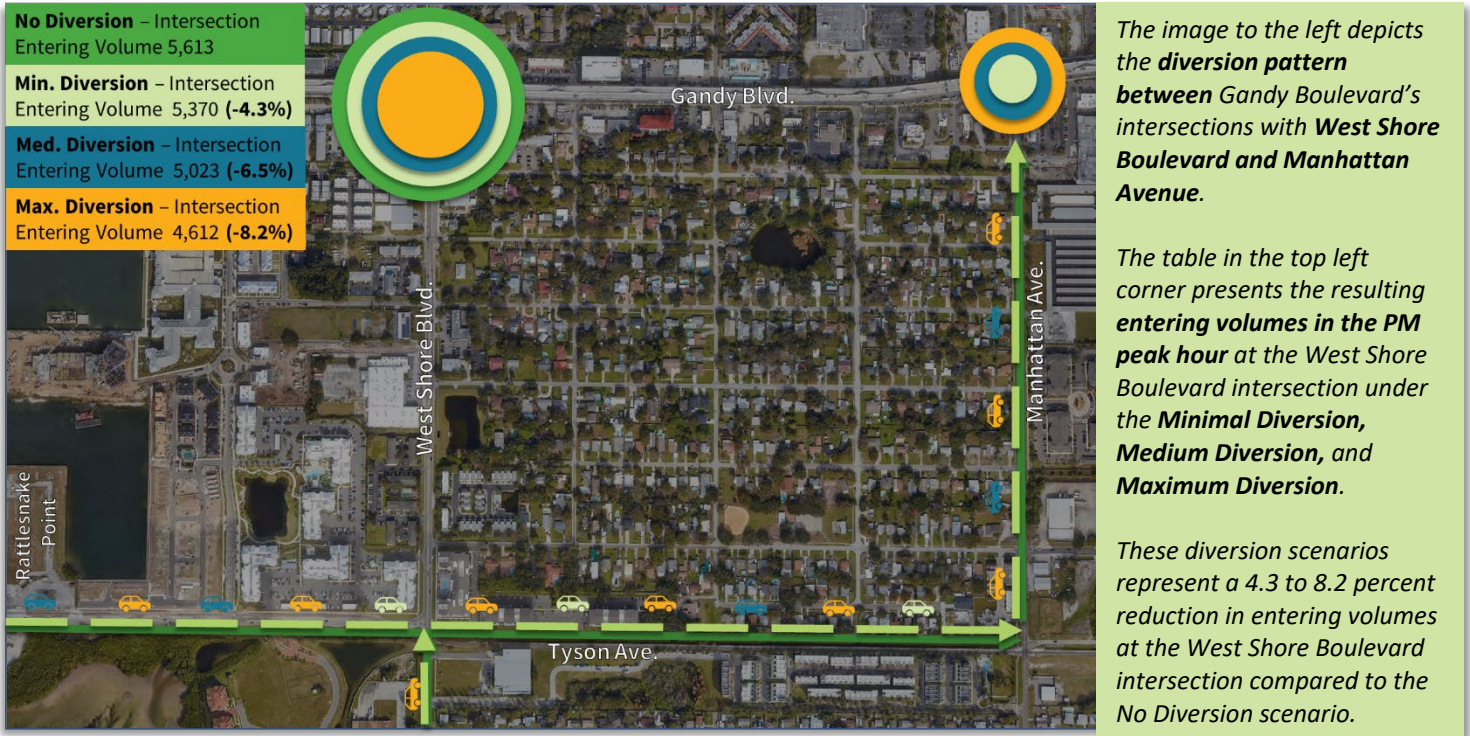
- Fifteen percent of trips making a northbound right-turn or westbound left-turn movement were reassigned to the Manhattan Avenue & Gandy Boulevard intersection and an additional five percent were reassigned to the Lois Avenue & Gandy Boulevard intersection.
- All reassigned trips were assumed to have used the Tyson Avenue corridor to distribute between the West Shore Boulevard, Manhattan Avenue, and Lois Avenue corridors.

### Medium Diversion

- Twenty percent of the existing northbound through, northbound right-turn, southbound through, and westbound left-turn movements at the West Shore Boulevard & Gandy Boulevard intersection were reassigned to the Manhattan Avenue & Gandy Boulevard intersection.
- An additional 10 percent of existing northbound right-turn movements were reassigned to the Lois Avenue & Gandy Boulevard intersection.
- For traffic generated by the proposed Rattlesnake Point developments, 20 percent of the trips making a northbound or southbound through movement at the West Shore Boulevard & Gandy Boulevard intersection were reassigned to the Manhattan Avenue & Gandy Boulevard intersection.
- Thirty percent of trips making a northbound right-turn or westbound left-turn movement were reassigned to the Manhattan Avenue & Gandy Boulevard intersection and an additional 10 percent were reassigned to the Lois Avenue & Gandy Boulevard intersection.
- All reassigned trips were assumed to have used the Tyson Avenue corridor to distribute between the West Shore Boulevard, Manhattan Avenue, and Lois Avenue corridors.

### Maximum Diversion

- For existing traffic and traffic generated by proposed Rattlesnake Point developments, 40 percent of the existing northbound through and southbound through movements at the West Shore Boulevard & Gandy Boulevard intersection were reassigned to the Manhattan Avenue & Gandy Boulevard intersection.
- Forty percent of the northbound right-turn and westbound left-turn movements were reassigned from the West Shore Boulevard & Gandy Boulevard intersection to the Manhattan Avenue & Gandy Boulevard intersection and an additional 20 percent were reassigned to the Lois Avenue & Gandy Boulevard intersection.
- All reassigned trips were assumed to have used the Tyson Avenue corridor to distribute between the West Shore Boulevard, Manhattan Avenue, and Lois Avenue corridors.



The results of the operational evaluation are presented in **Table 1**. Results are presented for each of the critical intersections under various scenarios: conditions before completion of the Selmon Extension, the existing condition, and the future conditions with anticipated development traffic under the various diversion scenarios.

Table 1: Operational Evaluation Results

Intersection	Pre-Selmon Extension	Existing	Future Conditions			
			No Diversion	Minimal Diversion	Medium Diversion	Maximum Diversion
AM						
West Shore & Gandy	0.84	0.53	0.84	0.78	0.70	0.66
Manhattan & Gandy	0.70	0.55	0.64	0.66	0.67	0.71
Dale Mabry & Gandy*	N/A	0.70	0.74	0.74	0.74	0.74
PM						
West Shore & Gandy	0.83	0.60	1.11	1.03	0.91	0.85
Manhattan & Gandy	0.72	0.65	0.85	0.84	0.82	0.81
Dale Mabry & Gandy*	N/A	0.83	0.91	0.91	0.91	0.91

\*Given the free-flow eastbound right-turn lane, this intersection was evaluated without the eastbound right-turn lane and associated volumes.

According to the results of the CAP-X evaluation, the West Shore Boulevard & Gandy Boulevard intersection is expected to operate above capacity (v/c ratio greater than 1.00) with the addition of development traffic and without the new Tyson Avenue connection and associated diversion in traffic. All intersections are anticipated to operate with v/c ratios less than 1.00 under the medium and maximum diversion scenarios. The results of this analysis confirm the need for the new roadway connection on the unimproved Tyson Avenue right-of-way and the extension of the second



southbound through lane on Manhattan Avenue from the current terminus at Paul Avenue to the proposed Tyson Avenue connector.

Additional mitigation improvements have been identified at the study intersection from traffic impact analyses conducted for the major developments in the study area. Those improvements include:

- West Shore Boulevard & Gandy Boulevard: northbound right turn lane
- Gandy Boulevard & Manhattan Avenue: southbound and northbound right turn lanes
- Gandy Boulevard & Dale Mabry Highway: eastbound and southbound left turn lanes

While the improvements at the intersections along Gandy Boulevard would increase capacity, all of these intersections exist within constrained environments and implementation of these improvements would result in significant impacts to private property.

## Multimodal Evaluation

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With the understanding that options to address mobility are limited through roadway widening or turn lane additions at the study intersections, an evaluation was conducted to evaluate how the study area transportation network could be optimized to expand transportation choices, improve safety, and enhance quality of life for residents. The following sections highlight the proposed improvements developed to accomplish these goals, including sidewalk improvements, modifications to neighborhood streets to improve accommodation of nonmotorized users and discourage speeding or cut-through traffic, streetscape improvements in commercial corridors, and new or improved pedestrian and bicycle crossings on major roads. Those improvements are listed in **Table 2**, mapped in **Figure 5** and **Figure 7**, and described in more detail in the sections that follow.

Ninety-nine total improvements were recommended for the SOG community to improve traffic flow, safety, and accessibility, including:

- 42 all-way stops/neighborhood traffic circles
- 17 proposed crossings
- 12 improvements to neighborhood collectors
- Nine (9) sidewalk extensions
- Five (5) enhancements to existing crossings
- Four (4) sections recommended for either wide sidewalks or shared use paths
- Two (2) proposed signals
- Two (2) proposed shared use paths
- Two (2) segments of streetscape improvements
- Four (4) instances of previously proposed projects (MacDill 48 connection, Interbay Boulevard recommendations, and two South Tampa Greenway segments)

Cost and time estimates were based on the complexity and size of the recommendation, as well as prioritization of the project type for high-concern areas.

Table 2: Proposed Multimodal Improvements

Location	Improvement Type	Cost	Length (ft)	Timeline
Ballast Point Blvd. and Quincy St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Ballast Point Blvd. and Trask St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Bay Ave. and Russell St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Bradley St. and Shamrock Rd.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Elrod Ave. and Engelwood Ave.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Idaho St. and Fault St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Idaho St. and Obrien St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Idaho St. and Westshore Blvd.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Ingraham St. and Fitzgerald St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Ingraham St. and Sherrill St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Ingraham St. and Westshore Blvd.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Iowa Ave. and Trask St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Leila Ave. and 1st St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Leila Ave. and Grady Ave.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Loughman St. and Shamrock Rd.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Mango Ave. and Clark Ave.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Napolean Ave. and Engelwood Ave.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Napolean Ave. and Sheridan Rd.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Paul Ave. and Sheridan Rd.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Paul Ave. and Sherwood Ave.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Paxton Ave and Hesperides St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Paxton Ave. and Quincy St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Paxton Ave. and Russell St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Paxton Ave. and Sheridan Rd.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Pearl Ave. and 6th St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Prescott St. and Sparkman Rd.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Price Ave. and Zion St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Tarpon St. and Kissimmee St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Tarpon St. and Obrien St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short

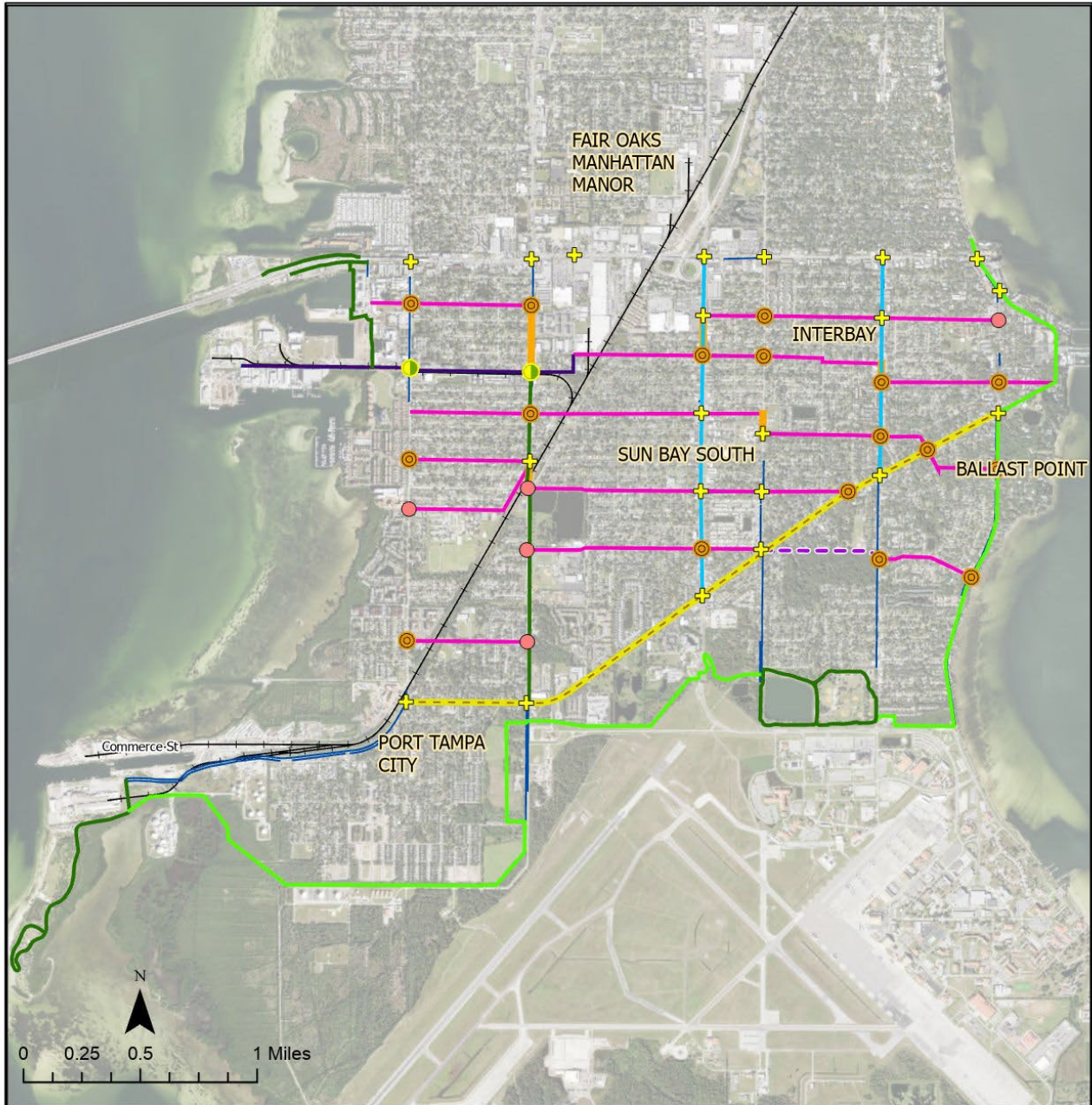
Location	Improvement Type	Cost	Length (ft)	Timeline
Tarpon St. and Sherrill St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Tarpon St. and Swoope St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Trilby Ave. and Trask St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Tyson Ave. and Grady Ave.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Tyson Ave. and Quincy St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Van Buren Dr. and Court Dr.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Van Buren Dr. and Sheridan Rd.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Wallace Ave. and 1st St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Wallace Ave. and 6th St.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Wallace Ave. and Church Ave.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Wallace Ave. and Sheridan Rd.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Wisconsin Ave. and Grady Ave.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
Wyoming Ave. and Church Ave.	All Way Stop/Neighborhood Traffic Circle	\$	N/A	Short
N. boundary of MacDill 48 Park from Interbay Blvd. to MacDill Ave.	Connection through MacDill 48	\$\$\$	933.6	Mid
Ballast Point Blvd. and Bayshore Blvd.	Enhance Existing Crossing	\$\$	N/A	Short
Manhattan Ave. and Bay Ave.	Enhance Existing Crossing	\$\$	N/A	Short
Manhattan Ave. and Mango Ave.	Enhance Existing Crossing	\$\$	N/A	Short
Manhattan Ave. and McCoy St.	Enhance Existing Crossing	\$\$	N/A	Short
Westshore Blvd. and Montgomery Ave.	Enhance Existing Crossing	\$\$	N/A	Short
Interbay Blvd. from Westshore Blvd. to Bayshore Blvd.	Interbay Blvd. Recommendations	\$\$\$	5,279.5	Mid
Averill Ave. from MacDill Ave. to Bayshore Blvd.	Neighborhood Collector	\$\$	757.6	Mid
Ballast Point Blvd. from Dale Mabry Hwy. to Bayshore Blvd.	Neighborhood Collector	\$\$\$	2,301.6	Long
Bay Ave. from Manhattan Ave. to Interbay Blvd.	Neighborhood Collector	\$\$\$	2,501.3	Long
Mango Ave. from Manhattan Ave. to Interbay Blvd.	Neighborhood Collector	\$\$	1,364.9	Mid
McCoy St. from Westshore Blvd. to Manhattan Ave.	Neighborhood Collector	\$\$	936.5	Mid
Montgomery Ave. from Westshore Blvd to Manhattan Pl. to Manhattan Ave.	Neighborhood Collector	\$\$\$	1,173.1	Mid
Oklahoma Ave. from Westshore Blvd. to Himes Ave.	Neighborhood Collector	\$\$\$	2,747.4	Long
Pearl Ave. from Lois Ave. to MacDill Ave.	Neighborhood Collector	\$\$\$	2,429.5	Mid



Location	Improvement Type	Cost	Length (ft)	Timeline
Price Ave. from Bridge St. to Manhattan Ave.	Neighborhood Collector	\$\$\$	1,256.5	Long
Tyson Ave. from MacDill Ave. to Interbay Blvd.	Neighborhood Collector	\$\$\$	1,343.7	Mid
Wyoming Ave. from Himes Ave to 1st St.	Neighborhood Collector	\$\$\$	1,223.1	Long
1st St. from Wyoming to Bay Ave. to Bayshore Blvd.	Neighborhood Collector	\$\$	782.8	Long
Averill Ave. and Bayshore Blvd.	Proposed Crossing	\$\$	N/A	Mid
Bay Ave. and Bayshore Blvd.	Proposed Crossing	\$\$	N/A	Mid
Dale Mabry Hwy. and Mango Ave.	Proposed Crossing	\$\$	N/A	Mid
Dale Mabry Hwy. and Pearl Ave.	Proposed Crossing	\$\$	N/A	Mid
Himes Ave. and Ballast Point Blvd.	Proposed Crossing	\$\$	N/A	Mid
Himes Ave. and Peal Ave.	Proposed Crossing	\$\$	N/A	Mid
Interbay Blvd. and 1st St.	Proposed Crossing	\$\$	N/A	Mid
Interbay Blvd. and Bay Ave.	Proposed Crossing	\$\$	N/A	Mid
MacDill Ave. and Averill Ave.	Proposed Crossing	\$\$	N/A	Mid
MacDill Ave. and Tyson Ave.	Proposed Crossing	\$\$	N/A	Mid
MacDill Ave. and Wyoming Ave.	Proposed Crossing	\$\$	N/A	Mid
Manhattan Ave. and Oklahoma Ave.	Proposed Crossing	\$\$	N/A	Mid
Price Ave. and Manhattan Ave.	Proposed Crossing	\$\$	N/A	Mid
Price Ave. and Westshore Blvd.	Proposed Crossing	\$\$	N/A	Mid
Tyson Ave. and Bayshore Blvd.	Proposed Crossing	\$\$	N/A	Mid
Westshore Blvd. and Iowa Ave.	Proposed Crossing	\$\$	N/A	Mid
Westshore Blvd. and McCoy St.	Proposed Crossing	\$\$	N/A	Mid
Tyson Ave. and Manhattan Blvd.	Proposed Signal	\$\$\$	N/A	Mid
Tyson Ave. and Westshore Blvd.	Proposed Signal	\$\$\$	N/A	Mid
Tyson Ave. from Rattlesnake Point to Manhattan Ave.	Shared Use Path	\$\$\$	2,253.8	Mid
Tyson Ave. from Manhattan to Lois Ave. to Pearl Ave.	Shared Use Path	\$\$	467.5	Mid
Commerce St. from Interbay Blvd. to Picnic Island Blvd.	Sidewalk	\$\$\$	12,449.6 (5,271.6 EB & 7,178 WB)	Long
Gandy Blvd. from Himes Ave. to Near Dale Mabry Hwy.	Sidewalk	\$\$	894.5 (WB)	Mid
Himes Ave. from Marcum St. to Iowa Ave.	Sidewalk	\$\$\$	5,231.6 (2,181.8 SB & 3,049.8 NB)	Mid

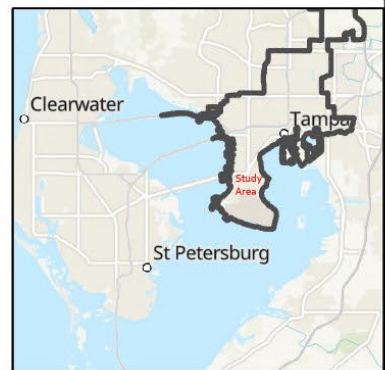
Location	Improvement Type	Cost	Length (ft)	Timeline
MacDill Ave. from Marcum St. to Interbay Blvd.	Sidewalk	\$\$\$	4,030.1 (SB)	Mid
Manhattan Ave. from Gandy Blvd. to Price Ave.	Sidewalk	\$\$	1,184.5 (NB)	Mid
Manhattan Ave. from Interbay. to Richardson Ave.	Sidewalk	\$\$\$	4,656.5 (1,950.2 NB & 2,706.3 SB)	Long
Westshore Blvd. from Gandy Blvd. to Leila Ave.	Sidewalk	\$\$	2639 (SB)	Mid
Bayshore Blvd. from Jules Verne Ct. to Paxton Ave.	Sidewalk	\$	254.9 (NB)	Mid
Bayshore Blvd. from Price Ave. to Interbay Blvd.	Sidewalk	\$	253.8 (SB)	Mid
Bayshore Blvd from Gadsden Park Trail to Hawthorne Rd.	South Tampa Greenway	\$\$\$	7,261.4	Long
MacDill AFB Boundary from Picnic Island Blvd. to Gadsden Park Trail	South Tampa Greenway	\$\$\$	5159	Long
Dale Mabry Hwy. from Gandy Blvd. to Interbay Blvd.	Streetscape Improvements	\$\$\$	2,654.6	Long
MacDill Ave. from Gandy Blvd. to Interbay Blvd.	Streetscape Improvements	\$\$\$	1,705.7	Long
Himes Ave. from Oklahoma Ave. to Wyoming Ave.	Wide Sidewalk or Shared Use Path	\$\$	157.2	Long
Manhattan Ave. from Price Ave. to Tyson Ave.	Wide Sidewalk or Shared Use Path	\$\$	537.1	Long
Manhattan Ave. from Iowa Ave. to Bay Ave.	Wide Sidewalk or Shared Use Path	\$\$	212.7	Long
MacDill Ave. from Pearl Ave. to Tyson Ave.	Wide Sidewalk or Shared Use Path	\$\$	145.7	Mid

Figure 5: Multimodal Recommendations



### Proposed Multimodal Improvements

- |   |  |
|---|--|
|  Existing Crossing             |  Interbay Boulevard Recommendations |
|  Existing Trail                |  Wide Sidewalk or Shared Use Path   |
|  Enhance Existing Crossing     |  Sidewalk                           |
|  Proposed Crossing             |  Shared Use Path                    |
|  Proposed Signal               |  Neighborhood Collector             |
|  Connection through MacDill 48 |  Streetscape Improvements           |
|  South Tampa Greenway          |  |



## Planned Improvements

As mentioned previously, several planned improvements will address multimodal needs in the study area. These multimodal improvements include plans to construct a shared use path on the unimproved Tyson Avenue right-of-way between West Shore Boulevard and Manhattan Avenue, as well as shared use path and sidewalk improvements identified for Interbay Boulevard between West Shore Boulevard and Bayshore Boulevard. The South Tampa Greenway is a planned improvement for the study area, though funding has not been identified for the construction of this facility. Portions of the facility in Gadsden Park and Picnic Island Park have already been constructed, and the remainder of the trail facility is identified as a planned and studied trail in the most recent (2019) Tampa-Hillsborough Greenways and Trails Plan Map.

## Neighborhood Collectors

The network of major north-south roadways is well-defined in the study area and includes West Shore Boulevard, Manhattan Avenue, Dale Mabry Highway, Himes Avenue, MacDill Avenue, and Bayshore Boulevard. These facilities provide significant connectivity and redundancy throughout the Interbay Peninsula. Conversely, the network of major east-west connections in the study area is limited to the Gandy Boulevard and Interbay Boulevard corridors.

The development of additional east-west corridors is complicated by land use compatibility, with all other east-west roadways in the study area fronted primarily by single-family residential uses that face toward and connect to the street through private driveways. Additionally, the presence of physical barriers, including railroads, private development (particularly the large-scale commercial and industrial development near the Gandy Boulevard/Selmon Expressway interchange), closed medians and directional median openings on Dale Mabry Highway, and breaks in the street grid have resulted in only a handful of roadways that provide meaningful east-west connectivity in the study area.

Given the connectivity provided, combined with congestion on the major roadways, diverted traffic tends to concentrate on these neighborhood roads. Traffic calming measures (i.e., speed humps) have been implemented on many of these roads to slow speeds and discourage cut-through traffic. Due to the connectivity provided, these east-west roadways are also logical corridors for non-motorized users to travel. This study has identified these facilities as neighborhood collectors and has identified additional strategies to slow speeds and enhance conditions for non-motorized users on these facilities. The neighborhood corridors are mapped in **Figure 5**.

With the goals of connectivity, compatibility, and safety in mind, a typical section has been developed for these roadways that aims to control motorist speeds, provide comfortable environments for walking and biking, and improve neighborhood aesthetics. This typical section, shown in **Figure 6**, provides sidewalks, street trees within a wide verge (area between the sidewalk and the roadway), raised curbs, and narrow travel lanes with shared lane markings. This typical section was developed to fit comfortably within a 60' right-of-way, the standard right-of-way dimension for neighborhood streets in the study area. Where they exist, more constrained rights-of-way may require narrowing or eliminating the verge and street trees, eliminating the curb and gutter, and/or narrowing travel lanes to fit the proposed multimodal elements into the available right-of-way.



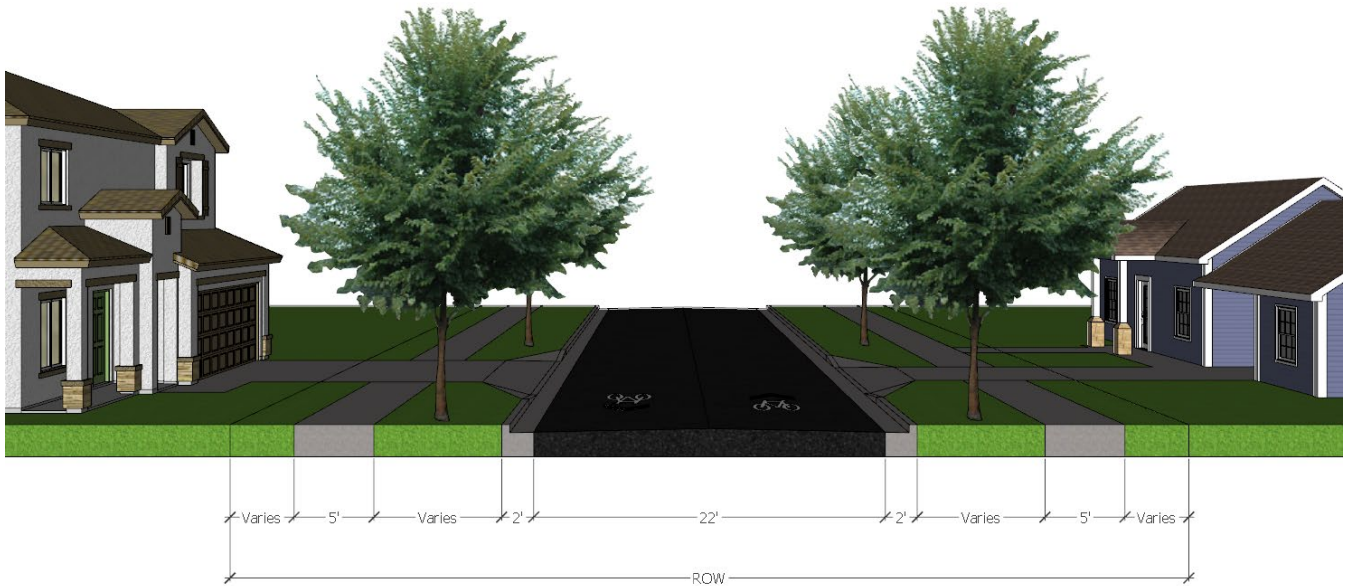


Figure 6: Neighborhood Collector Typical Section

Consideration should also be given to spot improvements on these neighborhood collectors to slow speeds while maintaining corridor connectivity and capacity. Those potential spot improvements include:

- **Speed Table/Raised Crosswalks:** Vertical deflection in the roadway used to physically limit the speed of motorists. These raised areas can also be used as a crosswalk.



Source: Safe Routes to School - Raised Crosswalks

- **Chicane/Lateral Shift:** Realignment of an otherwise straight street to introduce horizontal deflection with the intent of slowing operating speeds.



Source: National Association of City Transportation Officials - Chicane

- **Traffic Circle:** Raised island placed in the center of an unsignalized intersection around which intersection traffic circulates (similar to a roundabout). Traffic circles are typically small and designed to fit within the travel way of an existing intersection. They can be stop or yield controlled.



Source: Re:Streets – Traffic Circle

## Pedestrian and Bicycle Crossings

As a complement to the system of neighborhood collectors, the study team developed a series of pedestrian and bicycle crossings. These crossings were strategically located to facilitate the crossing of non-motorized traffic on neighborhood collectors and trail facilities across the major roads. Additionally, it was noted during the field review of traffic conditions that limited gaps occurred for vehicles turning from side streets onto the major roads, particularly on West Shore Boulevard. A secondary benefit of these crossing opportunities will be speed management and the creation of gaps for turning traffic on the major north-south roadways.

The recommended crossing enhancements are also mapped on **Figure 5** and include locations to enhance existing and add new crossing locations.

## Commercial Corridor Streetscape Improvements

Community members had indicated a significant need for more retail opportunities south of Gandy Boulevard. Though this strategy would certainly have positive transportation benefits (i.e., improving job to housing ratios in the study area, thus reducing demand for regional travel) the location of the study area at the end of a peninsula is a major hurdle to attracting retailers looking to maximize their proximity to households. Seeking to mitigate this



geographic limitation, the study team considered strategies that could be employed to encourage retail development in the study area.

While decisions about where to locate retail stores are ultimately market-driven decisions made by private entities and outside the control of the local government, improvements identified in **Figure 5** were identified as strategies to help lay the foundation for increased retail uses in the study area. An ongoing effort is currently underway to examine land use strategies that will allow and encourage retail development. In concert with these land use strategies, streetscaping improvements on the two commercial corridors in the study area, MacDill Avenue and Dale Mabry Highway, can help attract retail activity by enhancing corridor aesthetics and walkability.

## Sidewalk Improvements

Sidewalk data in the study area were reviewed to identify high-priority locations to install sidewalk connections where they are currently missing on major roads. Existing gaps on major roads, specifically Gandy Boulevard, West Shore Boulevard, Manhattan Avenue, Himes Avenue, and Commerce Street, are identified in **Figure 5**. Existing sidewalk gaps on Bayshore Boulevard, MacDill Avenue, and Interbay Boulevard are assumed to be addressed by the projects identified for each of these facilities (i.e., the South Tampa Greenway, MacDill Avenue streetscape improvements, and Interbay Boulevard study recommendations, respectively).

## Neighborhood Intrusion

As major roadways and intersections approach capacity, the potential for the diversion of regional traffic onto neighborhood streets increases. As this potential exists (and may already be occurring in some locations), this evaluation also identified opportunities to use traffic control to better manage traffic diversion and speeds on neighborhood streets. Existing traffic control on neighborhood streets was reviewed throughout the study area. Recommendations were developed to ensure that there is a stop or yield at least once every quarter mile on neighborhood streets where traffic calming (speed humps) is not currently present. The intersections for which implementation of an all-way stop or neighborhood traffic circle is recommended for consideration are presented in **Figure 7**.

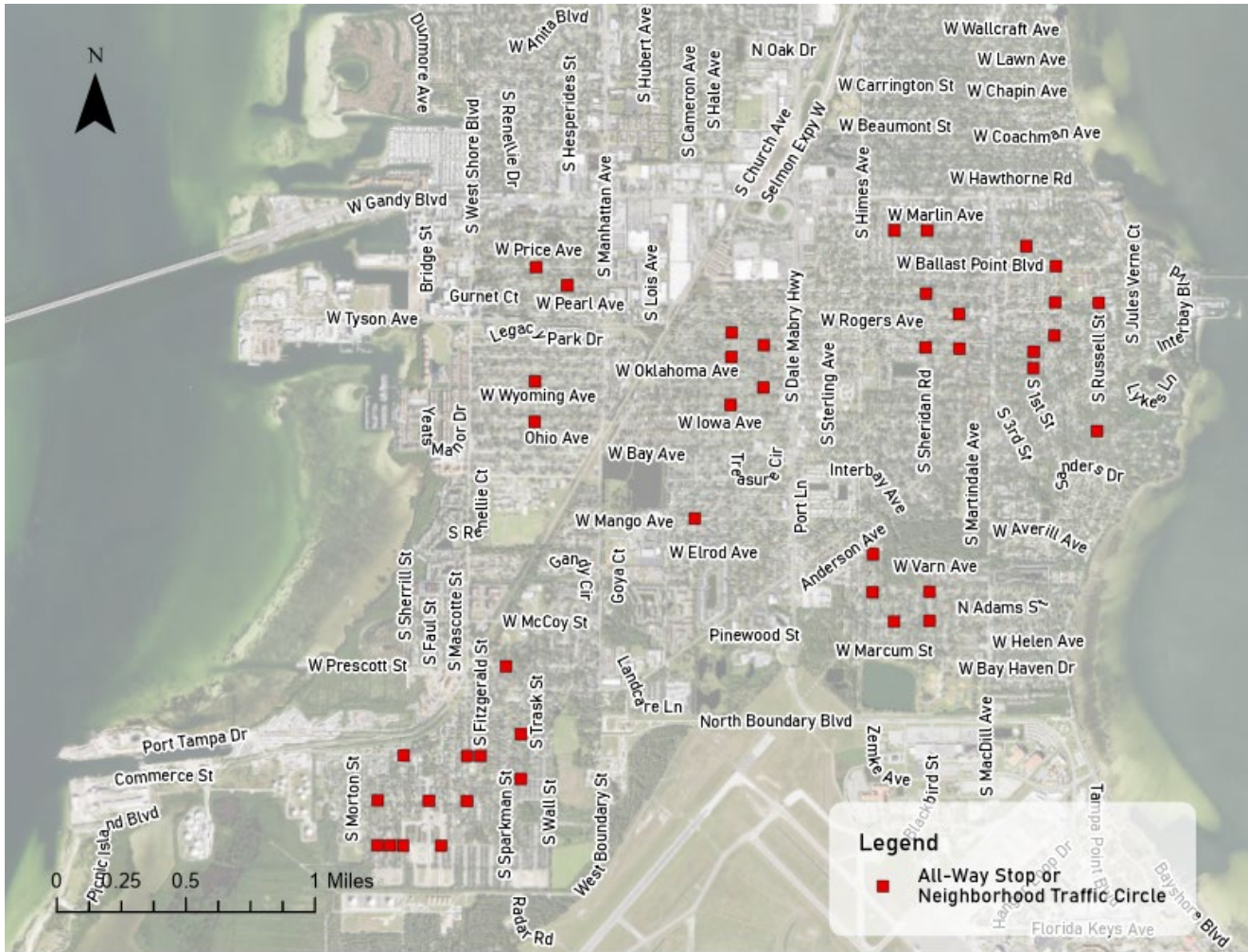


Figure 7: All-Way Stop or Neighborhood Traffic Circle

## Truck Routes

Figure 8 shows the truck routes in the study area along with the industrial and commercial land uses. Designated truck routes in the corridor include Gandy Boulevard, Interbay Boulevard, Commerce Street, West Shore Boulevard, Dale Mabry Highway, MacDill Avenue, the Selmon Expressway, and short segments of Lois Avenue, Pearl Avenue, and Manhattan Avenue. These designated truck routes align with the corridors with a significant presence of commercial and/or industrial uses. As the known development proposals and any future proposals to convert industrial lands to residential uses are constructed, the presence of trucks is anticipated to decrease on study area roadways.



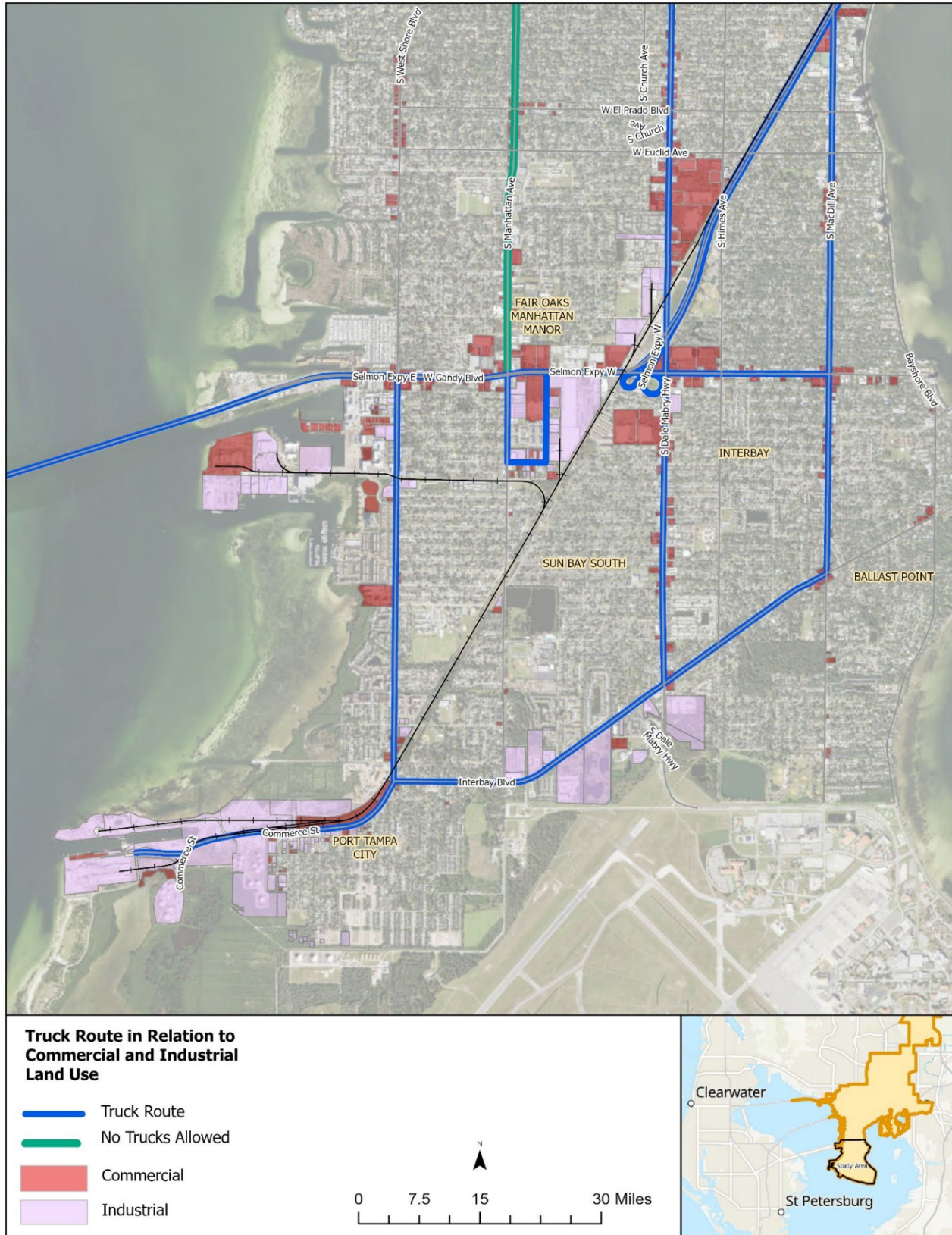


Figure 8: Truck Routes

## Hurricane Evacuation

Evacuation zones, lettered A through E, are intended to reflect those areas of land that may be inundated by storm surge in the event of a hurricane. The zones correspond to the Saffir-Simpson hurricane wind scale (Categories 1 through 5), with Evacuation Zone A reflecting the area that may flood because of storm surge in a Category 1 hurricane, Evacuation Zone B reflecting the area flooded in a Category 2 hurricane, and so on. The entirety of the Interbay Peninsula south of Gandy Boulevard is located in Evacuation Zones A or B, meaning that the entire study area is at risk of inundation in a Category 2 or higher hurricane. As shown in **Figure 9**, the entirety of the Interbay Peninsula south of Kennedy Boulevard is located in Evacuation Zones A, B, or C, meaning that the entire Interbay Peninsula would be at risk of inundation in a Category 3 hurricane.

The primary evacuation routes serving the area include the Selmon Expressway, Gandy Boulevard, and Dale Mabry Highway. The study area is served by three Hillsborough Area Regional Transit (HART) public transportation routes to shelters during an evacuation. Those routes include:

- Evacuation Route A to Smith Middle School serving the Manhattan Avenue and West Shore Boulevard corridors
- Evacuation Route D to Pizzo Elementary School serving the Dale Mabry Highway and MacDill Avenue corridors.
- Evacuation Route F to Middleton High School serving the Gandy Boulevard corridor.

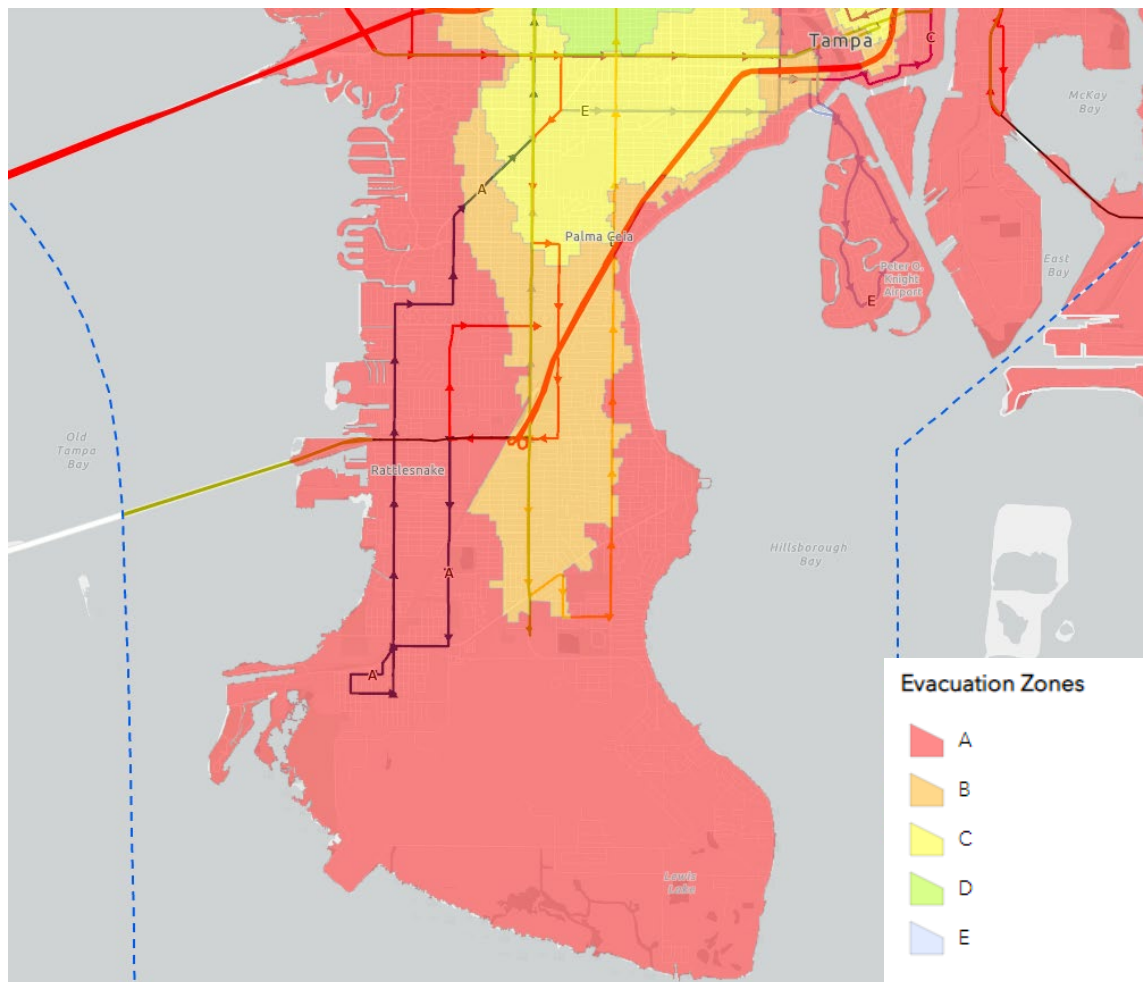


Figure 9: South of Gandy Evacuation Routes

## Hillsborough TPO's Storm Evacuation Forecast & Shelter-In-Place Scenarios Study

The Hillsborough TPO recently completed a planning analysis, published in August 2022, to identify alternative strategies other than road widening to improve how Hillsborough County residents would evacuate and shelter-in-place during a severe weather event. Hillsborough County has sufficient shelter space to meet evacuation standards; however, the critical concern is the clearance time—the length of time required for all people leaving evacuation zones to reach a shelter or other safe destination after evacuation orders have been activated.

The report identified arterial and hotspot locations using data from the 2045 Long Range Transportation Plan and travel speed data from the days leading up to the landfall of Hurricane Irma in 2017, notably before construction of the Selmon Extension. This analysis identified the segment of Dale Mabry Highway south of Gandy Boulevard as the lone hotspot on the Interbay Peninsula.

The analysis evaluated three strategies using the Florida Statewide Hurricane Evaluation Model (TIME) to evaluate the implications on evacuation clearance time during a Category 3 hurricane. Those strategies included:

- Small/low-cost interchange or intersection improvements at the hotspot locations
- Emergency shoulder use on the interstates
- Improved communications resulting in people evacuating faster after being given evacuation orders

The findings of the evaluation indicated that additional capacity at intersections/interchanges and emergency shoulder use did not reduce evacuation clearance times. The study team noted that, due to the long trip lengths of those evacuating, there was a strong preference for interstate travel; when additional capacity was provided on the interstates, travel demand shifted from the local roads to the interstates. The results of the evaluation indicated that adding capacity for evacuation purposes may not be an effective strategy. Clearance times were reduced when residents responded more quickly to evacuation orders, highlighting the importance of enhancing communications around evacuation information.

As the population increases, the report identified several transportation strategies to reduce or maintain clearance times:

- **Traffic Congestion**—Based on the results of the study, interchange ramp and intersection roadway capacity improvements do not improve evacuation clearance times. Some intervention into “hotspot” congestion intersections may improve conditions slightly, but the onus of evacuation lies with the interstate system. The planned lane expansion of I-75 and I-4, as well as the continued upkeep and recovery of these highways and the Selmon Expressway after evacuation events, have the most positive impact on evacuation. Coordination of traffic signals and phased evacuations were also identified as viable strategies to alleviate congestion during emergency evacuations.
- **Transit**—Transit is crucial and ensuring both fixed-route and paratransit accessibility to evacuation shelters is essential. Jurisdictions should continue to develop and enhance transit evacuation plans, investigate maintaining consistent transit route operation during events, consider ways to expand transportation services for those without vehicles (especially those traveling with pets), and provide information about paratransit and transit evacuation plans to users.
- **Communication**—Improved communication and response time were identified as one of the most impactful strategies to improve evacuation. The County should provide information both off and on-season for hurricanes, in multiple languages, and incorporate communication strategies in the TPO's public participation and involvement plan. The municipality should facilitate and encourage the education of residents on hurricane safety and preparedness through plan-making, social media, and continued communication. Additionally, messaging signs are recommended to be deployed in evacuation zones that can communicate vital information to residents during emergencies.



- **Coordination and Collaboration**—Local governments and agencies should coordinate to assess housing for vulnerability to high winds and identify and provide opportunities for home hardening in addition to coordinating potential strategies to improve efficiency during evacuations.
- **Equity**—Residents with special needs, lack of access to technology, and limited mobility, may need concerted efforts to accommodate needs in shelter space, improve communication, and link to transportation options. Using TPO data, emergency response agencies can target populations that are especially vulnerable to address their unique needs during times of preparation and evacuation.

Particularly relevant to the study area, the report also discussed the use of phased evacuations to improve evacuation operations. One option specifically considered was enhanced coordination with MacDill Air Force Base to evacuate families and non-essential personnel early.

## Statewide Regional Evacuation Study Program

The Statewide Regional Evacuation Study Program (SRESP) is a coordinated effort between the Florida Division of Emergency Management, Division of Community Planning (now Department of Economic Opportunity), and Department of Transportation to evaluate and enhance evacuation plans and procedures throughout the state. The program focuses on improving transportation infrastructure and enhancing public education and communication strategies to facilitate timely and safe evacuations for residents and visitors. In the Tampa Bay region, the effort is coordinated through the Tampa Bay Regional Planning Council and covers Citrus, Hernando, Hillsborough, Manatee, Pasco, and Pinellas Counties.

An important component of the SRESP is the Transportation Interface for Modeling Evacuations (TIME) model. The TIME model is a tool used by emergency management officials and transportation planners to evaluate the performance of the transportation network during various emergency evacuation scenarios. This model uses demographic and transportation network data to forecast travel demand during an evacuation, identify network bottlenecks, and estimate the clearance time for the region.

In support of this study, the results of the most recent TIME model for the Tampa Bay region were reviewed. This review focused on the model scenarios for the years 2020 and 2025 (the only two available analysis years) under Zone B and Zone E evacuations. Transportation networks used in the 2020 and 2025 models do not include the Selmon Extension, a regionally significant capacity improvement that has decreased surface traffic from Pinellas County on Gandy Boulevard and will potentially improve evacuation operations for the lower Interbay Peninsula. The scenarios also assume a 100% response rate (i.e., all residents in evacuation zones complying with evacuation orders). The combination of two factors leads to a conservative evacuation scenario, meaning that the model is assuming more people on the road evacuating with less road capacity—a “worst” case scenario—that is unlikely to occur.

While it is the most powerful tool available, it is important to note the limitations of regional evacuation models. Mathematically modeling the response of people in a region to a shifting threat is difficult to do, and the results of these models cannot easily be validated through observations. The sections that follow report the estimates derived from the regional evacuation model relative to clearance times and travel times on key study area roadways.

## Clearance Times

The amount of time required to complete an evacuation is called clearance time. The clearance time is calculated from the moment the evacuation order is given, to the moment all evacuees are able to exit the analysis zone. The response curve is the amount of time assumed from when the evacuation order is given to when all evacuating residents begin their evacuation. In all scenarios evaluated, the assumed response curve is 12 hours. Thus, the minimum clearance time possible in the analysis is 12 hours, as evacuees within the zone are beginning their evacuation up until that point.



Clearance times for the Tampa Bay region, Hillsborough County, the portions of the Interbay Peninsula south of Kennedy Boulevard and south of Gandy Boulevard are presented in **Figures 10, 11, and 12**.

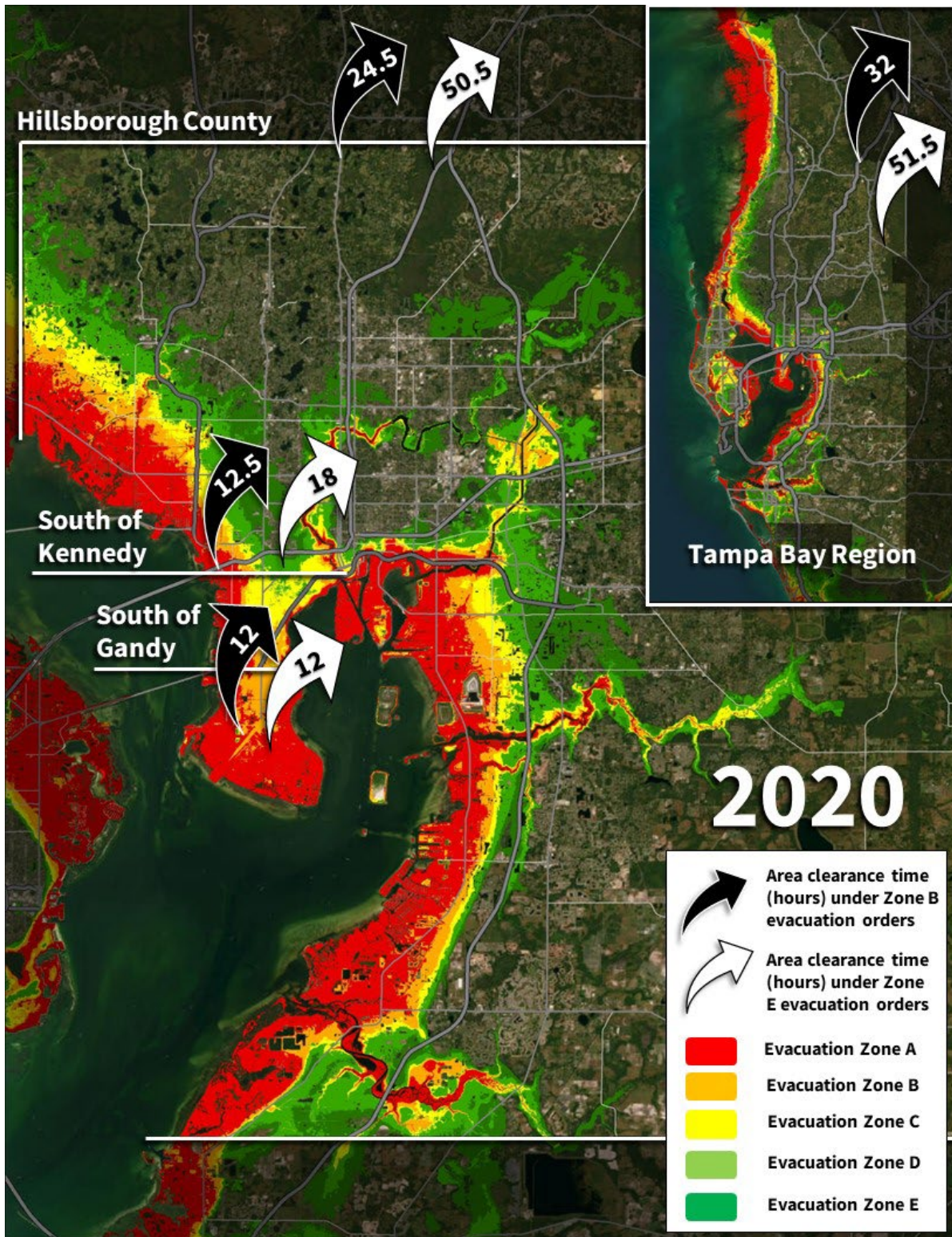


Figure 10: 2020 TIME Model Clearance Times



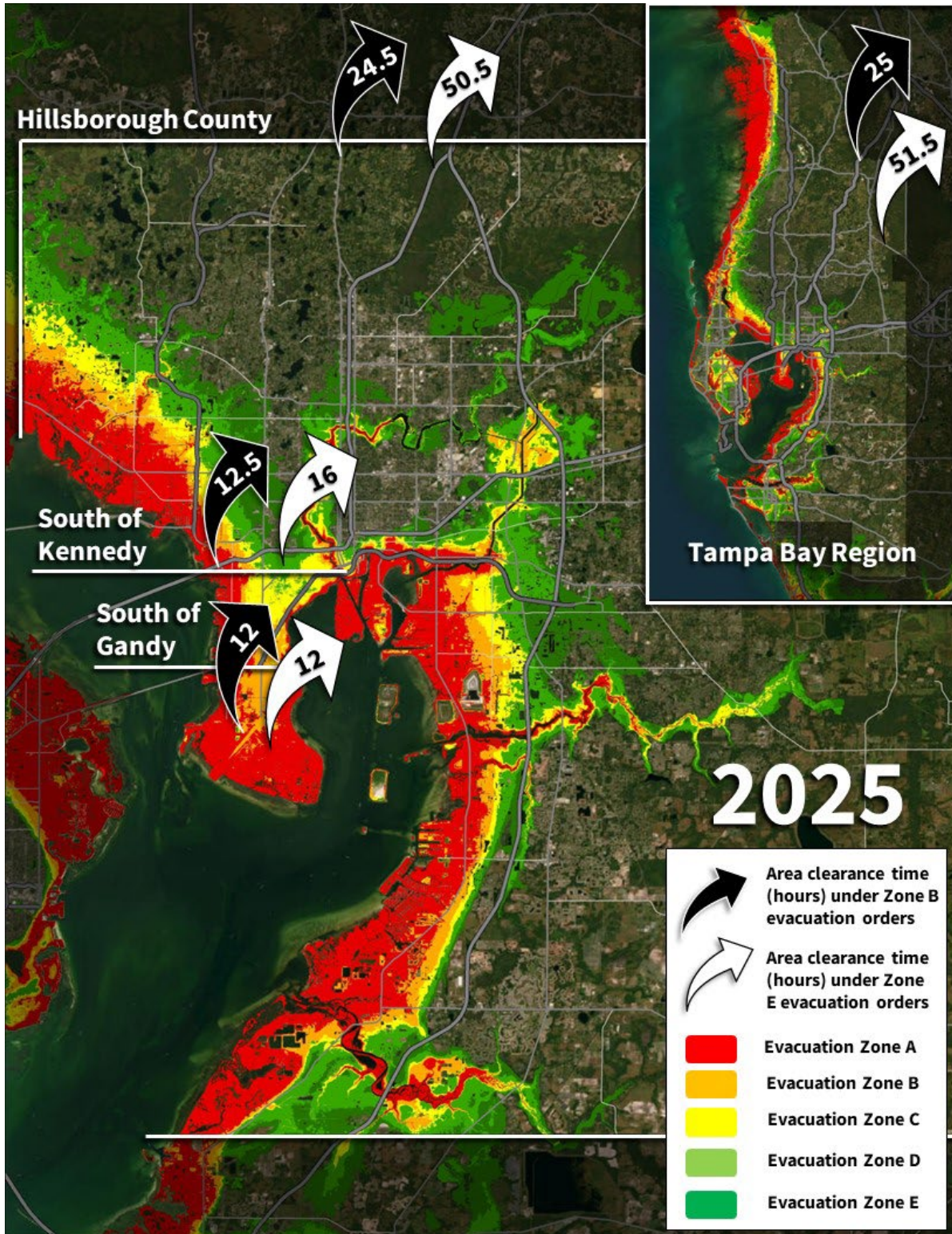


Figure 11: 2025 TIME Model Clearance Times

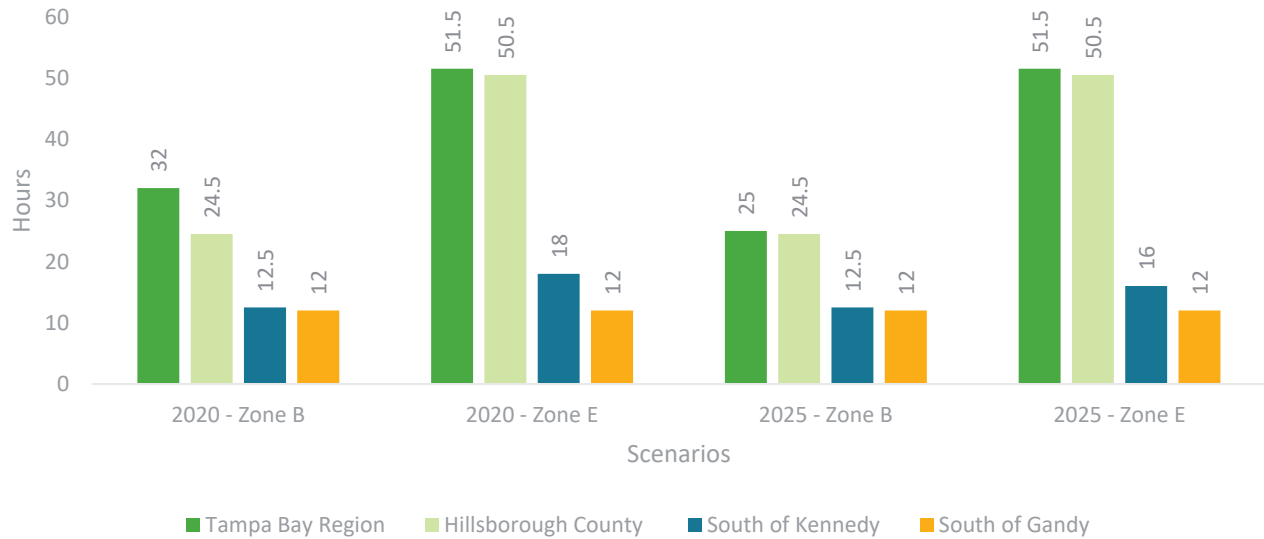


Figure 12: TIME Model Clearance Times

The results of the analysis generally support the observations of previous evacuations within the Tampa Bay region (discussed in more detail in the Hurricane Ian case study that follows). Sufficient roadway capacity exists within the urbanized areas to connect residents and visitors to the primary regional routes connecting to inland locations, such as I-4, I-75, SR 60, and US 19. However, because all regional traffic funnels to these limited routes, bottlenecks on these facilities control the clearance times of the region as a whole. This means that population growth on the Interbay Peninsula would likely have a similar impact on the regional evacuation clearance time as it would if located elsewhere in the Tampa Bay region.

For all scenarios, the amount of time for roadways on the Interbay Peninsula to clear is relatively steady. In all evacuation scenarios, the clearance times for the roadways south of Gandy Boulevard do not exceed the 12-hour response curve. This means that the roadway capacity is anticipated to be sufficient in handling the evacuation demand within the designated response time without any residual queues or delays. Clearance time for the portion of the Interbay Peninsula south of Kennedy Boulevard ranges from 12.5 to 18 hours, meaning that residual queuing or delays on roadways are expected to last a half hour to 6 hours after the end of the response curve on all roadways south of Kennedy Boulevard.

Clearance times for Hillsborough County and the Tampa Bay region are consistent within each of the scenarios examined. The county and regional clearance times are significantly influenced by the extent of evacuations, with substantially longer clearance times for Zone E evacuations than for Zone B evacuations, though are not anticipated to significantly change from 2020 to 2025. The estimated in-county evacuation clearance time for Zone B evacuation is 24.5 hours for the years 2020 and 2025, while Zone E clearance time is estimated at 50.5 in 2020 and 2025. The estimated regional evacuation clearance time for Zone B evacuation improve from 32 hours in 2020 to 25 hours in 2025 (possibly due to regional capacity/mobility improvements outside of the study area), while Level E clearance time is estimated to remain unchanged at 51.5 hours in 2020 and 2025.

### Travel Times

Travel times for Dale Mabry Highway and the Selmon Expressway were also examined during the most congested point of the evacuation for each scenario. In 2020, the northbound travel times on Dale Mabry from Gandy Boulevard to Kennedy Boulevard are estimated at 7 minutes in a Level B evacuation and 13.2 minutes in a Level E evacuation. In

2025, these travel times are anticipated to be 8 minutes in a Level B evacuation and 12.5 minutes in a Level E evacuation.

In 2020, northbound travel times on the Selmon Expressway between Gandy Boulevard and the Willow Avenue exit are estimated at 6 minutes in a Level B evacuation and 66 minutes in a Level E evacuation. In 2025, these travel times are anticipated to be 6 minutes in a Level B evacuation and 51 minutes in a Level E evacuation.

## Case Study: Hurricane Ian

The sections that follow examine the timeline of events and the performance of the regional roadway network in the days leading up to the landfall of Hurricane Ian.

### Timeline of Key Events

**Sunday, September 25, 2022:** The center of the track for Hurricane Ian is centered on the Big Bend region of Florida, north of the Tampa Bay area, reaching a Category 4 storm before weakening to a Category 2 storm at landfall early Friday. The cone of uncertainty extends from Pensacola to Fort Myers.

**Monday, September 26, 2022:** Hurricane Ian's track shifts east throughout the day first skirting the coast of Tampa Bay as a Category 2 hurricane then directly striking the Tampa Bay region as a Category 3 storm on Wednesday evening. Evacuation orders in the Tampa Bay region start being issued. At 10:00 AM Hillsborough County issues mandatory evacuation orders for Zone A and mobile homes/manufactured housing and voluntary evacuation orders for Zone B starting at 2:00 PM. Evacuation is to be completed by Tuesday at 9:00 PM. At 2:00 PM, Pinellas County issues mandatory evacuation orders for Zone A and mobile homes starting at 6:00 PM and mandatory evacuation orders for Zones B and C starting at 7:00 AM Tuesday.

**Tuesday, September 27, 2022:** In the morning, Ian's track shifts further east, with the center of the track on Sarasota County as a forecasted Category 4 storm. The Tampa Bay region is still well within the cone of uncertainty. At 10:00 AM, Hillsborough County extends the mandatory evacuation order to Zone B to commence at noon and to be completed by 9:00 PM. Later in the evening, at the 11:00 PM update, the track shifts further east with landfall expected in Fort Myers as a Category 4 storm mid-day Wednesday. The Interbay Peninsula is on the northern edge of, but still within, the cone of uncertainty.

**Wednesday, September 28, 2022:** Ian makes landfall near Cayo Costa, just west of Fort Myers, around 3:00 PM as a Category 4 storm with maximum sustained winds of 150 mph.

### Traffic Operations

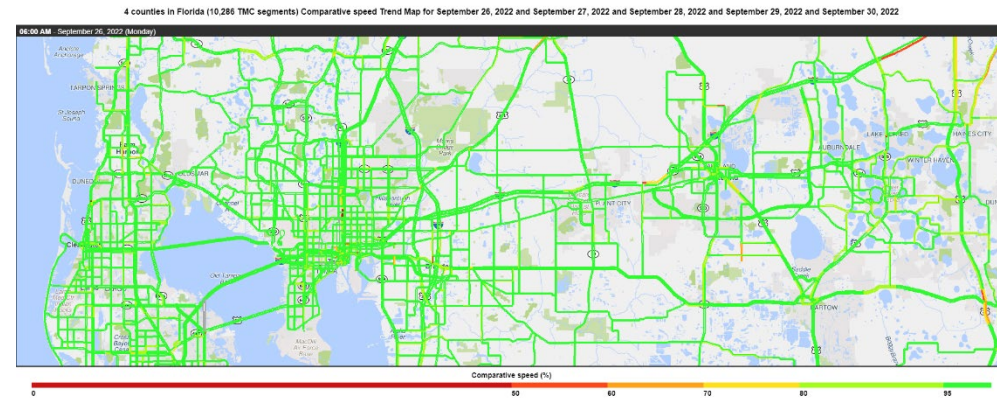
Regional travel time and speed data for Monday, September 26, 2022, and Tuesday, September 27, 2022, were extracted from the Regional Integrated Transportation Information System (RITIS) Probe Data Analytics Suite in hourly increments. The evaluation considered the comparative speeds on corridors throughout the region to identify the facilities for which operations were most impacted by the hurricane evacuation. Comparative speed is defined by RITIS as the "measured speed as a percentage of the historical average speed for this time of day and day of week." The maps of the comparative speeds throughout the region are shown in **Figures 13** and **14**. Lower comparative speeds, shown in red and orange, indicate the facilities on which traffic moved substantially slower compared to typical conditions for that time of day and day of week.

As evident from the maps, arterial and collector facilities were not substantially impacted by hurricane evacuations, with prevailing travel speeds generally reflective of typical operating conditions. Conversely, interregional facilities, particularly those with limited or controlled access and are most notably strained under evacuation operations. In

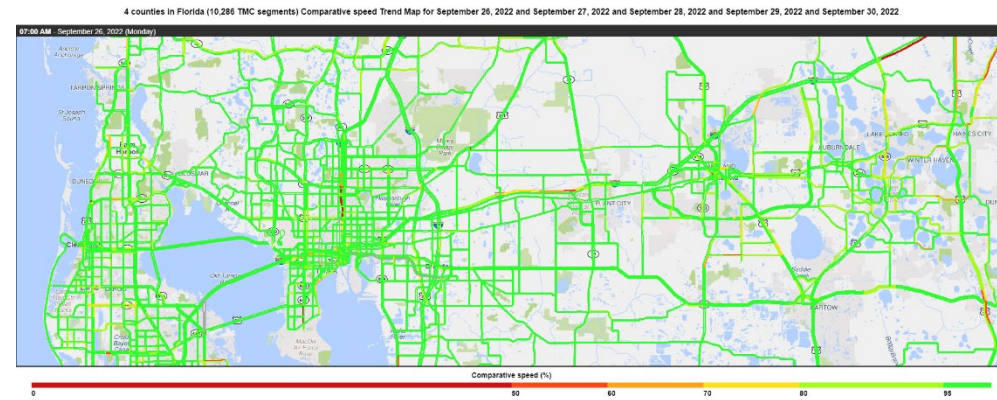
the Tampa Bay region, these facilities include the interstate system (I-75, I-275, and I-4), and regional arterials, like US 301, US 41, SR 60, US 19, US 92, and SR 574 that provide inland connections. The data show that the arterial network within the urbanized areas provides adequate capacity in connecting evacuation zones to safe, inland locations within Hillsborough County, but that congestion occurs outside of the urbanized area, at locations on limited interregional facilities where traffic leaving evacuation zones for more distant destinations converges. The data show that while these facilities are indeed congested during daytime, the roadways clear at night and provide opportunities for faster travel. Understanding that trips throughout the County would ultimately converge on these same facilities to reach more distant destinations, these results indicate that growth in population or employment in any portion of the city or county would have similar effects on the evacuation bottlenecks for residents throughout the county.



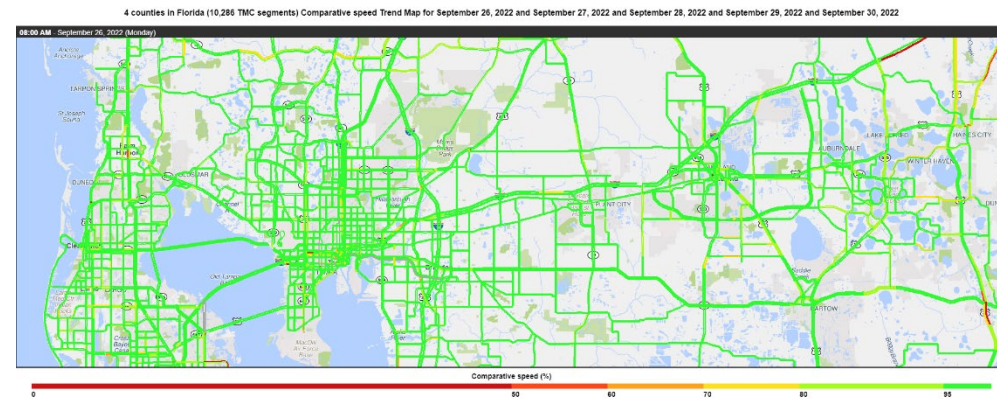
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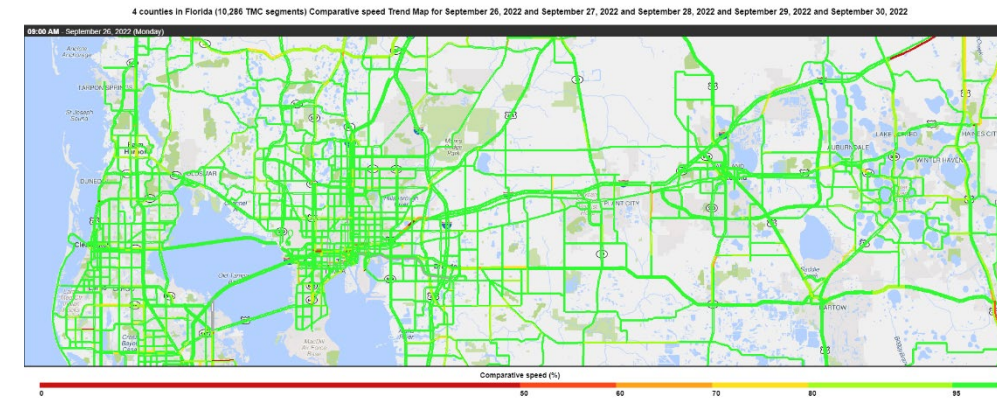
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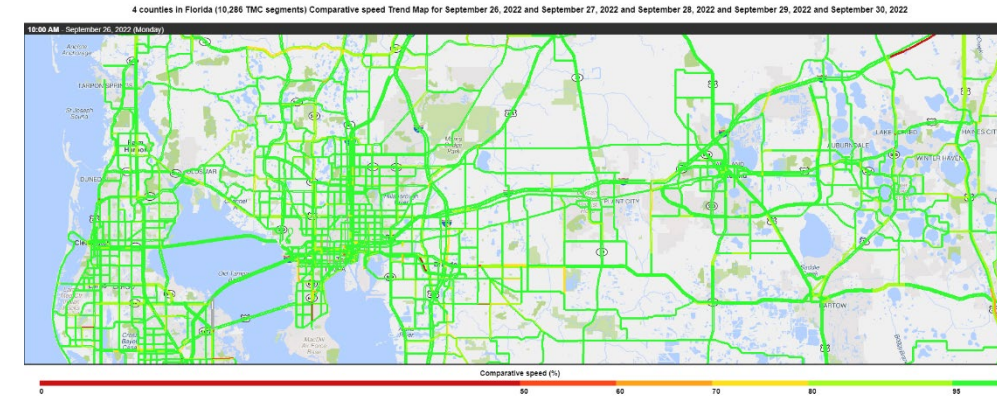
8:00 AM



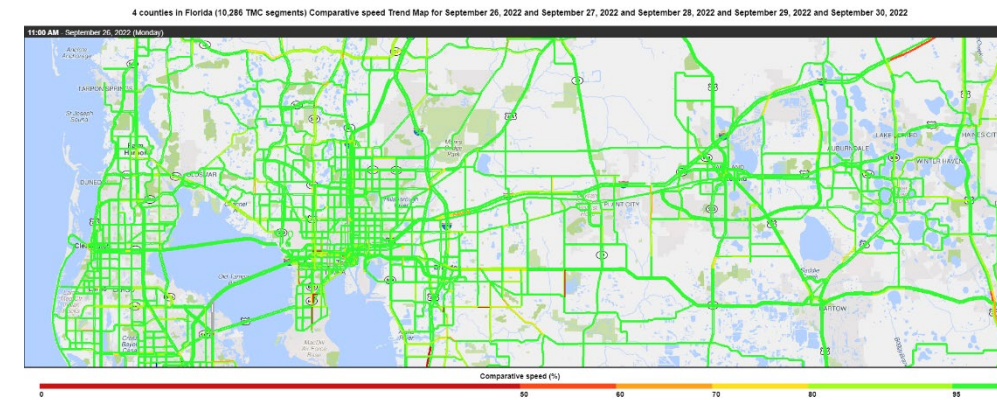
9:00 AM



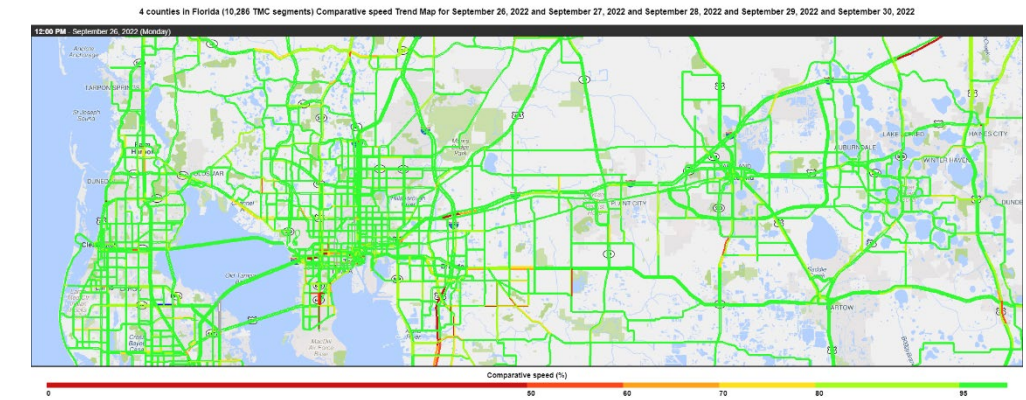
10:00 AM



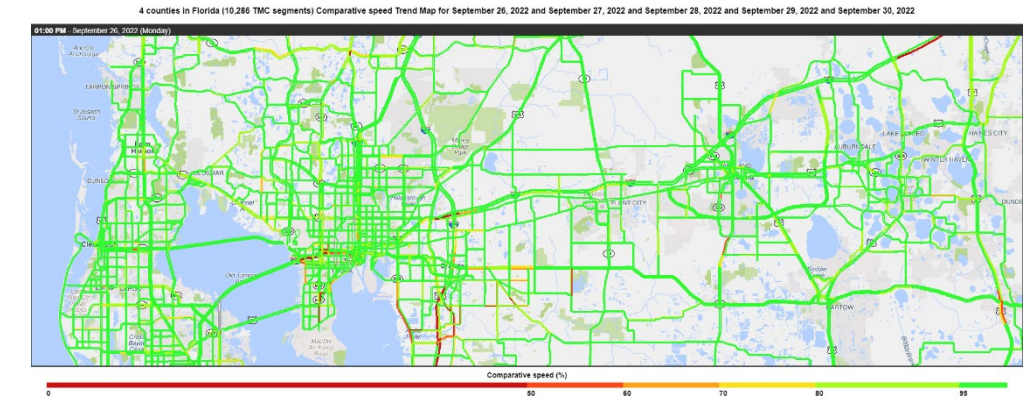
11:00 AM



12:00 PM



1:00 PM



2:00 PM

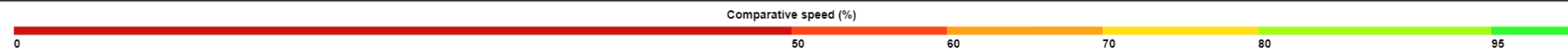
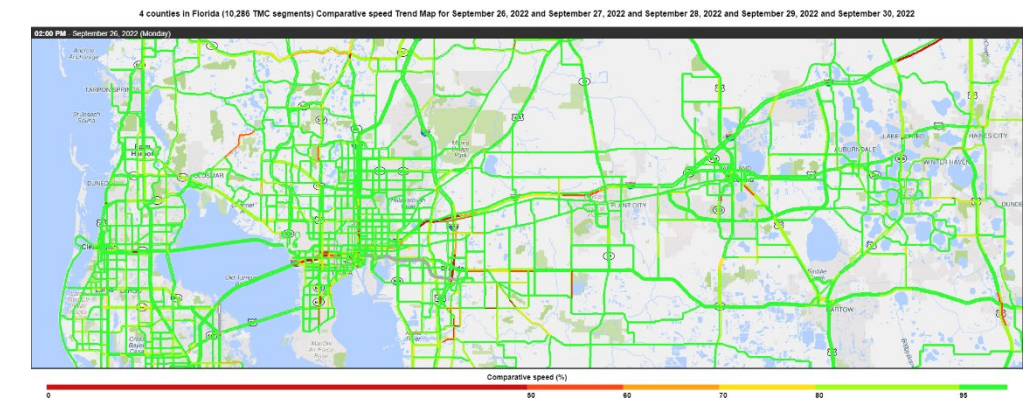
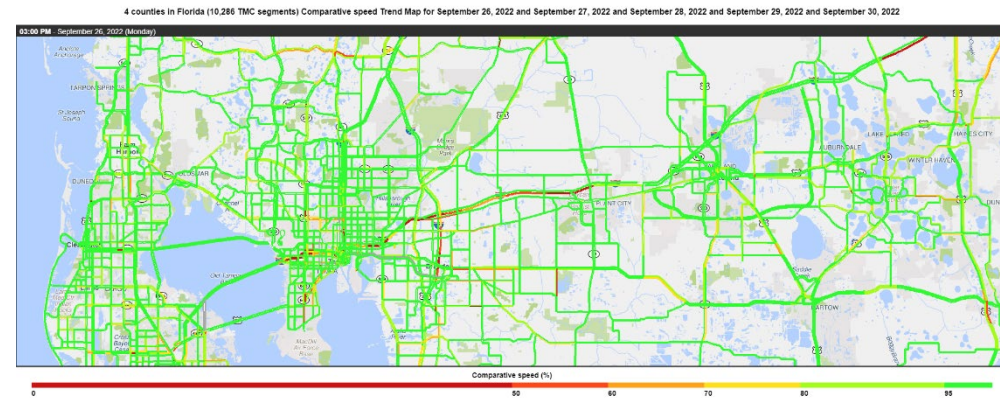


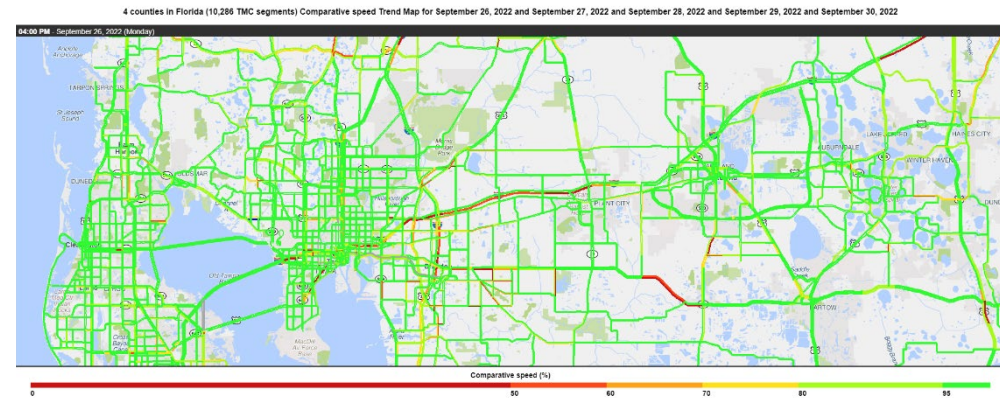
Figure 13: Hourly Comparative Speeds for Monday, September 26, 2022



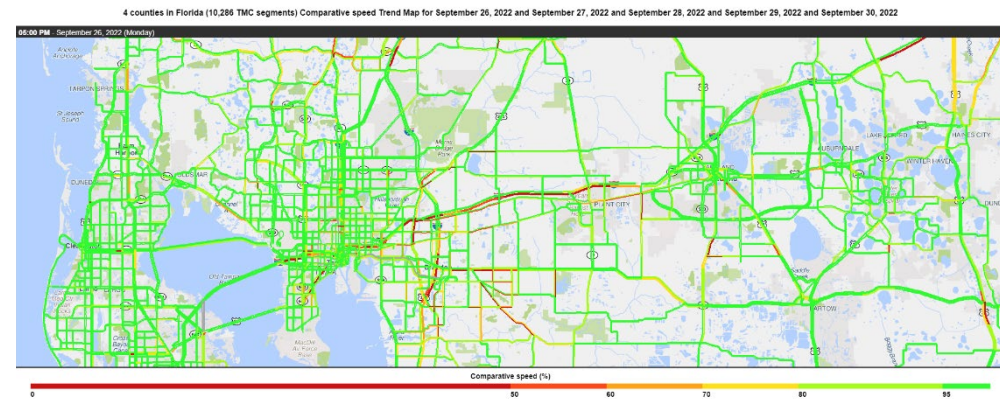
Monday, September 26, 2022  
3:00 PM



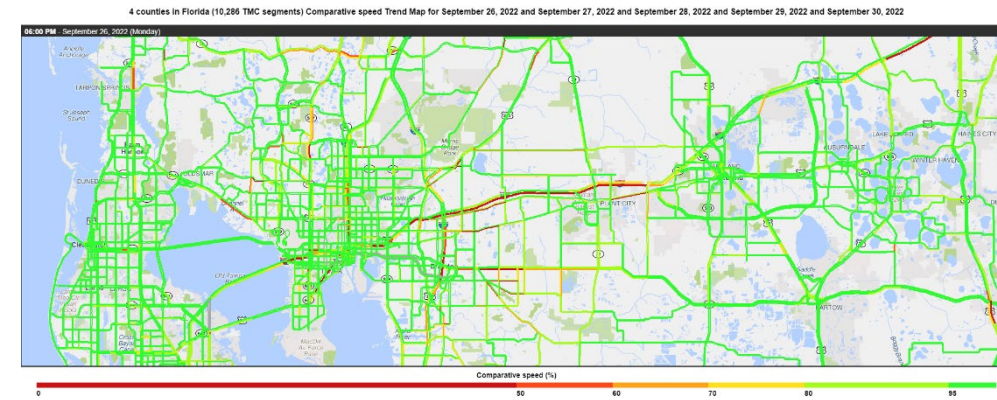
4:00 PM



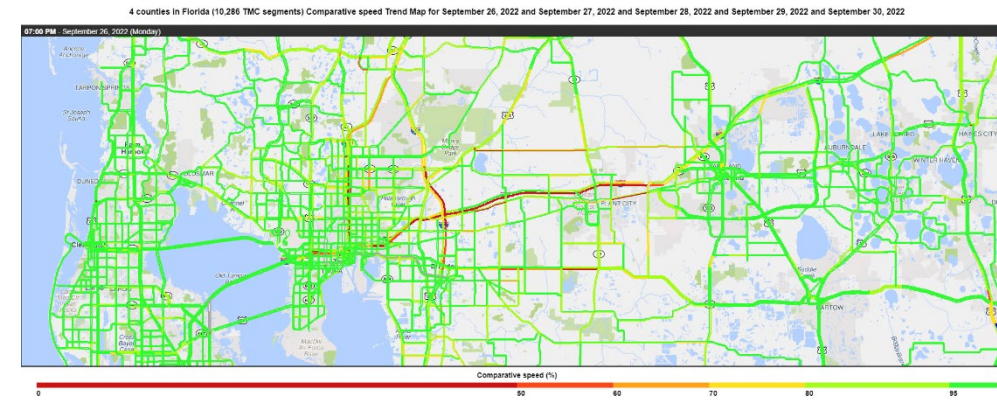
5:00 PM



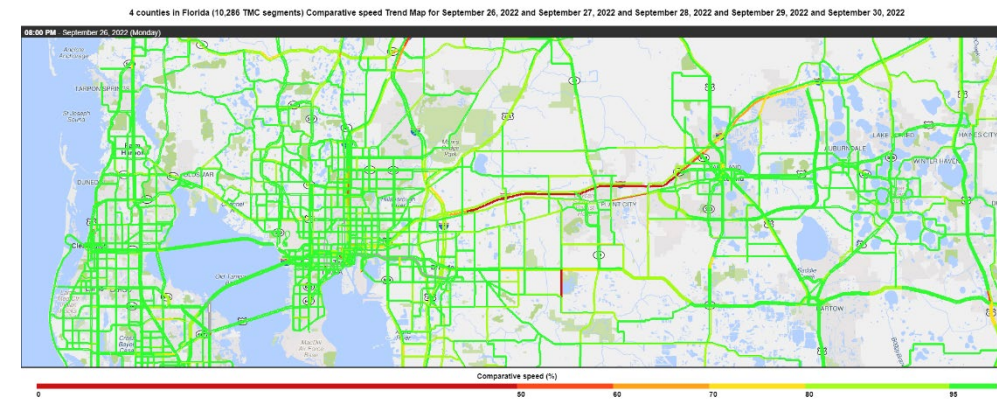
6:00 PM



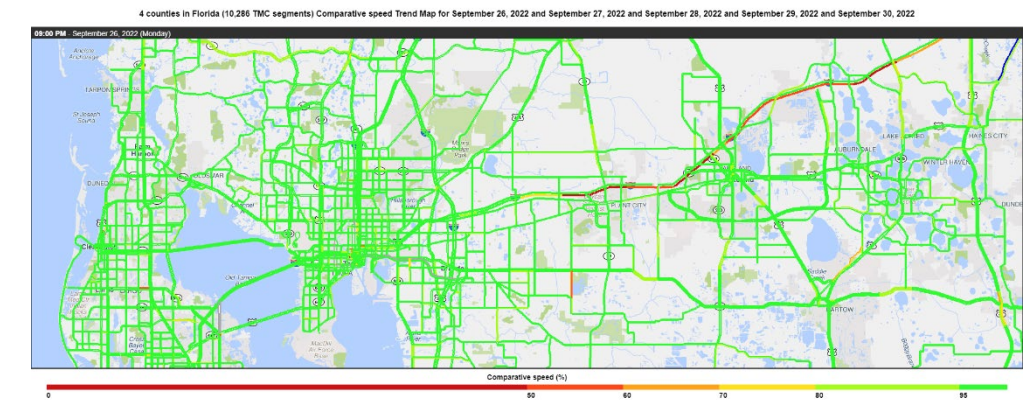
7:00 PM



8:00 PM



9:00 PM



10:00 PM

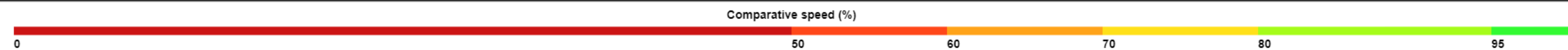
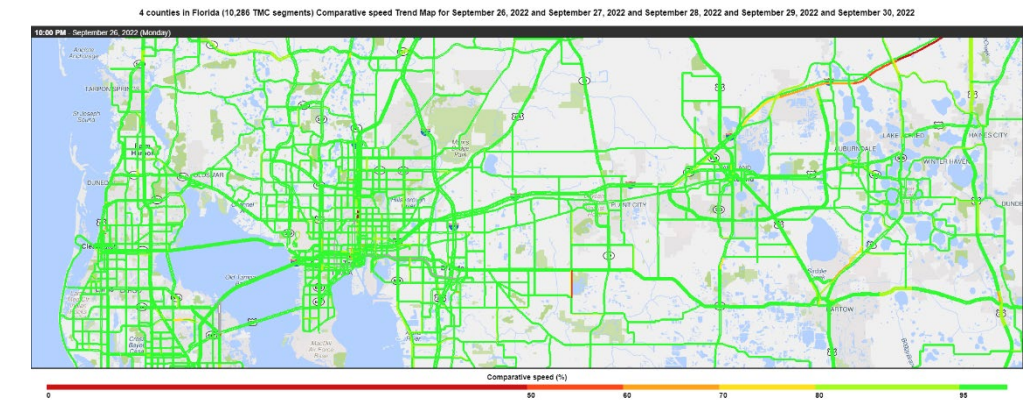
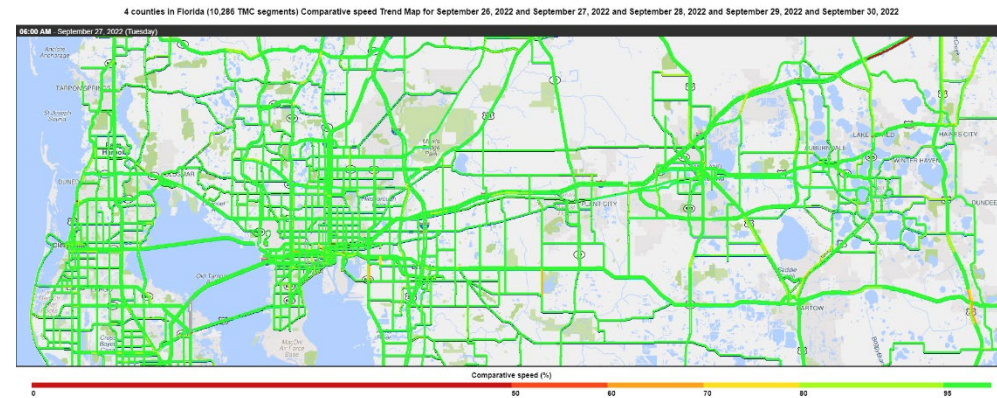


Figure 13 (cont.): Hourly Comparative Speeds for Monday, September 26, 2022

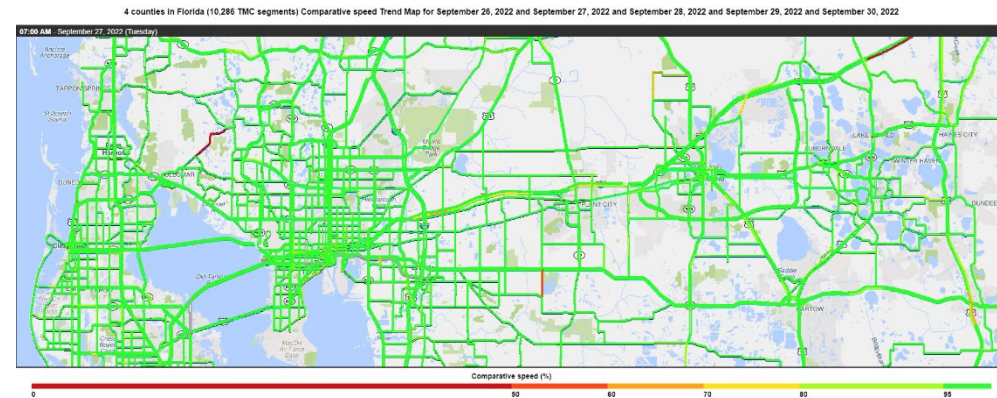


Tuesday, September 27, 2022

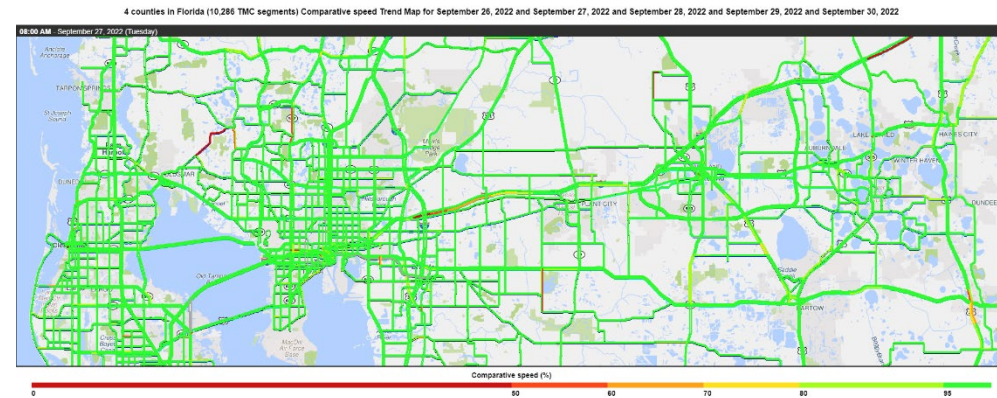
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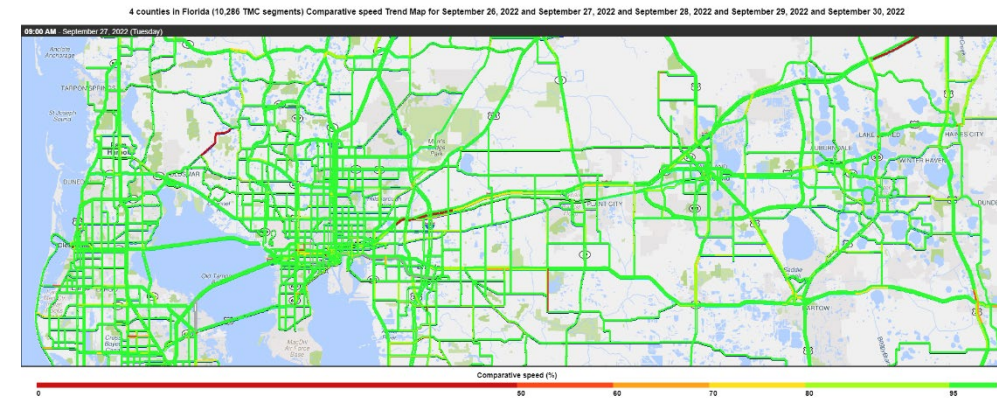
7:00 AM



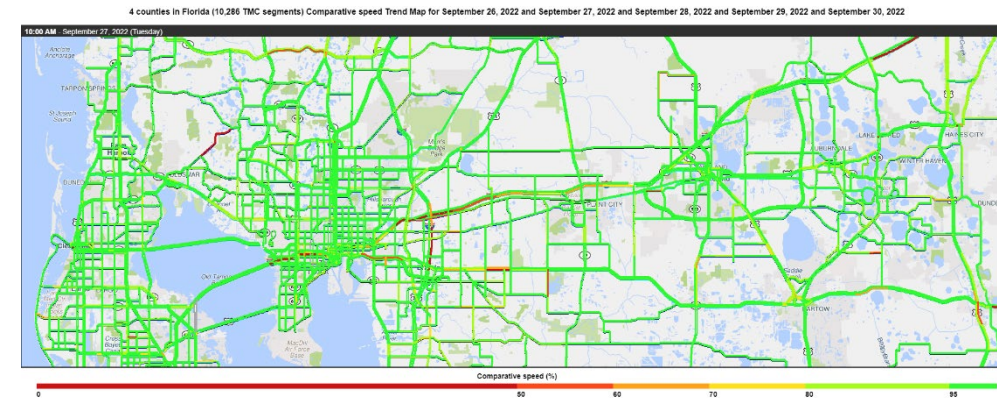
8:00 AM



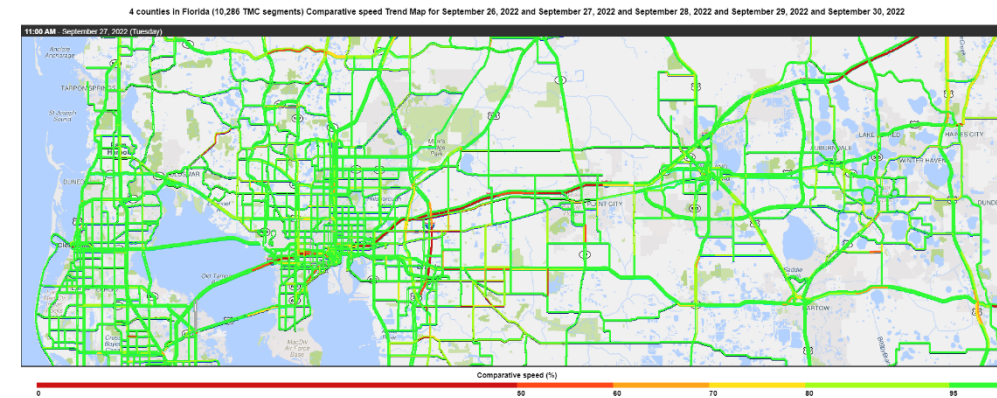
9:00 AM



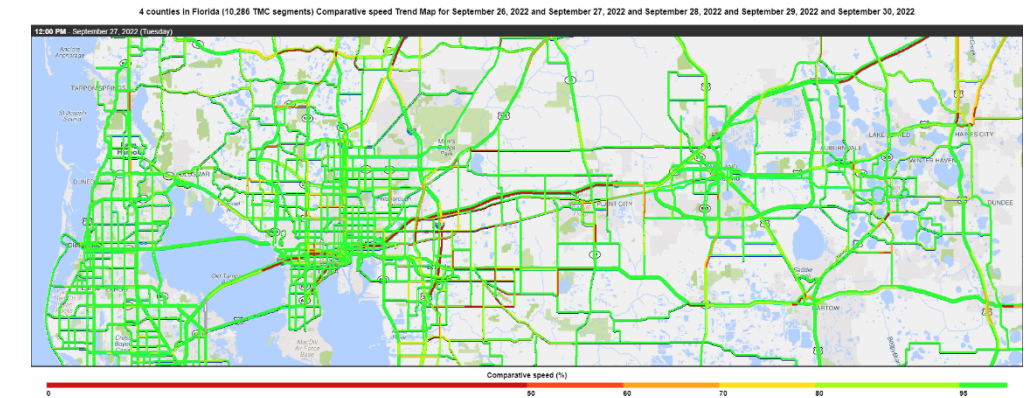
10:00 AM



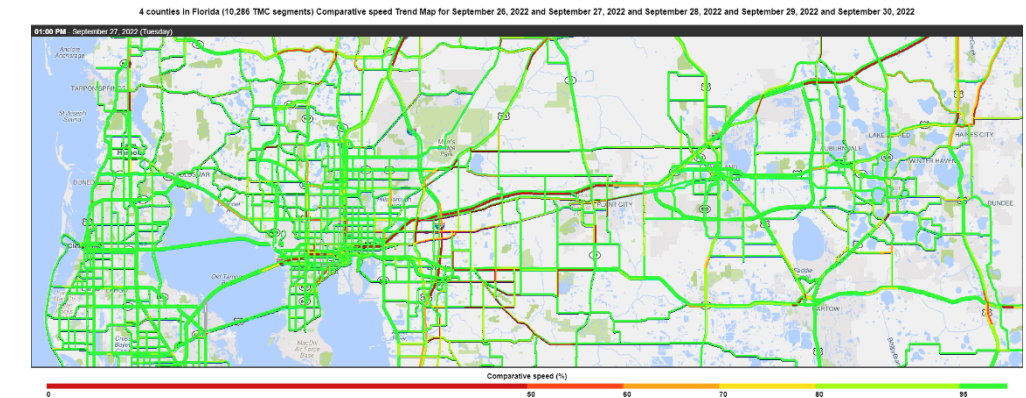
11:00 AM



12:00 PM



1:00 PM



2:00 PM

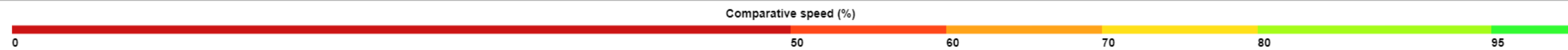
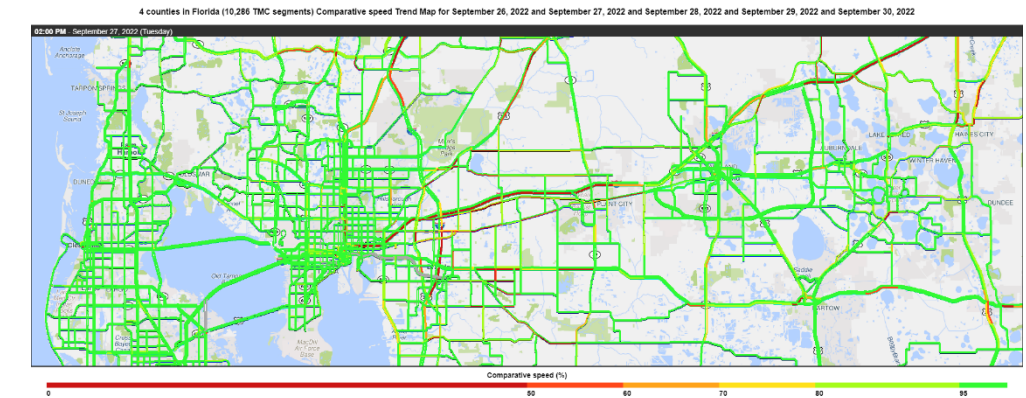
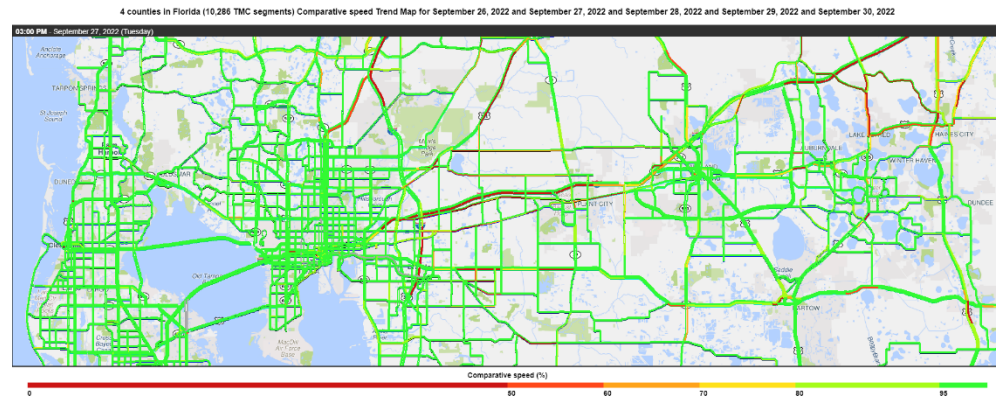


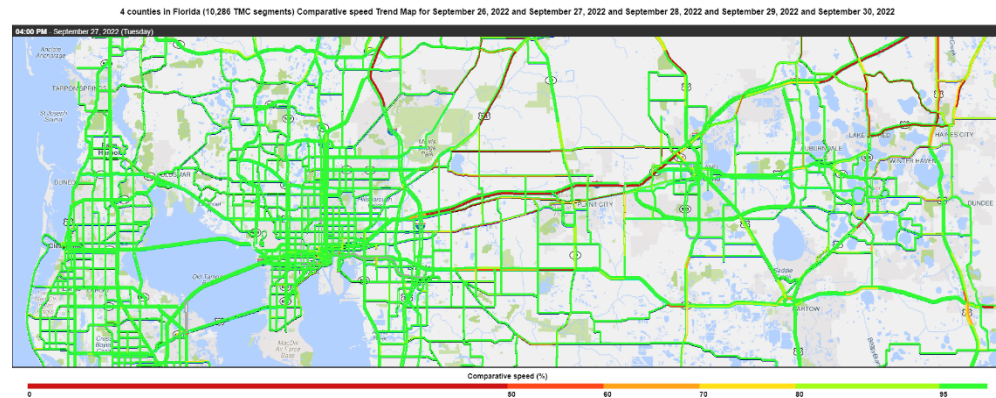
Figure 14: Hourly Comparative Speeds for Tuesday, September 27, 2022



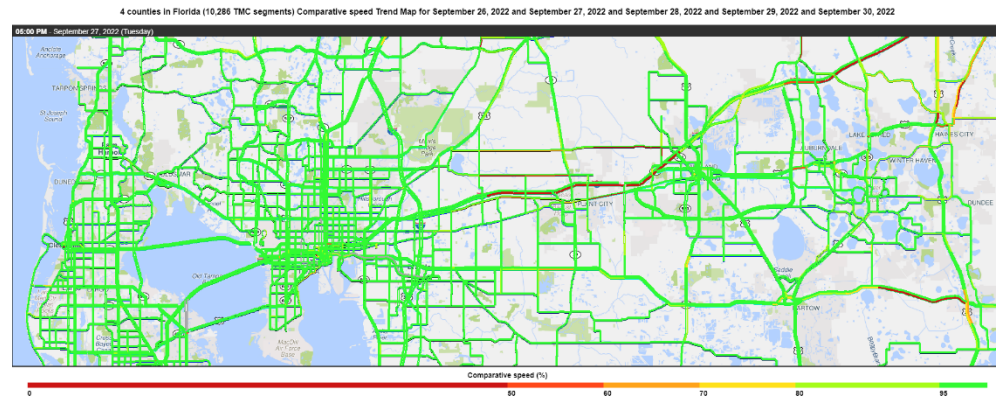
Tuesday, September 27, 2022  
3:00 PM



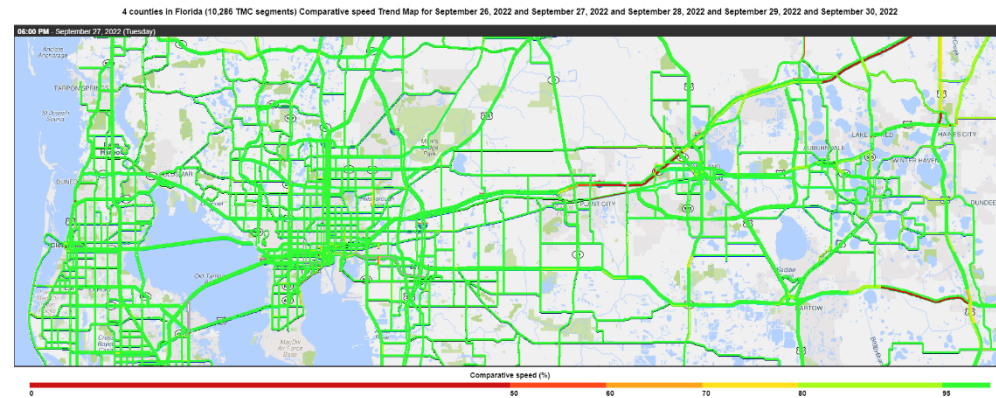
4:00 PM



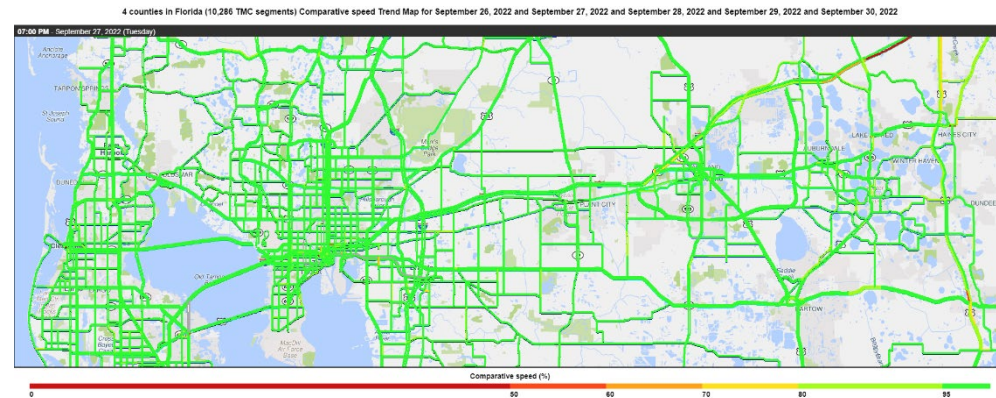
5:00 PM



6:00 PM



7:00 PM



8:00 PM

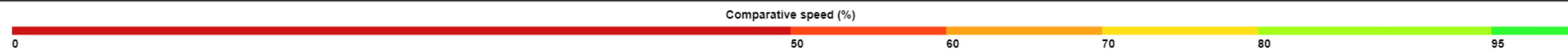
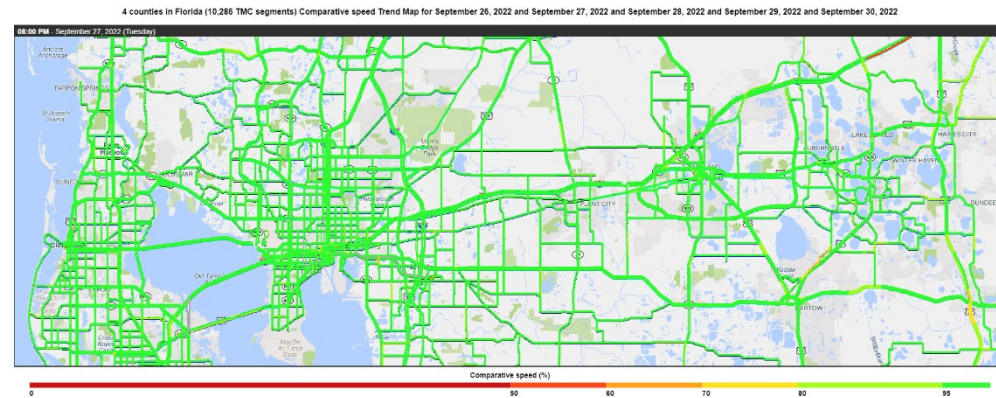


Figure 14 (cont.): Hourly Comparative Speeds for Tuesday, September 27, 2022

Examining the Interbay Peninsula in greater detail, the only facilities with a significant decline in operating speeds during the evacuation were the Selmon Expressway and Dale Mabry Highway. The performance of these facilities was examined in greater detail using performance charts for the days leading up to the hurricane.

Figures 15, 16, and 17 show the speed in miles per hour (mph), the comparative speed, and the travel time in minutes for Dale Mabry Highway from MacDill Air Force Base to Gandy Boulevard, Dale Mabry Highway from Gandy Boulevard to I-275, and the Selmon Expressway from Gandy Boulevard to the I-4/Selmon Expressway Connector, respectively.

On Dale Mabry Highway, from MacDill Air Force Base to Gandy Boulevard, northbound travel speeds were significantly slower than typical conditions on Monday, September 25 between 10 AM and 2 PM, immediately after evacuation orders were announced in Hillsborough County. Between 2 PM and 4 PM, speeds rebounded though were still slightly lower than normal operating conditions. Outside of this window of time, corridor speeds were generally reflective of normal operating conditions, indicating that ample capacity was available to support the movement of traffic north of Gandy during the evacuation.

Northbound travel times were generally around five minutes for the corridor except during the noted period on Monday between 10 AM and 4 PM. Travel times were greater than 10 minutes for about three and a half hours and reached 23 minutes during the worst 15-minute period at 12:30 PM.

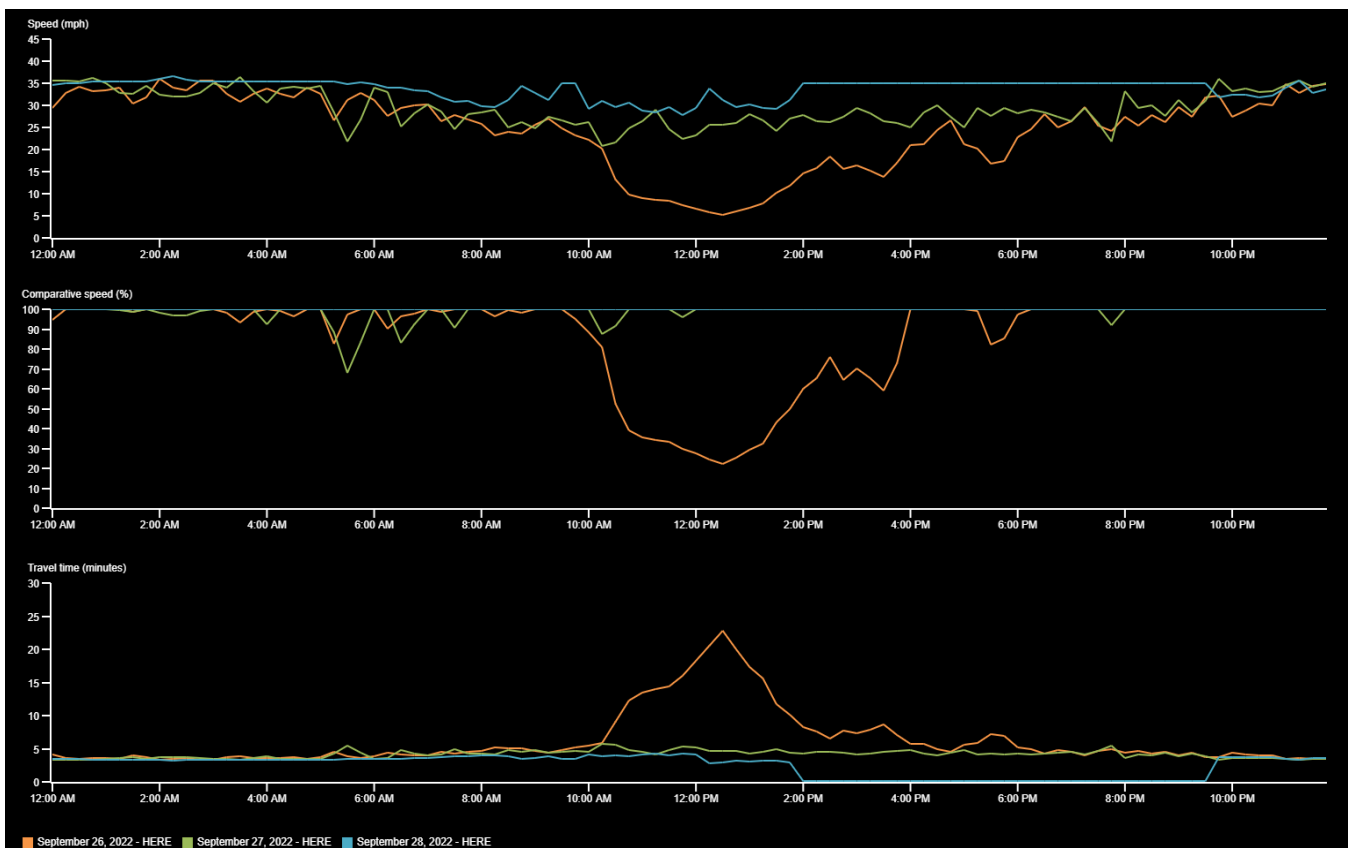


Figure 15: Performance Charts: Dale Mabry Highway, from MacDill Air Force Base to Gandy Boulevard

On Dale Mabry Highway, between Gandy Boulevard and I-275, northbound travel speeds were slower than typical conditions on Monday, September 25 between 11 AM and 4 PM, immediately after evacuation orders were announced in Hillsborough County. Outside of this window of time, corridor speeds were generally reflective of

normal operating conditions, indicating that ample capacity was available to support the movement of traffic to I-275 or destinations to the north.

Northbound travel times were generally around or below 10 minutes for the corridor, except during the noted period on Monday between 10 AM and 4 PM. Travel times exceed 20 minutes for about two hours and reached 27 minutes at the worst 15-minute period around 12:30 PM.

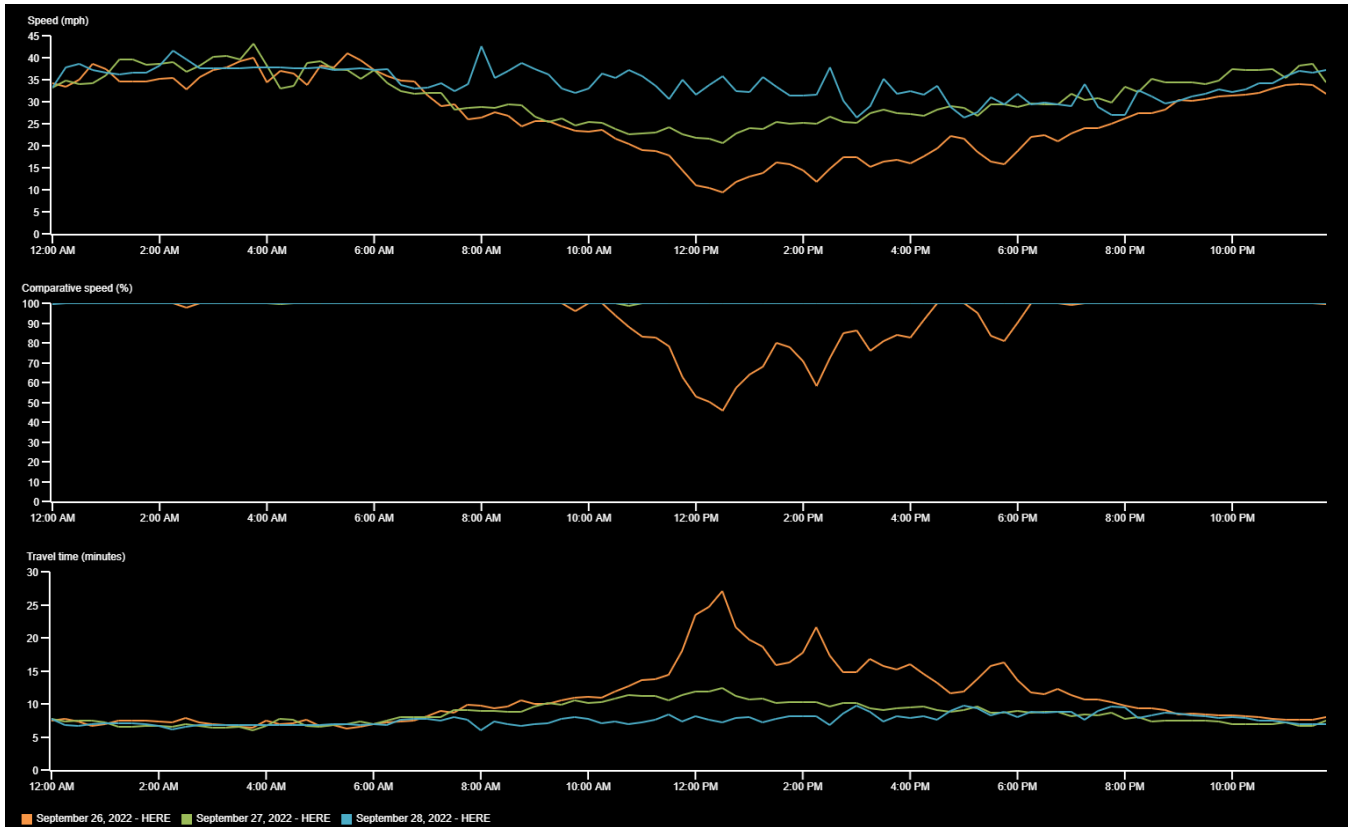


Figure 16: Performance Charts: Dale Mabry Highway, from Gandy Boulevard to I-275

On the Selmon Expressway from Gandy Boulevard to the I-4/Selmon Expressway Connector, eastbound travel speeds were slightly slower than typical conditions on Monday, September 25 between 11 AM and 7 PM, and on Tuesday, September 26 between 11 AM and 1 PM. Outside of these windows, corridor speeds were generally reflective of normal operating conditions. During these periods, speeds were generally 10-25% slower than in normal conditions.

Eastbound travel times were generally around or below 25 minutes for the corridor except during the noted periods. During these periods travel times ranged from around 30-45 minutes. These results indicate that during the worst part of the evacuation, it took evacuees from the southernmost portion of the study area roughly 48 minutes to reach I-275 via Dale Mabry Highway and 64 minutes to reach the I-4/Selmon Expressway Connector via the Selmon Expressway. Travel times were significantly lower throughout the remainder of the evacuation and alternative routes continued to operate under typical conditions.

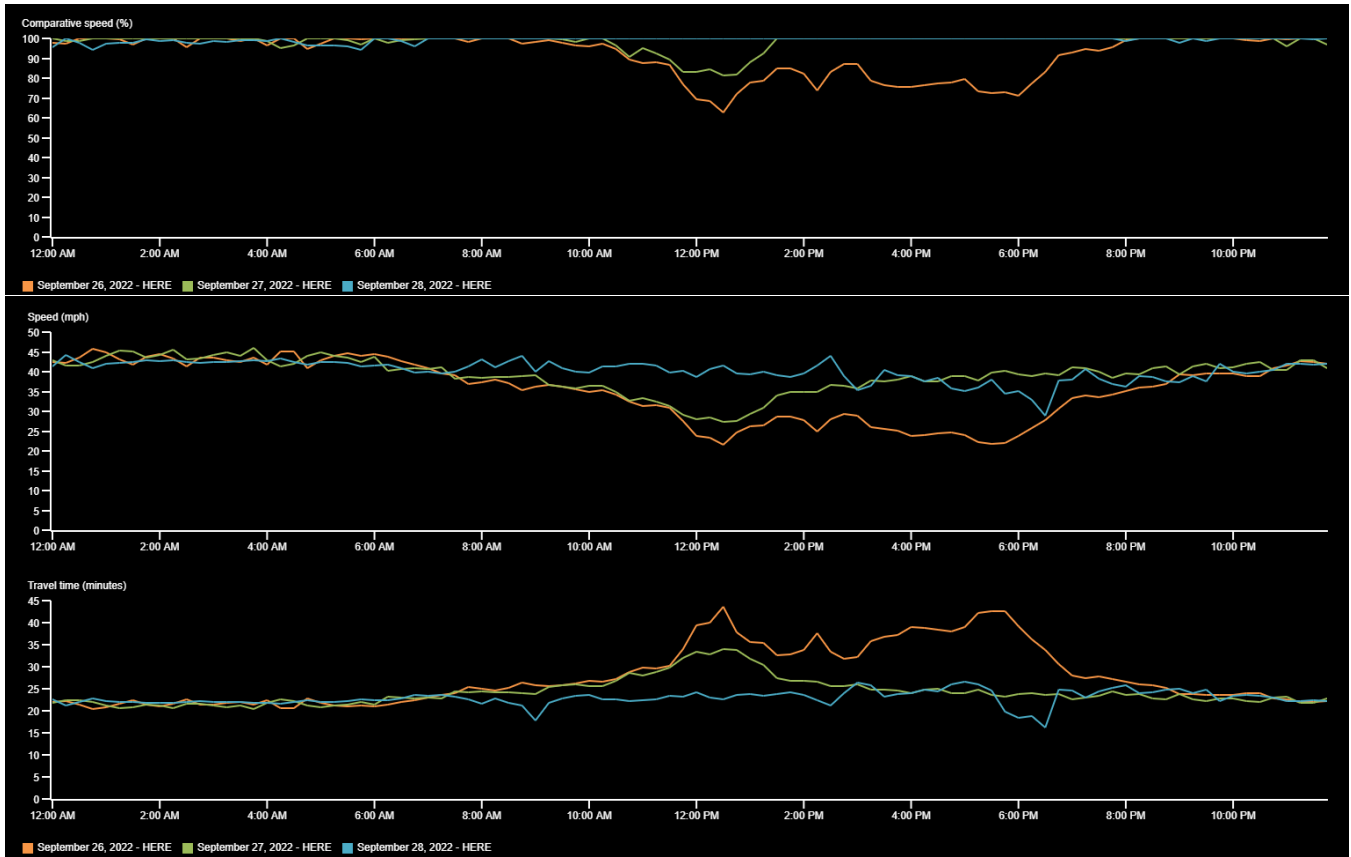


Figure 17: Performance Charts: Selmon Expressway from Gandy Boulevard to the I-4/Selmon Expressway Connector