Project Traffic Analysis Report (PTAR)

State Road 869 / SW 10th Street Connector

Project Development and Environment (PD&E) Study

Broward County, Florida

Financial Project ID No. 439891-1-22-02

ETDM No.: 14291 / FAP No.: TBD

Prepared for:
FDOT District Four
3400 W. Commercial Blvd.
Ft. Lauderdale, FL 33309

September 2019

The environmental review, consultation, and other actions required by applicable federal environmental laws for the project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. §327 and a Memorandum of Understanding dated December 14, 2016 and executed by the Federal Highway Administration and FDOT.

PROFESSIONAL ENGINEER CERTIFICATION

PROJECT TRAFFIC ANALYSIS REPORT

Project: State Road 869 / SW 10th Street Connector PD&E Study

ETDM Number: 14291

Financial Project ID: 439891-1-22-02

Federal Aid Project Number: TBD

This project traffic analysis report contains engineering information pertaining to the State Road 869 / SW 10th Street Connector Project Development & Environment Study from Florida's Turnpike / Sawgrass Expressway to I-95 in Broward County, Florida. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

I hereby certify that I am a registered professional engineer in the State of Florida practicing with RS&H, Inc., and that I have prepared or approved the evaluation, findings, opinions, conclusions or technical advice for this project.

Insert Seal Picture

This item has been digitally signed and sealed by *Lisa Dykstra* on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Project Traffic Analysis Report
For the SR 869 / SW 10th Street Connector PD&E Study

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1.0 Executive Summary

SW 10th Street from Sawgrass Expressway/Florida's Turnpike to I-95 is a missing link in the existing and planned regional managed lanes system network. The addition of a new managed lane limited access facility within the existing SW 10th Street corridor is being evaluated to link the regional managed lanes network by providing a connection between planned managed lanes on Sawgrass Expressway, Turnpike, and I-95. The proposed improvements are intended to reduce the amount of traffic on local SW 10th Street by allowing vehicles to bypass the SW 10th Street local lanes via the new managed lane facility.

This Project Traffic Analysis Report (PTAR) documents the operations and safety analysis completed for the project. Existing and future (2040) conditions were analyzed along the SW 10th Street study corridor from the Sawgrass Expressway / Florida's Turnpike to I-95.

1.1 Summary of Existing Conditions Analysis

The study segment of SW 10th Street from the Sawgrass Expressway / Florida's Turnpike to I-95 is an existing Principal Arterial that is part of the Strategic Intermodal System (SIS) and National Highway System (NHS). Generally, SW 10th Street has six lanes (three in each direction) from the terminus of the Sawgrass Expressway to SR 845 (Powerline Road), four lanes (two in each direction) from Powerline Road to Military Trail, and six lanes (three in each direction) from Military Trail to I-95.

Eastbound traffic along SW 10th Street is heaviest during the AM peak, while westbound traffic is heaviest during the PM peak. During the AM peak, existing eastbound SW 10th Street traffic exceeds the roadway capacity from west of SW 30th Avenue to west of Military Trail. During the PM peak hour, westbound SW 10th Street traffic exceeds capacity from Military Trail to west of SW 30th Avenue, and from Powerline Road to Waterways Boulevard.

Intersection operational analysis indicates that four of the eleven study intersections operate below the Level of Service (LOS) target "D" during the AM peak hour, while five intersections operate below LOS D during the PM peak hour. Field observations confirm significant queueing along the SW 10th Street corridor between intersections during both the AM and PM peak hours.

A total of 896 crashes were reported on SW 10th Street from Florida's Turnpike / Sawgrass Expressway to I-95 from January 2012 through December 2016. During the study period, one (1) fatal crash occurred in 2015. Three segments and five intersections along the SW 10th Street corridor were identified as high crash locations (HCLs) during at least one year between 2012 and 2016. Overall, the total number of crashes has steadily increased over the last five years. Most reported crashes for each year were rear end collisions, and the majority of crashes consistently happened during weekdays, during daylight, in clear weather, and dry conditions.

1.2 Summary of Future Year (2040) Alternatives Analysis

Planned and programmed roadway improvements in the area are expected to be constructed by 2040 and are assumed to be in place with the No Action Alternative and the Build Alternative. The planned Sawgrass Expressway widening, Florida's Turnpike widening, and I-95 widening for express lanes are assumed to be complete. In addition, planned Sawgrass Expressway / Turnpike interchange improvements are assumed to be in place, including new ramps connecting SW 10th Street to and from the Turnpike's general purpose lanes north of SW 10th Street, and new ramps connecting SW 10th Street to and from the Turnpike's managed lanes south of SW 10th Street. Planned interchange improvements at I-95 and SW 10th Street that include new ramps connecting the I-95 northbound and southbound express lanes to SW 10th Street west of I-95 are also assumed to be constructed.

No Action Alternative

The lane geometry for the No Action Alternative along the SW 10th Street corridor from Waterways Boulevard to west of Military Trail is the same as existing conditions. For future year 2040 conditions, changes to the surrounding roadway network are assumed, along with population and employment growth. These changes will contribute to traffic volume increases along SW 10th Street and the study area by 2040.

Analysis of the No Action Alternative under 2040 conditions shows that eastbound and westbound volumes will significantly exceed the capacity of the SW 10th Street local lanes in many sections of the corridor. With the travel demand expected to be almost twice the

capacity of SW 10th Street in some segments, gridlock along SW 10th Street during peak periods can be expected. During the AM peak hour, 7 of the 11 study intersections will operate below LOS D, and during the PM peak hour all but one of the study area intersections will operate at LOS E or F. In the PM peak hour, the considerable westbound traffic volume at Powerline Road causes queueing that extends through most of the upstream network, resulting in long delay, long queues, and undesirable LOS at the other intersections. Both the northbound and southbound I-95 off-ramp terminals experience LOS F, and queues are very long, indicating that the queues impact upstream operations on the I-95 mainline in both directions.

Without additional capacity and safety improvements in place on SW 10th Street, the duration of congestion, vehicular delay, and queue lengths are expected to increase throughout the corridor. The No Action Alternative does not satisfy the objectives or purpose and need of this project. It fails to improve local traffic flow or increase capacity along the corridor and does not address existing operational and safety deficiencies.

Build Alternative

The Build Alternative incorporates a new four-lane Connector managed lane facility on the north side of the corridor from the Sawgrass Expressway / Florida's Turnpike to I-95. Eastbound and westbound entrance and exit ramps between Powerline Road and Newport Center Drive provide connections between the SW 10th Street local lanes and the Connector managed lanes. In addition, an eastbound entrance ramp and westbound exit ramp will be provided west of Waterways Boulevard as part of FTE's ongoing Sawgrass Expressway PD&E Study. The SW 10th Street local lanes remain along the south side of the corridor and consist of three lanes in each direction from west of Waterways Boulevard to east of Powerline Road, two lanes in each direction from east of Powerline Road to Military Trail, and three lanes in each direction from Military Trail to I-95. The speed limit for the local lanes will be lowered from 40 mph and 45 mph to 35 mph. This is to coincide with the new design of the local lanes, which are being narrowed and separated from the higher speed through traffic, and will primarily provide access to adjacent developments instead of through traffic. The speed limit for the Connector managed lanes will be 60 mph. The Connector managed lanes will be physically separated from the local lanes by a barrier and / or a grade separation.

When the Build Alternative is constructed and open to traffic, all vehicle types will be allowed to travel in the SW 10th Street Connector managed lanes, including all types of trucks. Trucks with 3 or more axles are prohibited from accessing the Sawgrass, Turnpike, and I-95 express lane facilities, including the direct connect ramps. So, trucks will be able to enter or exit the Connector managed lanes, beginning from the new entrance and exit ramps west of Waterways Boulevard, to the entrance and exit ramps at Newport Center Drive. In addition, no toll will be implemented on the Connector managed lanes when open to traffic. If it becomes necessary to further manage operations or safety in the Connector managed lane, then tolling and/or vehicle eligibility requirements may be implemented.

Analysis of the Build Alternative 2040 conditions shows that the vast majority of SW 10th Street local lanes roadway segments will operate at or below capacity. A much shorter length of the corridor is expected to exceed capacity when compared to the No Action Alternative. Per visual audits of the microsimulation results, the magnitude and severity of congestion along the SW 10th Street local lanes is significantly less under the Build Alternative than the No Action Alternative. In addition, analysis indicates that the proposed two Connector managed lanes in each direction, as well as the entrance and exit ramps between Powerline Road and Newport Center Drive, can accommodate the future volumes forecasted to use the Connector managed lanes.

From the VISSIM microsimulation results, the Build Alternative results show overall acceptable traffic operations during both the 2040 AM and PM peak hours. The Build Alternative AM and PM peak hour results show all study area intersections operating at an acceptable level of service (D or better). The SW 10th Street local lanes during the AM peak and PM peak were generally recorded with traffic speeds between 30 mph and 35 mph. Speeds were slower (between 15 mph and 30 mph) in the AM peak from west of Waterways Boulevard to Powerline Road, and in the AM and PM peak from Military Trail to Natura Boulevard/FAU Research Park Boulevard. With a speed limit of 35 mph on local SW 10th Street, the analysis shows acceptable travel speeds and queuing along the corridor. In addition, operations on the northbound and southbound approaches of the Powerline Road and Military Trail intersections are acceptable, with queues extending no further than the

upstream side streets. Modest queuing is anticipated on the northbound and southbound I-95 off-ramps and does not impact the mainline.

With an auxiliary lane (third lane) provided for the Connector managed lanes in both the eastbound and westbound directions between the ingress and egress points located east of Powerline Road and west of Military Trail, average speeds in the SW 10th Street Connector managed lanes are at least 45 mph. Analysis of the weaving conditions in the Connector managed lanes showed that LOS D or better is maintained for all segments between the managed lane ingress and egress points, during the 2040 AM and PM peak.

The results of the local lane and Connector managed lane traffic analysis show that the Build Alternative satisfies the objectives and purpose and need of this project. The Build Alternative improves traffic flow in the local lanes by providing a separate Connector managed lane facility that reduces the future 2040 traffic volumes in the local lanes (between Waterways Boulevard and Military Trail) by at least 45% when compared to the No Action Alternative. In addition, the Build Alternative increases capacity throughout the corridor. Improving operations in the local lanes will also help address existing corridor safety deficiencies associated with excessive congestion.

2.0 Introduction

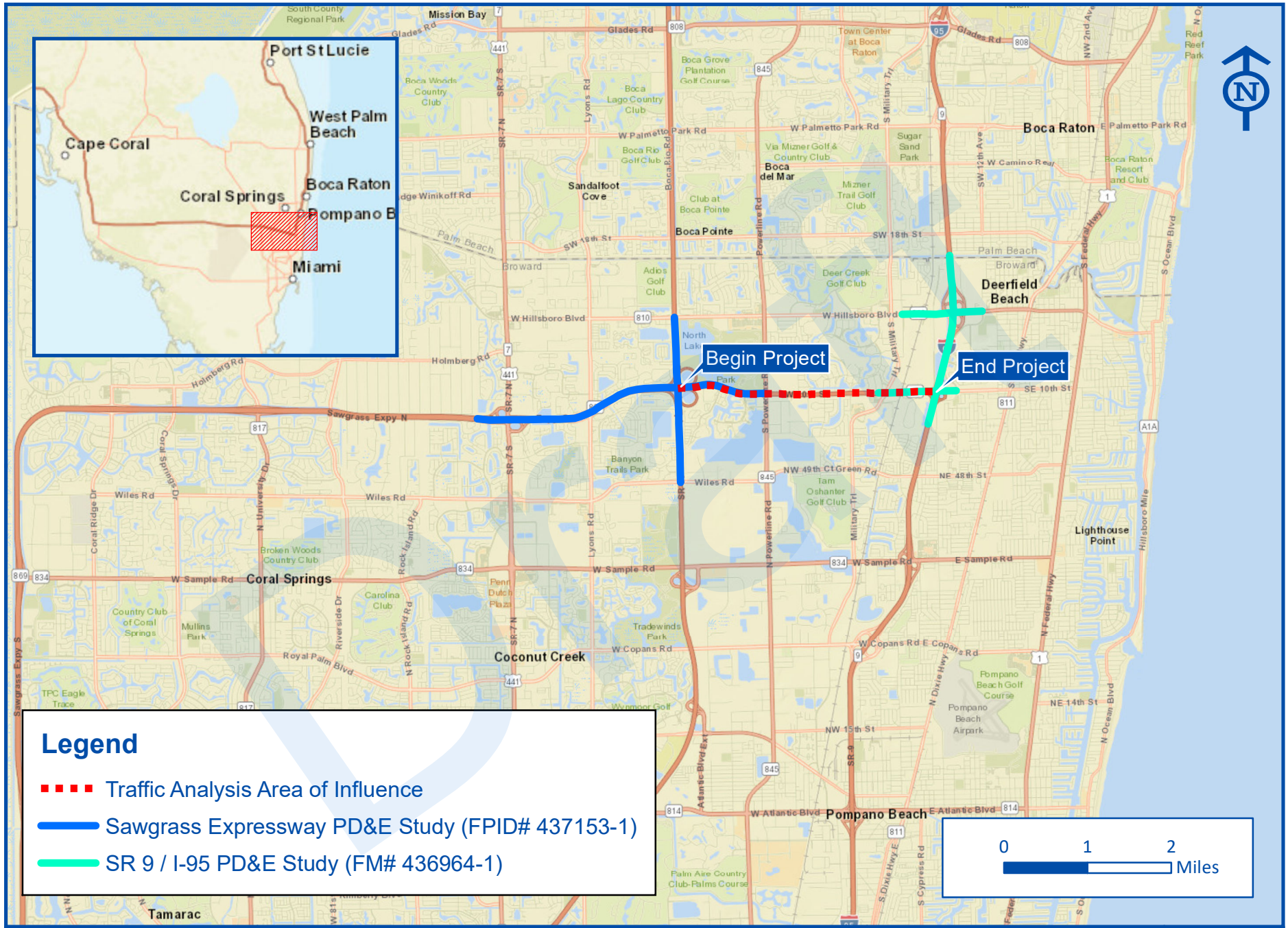
2.1 Project Description

The Florida Department of Transportation (FDOT) is evaluating alternatives to improve SR 869 (SW 10th Street) from Sawgrass Expressway / Florida's Turnpike to west of I-95, a distance of approximately 3.0 miles. The project is located in Broward County, Florida and is contained within the municipality of Deerfield Beach. Figure 2-1 depicts the project location and limits of the SW 10th Street Connector PD&E Study.

SW 10th Street is an east-west Principal Arterial that connects three limited access facilities: Florida's Turnpike, Sawgrass Expressway, and I-95. SW 10th Street is part of the state's Strategic Intermodal System (SIS) and the National Highway System (NHS). SW 10th Street from the Sawgrass Expressway to I-95 is part of the State Highway System and is under the jurisdiction of the Florida Department of Transportation. In addition, SW 10th Street is a designated emergency evacuation route in Broward County.

SW 10th Street currently consists of six lanes (three in each direction) from Florida's Turnpike to SR 845 (Powerline Road), four lanes (two in each direction) from Powerline Road to east of Military Trail, and five lanes (two westbound and three eastbound) from west of Military Trail to I-95. This segment of SW 10th Street is functionally classified as a Divided Urban Principal Arterial and has posted speed limits of 45 miles per hour from Florida's Turnpike to Military Trail, and 40 miles per hour from Military Trail to I-95. The access management classification from Florida's Turnpike to Powerline Road is Class 1. East of Powerline Road, the access management classification is Class 3.

SW 10th Street from Sawgrass Expressway/Florida's Turnpike to I-95 is a missing link in the existing and planned regional managed lanes system network. The addition of a new managed lane limited access facility within the existing SW 10th Street corridor is being evaluated to link the regional managed lanes network by providing a connection between planned managed lanes on Sawgrass Expressway, Turnpike, and I-95. The proposed improvements are intended to reduce the amount of traffic on local SW 10th Street by allowing vehicles to bypass the SW 10th Street local lanes via the new managed lane facility.



FDOT SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 2-1 Project Location and Traffic Analysis Area of Influence	Page No. 2-2

The ability to provide relief for local traffic is a component of the improved connectivity between the three adjacent limited access facilities. This is accomplished by providing dual systems (Local Access and Limited Access) within the SW 10th Street right-of-way. Improvements to the existing SW 10th Street local lanes, and pedestrian and bicycle facilities are also proposed. The local lanes will continue to provide access to adjacent residences and businesses along the corridor. They will also provide a connection to north-south roadways, such as Powerline Road and Military Trail, and general purpose lanes on the Sawgrass Expressway, Turnpike, and I-95. The proposed Connector managed lanes are proposed to be physically separated from the SW 10th Street local lanes through either barrier separation or grade separation. Improvements are planned for the Sawgrass Expressway and Florida's Turnpike interchange to the west and for the I-95 and SW 10th Street interchange to the east. A large volume of traffic is expected to use SW 10th Street Connector managed lanes to access I-95, Sawgrass and Turnpike.

2.2 Purpose and Need for the Project

The purpose of this project is to improve local traffic flow by implementing a separate connection between the Sawgrass Expressway and the I-95 managed lanes, increase capacity, and eliminate various existing operational and safety deficiencies along SW 10th Street between the Sawgrass Expressway, Florida's Turnpike and I-95 while also providing improved connectivity of the regional transportation network.

The primary need for this project is based on capacity and operational deficiencies for local traffic and regional connector traffic, system linkage and safety issues, with secondary considerations for the needs of modal interrelationships, transportation demand, social demands and economic development, and emergency response / evacuation for local traffic and the adjacent communities, as well as regional mobility.

2.3 Related Projects within the Study Area

A review of the FDOT Five-Year Work Program, as reported in the Broward MPO Transportation Improvement Program (TIP) for FY 2018/2019 – FY 2022/2023, identified the following projects related to the SW 10th Street Connector PD&E:

1. SR-9/I-95 from SW 10th Street to Broward/Palm Beach County line, add special use lanes
    - *FM Number: 433108-1 & 433108-6 Ongoing with funding in 2019 & 2020*

2. SR-9/I-95 from SR-870/Commercial Blvd to SR-869/SW 10th St, add auxiliary lanes (Phase 3 managed lanes (3A-2))
    - *FM Number: 433108-5 Ongoing with funding in 2019*

3. SR-9/I-95 from south of SW 10th Street to north of Hillsboro Boulevard, interchange improvement plus cross street improvement
    - *FM Number: 436964-1 and 436964-2 Ongoing with funding in 2019, 2022 and 2023*

4. Sawgrass Expressway, SR 7 to Powerline Road, widen from 6 lanes to 10 lanes with express lanes
    - *FM Number: 437224-1 Ongoing with funding in 2019 and 2020*

5. Sawgrass Expressway, north of Atlantic Boulevard to SR 7, widen from 6 lanes to 10 lanes with express lanes
    - *FM Number: 435461-1 Ongoing with funding in 2019 – 2022*

6. Sawgrass Expressway, south of Sunrise Boulevard to north of Atlantic Boulevard, widen from 6 lanes to 10 lanes with express lanes
    - *FM Number: 437155-1 Funding in 2020 - 2023*

7. Florida's Turnpike, from Sawgrass Expressway to Palm Beach/Broward County line, widen from 6 lanes to 8 lanes with express lanes
    - *FM Number: 415927-1* *Funding in 2019 and 2023*

The planned and programmed roadway improvements listed above that are within the immediate SW 10th Street study area are expected to be constructed at the same time or before the SW 10th Street Connector project is constructed. Therefore, the planned Sawgrass Expressway widening, Florida's Turnpike widening, and I-95 widening for express lanes are assumed to be complete for the future year 2040 analysis. In addition, planned Sawgrass Expressway / Turnpike interchange improvements are assumed to be in place. These include new ramps connecting SW 10th Street to and from the Turnpike's general purpose lanes north of SW 10th Street, and new ramps connecting SW 10th Street to and from the Turnpike's managed lanes south of SW 10th Street. Planned I-95 express lanes and interchange improvements at I-95 and SW 10th Street are also assumed to be constructed. The improvements include new ramps connecting the I-95 northbound and southbound express lanes to SW 10th Street west of I-95.

The Broward MPO's 2040 Long Range Transportation Plan (LRTP) Regionally Significant Affordable Projects list includes the following nearby projects:

1. SR 834/Sample Road – upgrades to support enhanced bus service from SR 869 / Sawgrass Expressway to US 1 planned for 2015 – 2025

2. Military Trail and SR 834/Sample Road – reconstruct the intersection, planned for 2021 – 2025

3. NE 3rd Avenue – widen from 2 to 4 lanes from Sample Road to SW 10th Street, planned for 2031 - 2040

3.0 Traffic Analysis Assumptions and Methodology

The *SW 10th Street PD&E Project Traffic Forecast Memorandum (PTFM)*, dated January 2019, documents existing traffic data, existing conditions traffic operational analysis, travel demand modeling, and future year traffic forecasts for various scenarios. Traffic forecast information contained in the PTFM, along with information provided in a *SW 10th Street Connector – Toll-Free Project Traffic Forecast Technical Memorandum*, dated July 2019, provide the basis for the 2040 forecast volumes for the No Action and Build alternatives documented in this Project Traffic Analysis Report. A copy of the *SW 10th Street PD&E PTFM* is attached in Appendix A, and Appendix B contains a copy of the *SW 10th Street Connector – Toll-Free Project Traffic Forecast Technical Memorandum*.

The traffic analysis for the SW 10th Street Connector PD&E Study was completed in coordination with the I-95 PD&E Study from SW 10th Street to Hillsboro Boulevard (FM# 436964-1) to ensure that key assumptions are consistent. The methodology for the SR 9 / I-95 and SW 10th Street (SR 869) Interchange Access Request is documented in a signed Methodology Letter of Understanding (MLOU) Amendment, dated May 4, 2017. The methodology for the SW 10th Street Connector PD&E Study traffic analysis considered the requirements, assumptions and factors used for the I-95 at SW 10th Street Interchange Modification Report (IMR).

3.1 Traffic Analysis Area of Influence

The area of influence for the SW 10th Street Connector traffic analysis incorporates the following roadway segment: SW 10th Street from east of Florida's Turnpike / Sawgrass Expressway to east of I-95. The study intersections are as follows:

1. SW 10th Street at Waterways Boulevard
2. SW 10th Street at Independence Drive
3. SW 10th Street at Powerline Road
4. SW 10th Street at SW 30th Avenue
5. SW 10th Street at SW 28th Avenue
6. SW 10th Street at SW 24th Avenue
7. SW 10th Street at Military Trail
8. SW 10th Street at Newport Center Drive
9. SW 10th Street at I-95 southbound on and off-ramp terminals

10. SW 10th Street at I-95 northbound on and off-ramp terminals
11. SW 10th Street at Natura Boulevard/FAU Research Park Boulevard

As depicted on Figure 2-1, the area of influence for the SW 10th Street Connector PD&E Study overlaps on the west end of the corridor with the ongoing Sawgrass Expressway PD&E Study (FPID# 437153-1) limits. It also overlaps on the east end of the corridor with the ongoing SR-9/I-95 PD&E Study from south of SW 10th Street to north of Hillsboro Boulevard. Traffic analysis conducted for the SW 10th Street Connector PD&E Study was completed in coordination and consultation with both adjacent PD&E study teams. To ensure consistency throughout all studies, Florida's Turnpike Enterprise (FTE) completed the travel demand forecasting and existing conditions analysis for this PD&E Study as well as for the adjacent PD&E Studies

3.2 Analysis Years

The analysis years for the project are as follows:

- Existing year: 2016
- Design year: 2040

3.3 Data Collection

As documented in the *Project Traffic Forecast Memorandum*, traffic volume data for the SW 10th Street corridor was obtained through multiple data collection efforts that were also supplemented with existing and historical data from the FDOT Florida Traffic Information (FTI) online website application. Traffic volume, origin-destination, and speed data was collected in 2014, 2015 and 2016. Additional speed and travel time data along the corridor was obtained from RITIS from INRIX data for fall of 2018. Turning movement and 24-hour continuous count data for SW 10th Street between Sawgrass Expressway and Powerline Road were collected in October and November 2014 as part of the Sawgrass Expressway (south of Sunrise Boulevard to south of U.S. 441) PD&E Study Traffic Technical Memorandum (TTM) effort. Additional turning movement and 24-hour continuous traffic counts along SW 10th Street were collected by FDOT District Four in March 2016. FTE collected more turning movement and 24-hour continuous traffic counts along SW 10th Street, Powerline Road, and Military Trail in October 2016.

The traffic volume data was used to estimate the existing year 2016 Annual Average Daily Traffic (AADT) and directional design hour volumes (DDHVs) along the corridor, as well as AM and PM weekday peak hour intersection turning movement volumes at the study intersections. The peak hours on SW 10th Street are 7:30 am to 8:30 am, and 5:00 pm to 6:00 pm. The existing year (2016) AADTs are summarized on Figure 3-1.

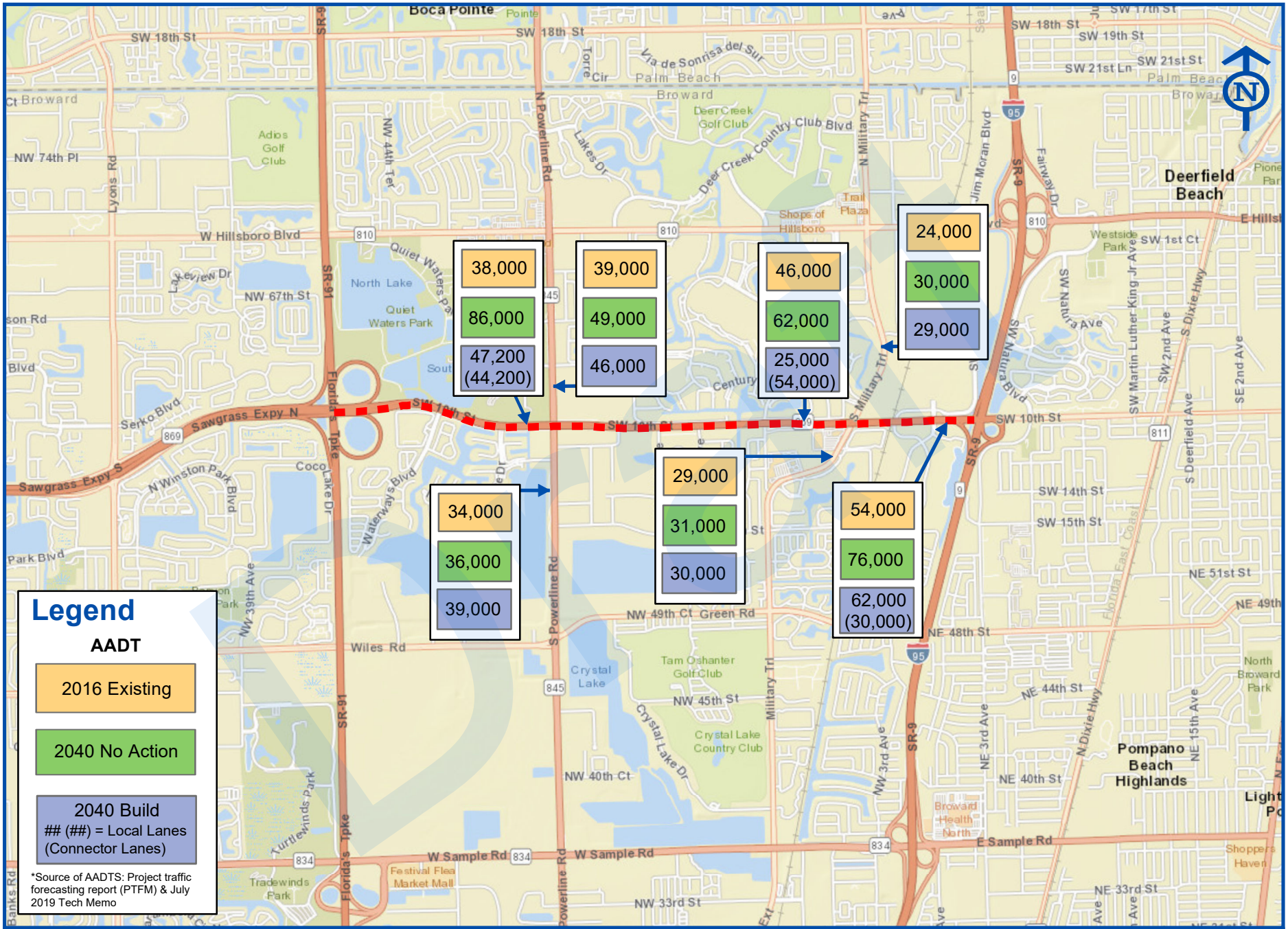
Bluetooth origin-destination (O-D) data collection efforts were completed for the SW 10th Street study corridor. FTE completed an O-D study for portions of the Sawgrass Expressway, Turnpike, SW 10th Street, and I-95 in February 2015 to support multiple projects in the area. FDOT District Four also collected O-D data for the SW 10th Street corridor between Florida's Turnpike and I-95 in April 2016 using Bluetooth equipment. The O-D data obtained from both efforts provided information about daily, AM and PM peak period traffic patterns. It also gave insight into the number of vehicles that would be eligible to use the proposed SW 10th Street Connector managed lanes. The PTFM, developed by FTE and dated January 2019, documents the data collection efforts within the area of influence, is available under separate cover.

3.4 Travel Demand Forecasting

Future year (2040) traffic volumes were forecasted for the SW 10th Street corridor by Florida's Turnpike Enterprise (FTE) for various scenarios throughout the course of the study. The various traffic volume forecasts are documented in detail in the following support documents:

- *Project Traffic Forecast Memorandum (PTFM)*, dated January 2019
- *SW 10th Street Connector – Toll-Free Project Traffic Forecast Memorandum,* dated July 18, 2019

A copy of the *SW 10th Street PD&E PTFM* is attached in Appendix A. Appendix B contains a copy of the *SW 10th Street Connector – Toll-Free Project Traffic Forecast Technical Memorandum*.



FDOT SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 3-1 Annual Average Daily Traffic	Page No. 3-4

Traffic volume scenarios were named and documented prior to design concepts being developed for the project, so volume scenario names differ from alternative names. The "Partial Build" volume scenario documented in the PTFM corresponds to the "No Action Alternative" for the SW 10th Street Connector PD&E Study. The "Scenario 4 Non-tolled" volume scenario documented in the *SW 10th Street Connector – Toll-Free Project Traffic Forecast Memorandum* corresponds to the "Build Alternative" for the SW 10th Street Connector PD&E Study. The many different traffic volume forecast scenarios produced for the project are described below.

Volume Scenarios in the Project Traffic Forecast Memorandum (PTFM)

The forecast scenarios documented in the January 2019 PTFM are described below.

1. "No-Build" – This volume scenario assumed that additional capacity will be in place for Sawgrass Express Lanes, Turnpike Express Lanes, and I-95 Express Lanes, as well as existing plus committed roadway capacity improvements for the surrounding area.

2. "Partial-Build" – In addition to the No-Build improvements, this scenario also assumed:
    - Interchange modifications at Turnpike / Sawgrass / SW 10th Street as proposed as part of the Sawgrass Expressway PD&E Study.
    - Interchange modifications at I-95 / SW 10th Street as proposed as part of the I-95 from SW 10th Street to Hillsboro Blvd PD&E Study.

3. "Build" – This volume scenario assumed the same number of SW 10th Street arterial lanes that currently exist, along with proposed new separated express lanes in the center of SW 10th Street which included overpasses at all signalized intersections, and intermediate ingress and egress in both directions between Powerline Road and Military Trail.

Seven variations of the "Build" forecast are presented in the PTFM (Option 3A, Option 3D-1.1, Option 3D-1.2, Option 3D-1.3, Option 3D-1.4, Option 3D-1.5, and Option 3D-1.6). These

volume scenarios in the PTFM all assumed different Connector managed lane ingress and egress configurations, and all assumed a Center alignment for the Connector managed lanes. Volume scenarios were then developed assuming a North alignment of the Connector managed lanes, in the *Tier 1 Traffic Analysis and Tier 2 Traffic Analysis Results Memorandum,* for Options 3D-1.1, 3D-1.2, 3D-1.3, 3D-1.4, 3D-1.5, and 3D-1.6. Managed lanes configuration Option 3D-1.3, was recommended as a result of the analysis in the *Tier 1 Traffic Analysis and Tier 2 Traffic Analysis Results Memorandum.*

Build Option 3D-1.3 volume scenario assumes the following ingress and egress points, which were carried forward into the Build Alternative documented in this PTAR:

1) Eastbound entrance ramp from SW 10th street local lanes to Connector managed lanes located east of Powerline Road,
2) Eastbound exit ramp from Connector managed lanes to SW 10th Street local lanes located west of Newport Center Drive,
3) Westbound entrance ramp from SW 10th Street local lanes to Connector managed lanes located west of Newport Center Drive, and
4) Westbound exit ramp from Connector managed lanes to SW 10th Street local lanes located east of Powerline Road.

Volume Scenarios in the SW 10th Street Connector – Toll-Free Project Traffic Forecast Memorandum

Following completion of the PTFM and *Tier 1 Traffic Analysis and Tier 2 Traffic Analysis Results Memorandum*, additional "Build" scenario traffic forecasts were prepared. Florida's Turnpike Enterprise (FTE) produced a *SW 10th Street Connector – Toll-Free Project Traffic Forecast Memorandum,* dated July 18, 2019. This memorandum provides supplemental traffic forecast scenarios as described below.

- Scenario 1 - This option includes the same Connector managed lanes ingress and egress points as described above for Build Option 3D-1.3 volume scenario documented in the SW 10th Street PTFM. In addition, a new eastbound ingress and westbound egress is assumed west of Waterways Boulevard between the Sawgrass Expressway

general purpose lanes and the Connector managed lanes. It assumes dynamic tolling for the Connector managed lanes, and in keeping with express lane policy, assumed trucks with 3 or more axles are not allowed to use the Connector managed lanes.

- Scenario 2 – This option includes the same Connector managed lanes ingress and egress points as Option 3D-1.3 documented in the SW 10th Street PTFM, and assumes an additional eastbound ingress and westbound egress west of Waterways Boulevard. It assumes static tolling of the Connector managed lanes (similar to the Sawgrass Expressway general toll lanes). Vehicles choosing to use the Connector managed lanes only between east of Powerline Road and Newport Center Drive (aka "Military Trail Bypass") in both the eastbound and westbound directions are not tolled. Trucks can use the Connector from the ingress/egress ramps west of Waterways Boulevard to the ingress/egress ramps east of Military Trail. Trucks are still prohibited from managed lanes on the Sawgrass Expressway, Turnpike Mainline, and I-95.

- Scenario 3 – This option is similar to Scenario 2 described above, except that it excludes the Connector managed lanes westbound egress located east of Powerline Road.

- Scenario 4 Non-tolled – This option is similar to Scenario 2, but assumes there is no toll for vehicles using the Connector managed lanes from the ingress/egress points located west of Waterways Boulevard to the ingress/egress points located east of Military Trail, including no toll for the ingress/egress points located east of Powerline Road. It assumed that all vehicles are eligible to use the Connector managed lanes including all size trucks.

- Scenario 4 Tolled – This option is like Scenario 4 Non-tolled and includes the additional ingress/egress point west of Waterways Boulevard, and trucks are allowed on the Connector managed lanes. However, it assumes traffic using the Connector managed lanes is dynamically tolled, including at the ingress/egress points located west of Waterways Boulevard, east of Powerline Road, and east of Military Trail.

The five volume scenarios do not each represent a fully developed build concept. Each volume scenario was documented in the Toll-Free Project Traffic Forecast Memorandum to demonstrate how the incremental changes to assumptions (managed lane access points, toll and non-toll variations, and no truck restrictions) affect the traffic volume forecast. The only volume scenario that was fully developed into a Build Alternative is Scenario 4 Non-tolled. Based on input received from stakeholders following the Public Alternatives Workshop held in November 2018, this more desirable scenario was developed into the Build Alternative documented in this PTAR. This concept was more desirable than previous concepts, since it achieves the most objectives set forth by the stakeholders. It allows the highest volume of vehicles to use the proposed Connector managed lanes, including all sizes of trucks, and reduces the most traffic volume and delay in the local SW 10th Street lanes.

Volume Scenarios for 2040 Alternatives in Project Traffic Analysis Report (PTAR)

The "Partial Build" volume scenario documented in the PTFM corresponds to the "No Action Alternative" documented in this PTAR for the SW 10th Street Connector PD&E Study. This alternative assumes:

- Planned and programmed projects in the surrounding area are completed, including the interchange improvements at Sawgrass/Turnpike and I-95 / SW 10th Street, and
- SW 10th Street arterial lanes remain the same as existing.

The "Scenario 4 Non-tolled" volume scenario documented in the *SW 10th Street Connector – Toll-Free Project Traffic Forecast Memorandum* corresponds to the "Build Alternative" documented in this PTAR for the SW 10th Street Connector PD&E Study. This alternative assumes:

- Planned and programmed projects in the surrounding area are completed, including the interchange improvements at Sawgrass/Turnpike and I-95 / SW 10th Street,
- SW 10th Street arterial lanes remain the same number of lanes as existing (2-3 lanes in each direction),
- Proposed new Connector managed lanes (2-3 lanes in each direction) between Sawgrass Expressway, Turnpike and I-95 are constructed, and
- All vehicles are eligible to use the Connector managed lanes, and the Connector managed lanes are not tolled.

The design year (2040) AADTs for the No Action Alternative and Build Alternative are shown in Figure 3-1.

An adjusted and validated version of the Southeast Regional Planning Model (SERPM) 6.5.4, developed by Florida's Turnpike Enterprise (FTE), was used to develop future volumes for this study. The SERPM-FTE model has a base year of 2010 and future year models were developed for years 2020 and 2040. The travel demand model (SERPM-FTE) used for the SW 10th Street project was built upon the Sawgrass PD&E travel demand model and includes the most recent SERPM 7 socioeconomic data (version 7.062). The SERPM-FTE model was used to produce travel demand forecasts at a daily level and for three time periods: AM peak period (6:30 am to 9:30 am), PM peak period (3:30 pm to 6:30 pm), and off-peak period (remainder of the day).

The Express Lane Time-of-Day (ELToD) model v2.2 was used in conjunction with the SERPM-FTE model to utilize daily and peak period subarea trip tables and produce traffic estimates by hour and direction. The ELToD model was used to produce traffic estimates for SW 10th Street local lanes and Connector managed lanes segments. The SW 10th Street intersection volumes were developed, and the peak hour intersection traffic forecasts were balanced along the corridor. Details of the forecasting process are described in more detail in the project traffic memorandums previously described.

3.5 Analysis Methods, Tools and Factors

The AM and PM peak hour operations along the SW 10th Street corridor were assessed under existing conditions, 2040 No Action, and 2040 Build conditions. The detailed methods, tools and assumptions are described in the sections that follow.

Volume-to-Capacity Ratio Analysis

For existing conditions, 2040 No Action, and 2040 Build conditions, the directional AM and PM peak hour volumes along the corridor were assessed against its generalized roadway capacity. The assessment of the SW 10th Street Level of Service (LOS) and volume-to-capacity ratio utilized the generalized peak hour directional capacity values from Table 7 in

the 2013 FDOT Quality / Level of Service Handbook. The posted speed limit on SW 10th Street between Florida's Turnpike and I-95, is 45 mph and 40 mph in various segments. Therefore, the existing conditions and 2040 No Action Alternative roadway capacity for SW 10th Street is based on the LOS D service volume thresholds for a Class I state signalized arterial (40 mph or higher). The roadway capacity for SW 10th Street under the 2040 Build Alternative, though, is based on the LOS D thresholds for a Class II state signalized arterial (35 mph or less).

Existing (2016) Conditions Synchro Analysis

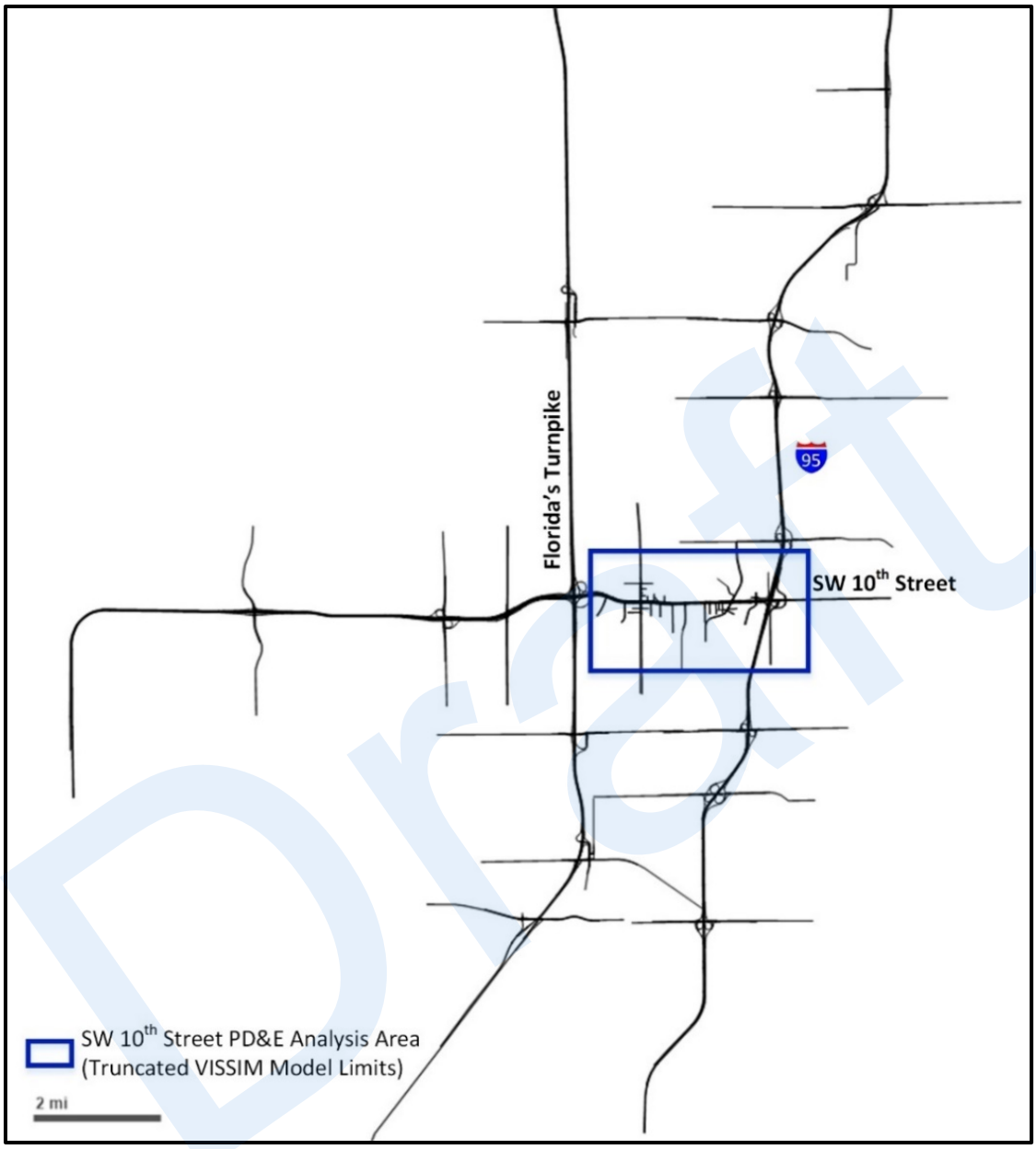
Existing conditions AM and PM peak hour intersection analysis was completed by FTE and documented in the PTFM, dated January 2019. A summary of the existing intersection analysis results from the PTFM is provided in this report. The analysis was completed by FTE using Synchro software (version 9), with delay and LOS reported based on Highway Capacity Manual (HCM) 2000 methodology. The analysis was performed with existing turning movement volumes, intersection lane configurations, and existing signal timing plans as of September 2016. The overall intersection AM and PM peak hour factors calculated from the turning movement count data were used for each intersection. In addition, a heavy vehicle factor of 2% was used for all intersections based on 2016 truck percentages from FDOT classification count data on SW 10th Street and 2016 peak hour truck turning movement counts.

2040 No Action and Build Alternative VISSIM Analysis

FTE developed an overall regional existing base year model of the area surrounding the SW 10th Street corridor for FDOT District Four. The regional VISSIM simulation model was developed to assess the operations of a larger region that includes Florida's Turnpike, I-95, and SW 10th Street, as documented in the PTFM. Figure 3-2 shows the extent of the regional VISSIM model. The calibration of the base year model is documented in FTE's *SW 10th Street PD&E VISSIM Model Calibration, Florida's Turnpike to I-95* report, dated July 2017. Specific driver behavior parameters for AM and PM peak periods were previously reviewed and approved by the District as part of the calibration effort to match with previously utilized I-95 parameters.

FTE provided calibrated regional year 2040 VISSIM models to the SW 10th Street Connector PD&E team. To focus on assessing the operations of the SW 10th Street Connector PD&E study area between the Sawgrass Expressway and I-95, RS&H developed truncated VISSIM models from the regional year 2040 VISSIM models. The truncated VISSIM model area used for the SW 10th Street Connector PD&E Study analysis is also identified in Figure 3-2. These models maintained the same driving behavior parameters as the regional models. The vehicle inputs and routing decisions were coded into the truncated models and reflect the 2040 traffic volume developed for the study area.

Figure 3-2: Truncated VISSIM Model Limits



The SW 10th Street Connector PD&E team used VISSIM microsimulation to analyze the 2040 AM and PM peak period operations of both the local lanes and Connector managed lanes as part of the No Action Alternative and Build Alternative. The analysis was completed using VISSIM 8, and signal optimization of the timings and offsets was performed using Synchro. Where possible, existing signal phasing was maintained; however, some intersections

required revised phasing due to changes in geometry and access. These modifications were also performed using Synchro.

Intersection delays are reported from the 2040 No Action Alternative VISSIM models and 2040 Build Alternative VISSIM models. The VISSIM delays were correlated to the HCM LOS delay thresholds for signalized and unsignalized intersections to report the 2040 AM and PM peak hour LOS for each study intersection. Maximum simulated queue lengths and throughput volumes based on the VISSIM analyses were also reported. VISSIM's link evaluation functionality was used to map the average simulated speeds along the SW 10th Street corridor (local and managed lanes, where applicable), adjacent arterials and side streets, and ramps to and from I-95. Network-wide Measures of Effectiveness (MOE's) were utilized to assess and compare the two alternatives. All VISSIM results presented in this report represent the average of 10 simulation runs generated using distinct random seeds.

2040 Peak Hour Factors

Approved peak hour factors determined in coordination with FDOT District Four were used for future (2040) conditions analysis. A peak hour factor of 0.95 was used for the following intersections:

- SW 10th Street at Waterways Boulevard
- SW 10th Street at Independence Drive
- SW 10th Street at Powerline Road
- SW 10th Street at SW 30th Avenue
- SW 10th Street at SW 28th Avenue
- SW 10th Street at SW 24th Avenue
- SW 10th Street at I-95 Northbound and Southbound Ramps

Consistent with the I-95 and SW 10th Street IMR MLOU, a peak hour factor of 0.92 was used for the following intersections:

- SW 10th Street at Military Trail
- SW 10th Street at Newport Center Drive
- SW 10th Street at Natura Boulevard / FAU Research Park Boulevard

2040 Truck Traffic Factors

To model and compare 2040 operations of the No Action Alternative versus the Build Alternative, both VISSIM models were coded with specific 2040 truck traffic assumptions. Existing FDOT express lane policy allows 2 axle trucks to pay a toll to use express lanes, but 3 or more axle trucks are not eligible to use express lanes. The SW 10th Street Connector Build Alternative assumes that vehicles of all types, including all types of trucks, may use the Connector managed lanes. Given the mix of different eligible types of vehicles that will use the various roadway facilities, it was important to model the No Action and Build Alternatives using a simulated mix of vehicle types for each facility.

Coding specific truck types and truck volumes into the models allowed the PD&E team to analyze operations throughout the study roadway network, considering impacts from driving characteristics of various vehicle types at each point in the roadway network. For the Build Alternative, it was particularly important to evaluate operations of critical areas, assuming larger, slower vehicle types would be included in the mix of traffic using the Connector managed lanes.

The critical analysis areas that were evaluated in detail considering the impacts of truck traffic, are noted below.

- An eastbound and westbound weave area in the proposed Connector managed lanes between the ingress and egress points located east of Powerline Road and east of Military Trail.
- Connector managed lane traffic merging into local lane traffic eastbound east of Military Trail, and westbound east of Powerline Road.

Forecasted 2040 daily truck percentages for the roadways in the study area are shown in Table 3-1, along with estimated AM and PM peak hour truck percentages used for the 2040 VISSIM analysis. The peak hour truck percentages were divided into 2 axle trucks, and trucks with 3 or more axles, based on existing vehicle classification data at count stations along the SW 10th Street corridor, which showed the split in the total truck volume between these two groups of trucks to be approximately 50/50. Note that 3 or more axle trucks were

prohibited from accessing the Sawgrass, Turnpike, and I-95 express lane facilities, including the direct connect ramps.

Table 3-1: 2040 Truck Percentages

Location	Daily Total Truck %	Peak Hour Total Truck %		Peak Hour 2-axle Truck %		Peak Hour 3+ axle Truck %	
		AM	PM	AM	PM	AM	PM
Sawgrass Expwy west of Waterways Blvd	8.0%	4.0%	4.0%	2.0%	2.0%	2.0%	2.0%
SW 10th St east of I-95	7.0%	3.5%	3.5%	2.0%	2.0%	2.0%	2.0%
Powerline Rd north of SW 10th St	5.0%	2.5%	2.5%	1.5%	1.5%	1.5%	1.5%
Powerline Rd south of SW 10th St	7.0%	3.5%	3.5%	1.5%	1.5%	1.5%	1.5%
Military Trail north of SW 10th St	7.0%	3.5%	3.5%	2.0%	2.0%	2.0%	2.0%
Military Trail south of SW 10th St	7.0%	3.5%	3.5%	2.0%	2.0%	2.0%	2.0%
I-95 north of SW 10th St	5.0%	2.5%	2.5%	1.5%	1.5%	1.5%	1.5%
I-95 south of SW 10th St	6.0%	3.0%	3.0%	1.5%	1.5%	1.5%	1.5%

Notes:

(1) Peak hour total truck % approximated as 1/2 of daily total truck %.

(2) Peak hour 2 axle truck % and peak hour 3+ axle truck % approximated as 1/2 of total peak hour total truck % and rounded to nearest 0.5%. To maintain consistency with inputs for trucks along Powerline Road north and south of SW 10th St., the peak hour 2-axle and 3+ axle truck %s on Powerline Road north and south of SW 10th St. were averaged.

3.6 Level of Service Targets and Performance Measures

The study corridor is part of the State Highway System and is located within an urbanized area in Broward County, Florida. FDOT Policy Topic No. 000-525-006c provides Level of Service (LOS) targets for the State Highway System. The LOS target for the SW 10th Street corridor and intersections is LOS D.

To assess the performance of the existing conditions, 2040 No Action Alternative and 2040 Build Alternative, the following performance measures are reported and used to compare traffic operations along the corridor:

- SW 10th Street Local Arterial Lanes
  - Volume to Capacity (V/C) ratio
  - LOS
- SW 10th Street Local Arterial Study Intersections
  - LOS
  - Control delay
  - 95th percentile queues
- SW 10th Street Connector Managed Lane Freeway Segments
  - Volume to Capacity (V/C) ratio
  - LOS
  - Speeds
- SW 10th Street Connector Managed Lane Freeway Merge and Diverge Segments
  - Density
  - LOS

4.0 Existing Conditions

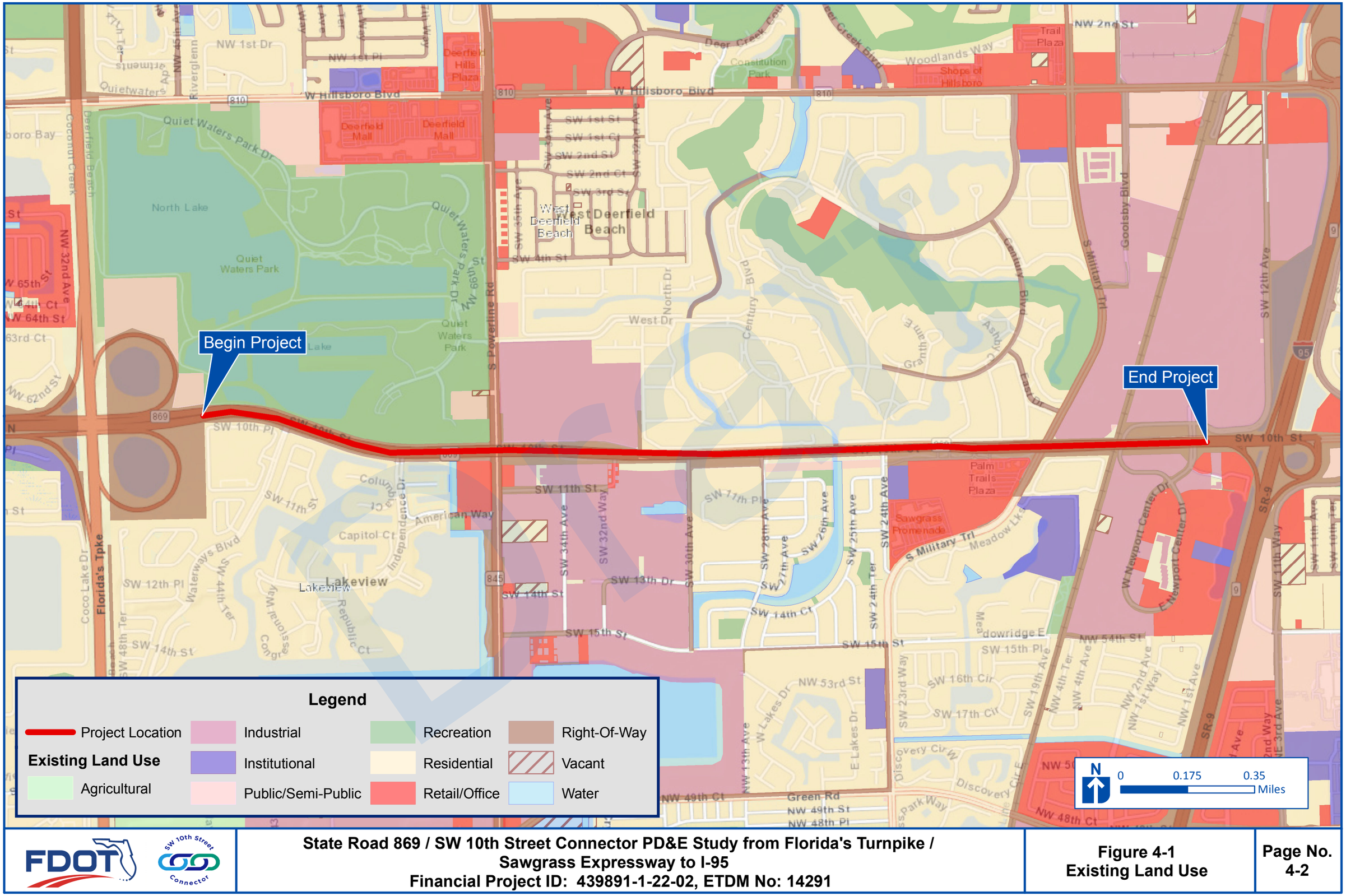
4.1 Existing Land Use

The project lies within the City of Deerfield Beach, in Broward County, Florida, although it is not within the city's Community Redevelopment Area. The primary land uses along the project corridor include residential (multi-family and single family), recreational, industrial, and commercial. Industrial development includes the Publix Distribution Center near I-95, while the major residential developments are:

- Enclave Apartments
- Waterways
- Independence Bay Community
- Century Village
- Waterford Courtyards
- Waterford Homes
- Lakes at Deerfield Apartments

Commercial development along the SW 10th Street corridor includes: the Sports Complex, Shell Gas Station, Med Care Pharmacy, Deerfield Storage, Quiet Waters Business Park, Public Storage, Walmart, Publix, Quorum Business Center, and the Newport Center.

Quiet Waters Park and Crystal Heights Park represent the recreational uses along SW 10th Street. Figure 4-1 shows the existing land uses along the project corridor.



State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95
Financial Project ID: 439891-1-22-02, ETDM No: 14291

Figure 4-1
Existing Land Use

4.2 Existing Transportation Network

4.2.1 Existing Roadway Network

SW 10th Street is an existing six-lane and four-lane east-west urban principal arterial between Sawgrass Expressway/Florida's Turnpike and I-95. The posted speed is 45 mph on SW 10th Street from Florida's Turnpike to Military Trail and 40 mph from Military Trail to I-95. SW 10th Street provides direct access to local residential, commercial and industrial properties, as well as serving as an east-west regional connection. SW 10th Street is part of the state's Strategic Intermodal System (SIS) and currently provides the opportunity for commuters and local residents to connect directly to two major limited access facilities: Sawgrass Expressway and I-95. Florida's Turnpike is adjacent to the west end of the corridor; however, no direct access is provided between the Turnpike and SW 10th Street.

The roadway network surrounding the study corridor includes Interstate 95 on the east end, which is an eight-lane, north-south freeway that has an interchange with SW 10th Street providing access to and from all directions. Existing toll roads on the west end of the corridor include Florida's Turnpike, which is a six-lane freeway facility that runs north-south throughout the state, and Sawgrass Expressway, a six-lane freeway facility. The end point of the Sawgrass Expressway is at SW 10th Street/Turnpike, where it transitions to four-lanes and eventually into SW 10th Street. The Sawgrass Expressway provides access to southwestern Broward County and Miami-Dade County. In addition, Powerline Road, which is a north-south six-lane state arterial, and Military Trail, which is a four-lane north-south municipal arterial, are significant local facilities that intersect with the corridor.

Waterways Boulevard and Independence Drive are both four-lane local roads that intersect with SW 10th Street, and provide access to residential developments located south of SW 10th Street. SW 30th Avenue, SW 28th Avenue, and SW 24th Avenue are two-lane local roads that also connect to SW 10th Street and provide access to residential neighborhoods located south of the corridor. Newport Center Drive is a four-lane local road that crosses SW 10th Street and provides access to commercial and industrial developments located north and south of SW 10th Street. Natura Boulevard and FAU Research Park Boulevard form the easternmost study intersection with SW 10th Street. North of SW 10th Street, Natura Boulevard is a four-lane local road, and FAU Research Park Boulevard south of SW 10th Street is a two-lane local road. The existing roadway and intersection lane configurations are depicted in Figure 4-2.

Legend

- General Use Lane/Arterial
- Intersection Lane Configuration
- 1 > General Use Lane/Arterial Lane Configuration
- Signalized Intersection
- Unsignalized Intersection

N

N.T.S.

West Dr

Quietwaters N Driveway

Quietwaters S Driveway

Driveway F

Industrial Park Access

Matchline A

To WB Sawgrass

SW 10th St

< 3 | < 3 | < 3 | < 3 | < 2 | < 2

4 > | 4 > | 3 > | 3 > | 2 > | 2 > | 2 >

From EB Sawgrass

SW 10th St

Page 2

Waterways Blvd

Independence Dr

SW 11th Ct

American Way

Powerline Rd

SW 30th Ave

FDOT

SW 10th Street Connector

State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95
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Figure 4-2
Existing Lane Geometry

Legend

- General Use Lane/Arterial
- Intersection Lane Configuration
- 1 > General Use Lane/Arterial Lane Configuration
- Signalized Intersection
- Unsignalized Intersection

N

N.T.S.

Matchline A

Matchline B

Page 1

Page 3

< 2 < 2 < 2 < 2 < 2 SW 10th St < 3

2 > 2 > 2 > 2 > 3 > 3 > SW 10th St 3 >

Military Trail

East Drive

SW 28th Ave

SW 24th Ave

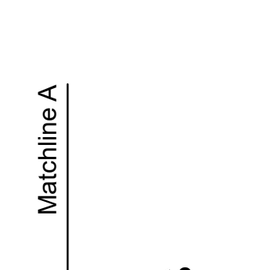
W. Driveway

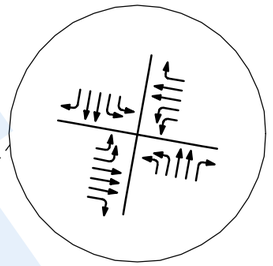
E. Driveway

Palm Trails Plaza

The Lakes at Deerfield Apts Driveway

Horizon Club Driveway





Legend

- General Use Lane/Arterial
- Intersection Lane Configuration
- 1 > General Use Lane/Arterial Lane Configuration
- Signalized Intersection
- Unsignalized Intersection

N

N.T.S.

Matchline B

SW 10th St

< 3 < 4 < 3

3 > 4 > 4 > 3 >

SW 10th St

Page 2

SW 12th Ave

Newport Center Dr

Newport Center Dr

From Hillsboro Blvd

4 < 1 > 4 <

4 < 1 > 4 <

95

To Hillsboro Blvd

< 4 1 > < 4

< 4 1 > < 4

SW Natura Blvd

< 3

3 > 3 > 3 >

< 1 1 >

FAU Research Park Blvd

FDOT / SW 10th Street Connector	**State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95** **Financial Project ID: 439891-1-22-02, ETDM No: 14291**	**Figure 4-2** **Existing Lane Geometry**

4.2.2 Existing Transit Network

The City of Deerfield Beach partners with Broward County Transit (BCT) to provide a free community bus service. The Express I route runs Monday through Friday, 8:00 am to 4:00 pm, and busses stop at assigned bus stops every 60 minutes. The Express I route runs west along SW 10th Street from MLK Jr. Boulevard (east of I-95) to Powerline Road. It has one stop on SW 10th Street at the Walmart located in the south-west corner of Military Trail and SW 10th Street. In the vicinity of the study corridor, BCT also operates regular bus service on Route 14 which runs along Powerline Road, Route 48 along Hillsboro Boulevard, and Route 34 along Sample Road.

4.2.3 Existing Bicycle and Pedestrian Facilities

Sidewalks are located along SW 10th Street's eastbound and westbound lanes from Military Trail to I-95; however, from Waterways Boulevard to Military Trail, sidewalks are only present in the eastbound direction. Bicycle facilities are not designated along SW 10th Street. Existing five-foot paved shoulders, which serve as undesignated bicycle lanes, are present in both directions from Powerline Road to Military Trail. East of Military Trail, the paved shoulder narrows to three feet and can no longer be used as a bicycle lane. Figure 4-3 illustrates the existing bicycle and pedestrian facilities along SW 10th Street.

Figure 4-3: Existing Sidewalk and Bicycle Lane Photo on SW 10th Street

4.3 Existing (2016) Peak Hour Traffic Volumes

As part of the pre-work activities conducted in advance of the PD&E Study, the FDOT collected existing year traffic counts at locations throughout the project study area. As described in Section 3.3, turning movement and 24-hour continuous count data were collected in 2014 and 2016. The traffic volume data is documented in the PTFM.

The traffic volume data was used to estimate the existing year 2016 Annual Average Daily Traffic (AADT) and directional design hour volumes (DDHVs) along the corridor, as well as AM and PM weekday peak hour intersection turning movement volumes at the study intersections. The peak hours on SW 10th Street are 7:30 am to 8:30 am, and 5:00 pm to 6:00 pm.

The existing year (2016) AM and PM peak hour traffic volumes along the SW 10th Street corridor are summarized on Figure 4-4.

Legend

X,XXX (X,XXX)	AM (PM) Peak Hour Volume
●	Signalized Intersection
○	Unsignalized Intersection

N

N.T.S.

West Dr

Quietwaters N Driveway

Quietwaters S Driveway

Driveway F

320 (675) ↲
1,220 (980) ↓
180 (225) ↳
240 (200) ↰
1,125 (2,105) ←
255 (255) ↱
705 (345) ↲
2,095 (1,145) →
355 (175) ↳
245 (480) ↰
1,110 (1,110) ↑
305 (290) ↱

35 (55) ↲
10 (95) ↳
50 (10) ↰
1,585 (2,505) ←
85 (30) ↲
2,495 (1,630) →

Industrial Park Access

Matchline A

To WB Sawgrass

SW 10th St

From EB Sawgrass

SW 10th St

Page 2

Waterways Blvd

Independence Dr

SW 11th Ct

American Way

Powerline Rd

SW 30th Ave

1,620 (2,880) ←
80 (325) ↱
2,770 (1,475) →
10 (60) ↳
110 (45) ↰
335 (160) ↱

1,670 (3,195) ←
20 (65) ↱
3,095 (1,605) →
10 (30) ↳
30 (10) ↰
60 (60) ↱

1,620 (2,495) ←
95 (30) ↱
2,450 (1,705) →
55 (20) ↳
15 (20) ↰
55 (145) ↱

State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95
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Figure 4-4
Existing Peak Hour Volumes

Legend

X,XXX (X,XXX)	AM (PM) Peak Hour Volume
●	Signalized Intersection
○	Unsignalized Intersection

N

N.T.S.

Military Trail

East Drive

Matchline A

Matchline B

SW 10th St

SW 10th St

Page 1

Page 3

SW 28th Ave

SW 24th Ave

W. Driveway

E. Driveway

Palm Trails Plaza

The Lakes at Deerfield Apts Driveway

Horizon Club Driveway

← 1,555 (2,485)
← 25 (20)
2,370 (1,690) →
165 (105) ↴
50 (50) ↰
30 (35) ↱

← 1,615 (2,530)
← 55 (60)
2,380 (1,700) →
15 (85) ↴
70 (190) ↱

← 250 (435)
← 535 (785)
← 430 (220)
→ 285 (425)
→ 1,260 (2,020)
→ 290 (350)
280 (305) ↴
2,085 (1,430) →
85 (155) ↴
160 (135) ↰
765 (580) ↑
570 (300) ↱

← 1,595 (2,480)
← 10 (55)
2,470 (1,755) →
35 (95) ↴
120 (45) ↰
65 (40) ↱

← 1,580 (2,505)
← 35 (25)
2,375 (1,700) →
25 (25) ↴
20 (85) ↱

Legend

X,XXX (X,XXX)	AM (PM) Peak Hour Volume
●	Signalized Intersection
○	Unsignalized Intersection

N

N.T.S.

SW 12th Ave

Matchline B

SW 10th St

Newport Center Dr

From Hillsboro Blvd

5,470
(6,600)

700
(670)

6,170
(7,270)

I-95

6,690
(6,060)

To Hillsboro Blvd

670
(630)

7,360
(6,690)

SW Natura Blvd

275 (330)
145 (220)
215 (220)
70 (105)
1,395 (1,125)
80 (170)
155 (210)
1,040 (1,200)
200 (180)
195 (235)
125 (105)
105 (85)

Page 2

SW 10th St

80 (340)
10 (5)
35 (85)
305 (70)
1,705 (2,145)
320 (90)
265 (65)
2,370 (1,825)
450 (60)
50 (310)
10 (10)
95 (375)

Newport Center Dr

2,330 (2,305)
550 (545)
1,870 (1,660)
630 (625)

1,180
(1,170)

685 (825)
225 (135)
2,195 (2,025)
1,870 (1,660)

5,470
(6,600)

I-95

6,990
(6,820)

1,360
(1,090)

990
(1,220)

FAU Research Park Blvd

1,605 (1,395)
260 (295)
995 (1,000)
1,100 (795)
590 (630)
400 (590)

FDOT / SW 10th Street Connector	**State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95** **Financial Project ID: 439891-1-22-02, ETDM No: 14291**	**Figure 4-4** **Existing Peak Hour Volumes**

4.4 Existing Conditions Traffic Analysis

The primary objective of the existing conditions analysis is to establish the current operational conditions along the SW 10th Street corridor. The current eastbound and westbound peak hour volumes along SW 10th Street were compared to the capacity of the roadway segments, and the corresponding volume-to-capacity ratios and LOS were calculated. In addition, traffic operations as reported by FTE in the PTFM for each of the 10 signalized intersections along SW 10th Street from Waterways Boulevard to SW Natura Park Boulevard / FAU Research Park Boulevard, and the unsignalized intersections of SW 10th Street at SW 30th Avenue and SW 24th Avenue are summarized. The road network geometry and peak hour traffic volumes used in the analyses are consistent with the information presented in Figure 4-2 and Figure 4-4.

4.4.1 Existing Conditions LOS and V/C Analysis

The results of the existing conditions LOS and V/C analysis for each segment of SW 10th Street in the eastbound direction and westbound direction, are shown in Table 4-1.

Eastbound SW 10th Street traffic is heavier than westbound traffic during the AM peak hour, while westbound traffic is heaviest during the PM peak hour. During the AM peak hour, eastbound SW 10th Street traffic exceeds the roadway capacity from west of SW 30th Avenue to west of Military Trail. During the PM peak hour, westbound SW 10th Street traffic exceeds capacity from Military Trail to west of SW 30th Avenue, and from Powerline Road to Waterways Boulevard.

Table 4-1: Existing Conditions LOS and V/C Analysis

SW 10th Street Segments		No. of Lanes	Volume		Capacity (1)	LOS (2)		V/C (3)	
	Location Description		AM	PM		AM	PM	AM	PM
SW 10th Street Eastbound	West of Waterways	4	2,780	1,535	4,242	C	C	0.66	0.36
	Waterways Blvd to Independence Dr	4	3,105	1,635	4,242	C	C	0.73	0.39
	Independence Dr to Powerline Rd	3	3,155	1,665	3,171	D	C	0.99	0.53
	Powerline Rd to west of SW 30th Ave	3	2,580	1,660	3,171	C	C	0.81	0.52
	West of SW 30th Ave to SW 28th Ave	2	2,505	1,850	2,100	F	C	1.19	0.88
	SW 28th Ave to SW 24th Ave	2	2,535	1,795	2,100	F	C	1.21	0.85
	SW 24th Ave to west of Military Trail	2	2,400	1,785	2,100	F	C	1.14	0.85
	West of Military Trail to west of Newport Center Dr	3	3,085	1,950	3,171	C	C	0.97	0.61
	West of Newport Center Drive to I-95 SB On-Ramp	4	3,085	2,285	4,242	C	C	0.73	0.54
	I-95 SB On-Ramp to Natura Blvd	3	2,095	1,795	3,171	C	C	0.66	0.57
	East of Natura Blvd	3	1,360	1,505	3,171	C	C	0.43	0.47
SW 10th Street Westbound	West of Waterways	3	1,730	2,925	3,171	C	C	0.55	0.92
	Waterways Blvd to Independence Dr	3	1,700	3,205	3,171	C	F	0.54	1.01
	Independence Dr to Powerline Rd	3	1,690	3,260	3,171	C	F	0.53	1.03
	Powerline Rd to west of SW 30th Ave	3	1,620	2,560	3,171	C	C	0.51	0.81
	West of SW 30th Ave to SW 28th Ave	2	1,715	2,525	2,100	C	F	0.82	1.2
	SW 28th Ave to SW 24th Ave	2	1,605	2,535	2,100	C	F	0.76	1.21
	SW 24th Ave to Military Trail	2	1,670	2,590	2,100	C	F	0.8	1.23
	Military Trail to west of Newport Center Dr	3	1,835	2,795	3,171	C	C	0.58	0.88
	West of Newport Center Drive to Newport Center Drive	4	1,835	2,795	4,242	C	C	0.43	0.66
	Newport Center Drive to I-95 SB Off-Ramp	3	2,330	2,305	3,171	C	C	0.73	0.73
	I-95 SB Off-Ramp to Natura Blvd	3	2,195	2,025	3,171	C	C	0.69	0.64
	East of Natura Blvd	3	1,545	1,400	3,171	C	C	0.49	0.44

NOTES:
(1) Capacity thresholds from FDOT 2012 Generalized LOS Peak Hour Directional Volumes Table for Urbanized Areas at LOS D for Class I arterial (40 mph or higher), with +5% capacity adjustment for right turn lanes.
(2) LOS = Level of Service
(3) V/C = Ratio of Volume to Capacity

4.4.2 Existing Conditions Intersection Analysis

Existing conditions intersection analysis was completed using Synchro (version 9.2) software and Highway Capacity Manual (HCM) 2000 intersection analysis methodology. A summary of the existing conditions LOS and delays for each of the study intersections along the SW 10th Street corridor is provided, where AM peak hour conditions are summarized in Table 4-2, and PM peak hour conditions are compiled in Table 4-3. Results show that four intersections operate at a failing LOS F in the AM peak hour, while five intersections operate at a failing LOS F in the PM peak hour.

Field observations confirm significant queueing and congestion along the SW 10th Street corridor during the AM and PM peak hours. Significant queue lengths were observed at the following locations:

AM Peak Hour

- Eastbound at the Powerline Road and SW 10th Street intersection;
- Eastbound and northbound at the Military Trail and SW 10th Street intersection; and
- Eastbound and westbound queues on SW 10th Street between Military Trail and I-95.

PM Peak Hour

- Eastbound, westbound, northbound, and southbound at the Powerline Road and SW 10th Street intersection;
- Eastbound and southbound at the Military Trail and SW 10th Street intersection; and
- Westbound queues on SW 10th Street between Military Trail and I-95.

Table 4-2: Existing AM Peak Hour Intersection Performance

Intersection	Approach	Movement	Volume (vph)	Max. Queue (ft)	Delay and Level of Service (sec/veh)		
					Movement	Approach	Intersection
Waterways Blvd	EB	T	2,770	#790	B (18.5)	B (18.4)	B (13.8)
		R	10	8	A (5.8)		
	WB	L	80	112	D (35.9)	A (6.1)	
		T	1,620	193	A (4.7)		
	NB	L	110	114	D (46.0)	B (13.9)	
		R	335	22	A (3.4)		
Independence Dr	EB	T	3,095	#243	A (8.1)	A (8.1)	A (7.4)
		R	10	m0	A (0.4)		
	WB	L	20	m7	C (28.8)	A (4.6)	
		T	1,670	376	A (4.3)		
	NB	L	30	45	D (41.0)	D (40.2)	
		R	60	37	D (39.8)		
Powerline Rd	EB	L	705	#602	F (82.8)	E (67.2)	F (88.0)
		T	2,095	#1163	E (68.2)		
		R	355	253	C (30.6)		
	WB	L	255	m#263	F (101.4)	F (83.8)	
		T	1,125	582	E (79.8)		
		R	240	m247	F (83.9)		
	NB	L	245	211	F (83.0)	E (74.7)	
		T	1,110	#591	E (77.6)		
		R	305	299	E (57.4)		
	SB	L	180	161	E (75.2)	F (143.0)	
		T	1,220	#765	F (140.5)		
		R	320	227	F (190.9)		
SW 30th Ave*	EB	T	2,450	-	-	-	F (165.7)
		R	55	-	-		
	WB	L	95	-	-	-	
		T	1,620	-	-		
	NB	L	15	-	-	-	
		R	55	-	-		
SW 28th Ave	EB	T	2,470	m1380	D (38.1)	D (37.7)	C (29.2)
		R	35	m10	A (8.6)		
	WB	L	10	m4	D (45.0)	A (6.4)	
		T	1,595	278	A (6.2)		
	NB	L	120	#285	F (130.3)	F (111.7)	
		R	65	64	E (77.1)		
SW 24th Ave*	EB	T	2,370	-	-	-	F (120.4)
		R	165	-	-		
	WB	L	25	-	-	-	
		T	1,555	-	-		
	NB	L	50	-	-	-	
		R	30	-	-		

*Stop controlled intersections

- 95th percentile volume exceeds capacity, queue may be longer.

Table 4-2 (Continued): Existing AM Peak Hour Intersection Performance

Intersection	Approach	Movement	Volume (vph)	Max. Queue (ft)	Delay and Level of Service (sec/veh)		
					Movement	Approach	Intersection
Military Trail	EB	L	280	m217	F (95.1)	E (56.4)	F (85.7)
		T	2,085	933	D (51.2)		
		R	85	m11	E (58.7)		
	WB	L	290	#325	F (195.1)	E (72.9)	
		T	1,260	842	D (53.4)		
		R	285	184	C (34.7)		
	NB	L	160	140	F (81.3)	F (146.1)	
		T	765	#626	F (88.5)		
		R	570	#1025	F (241.7)		
	SB	L	430	#427	F (151.0)	F (89.7)	
		T	535	381	E (57.5)		
		R	250	196	D (52.9)		
Newport Center Dr	EB	L	265	#363	E (71.9)	C (28.0)	C (32.5)
		T	2,370	711	C (23.8)		
	WB	L	320	#621	F (174.3)	C (33.6)	
		T	1,705	314	B (10.8)		
		R	305	37	B (13.4)		
	NB	L	50	73	E (75.0)	E (73.6)	
		T	10	72	E (74.9)		
		R	95	5	E (72.8)		
	SB	L	35	58	E (75.2)	E (73.4)	
		T	10	58	E (74.5)		
		R	80	0	E (72.6)		
I-95 SB On-Ramp	EB	T	1,870	541	C (34.3)	C (25.8)	B (18.8)
		R	630	0	A (0.6)		
	WB	L	550	m471	E (65.8)	B (12.8)	
		T	2,330	m0	A (0.2)		
I-95 SB Off-Ramp	EB	T	1,870	5	A (3.4)	A (3.4)	D (35.1)
	WB	T	2,195	m77	A (4.6)	A (4.6)	
	SB	L	225	#795	F (156.9)	F (173.8)	
		R	685	#846	F (191.3)		
I-95 NB Ramps	EB	T	995	m348	C (25.3)	B (13.4)	D (48.2)
		R	1,100	m1066	A (2.5)		
	WB	L	260	m#548	F (224.5)	D (53.3)	
		T	1,605	m294	C (25.5)		
	NB	L	590	#546	F (100.7)	F (112.3)	
		R	400	#650	F (138.0)		
Natura Blvd	EB	L	155	m136	B (14.2)	B (15.6)	D (38.1)
		T	200	m361	B (15.8)		
	WB	L	80	49	A (10.0)	B (16.7)	
		T	1,395	396	B (17.3)		
		R	70	14	B (12.3)		
	NB	L	195	#355	F (169.9)	F (112.7)	
		T	125	99	E (65.0)		
		R	105	58	E (63.0)		
	SB	L	215	#306	F (106.5)	F (89.7)	
		T	145	229	E (77.2)		
		R	275	237	F (83.1)		

*Stop controlled intersections

- 95th percentile volume exceeds capacity, queue may be longer.

Table 4-3: Existing PM Peak Hour Intersection Performance

Intersection	Approach	Movement	Volume (vph)	Max. Queue (ft)	Delay and Level of Service (sec/veh)		
					Movement	Approach	Intersection
Waterways Blvd	EB	T	1,475	241	B (12.0)	B (11.9)	B (11.6)
		R	60	17	A (8.2)		
	WB	L	325	#341	E (56.2)	B (11.4)	
		T	2,880	617	A (6.3)		
	NB	L	45	60	D (47.9)	B (11.9)	
		R	160	10	A (1.8)		
Independence Dr	EB	T	1,605	343	A (8.9)	A (8.8)	B (10.5)
		R	30	m6	A (3.6)		
	WB	L	65	m9	A (3.5)	B (10.7)	
		T	3,195	m499	B (10.9)		
	NB	L	10	21	D (40.5)	D (40.3)	
		R	60	38	D (40.3)		
Powerline Rd	EB	L	345	#352	F (115.4)	E (56.5)	F (109.9)
		T	1,145	368	D (36.3)		
		R	175	108	E (73.3)		
	WB	L	255	m207	E (76.9)	F (114.8)	
		T	2,105	#1272	F (125.7)		
		R	200	m200	D (48.5)		
	NB	L	480	#497	F (155.7)	F (88.6)	
		T	1,110	#597	E (68.9)		
		R	290	214	D (52.9)		
	SB	L	225	205	F (90.1)	F (171.6)	
		T	980	501	E (74.7)		
		R	675	#1297	F (339.4)		
SW 30th Ave*	EB	T	1,705	-	-	-	F (372.4)
		R	20	-	-		
	WB	L	30	-	-	-	
		T	2,495	-	-		
	NB	L	20	-	-	-	
		R	145	-	-		
SW 28th Ave	EB	T	1,755	218	A (6.9)	A (6.6)	A (8.0)
		R	95	1	A (0.7)		
	WB	L	55	m13	A (4.6)	A (6.3)	
		T	2,480	m1126	A (6.3)		
	NB	L	45	102	F (92.1)	F (87.4)	
		R	40	45	F (82.2)		
SW 24th Ave*	EB	T	1,690	-	-	-	F (114.2)
		R	105	-	-		
	WB	L	20	-	-	-	
		T	2,485	-	-		
	NB	L	50	-	-	-	
		R	35	-	-		

*Stop controlled intersections

- 95th percentile volume exceeds capacity, queue may be longer.

Table 4-3 (Continued): Existing PM Peak Hour Intersection Performance

Intersection	Approach	Movement	Volume (vph)	Max. Queue (ft)	Delay and Level of Service (sec/veh)		
					Movement	Approach	Intersection
Military Trail	EB	L	305	#338	F (194.0)	E (61.7)	F (96.2)
		T	1,430	578	D (39.2)		
		R	155	3	A (8.7)		
	WB	L	350	m281	E (75.0)	F (142.7)	
		T	2,020	#1770	F (173.4)		
		R	425	m386	D (52.7)		
	NB	L	135	#144	F (101.5)	E (70.3)	
		T	580	434	E (68.3)		
		R	300	230	E (60.1)		
	SB	L	220	182	F (81.2)	E (69.2)	
		T	785	556	E (67.2)		
		R	435	483	E (66.8)		
Newport Center Dr	EB	L	65	m86	E (62.5)	B (16.6)	D (38.3)
		T	1,825	159	B (15.1)		
	WB	L	90	175	F (95.4)	C (21.7)	
		T	2,145	557	B (19.1)		
		R	70	5	A (4.5)		
	NB	L	310	#323	F (100.4)	F (115.1)	
		T	10	#332	F (102.1)		
		R	375	#409	F (127.0)		
	SB	L	85	94	E (64.9)	F (101.9)	
		T	5	94	E (64.9)		
		R	340	#458	F (111.7)		
I-95 SB On-Ramp	EB	T	1,660	283	D (36.5)	C (26.7)	B (16.3)
		R	625	m52	A (0.6)		
	WB	L	545	m422	D (40.6)	A (8.0)	
		T	2,305	m0	A (0.2)		
I-95 SB Off-Ramp	EB	T	1,660	45	A (6.0)	A (6.0)	D (46.1)
	WB	T	2,025	m88	A (7.8)	A (7.8)	
	SB	L	135	#958	F (183.6)	F (196.3)	
		R	825	#1001	F (209.5)		
I-95 NB Ramps	EB	T	1,000	m508	D (43.2)	C (24.6)	F (95.7)
		R	795	m512	A (1.1)		
	WB	L	295	472	E (70.6)	D (37.3)	
		T	1,395	479	C (30.2)		
	NB	L	630	#858	F (265.1)	F (281.2)	
		R	590	#980	F (316.4)		
Natura Blvd	EB	L	210	117	B (13.3)	B (17.8)	D (49.0)
		T	1,200	381	B (18.5)		
	WB	L	170	112	B (17.8)	B (18.5)	
		T	1,125	297	B (18.9)		
		R	105	30	B (14.9)		
	NB	L	235	#456	F (325.6)	F (206.7)	
		T	105	85	E (60.2)		
		R	85	48	E (58.8)		
	SB	L	220	#307	E (75.9)	F (82.1)	
		T	220	#343	F (88.2)		
		R	330	#326	F (82.2)		

*Stop controlled intersections

- 95th percentile volume exceeds capacity, queue may be longer.

4.5 Corridor Crash Analysis

FDOT's Crash Analysis Reporting System (CARS) was used to gather historical crash records for the SW 10th Street corridor (SR 869) from Florida's Turnpike / Sawgrass Expressway to I-95. Crashes were gathered for Roadway ID 86472000 from MP 20.647 to MP 21.835, and Roadway ID 86012000 from MP 0.000 to MP 2.152. CARS is a database maintained annually by the FDOT for crashes reported along state highway facilities. The database provides information on various characteristics associated with each crash including: collision type, severity, weather conditions, road surface conditions and date/time information. The CARS database was researched to identify and extract crashes reported along the study corridor during the period from January 1, 2012 through December 31, 2016. The crashes were analyzed to make an assessment of safety conditions along the study corridor. The data and findings from the safety analysis are summarized below.

SW 10th Street Corridor

A shown in Table 4-4, crash data for the SW 10th Street corridor from Florida's Turnpike / Sawgrass Expressway to I-95 revealed that a total of 896 reported crashes occurred from January 2012 through December 2016. During the study period, one (1) fatal crash occurred in 2015. A majority of the crashes experienced along the study corridor were rear end collisions accounting for 490 crashes (or 55%), followed by angle collisions accounting for 102 crashes (or 11%), and 97 sideswipe crashes (or 11%). Approximately 69% of the crashes occurred during daylight conditions, and 26% of the crashes occurred during dark conditions. The remaining 5% of the crashes occurred during dusk or dawn. Approximately 82% of the crashes occurred under dry roadway surface conditions, and 18% occurred under wet roadway surface conditions.

The total number of crashes has increased over the last five years, with an average of 179 crashes per year in the study corridor. Histograms show the majority of crashes each year were rear end collisions, and the majority of crashes consistently happened during daylight, in clear weather, and dry conditions. In addition, the histograms presented in Figure 4-4 show that in recent years, crashes occurred more frequently during weekdays.

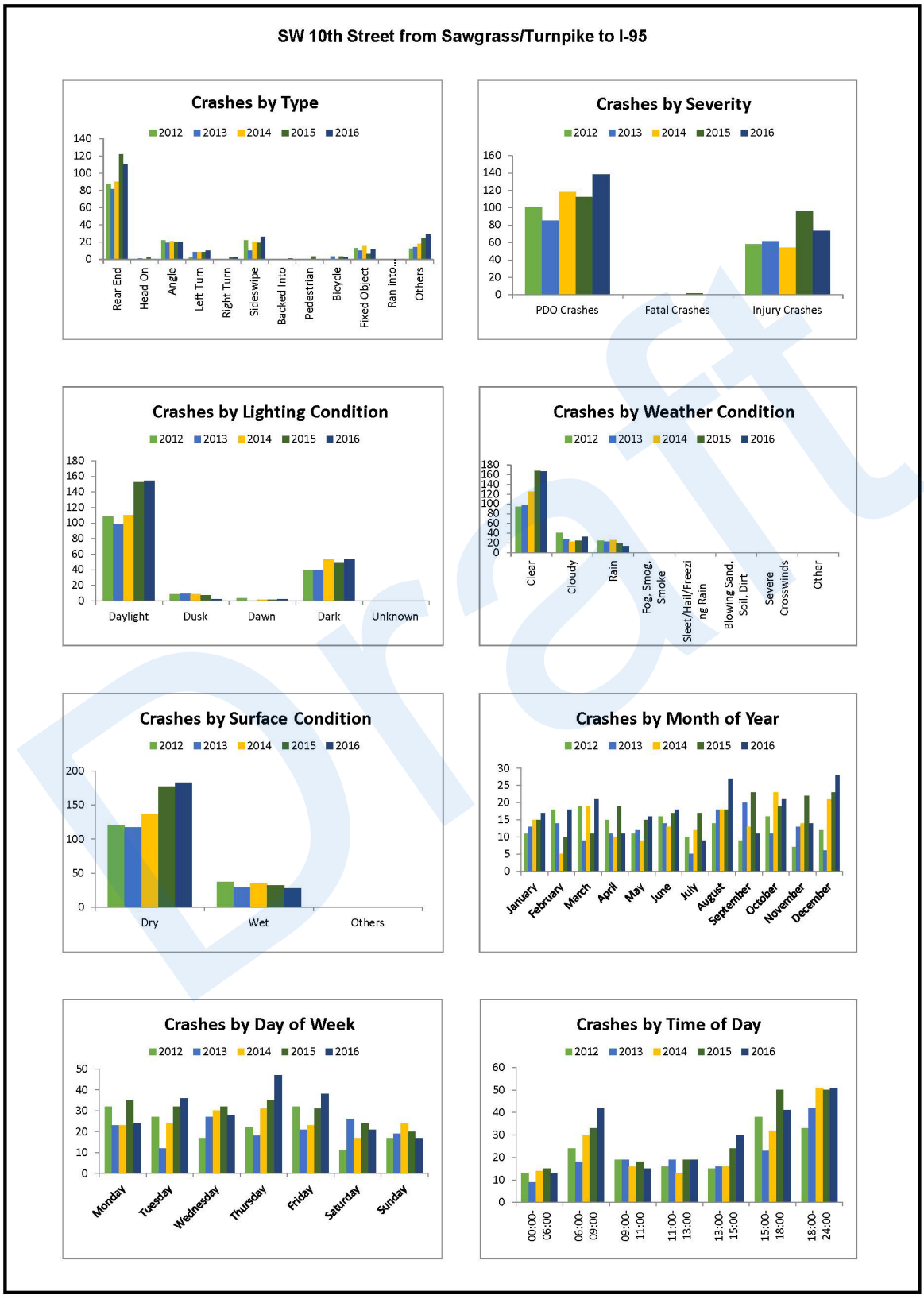
Table 4-4: SW 10th Street Corridor Crash Summary

SW 10th Street from Sawgrass/Turnpike to I-95		Number of Crashes Year					5 Year Total Crashes	Mean Crashes Per Year	%
		2012	2013	2014	2015	2016			
CRASH TYPE	Rear End	87	81	90	122	110	490	98	54.7%
	Head On	0	1	0	2	0	3	1	0.3%
	Angle	22	19	21	20	20	102	20	11.4%
	Left Turn	2	8	8	8	10	36	7	4.0%
	Right Turn	0	0	0	2	2	4	1	0.4%
	Sideswipe	22	10	20	19	26	97	19	10.8%
	Backed Into	0	0	0	0	1	1	0	0.1%
	Pedestrian	0	0	0	3	0	3	1	0.3%
	Bicycle	0	3	0	3	2	8	2	0.9%
	Fixed Object	*13*	*10*	*15*	*6*	*11*	*55*	*11*	*6.1%*
	Impact Attenuator/Crash Cushion	0	0	0	0	1	1	0	0.1%
	Bridge Overhead Structure	0	0	0	0	0	0	0	0.0%
	Bridge Pier or Support	0	0	0	0	0	0	0	0.0%
	Bridge Rail	0	0	0	0	0	0	0	0.0%
	Culvert	1	0	0	0	0	1	0	0.1%
	Curb	2	2	2	0	1	7	1	0.8%
	Ditch	0	0	0	0	0	0	0	0.0%
	Embankment	0	0	0	0	0	0	0	0.0%
	Guardrail Face	2	2	0	2	0	6	1	0.7%
	Guardrail End	0	0	0	0	2	2	0	0.2%
	Cable Barrier	0	0	0	0	0	0	0	0.0%
	Concrete Traffic Barrier	1	1	4	0	1	7	1	0.8%
	Other Traffic Barrier	0	0	0	0	0	0	0	0.0%
	Tree (Standing)	2	0	3	1	1	7	1	0.8%
	Utility Pole/Light Support	4	1	3	3	3	14	3	1.6%
	Traffic Sign Support	0	3	2	0	1	6	1	0.7%
	Traffic Signal Support	0	0	0	0	0	0	0	0.0%
	Other Post, Pole Or Support	0	1	1	0	0	2	0	0.2%
	Fence	0	0	0	0	1	1	0	0.1%
	Mailbox	0	0	0	0	0	0	0	0.0%
	Other Fixed Object	1	0	0	0	0	1	0	0.1%
	Other Non Fixed Object Collisions	*0*	*2*	*0*	*0*	*3*	*5*	*1*	*0.6%*
	Railway Vehicle (Train, Engine)	0	0	0	0	0	0	0	0.0%
	Animal	0	0	0	0	0	0	0	0.0%
	Motor Vehicle in Transport	0	0	0	0	0	0	0	0.0%
	Parked Motor Vehicle	0	2	0	0	3	5	1	0.6%
	Work Zone/Maintenance Equip.	0	0	0	0	0	0	0	0.0%
	Struck by Falling/Shifting Cargo	0	0	0	0	0	0	0	0.0%
	Other Non-Fixed Object	0	0	0	0	0	0	0	0.0%
	Non-Collisions	*1*	*1*	*5*	*3*	*7*	*17*	*3*	*1.9%*
	Overturn/Rollover	1	1	3	2	1	8	2	0.9%
	Fire/Explosion	0	0	0	0	0	0	0	0.0%
	Immersion	0	0	0	0	0	0	0	0.0%
	Jackknife	0	0	1	0	2	3	1	0.3%
	Cargo/Equipment Loss or Shift	0	0	0	0	0	0	0	0.0%
	Fell/Jumped from Motor Vehicle	0	0	0	1	0	1	0	0.1%
	Thrown or Falling Object	0	0	0	0	0	0	0	0.0%
	Ran into Water/Canal	0	0	0	0	0	0	0	0.0%
	Other Non-Collision	0	0	1	0	4	5	1	0.6%
	Others	11	11	13	21	19	75	15	8.4%
	Total Crashes	**158**	**146**	**172**	**209**	**211**	**896**	**179**	**100.0%**
SEVERITY	PDO Crashes	100	85	118	112	138	553	111	61.7%
	Fatal Crashes	0	0	0	1	0	1	0	0.1%
	Injury Crashes	58	61	54	96	73	342	68	38.2%
LIGHTING CONDITIONS	Daylight	108	98	110	152	154	622	124	69.4%
	Dusk	8	9	8	7	2	34	7	3.8%
	Dawn	3	0	1	1	2	7	1	0.8%
	Dark	39	39	53	49	53	233	47	26.0%
	Unknown	0	0	0	0	0	0	0	0.0%

Table 4-4: SW 10th Street Corridor Crash Summary (continued)

SW 10th Street from Sawgrass/Turnpike to I-95		Number of Crashes					5 Year Total Crashes	Mean Crashes Per Year	%
		Year							
		2012	2013	2014	2015	2016			
SURFACE CONDITIONS	Dry	121	117	137	177	183	735	147	82.0%
	Wet	37	29	35	32	28	161	32	18.0%
	Others	0	0	0	0	0	0	0	0.0%
MONTH OF YEAR	January	11	13	15	15	17	71	14	7.9%
	February	18	14	5	10	18	65	13	7.3%
	March	19	9	19	11	21	79	16	8.8%
	April	15	11	10	19	11	66	13	7.4%
	May	11	12	9	15	16	63	13	7.0%
	June	16	14	13	17	18	78	16	8.7%
	July	10	5	12	17	9	53	11	5.9%
	August	14	18	18	18	27	95	19	10.6%
	September	9	20	13	23	11	76	15	8.5%
	October	16	11	23	19	21	90	18	10.0%
	November	7	13	14	22	14	70	14	7.8%
	December	12	6	21	23	28	90	18	10.0%
DAY OF WEEK	Monday	32	23	23	35	24	137	27	15.3%
	Tuesday	27	12	24	32	36	131	26	14.6%
	Wednesday	17	27	30	32	28	134	27	15.0%
	Thursday	22	18	31	35	47	153	31	17.1%
	Friday	32	21	23	31	38	145	29	16.2%
	Saturday	11	26	17	24	21	99	20	11.0%
	Sunday	17	19	24	20	17	97	19	10.8%
HOUR OF DAY	00:00-06:00	13	9	14	15	13	64	13	7.1%
	06:00-09:00	24	18	30	33	42	147	29	16.4%
	09:00-11:00	19	19	16	18	15	87	17	9.7%
	11:00-13:00	16	19	13	19	19	86	17	9.6%
	13:00-15:00	15	16	16	24	30	101	20	11.3%
	15:00-18:00	38	23	32	50	41	184	37	20.5%
	18:00-24:00	33	42	51	50	51	227	45	25.3%
CONTRIBUTING CAUSES (VEHICLE ONLY)	No Contributing Action	6	13	3	7	6	35	7	3.9%
	Careless or Negligent Manner	19	19	37	39	51	165	33	18.4%
	Failed to Yield Right-Of-Way	15	7	7	14	12	55	11	6.1%
	Improper Backing	2	2	5	1	1	11	2	1.2%
	Improper Turn	2	1	4	5	5	17	3	1.9%
	Followed too Closely	39	27	25	43	31	165	33	18.4%
	Ran Red Light	1	8	4	10	5	28	6	3.1%
	Drove too Fast for Conditions	8	11	5	11	3	38	8	4.2%
	Ran Stop Sign	0	0	1	0	0	1	0	0.1%
	Improper Passing	3	1	3	0	2	9	2	1.0%
	Exceed Posted Speed	2	0	2	0	1	5	1	0.6%
	Wrong Side or Wrong Way	0	0	0	0	0	0	0	0.0%
	Failed To Keep In Proper Lane	6	2	6	5	9	28	6	3.1%
	Ran Off Roadway	1	0	1	0	1	3	1	0.3%
	Disregarded Other Traffic Sign	1	0	0	1	0	2	0	0.2%
	Disregarded other Road Markings	0	0	0	0	1	1	0	0.1%
	Over-Correcting/Over-Steering	0	0	3	0	0	3	1	0.3%
	Swerved Or Avoided	2	2	0	2	2	8	2	0.9%
	Erratic, Reckless or Aggressive	1	3	0	0	2	6	1	0.7%
	Other Contributing Action	50	50	66	71	79	316	63	35.3%
WEATHER CONDITIONS	Clear	94	97	125	167	166	649	130	72.4%
	Cloudy	40	27	22	24	32	145	29	16.2%
	Rain	24	22	25	18	13	102	20	11.4%
	Fog, Smog, Smoke	0	0	0	0	0	0	0	0.0%
	Sleet/Hail/Freezing Rain	0	0	0	0	0	0	0	0.0%
	Blowing Sand, Soil, Dirt	0	0	0	0	0	0	0	0.0%
	Severe Crosswinds	0	0	0	0	0	0	0	0.0%
	Other	0	0	0	0	0	0	0	0.0%

Figure 4-5: SW 10th Street Corridor Crash Histograms



High Crash Locations

FDOT's District Four high crash list (available from CARS) was reviewed for years 2012 through 2016 to identify High Crash Locations (HCL) within the study corridor. A high crash list is determined each year by FDOT using the CARS database, and it is differentiated by State, District, or County. HCLs are determined based on data from similar roadways in similar locations within the District. For an urban area location (such as SW 10th Street) to be on the high crash list, the data must have a confidence level of 99.95%. This means there is a 99.95% confidence level that the crash rate of the location is abnormally high when compared with similar locations within District Four in that year.

The locations on the HCL are noted in Table 4-5 along with the years in which the locations were listed.

Table 4-5: SW 10th Street Corridor High Crash Locations

	Description	Roadway Section ID	Begin MP	End MP	Years on High Crash List
Segments					
1	SW 10th St - Powerline Rd to Quiet Waters Business Park driveway east of Powerline Rd	86012000	0.000	0.300	2012, 2013, 2014
2	SW 10th St - east of Palm Trails Plaza driveway west of Military Tr, to east of Military Tr	86012000	1.315	1.449	2012, 2013, 2014, 2015, 2016
3	SW 10th St - west of Newport Center Dr to east of Newport Center Dr	86012000	1.749	1.849	2015, 2016
Intersections					
1	SW 10th St and SW 28th Ave	86012000	0.699		2013
2	SW 10th St and Military Tr	86012000	1.427		2012, 2013, 2014, 2015, 2016
3	SW 10th St and I-95 SB On-Ramp	86012000	1.955		2013
4	SW 10th St and I-95 SB Off-Ramp	86012000	2.010		2012, 2013, 2015, 2016
5	SW 10th St and I-95 NB On & Off-Ramp	86012000	2.118	2.149	2012, 2013, 2014, 2015

Note: Locations identified from the FDOT District 4 High Crash Lists available in CARS for years 2012, 2013, 2014, 2015, 2016.

Three segments and five intersections along the SW 10th Street corridor were identified as HCLs during at least one year between 2012 and 2016. A crash analysis was performed for each of the high crash locations listed in Table 4-5 to identify predominant crash patterns. In addition, a crash analysis was completed for the SW 10th Street and Powerline Road intersection. Although this intersection was not identified as a high crash location, a large number of crashes occurred at this location in all five years. Crash analysis summary tables for each high crash location and the Powerline Road intersection are provided in Appendix C.

SW 10th Street from Powerline Road to Quiet Waters Business Park Driveway

Crash data for the 1,580 foot long segment revealed that a total of 70 reported crashes occurred from January 2012 through December 2016. During the study period, no fatal crashes were reported within the segment. A majority of the crashes experienced along the study corridor were rear end collisions accounting for 41 crashes (or 59%), followed by angle collisions accounting for nine (9) crashes (or 13%), and sideswipe collisions accounting for nine (9) crashes (or 13%). The most common contributing causes noted for all crashes were "other contributing action," "careless or negligent manner," and "followed too closely." Approximately 60% of the crashes occurred during daylight conditions, and 34% of the crashes occurred during dark conditions. The remaining 6% of the crashes occurred during dusk. Approximately 76% of the crashes occurred under dry roadway surface conditions, while 24% occurred under wet roadway surface conditions.

SW 10th Street from west of Military Trail to east of Military Trail

This segment which is just over 700 feet long has a total of 140 reported crashes that occurred from January 2012 through December 2016. No fatal crashes were reported during the study period. Rear end collisions accounted for 85 crashes (or 61%), followed by angle collisions accounting for 18 crashes (or 13%), and sideswipe collisions accounting for 16 crashes (or 11%). The most common contributing cause noted for all crashes was "followed too closely." Approximately 73% of the crashes occurred during daylight conditions, and 22% of the crashes occurred during dark conditions. The remaining 5% of the crashes occurred during dusk or dawn. Approximately 85% of the crashes occurred under dry roadway surface conditions, while 15% occurred under wet roadway surface conditions.

SW 10th Street from west of Newport Center Drive to east of Newport Center Drive

From January 2012 through December 2016, a total of 76 reported crashes occurred along this 530 foot long segment. No fatal crashes were reported during the study period. Rear end collisions accounted for 46 crashes (or 60%), followed by angle collisions accounting for 9 crashes (or 12%). The most common contributing causes noted for all crashes were "other contributing action," "followed too closely," and "careless or negligent manner." Approximately 71% of the crashes occurred during daylight conditions, and 21% of the crashes occurred during dark conditions. The remaining 8% of the crashes occurred during dusk or dawn. Approximately 90% of the crashes occurred under dry roadway surface conditions, and 10% occurred under wet roadway surface conditions.

SW 10th Street at SW 28th Avenue Intersection

Crash data for the SW 10th Street at SW 28th Avenue intersection revealed that a total of 23 reported crashes occurred from January 2012 through December 2016. During the study period no fatal crashes were reported at the location. A majority of the crashes along the study corridor were rear end collisions accounting for 15 crashes (or 65%), followed by angle collisions accounting for five (5) crashes (or 22%). The most common contributing causes noted for all crashes were "followed too closely," and "other contributing action." Approximately 83% of the crashes occurred during daylight conditions, and 13% of the crashes occurred during dark conditions. The remaining 4% of the crashes occurred during dusk. Approximately 96% of the crashes occurred under dry roadway surface conditions, while only 4% occurred under wet roadway surface conditions.

SW 10th Street at Military Trail Intersection

A total of 144 reported crashes occurred at the SW 10th Street at Military Trail intersection between January 2012 and December 2016. No fatal crashes were reported at the location during the study period. Rear end collisions were the most frequent type of crash along the study corridor accounting for 90 crashes (or 62%), followed by 18 angle collisions (or 12%), and 16 sideswipe collisions (or 11%). The most common contributing causes noted for all crashes were "other contributing action." and "followed too closely." Approximately 73% of the crashes occurred during daylight conditions, and 22% of the crashes occurred during dark conditions. The remaining crashes occurred during dusk and dawn. Approximately 85% of

the crashes occurred under dry roadway surface conditions, and 15% occurred under wet roadway surface conditions.

I-95 Southbound On-Ramp Terminal Intersection at SW 10th Street

Analysis of the crash data for the I-95 southbound on-ramp terminal intersection shows a total of 50 reported crashes occurred from January 2012 through December 2016. No fatal crashes were reported during the study period at the location. A majority of the crashes at the intersection were rear-end collisions accounting for 30 crashes (or 60%), followed by seven (7) side swipe collisions (or 14%), and five (5) other type crashes (or 10%). The most common contributing causes noted for all crashes were "other contributing action," "careless or negligent manner," and "followed too closely." Approximately 70% of the crashes occurred during daylight conditions, and 24% of the crashes occurred during dark conditions. The remaining 6% of the crashes occurred during dusk or dawn. Approximately 90% of the crashes occurred under dry roadway surface conditions, while 10% under wet roadway surface conditions.

I-95 Southbound Off-Ramp Terminal Intersection at SW 10th Street

A total of 87 reported crashes occurred from January 2012 through December at the I-95 southbound off-ramp terminal intersection with SW 10th Street. During the study period, no fatal crashes were reported at the location. A majority of the crashes at the intersection were rear-end collisions accounting for 35 crashes (or 40%), followed by 21 side swipe collisions (or 24%), and 11 angle crashes (or 13%). The most common contributing causes noted for all crashes were "other contributing action," "careless or negligent manner," "followed too closely," and "ran red light." Approximately 69% of the crashes occurred during daylight conditions, and 29% of the crashes occurred during dark conditions. The remaining 2% of crashes occurred during dusk or dawn. Approximately 91% of the crashes occurred under dry roadway surface conditions, while only 9% occurred under wet roadway surface conditions.

I-95 Northbound On & Off-Ramp Terminal Intersection at SW 10th Street

Crash data for the I-95 northbound on- and off-ramp terminal intersection with SW 10th Street revealed that a total of 97 reported crashes occurred during the five-year study period. From January 2012 through December 2016 no fatal crashes were reported at the location.

A majority of the crashes along the study corridor were rear end collisions accounting for 48 crashes (or 50%), followed by fixed object accounting for 18 crashes (or 19%). The most common contributing causes noted for all crashes were "other contributing action," "careless or negligent manner," and "followed too closely." Approximately 64% of the crashes occurred during daylight conditions, and 32% of the crashes occurred during dark conditions. The remaining 4% of the crashes occurred during dusk. Approximately 71% of the crashes occurred under dry roadway surface conditions, and 29% occurred under wet roadway surface conditions.

SW 10th Street at Powerline Road Intersection

At the SW 10th Street and Powerline Road intersection, a total of 208 reported crashes occurred from January 2012 through December 2016. No fatal crashes were reported at the location during the study period. The majority of crashes at the intersection were rear-end collisions accounting for 132 crashes (or 64%), followed by 20 angle collisions (or 10%), and 18 other type crashes (or 9%). The most common contributing causes noted for all crashes were "other contributing action" and "followed too closely." Approximately 66% of the crashes occurred during daylight conditions, and 30% of the crashes occurred during dark conditions. The remaining 4% of the crashes occurred during dusk. Approximately 76% of the crashes occurred under dry roadway surface conditions, and 24% occurred under wet roadway surface conditions.

An assessment of probable crash causes, and safety impacts of the Build Alternative with respect to the No Action Alternative are discussed later in Section 6.5.

5.0 No Action Alternative

5.1 Future Land Use

Broward County is mostly built-out in the study area with little undeveloped land in the project corridor. Therefore, significant changes in land use are not anticipated. The Broward County Future Land Use Maps are consistent with the existing land use in the study corridor. The corridor will be mostly residential (multi-family and single family) and commercial. In addition, the Broward County Future Land Use map shows Quiet Waters Park will remain Recreation / Open Space. Figure 5-1 shows the Broward County Future Land Use.

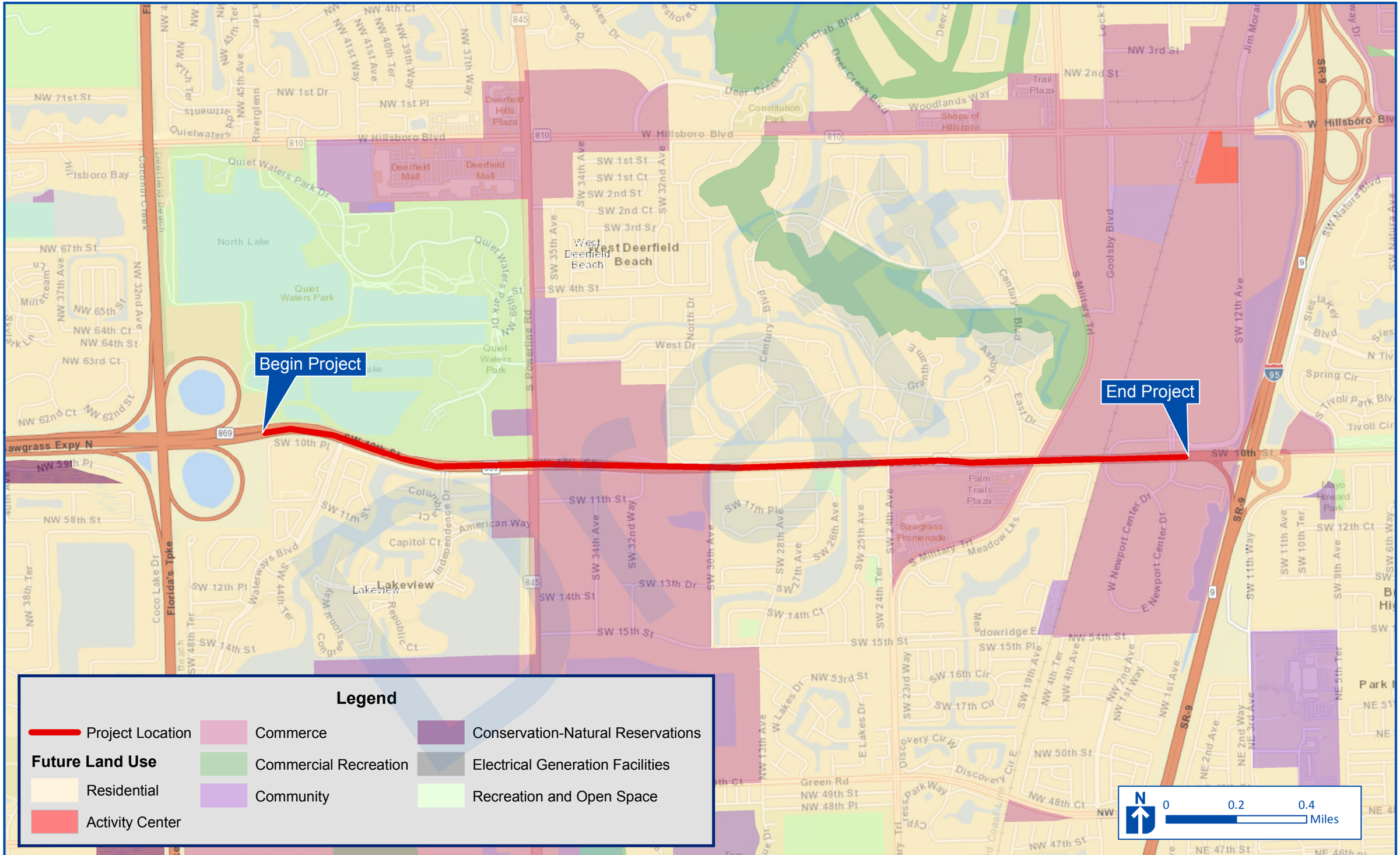
5.2 No Action Alternative Transportation Network

The No Action Alternative has the same lane geometry as existing conditions along the SW 10th Street corridor from Waterways Boulevard to west of Military Trail. For future year 2040 conditions, changes to the surrounding roadway network are assumed, along with population and employment growth. These changes will contribute to significant growth in traffic volumes along SW 10th Street and in the study area by 2040.

The following planned and programmed roadway improvements in the area are expected to be constructed by 2040, and are assumed to be in place with the No Action Alternative:

- Sawgrass Expressway widening for express lanes;
- Florida's Turnpike widening for express lanes;
- I-95 widening for express lanes;
- Sawgrass Expressway / Turnpike interchange improvements which include:
    - new ramps connecting SW 10th Street to and from the Turnpike general purpose lanes north of SW 10th Street;
    - new ramps connecting SW 10th Street to and from the Turnpike managed lanes south of SW 10th Street;
- I-95 at SW 10th Street interchange improvements with new ramps connecting I-95 northbound and southbound express lanes to SW 10th Street west of I-95.

The No Action Alternative lane geometry is shown in Figure 5-2.



State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95
Financial Project ID: 439891-1-22-02, ETDM No: 14291

Figure 5-1
Future Land Use

Legend

- Connector Lanes
- General Use Lane/Arterial
- Intersection Lane Configuration
- 1 > Connector Lane Configuration
- 1 > General Use Lane/Arterial Lane Configuration
- Signalized Intersection
- Unsignalized Intersection

N

N.T.S.

West Dr

Quietwaters N Driveway

Quietwaters S Driveway

Driveway F

Industrial Park Access

Matchline A

To WB Sawgrass

SW 10th St

< 3 < 3 < 3 < 3 < 2 < 2

From EB Sawgrass

4 > 4 > 3 > 3 > 2 > 2 > 2 >

SW 10th St

Page 2

Waterways Blvd

Independence Dr

SW 11th Ct

SW 30th Ave

American Way

Powerline Rd

FDOT

SW 10th Street Connector

State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95
Financial Project ID: 439891-1-22-02, ETDM No: 14291

Figure 5-2
No Action Alternative
Lane Geometry

Legend

- Connector Lanes
- General Use Lane/Arterial
- Intersection Lane Configuration
- 1 > Connector Lane Configuration
- 1 > General Use Lane/Arterial Lane Configuration
- Signalized Intersection
- Unsignalized Intersection

N

N.T.S.

Military Trail

East Drive

Matchline A

Matchline B

< 2 < 2 < 2 < 3 < 1 < 1

SW 10th St

1 >

< 2 < 3

SW 10th St

2 > 2 > 2 > 2 > 2 > 2 > 3 >

Page 1

Page 3

SW 28th Ave

SW 24th Ave

W. Driveway

E. Driveway

Palm Trails Plaza

The Lakes at Deerfield Apts Driveway

Horizon Club Driveway

FDOT / SW 10th Street Connector	**State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95** **Financial Project ID: 439891-1-22-02, ETDM No: 14291**	**Figure 5-2** **No Action Alternative** **Lane Geometry**

Legend

- Connector Lanes
- General Use Lane/Arterial
- Intersection Lane Configuration
- 1 > Connector Lane Configuration
- 1 > General Use Lane/Arterial Lane Configuration
- Signalized Intersection
- Unsignalized Intersection

N

N.T.S.

SW 12th Ave

Newport Center Dr

From Hillsboro Blvd

To Hillsboro Blvd

SW Natura Blvd

Matchline B

SW 10th St

SW 10th St

Page 2

Newport Center Dr

FAU Research Park Blvd

I-95

I-95

FDOT / SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 5-2 No Action Alternative Lane Geometry	Page 3 of 3

Future year 2040 transit service provided by the City and County along and near the SW 10th Street corridor is expected to be similar to existing conditions. A community bus route travels a portion of the SW 10th Street corridor and Broward County bus routes run on adjacent roadways such as Powerline Road. Planned future transit improvements identified in the Broward MPO's 2040 LRTP are shown on Military Trail and Sample Road, but future transit improvements are not identified on SW 10th Street.

Bicycle and pedestrian facilities along the SW 10th Street corridor would remain unchanged under the No Action Alternative.

5.3 No Action Alternative 2040 Peak Hour Volumes

A summary of the forecasting process used to develop 2040 volumes is provided in Section 3.4 Travel Demand Forecasting. The development of the travel demand forecast for the No Build Alternative is documented in detail in the *SW 10th Street PD&E Project Traffic Forecast Memorandum, January 2019*, prepared by FTE. This Technical Memorandum is attached in Appendix A as a companion reference document.

As described in the PTFM, future volumes developed for the No Action Alternative (referred to as "Partial Build" in the PTFM) assume adjacent improvements on Sawgrass Expressway, Turnpike, and I-95 are constructed. The development of design hour traffic followed procedures outlined in the FDOT Project Traffic Forecasting Handbook. Intersection volumes were developed using TMTool, and peak hour traffic forecasts were balanced along the corridor.

Figure 5-3 depicts the 2040 AM and PM peak hour traffic volumes forecasted for the No Action Alternative.

Legend

- Connector Lanes
- General Use Lane/Arterial
- X,XXX (X,XXX) AM (PM) Peak Hour Volume
- Signalized Intersection
- Unsignalized Intersection

N

N.T.S.

West Dr

Quietwaters N Driveway

Quietwaters S Driveway

Driveway F

570 (1,610)
975 (745)
235 (480)
545 (485)
1,780 (3,075)
355 (420)
1,345 (600)
3,455 (1,990)
995 (425)
470 (1,095)
940 (770)
385 (365)

1,765 (2,725)
40 (95)
15 (95)
10 (105)
65 (5)
5 (5)
85 (20)
2,715 (1,875)
55 (115)

1,860 (2,850)
40 (135)
2,730 (1,855)
100 (5)

35 (60)
10 (95)
50 (10)
2,645 (3,920)
85 (40)
3,990 (2,795)

Industrial Park Access

Matchline A

To WB Sawgrass

SW 10th St

From EB Sawgrass

SW 10th St

Page 2

Waterways Blvd

Independence Dr

SW 11th Ct

American Way

Powerline Rd

SW 30th Ave

2,800 (5,495)
60 (255)
5,540 (2,880)
30 (130)
210 (75)
235 (130)

2,800 (5,730)
20 (50)
5,765 (2,965)
10 (45)
60 (20)
30 (50)

2,655 (3,830)
75 (30)
3,925 (2,860)
75 (30)
40 (100)
50 (110)

FDOT

SW 10th Street Connector

State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95
Financial Project ID: 439891-1-22-02, ETDM No: 14291

Figure 5-3
No Action Alternative
2040 Peak Hour Volumes

Legend

- Connector Lanes
- General Use Lane/Arterial
- X,XXX (X,XXX) AM (PM) Peak Hour Volume
- Signalized Intersection
- Unsignalized Intersection

N

N.T.S.

Military Trail

East Drive

300 (640)
560 (765)
480 (440)
575 (540)
1,565 (2,175)
340 (485)
375 (350)
2,200 (1,800)
190 (190)
200 (255)
675 (515)
655 (400)

Matchline A

Matchline B

560 (880)

560 (880)

SW 10th St

1,160 (640)

1,160 (640)

SW 10th St

2,695 (2,150)
70 (150)

70 (190)

Page 1

SW 28th Ave

SW 24th Ave

W. Driveway

E. Driveway

Palm Trails Plaza

Page 3

The Lakes at Deerfield Apts Driveway

Horizon Club Driveway

2,535 (3,775)
25 (115)
90 (90)
3,900 (2,815)
75 (155)
195 (85)
105 (70)

2,600 (3,930)
25 (20)
3,930 (2,870)
165 (105)
50 (50)
35 (35)

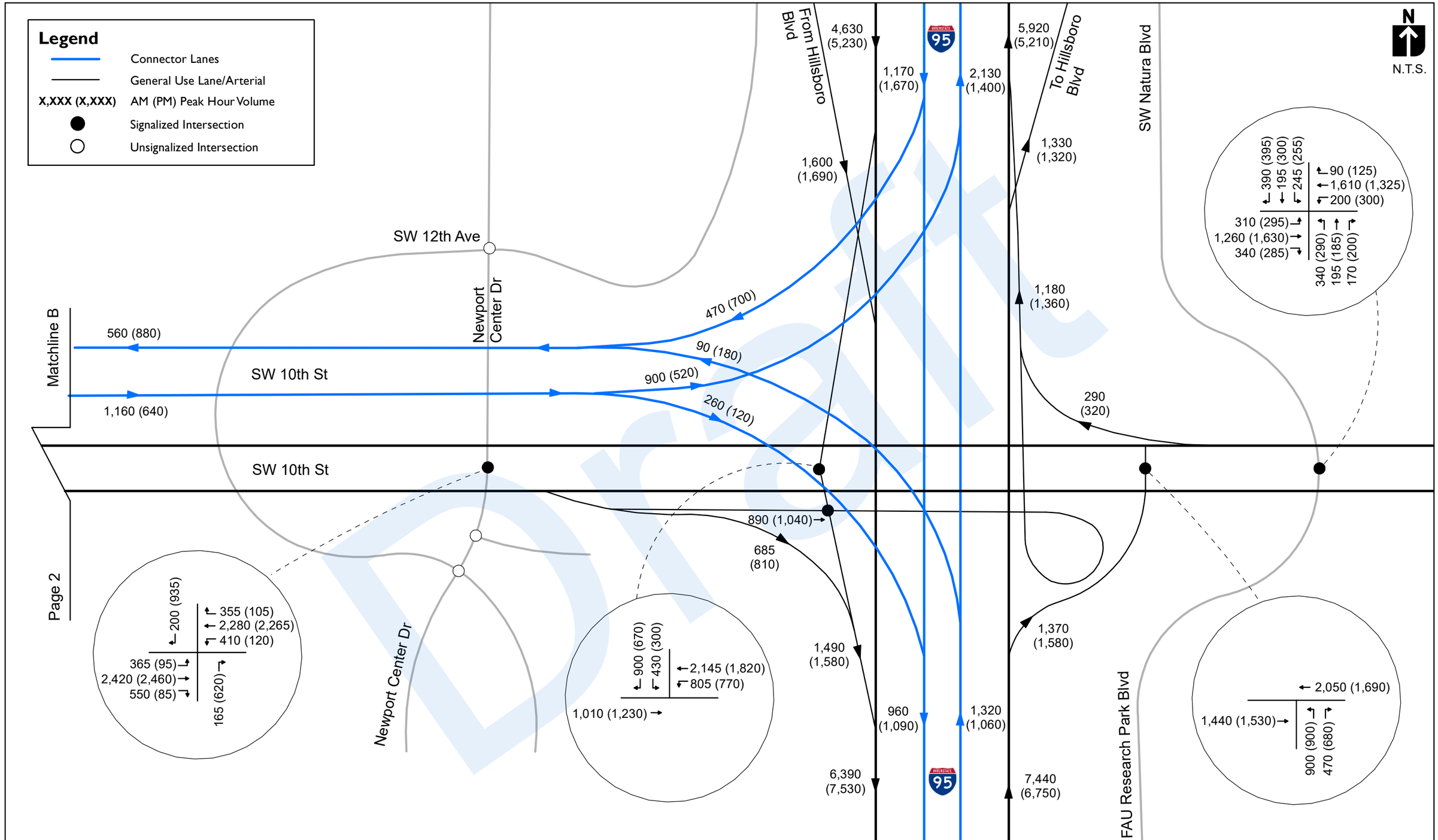
3,905 (2,855)
60 (50)
20 (85)

FDOT

SW 10th Street Connector

State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95
Financial Project ID: 439891-1-22-02, ETDM No: 14291

Figure 5-3
No Action Alternative
2040 Peak Hour Volumes



State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95
Financial Project ID: 439891-1-22-02, ETDM No: 14291

Figure 5-3
No Action Alternative
2040 Peak Hour Volumes

5.4 No Action Alternative Traffic Analysis

The No Action Alternative provides a baseline for comparison to the Build Alternative by assuming the proposed SW 10th Street Connector project is not constructed. Traffic analysis of the corridor was conducted for the No Action Alternative given 2040 design year conditions. The road network geometry and peak hour traffic volumes used in the analyses are consistent with the information presented in Figure 5-2 and Figure 5-3, respectively.

The volume-to-capacity (V/C) and LOS of the SW 10th Street segments was determined using FDOT's generalized LOS tables. VISSIM microsimulation analysis software was used to evaluate speeds, queueing, and congestion along the SW 10th Street local lanes. It was also used to evaluate intersection LOS, delay, and 95th percentile queues, for each of the study intersections along SW 10th Street local lanes between Waterways Boulevard and Natura Park Boulevard / FAU Research Park Boulevard.

5.4.1 No Action Alternative 2040 LOS and V/C Analysis

To assess the 2040 traffic conditions along the corridor, the directional peak hour volumes were compared to the roadway capacity. The corridor LOS based on the generalized table capacity thresholds is summarized in Table 5-1. The 2040 No Action peak hour directional V/C ratios for the SW 10th Street local lanes are also reported in Table 5-1.

Table 5-1: 2040 No Action Alternative – LOS and V/C Analysis

SW 10th Street Local Lane Segments		No. of	Volume		Capacity (1)	LOS(2)		V/C (3)	
	Location Description	Lanes	AM	PM		AM	PM	AM	PM
SW 10th Street Eastbound	West of Waterways Blvd	4	5,570	3,010	4,242	F	C	1.31	0.71
	Waterways Blvd to Independence Dr	4	5,775	3,010	4,242	F	C	1.36	0.71
	Independence Dr to Powerline Rd	3	5,795	3,015	3,171	F	C	1.83	0.95
	Powerline Rd to west of SW 30th Ave	3	4,075	2,835	3,171	F	C	1.29	0.89
	West of SW 30th Ave to SW 28th Ave	2	4,000	2,970	2,100	F	F	1.90	1.41
	SW 28th Ave to SW 24th Ave	2	4,095	2,975	2,100	F	F	1.95	1.42
	SW 24th Ave to eastbound Connector managed lane ingress	2	3,965	2,905	2,100	F	F	1.89	1.38
	Eastbound Connector managed lane ingress to Military Trail	2	2,765	2,340	2,100	F	F	1.32	1.11
	Military Trail to west of Newport Center Dr	2	3,335	2,640	2,100	F	F	1.59	1.26
	West of Newport Center Dr to Newport Center Dr	3	3,335	2,640	3,171	F	C	1.05	0.83
	Newport Center Dr to I-95 SB On-Ramp	4	2,585	3,080	4,242	C	C	0.61	0.73
	I-95 SB On-Ramp to I-95 NB Off-Ramp	3	1,440	1,530	3,171	C	C	0.45	0.48
	I-95 NB Off-Ramp to Natura Blvd	3	1,910	2,210	3,171	C	C	0.60	0.70
	East of Natura Blvd	3	1,675	2,085	3,171	C	C	0.53	0.66
SW 10th Street Westbound	West of Waterways Blvd	3	3,010	5,570	3,171	C	F	0.95	1.76
	Waterways Blvd to Independence Dr	3	2,860	5,750	3,171	C	F	0.90	1.81
	Independence Dr to Powerline Rd	3	2,820	5,780	3,171	C	F	0.89	1.82
	Powerline Rd to west of SW 30th Ave	3	2,680	3,980	3,171	C	F	0.85	1.26
	West of SW 30th Ave to SW 28th Ave	2	2,730	3,860	2,100	F	F	1.30	1.84
	SW 28th Ave to SW 24th Ave	2	2,650	3,980	2,100	F	F	1.26	1.90
	SW 24th Ave to westbound Connector managed lanes egress	2	2,625	3,950	2,100	F	F	1.25	1.88
	Westbound Connector managed lane egress to Military Trail	2	2,065	3,070	2,100	D	F	0.98	1.46
	Military Trail to Newport Center Dr	3	2,480	2,714	3,171	C	C	0.78	0.86
	Newport Center Dr to I-95 SB Off-Ramp	3	3,045	2,490	3,171	C	C	0.96	0.79
	I-95 SB Off-Ramp to west of Natura Blvd	5	2,950	2,590	5,313	C	C	0.56	0.49
	West of Natura Park Blvd to east of Natura Blvd	3	2,340	2,010	3,171	C	C	0.74	0.63

NOTES:

(1) Capacity thresholds from FDOT 2012 Generalized LOS Peak Hour Directional Volumes Table for Urbanized Areas at LOS D for Class I arterial (40 mph or higher), with +5% capacity adjustment for right turn lanes.

(2) LOS = Level of Service

(3) V/C = Ratio of Volume to Capacity

AM Peak Hour

The results show that eastbound volumes are expected to exceed the capacity of the SW 10th Street local lanes between the Sawgrass Expressway and Newport Center Drive in the AM peak hour. Meanwhile, the westbound volumes are expected to exceed the capacity of the SW 10th Street local lanes in the AM peak hour from the Connector managed lanes egress west of Military Trail to SW 30th Avenue.

PM Peak Hour

During the PM peak hour, eastbound volumes will exceed the corridor's capacity from west of SW 30th Avenue to west of Newport Center Drive. In addition, westbound SW 10th Street volumes from Military Trail to the Sawgrass Expressway will exceed capacity in the afternoon. Many sections of the local lanes along the corridor are expected to have traffic volumes that will significantly exceed the roadway capacity.

Findings summarized in Table 5-1 indicate that gridlock along SW 10th Street during peak hours can be expected. Without additional capacity and safety improvements along SW 10th Street, the duration of congestion is expected to increase corresponding to more delay and longer queues. The No Action Alternative does not satisfy the objectives or purpose and need of this project. It fails to improve local traffic flow or increase capacity throughout the corridor and does not address existing operational and safety deficiencies.

5.4.2 No Action Alternative 2040 VISSIM Analysis

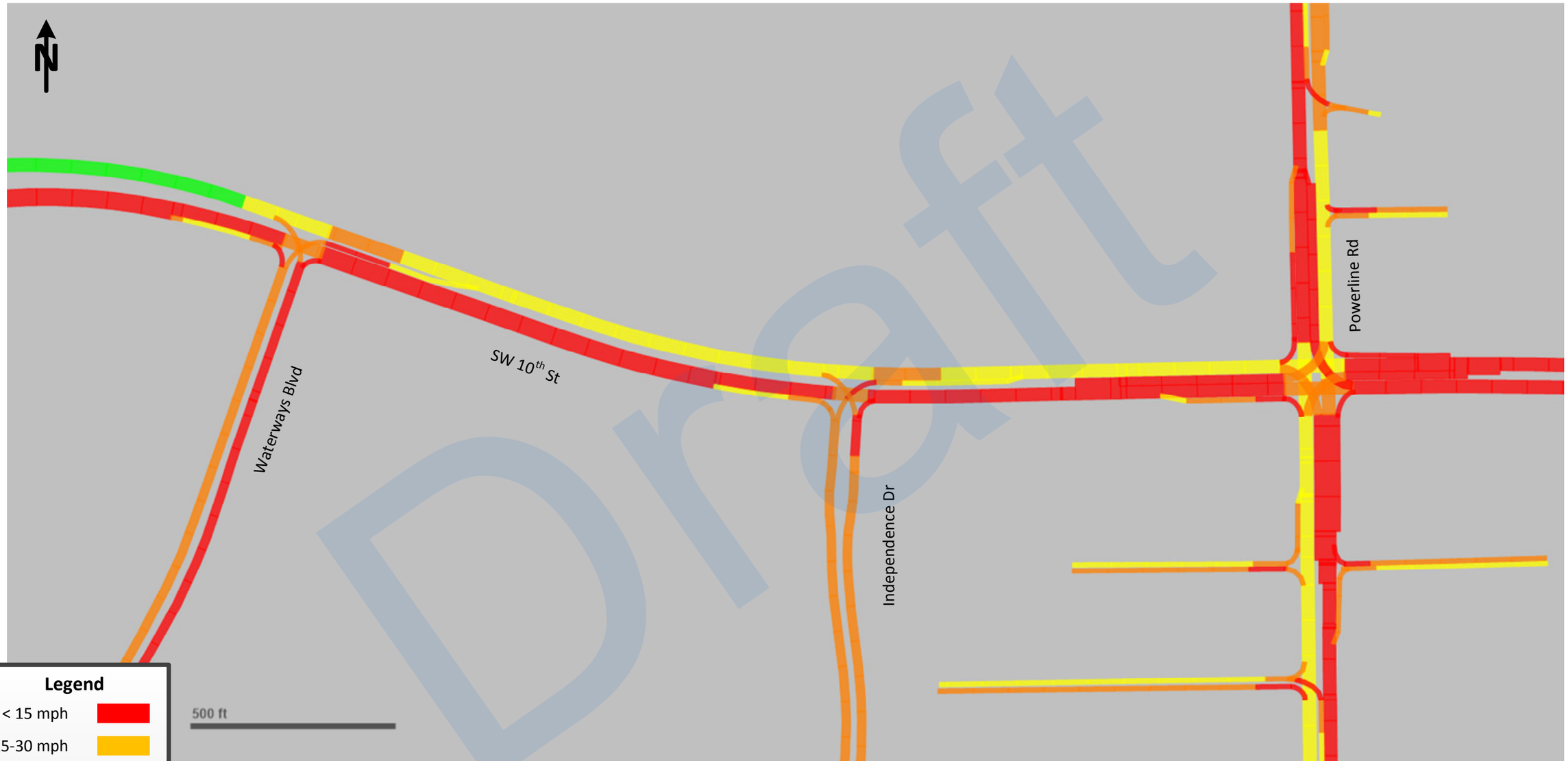
A detailed microsimulation analysis using VISSIM 8.0 was conducted to evaluate the system-wide operational performance of the study area. VISSIM was used to analyze the design year 2040 AM and PM peak periods for the No Action and Build Alternatives. The VISSIM model used for the analysis is the sub-area model extracted from the regional VISSIM model provided by FTE, which is described in the traffic analysis methodology section of this report. The 2040 VISSIM analysis included the local lanes, signalized intersections, Connector managed lanes, and entry and exit ramps. The average travel speeds along the corridor, intersection LOS, delay, 95th percentile queue lengths, and network wide MOEs are summarized.

Estimated 2040 AM and PM peak hour truck percentages used for the 2040 VISSIM analysis are shown in Table 3-1 in Section 3.5 of this report. Two types of trucks were coded into the 2040 VISSIM models to represent 2 axle trucks, and trucks with 3 or more axles. Trucks with 3 or more axles were then prohibited from accessing the Sawgrass, Turnpike, and I-95 express lane facilities, including the direct connect ramps.

The 180 second cycle length implemented in 2018 at all the signalized study intersections along the corridor, was used for the 2040 analysis. Splits were optimized as appropriate using Synchro software. Approved intersection peak hour factors determined in coordination with FDOT District Four were used for future conditions. The peak hour factors used for the various intersections are noted in Section 3.5. The 2040 No Action Alternative VISSIM analysis output is provided in Appendix D. Synchro HCM2000 reports and "Lanes, volumes, timings" reports are provided for additional information in Appendix D.

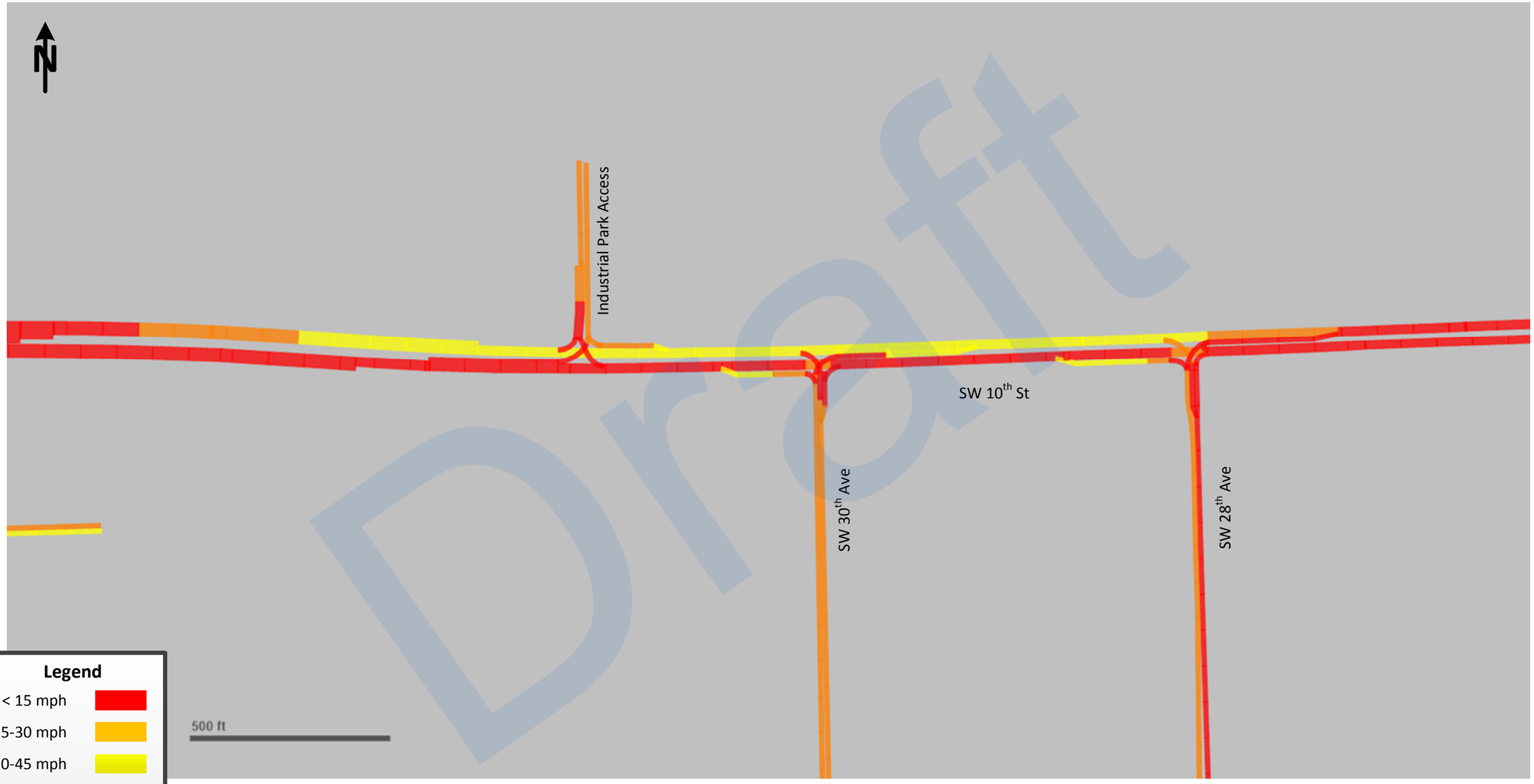
In general, the No Action Alternative results show heavy congestion during both the AM and PM peak hours. The 2040 link evaluation results, showing speeds along SW 10th Street and the cross streets during 2040 AM and PM peak hours, are summarized in Figures 5-4 and 5-5, respectively. In addition, volume and speed profiles are included in Appendix D.

No Action Alternative
2040 AM Peak Hour Average Travel Speed (Waterways Blvd to East of Powerline Rd)



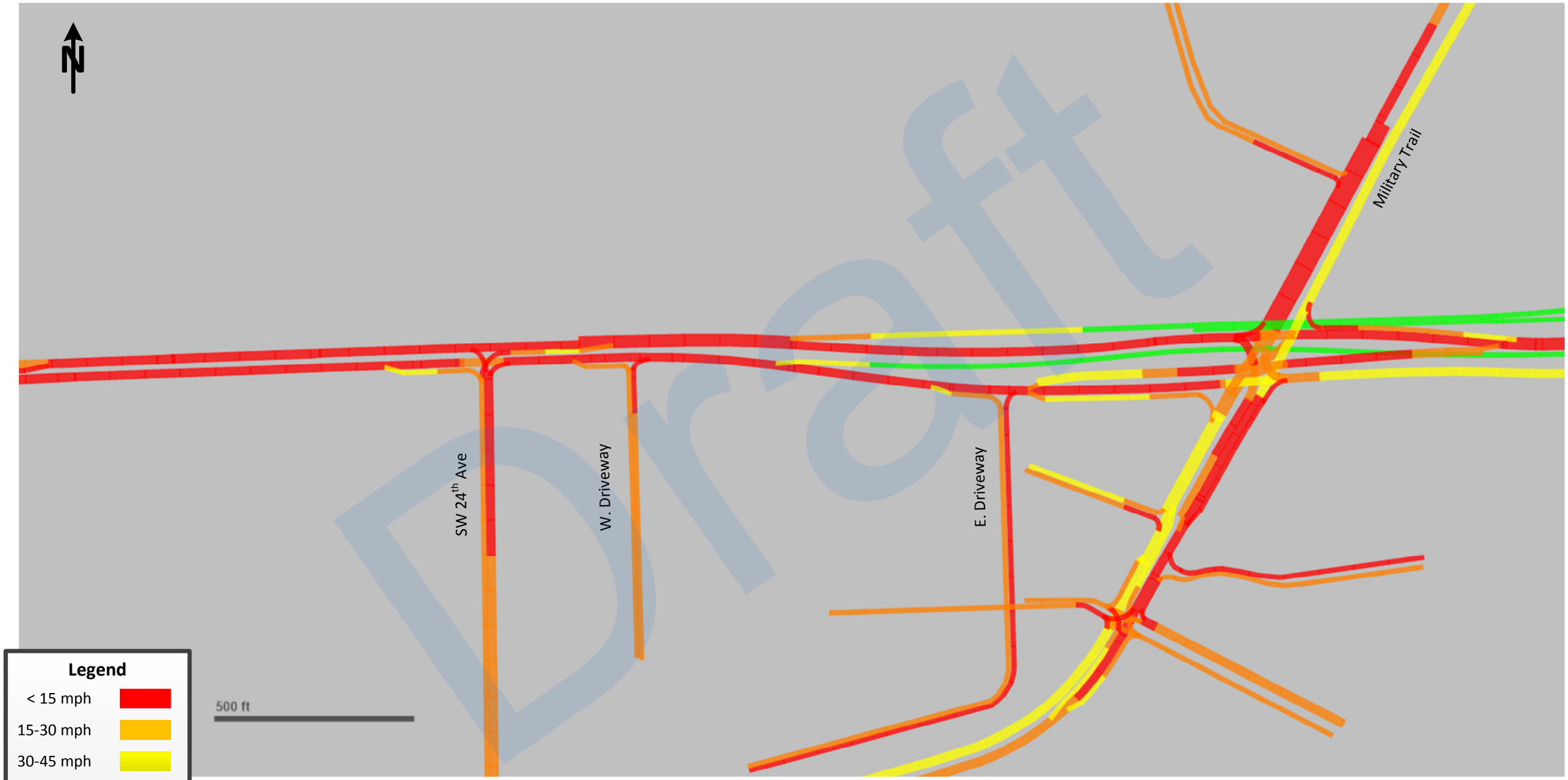
FDOT / SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 5-4 No Action Alternative 2040 AM Peak Hour Average Travel Speed	Page No. 1 of 4

No Action Alternative
2040 AM Peak Hour Average Travel Speed (East of Powerline Rd to East of SW 28th Ave)



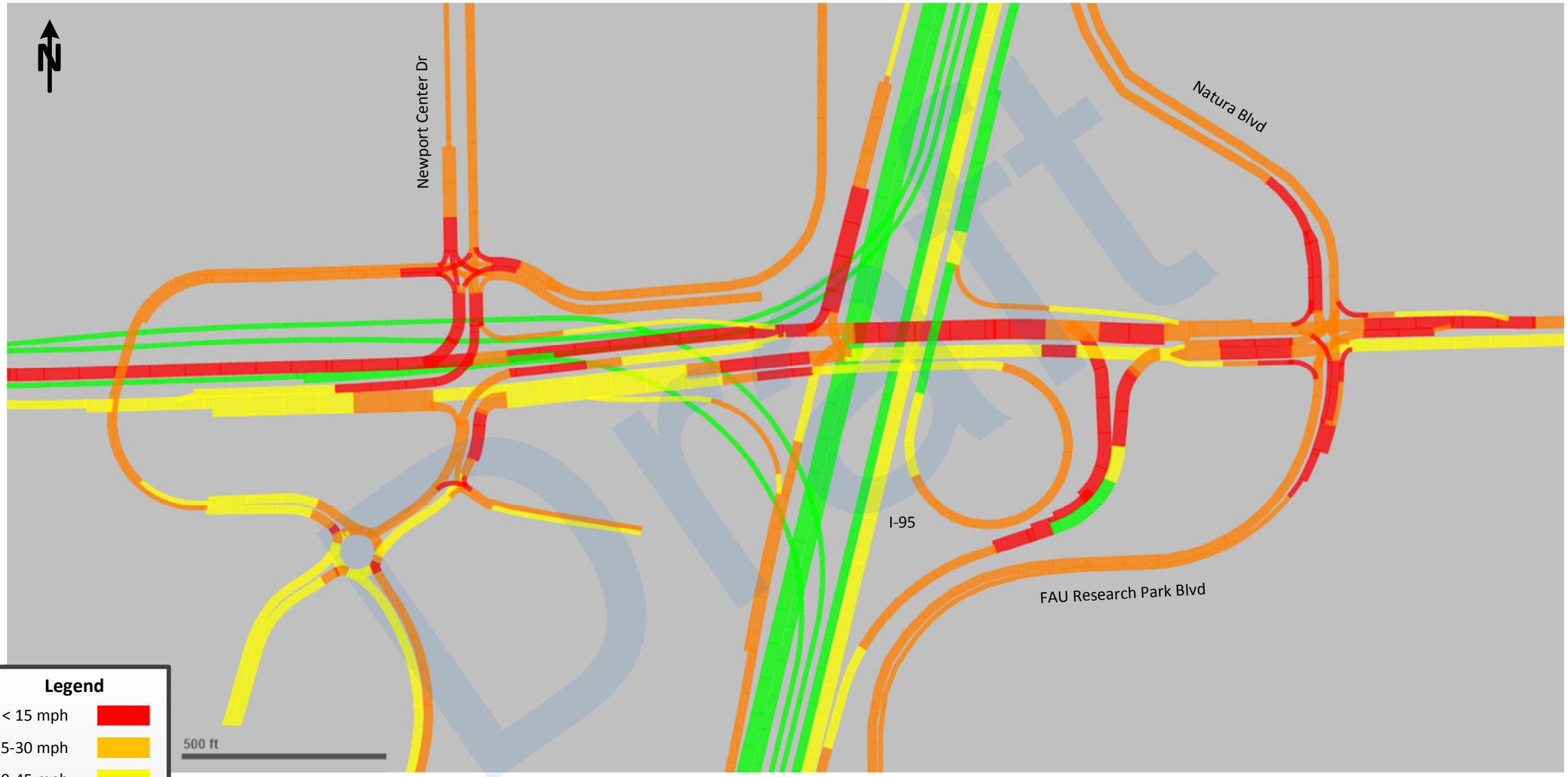
FDOT / SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 5-4 No Action Alternative 2040 AM Peak Hour Average Travel Speed	Page No. 2 of 4

No Action Alternative
2040 AM Peak Hour Average Travel Speed (East of SW 28th Ave to East of Military Trail)



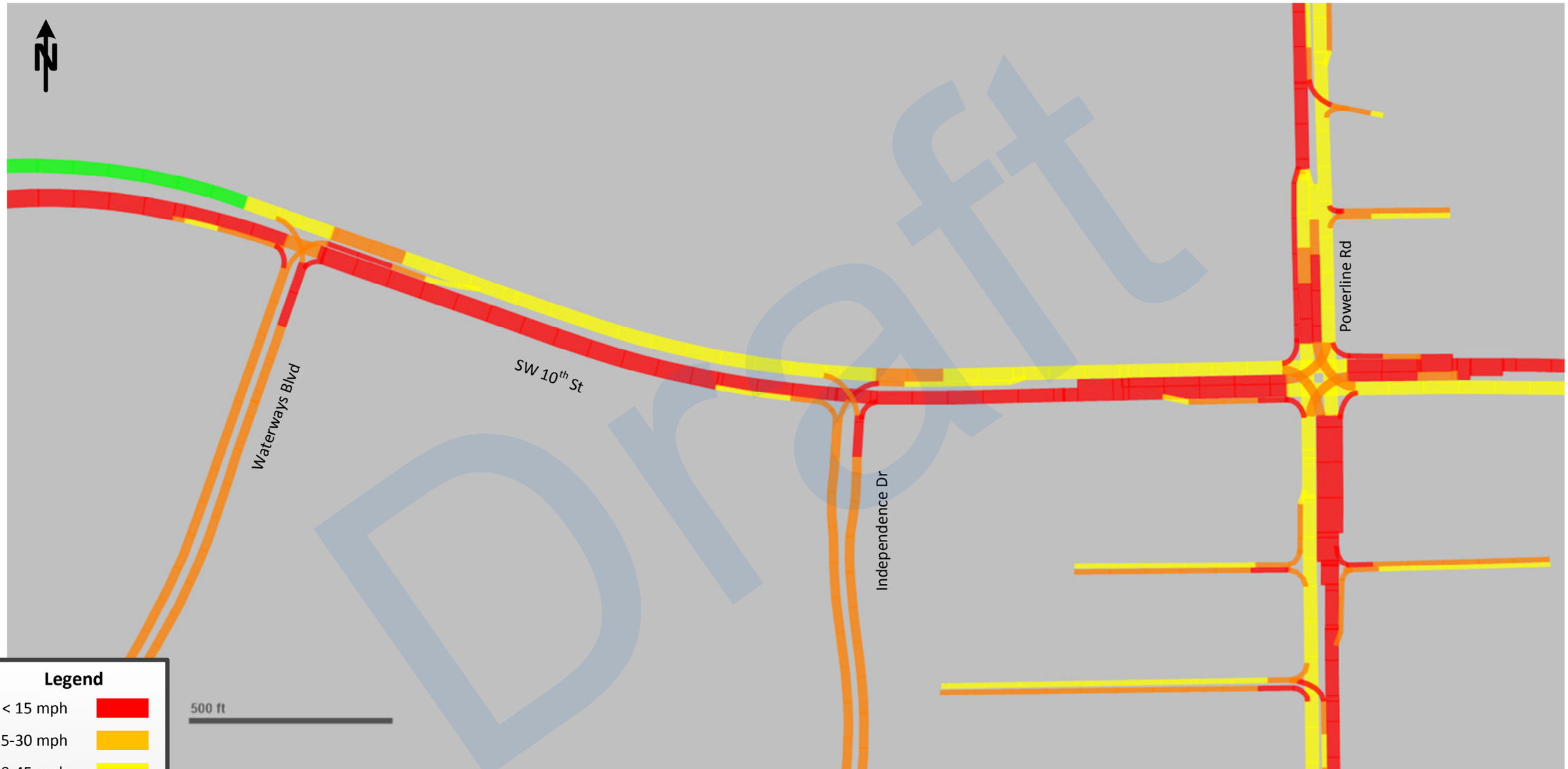
FDOT / SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 5-4 No Action Alternative 2040 AM Peak Hour Average Travel Speed	Page No. 3 of 4

No Action Alternative
2040 AM Peak Hour Average Travel Speed (East of Military Trail to FAU Research Park Blvd)



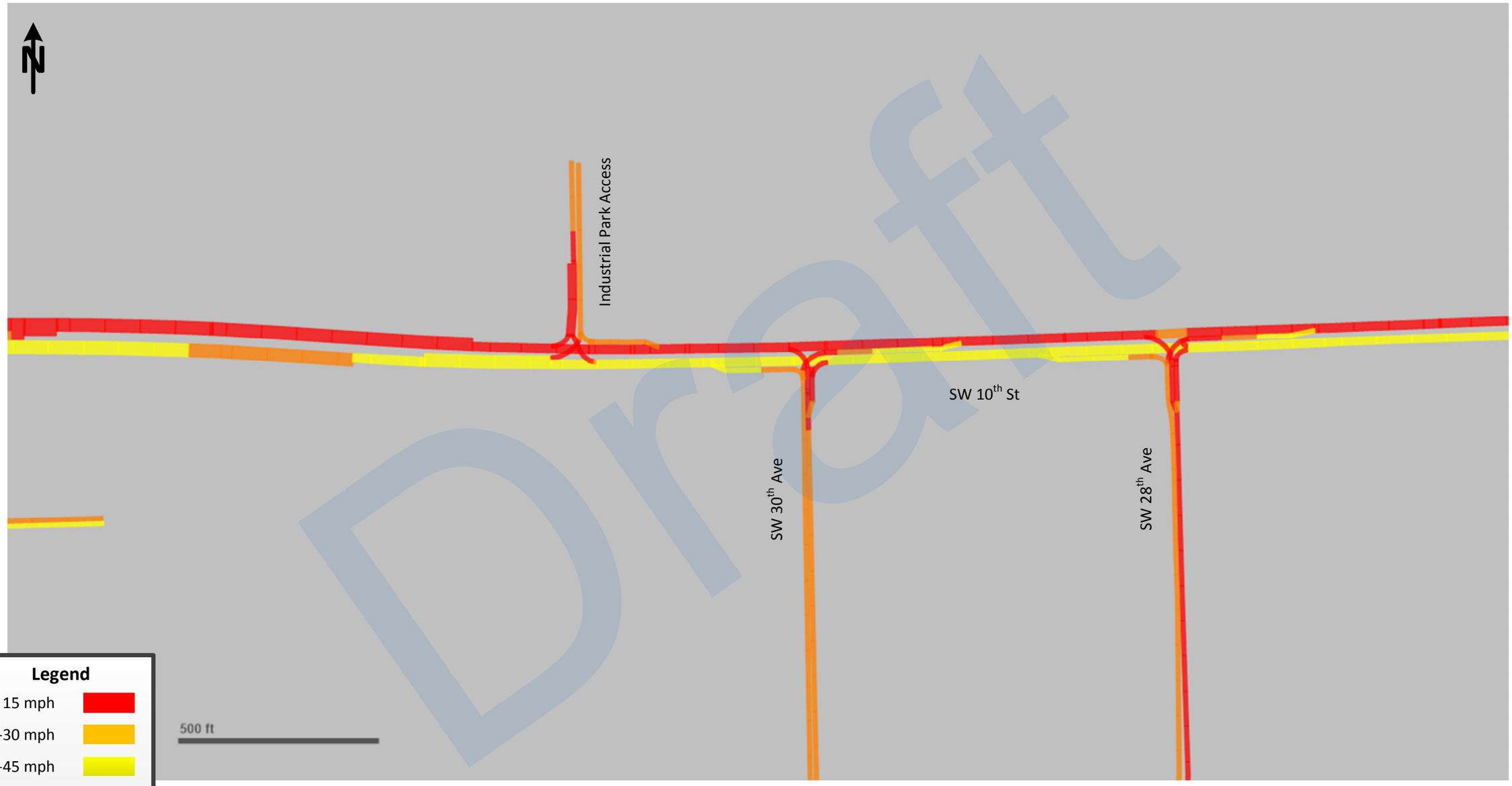
FDOT / SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 5-4 No Action Alternative 2040 AM Peak Hour Average Travel Speed	Page No. 4 of 4

No Action Alternative
2040 PM Peak Hour Average Travel Speed (Waterways Blvd to East of Powerline Rd)



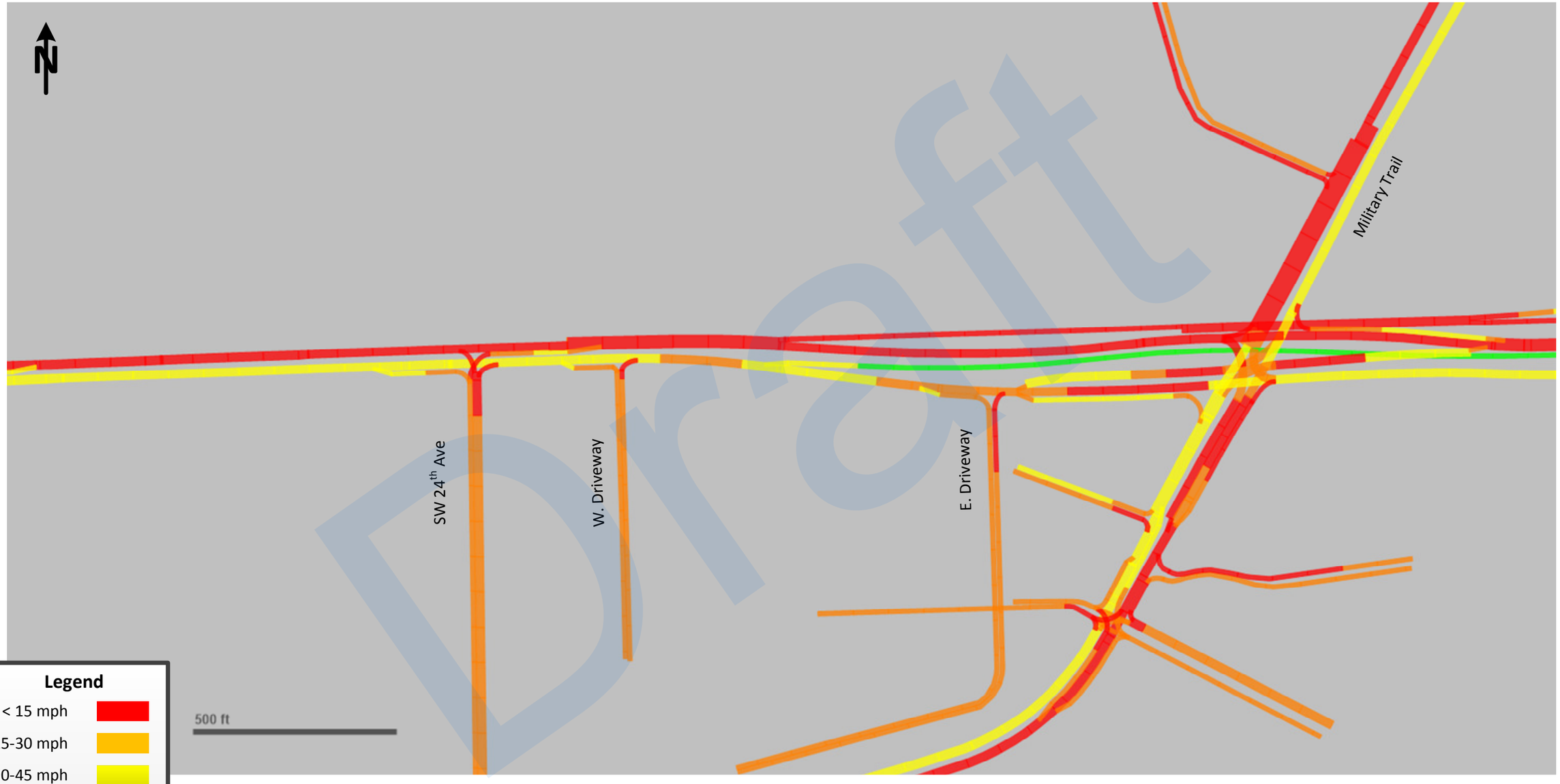
FDOT / SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 5-5 No Action Alternative 2040 PM Peak Hour Average Travel Speed	Page No. 1 of 4

No Action Alternative
2040 PM Peak Hour Average Travel Speed (East of Powerline Rd to East of SW 28th Ave)



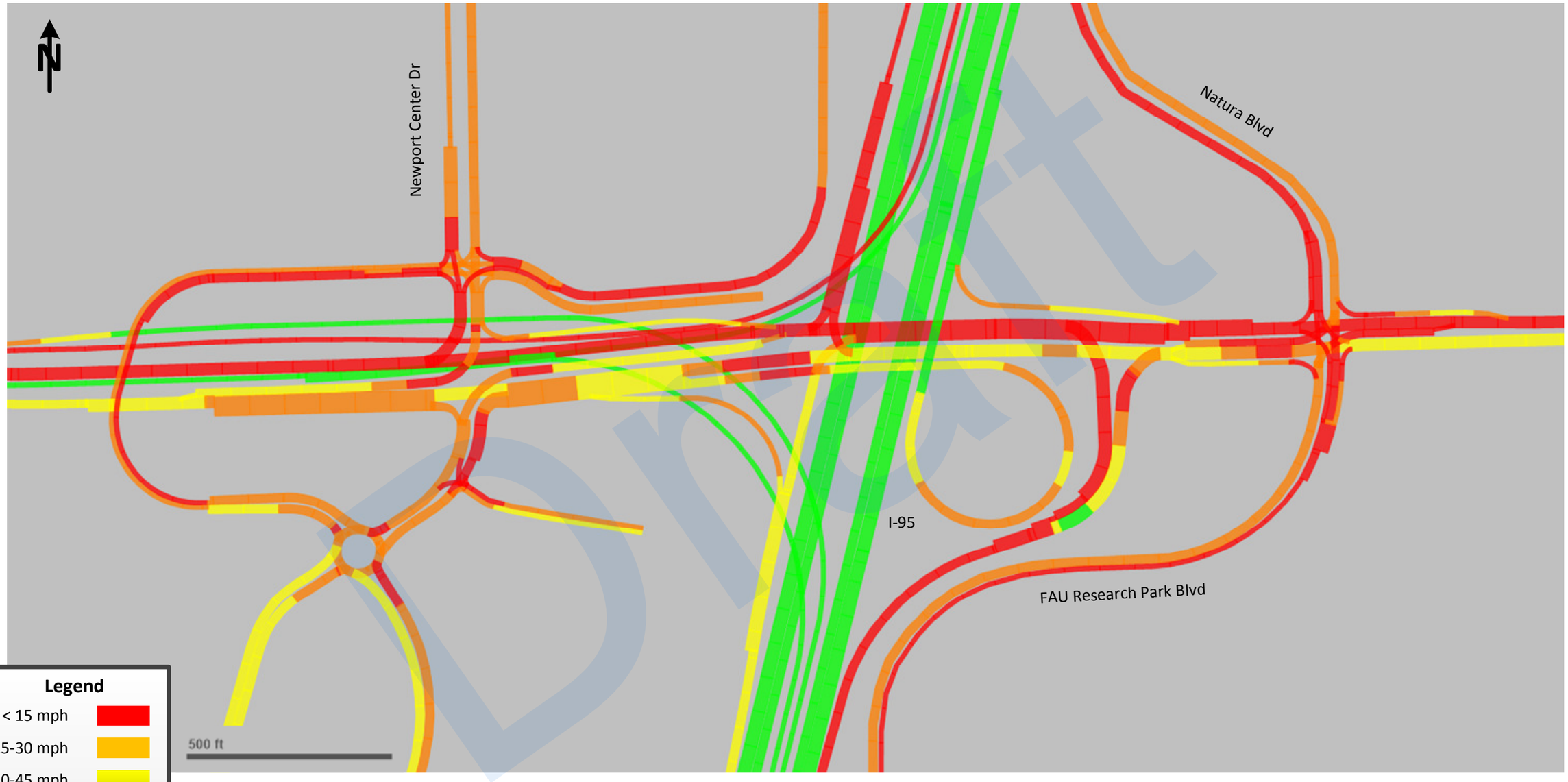
FDOT / SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 5-5 No Action Alternative 2040 PM Peak Hour Average Travel Speed	Page No. 2 of 4

No Action Alternative
2040 PM Peak Hour Average Travel Speed (East of SW 28th Ave to East of Military Trail)



FDOT / SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 5-5 No Action Alternative 2040 PM Peak Hour Average Travel Speed	Page No. 3 of 4

No Action Alternative
2040 PM Peak Hour Average Travel Speed (East of Military Trail to FAU Research Park Blvd)



FDOT / SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 5-5 No Action Alternative 2040 PM Peak Hour Average Travel Speed	Page No. 4 of 4

AM Peak Hour Link Evaluation

VISSIM analysis of the AM peak hour revealed severe congestion in the peak eastbound direction, with traffic backing up along SW 10th Street local from Military Trail to the Sawgrass Expressway. The simulated speeds in the eastbound direction are generally lower than 15 mph in this section. Westbound traffic in the morning from SW 28th Avenue to Natura Boulevard slows down to 10 mph or less after the first hour of simulation. The slow eastbound and westbound speeds during the AM peak period can be seen in the average travel speeds on Figure 5-4, and on the speed and volume profiles found in Appendix D.

In addition, slow speeds and long queues are expected on northbound Waterways Boulevard, northbound and southbound Powerline Road, northbound SW 28th Avenue, and the east driveway (located just west of Military Trail). In addition, the northbound and southbound approaches on Military Trail exhibit queuing that extends upstream beyond the adjacent side streets. These locations experienced extensive queueing due to heavy traffic on SW 10th Street and limited gaps for vehicles to turn onto SW 10th Street.

PM Peak Hour Link Evaluation

VISSIM analysis of the PM peak hour revealed severe congestion on the SW 10th Street corridor due to high demand and restricted capacity. In both travel directions, Powerline Road intersection operates as a bottleneck where the traffic demand on SW 10th Street is unable to be processed. In the eastbound direction, average simulated speeds are lower than 15 mph upstream through the Independence Drive and Waterways Boulevard intersections. This congestion causes metering of the throughput volumes resulting in higher average speeds (but limited throughput) east of Powerline Road. Note that the eastbound demand volume downstream of Powerline Road is 2,835 vph, while the volume profiles in Appendix D indicate that the throughput is capped at approximately 1,500 vph during the peak hour.

In the westbound direction, queuing from the Powerline Road intersection (with speeds lower than 10 mph) are noted through the entire westbound corridor. The westbound through movement at Powerline Road has a demand volume of 3,075 vph. This far exceeds the capacity of the three lanes provided, and the negative impacts have a far-reaching effect on the overall network operations. Note that the westbound demand volume downstream of Powerline Road is 5,780 vph, while the volume profiles in Appendix D indicate that the

throughput is capped at approximately 1,500 vph during the peak hour. On Powerline Road itself, queuing from the intersection extends far upstream in both the northbound and southbound directions. Access from SW 28th Avenue is severely restricted due to the queuing on westbound SW 10th Street. This results in slow speeds and heavy queuing on those approaches as well.

Heavy congestion was simulated on the northbound and southbound approaches at Military Trail and at Natura Boulevard, as well as the southbound right turn from Newport Center Drive under the No Action Alternative. The I-95 southbound and northbound ramp terminal intersections are also impacted, with speeds lower than 15 mph observed along the length of the off-ramps. Significant vehicular spillbacks are realized onto I-95 itself in both directions. Finally, the I-95 express lanes are impacted by the congestion as well, particularly the direct connect from I-95 southbound which reports speeds lower than 15 mph along the length of the ramp. This impacts operations of the I-95 express lanes.

AM Peak Hour Intersection Analysis

VISSIM was also used to analyze the intersections along the corridor. Results of the AM peak hour signalized intersection analysis are summarized in Table 5-2. HCM LOS delay thresholds were used to report the approximate LOS for each intersection. Delay calculations in VISSIM differ from HCM delay calculations; therefore, the reported LOS is an approximate LOS. The 2040 AM peak hour VISSIM analysis indicates the following SW 10th Street intersections will operate below the LOS D target with the No Action Alternative:

- Waterways Boulevard intersection (LOS F);
- Powerline Road intersection (LOS F);
- SW 28th Avenue intersection (LOS F);
- SW 24th Avenue intersection (LOS E);
- Military Trail intersection (LOS F);
- I-95 off-ramp terminal intersections (LOS E); and
- Natura Boulevard intersection (LOS E).

Table 5-2: 2040 No Action Alternative AM Peak Intersection Performance

Intersection	Approach	Movement	Volume (vph)	Max. Queue (ft)	Delay and Level of Service (sec/veh)		
					Movement	Approach	Intersection
Waterways Blvd	EB	T	3,079	9,651	200+ (F)	200+ (F)	187.9 (F)
		R	17	0	200+ (F)		
	WB	L	52	154	114 (F)	7.2 (A)	
		T	2,367	579	5 (A)		
	NB	L	157	1,495	200+ (F)	200+ (F)	
		R	206	1,429	160 (F)		
Independence Dr	EB	T	3,285	1,657	74 (E)	73.8 (E)	45.2 (D)
		R	5	0	7 (A)		
	WB	L	19	25	35 (C)	4.2 (A)	
		T	2,356	427	4 (A)		
	NB	L	59	152	93 (F)	81.5 (F)	
		R	31	193	60 (E)		
Powerline Rd	EB	L	770	1,315	83 (F)	74.8 (E)	91.1 (F)
		T	1,957	1,318	80 (E)		
		R	581	1,137	47 (D)		
	WB	L	285	1,375	200+ (F)	85.9 (F)	
		T	1,480	1,561	71 (E)		
		R	454	1,558	51 (D)		
	NB	L	354	592	200+ (F)	116.9 (F)	
		T	829	592	98 (F)		
		R	348	657	52 (D)		
	SB	L	198	470	200+ (F)	107.3 (F)	
		T	885	550	115 (F)		
		R	537	588	24 (C)		
SW 30th Ave*	EB	T	2,403	687	24 (C)	24.1 (C)	14.6 (B)
		R	45	18	9 (A)		
	WB	L	62	163	66 (F)	2.4 (A)	
		T	2,168	93	1 (A)		
	NB	L	40	111	72 (F)	58.3 (F)	
		R	47	91	47 (E)		
SW 28th Ave	EB	T	2,401	1,174	40 (D)	39.7 (D)	80.8 (F)
		R	48	80	21 (C)		
	WB	U	63	1,662	200+ (F)	68.5 (E)	
		L	19	1,662	200+ (F)		
		T	2,081	1,247	46 (D)		
	NB	L	145	2,827	200+ (F)	200+ (F)	
		R	72	2,824	200+ (F)		
SW 24th Ave*	EB	T	2,429	1,653	60 (F)	59 (F)	44.1 (E)
		R	104	25	46 (E)		
	WB	L	22	69	45 (E)	12.4 (B)	
		T	2,154	532	12 (B)		
	NB	L	48	438	83 (F)	200+ (F)	
		R	24	458	200+ (F)		

* Intersection LOS estimated based on VISSIM node delay results and HCM intersection LOS delay thresholds for signalized intersections and stop controlled intersections.
** Reported maximum queues are capped by the presence of upstream intersection nodes or the extent of the network

Intersection	Approach	Movement	Volume (vph)	Max. Queue (ft)	Delay and Level of Service (sec/veh)		
					Movement	Approach	Intersection
Military Trail	EB	L	125	156	70 (E)	56.7 (E)	110.3 (F)
		T	1,362	693	58 (E)		
		R	66	33	5 (A)		
	WB	L	282	575	200+ (F)	145.5 (F)	
		T	1,277	2,105	165 (F)		
		R	496	451	35 (C)		
	NB	L	181	287	168 (F)	81.6 (F)	
		T	652	499	78 (E)		
		R	628	588	60 (E)		
	SB	L	424	573	200+ (F)	154.7 (F)	
		T	505	573	123 (F)		
		R	257	573	100 (F)		
Newport Center Dr	EB	L	264	285	88 (F)	13.1 (B)	38.2 (D)
		T	1,754	616	4 (A)		
		R	396	309	4 (A)		
	WB	L	363	302	83 (F)	57.6 (E)	
		T	1,944	1,612	61 (E)		
		R	309	96	6 (A)		
	NB	R	156	134	45 (D)	45.4 (D)	
	SB	R	185	144	86 (F)	85.8 (F)	
I-95 Ramps	EB	L	658	224	11 (B)	19.9 (B)	70.9 (E)
		T	755	305	40 (D)		
		R	500	0	1 (A)		
	WB	L	780	683	109 (F)	75.2 (E)	
		T	1,131	683	70 (E)		
		R	279	415	3 (A)		
	NB	L	692	5,570	168 (F)	138.5 (F)	
		R	407	222	88 (F)		
	SB	L	430	2,972	79 (E)	81.6 (F)	
		R	855	2,972	83 (F)		
Natura Blvd	EB	L	264	245	86 (F)	36.7 (D)	62 (E)
		T	1,046	359	32 (C)		
		R	281	216	7 (A)		
	WB	L	192	781	150 (F)	82.1 (F)	
		T	1,546	1,707	76 (E)		
		R	89	109	36 (D)		
	NB	L	334	1,309	80 (E)	67.5 (E)	
		T	201	621	79 (E)		
		R	168	118	30 (C)		
	SB	L	241	1,101	58 (E)	61.5 (E)	
		T	198	1,101	90 (F)		
		R	381	1,006	49 (D)		

* Intersection LOS estimated based on VISSIM node delay results and HCM intersection LOS delay thresholds for signalized intersections and stop controlled intersections.
** Reported maximum queues are capped by the presence of upstream intersection nodes or the extent of the network

PM Peak Hour Intersection Analysis

VISSIM results of the PM peak hour signalized intersection analysis are summarized in Table 5-3. HCM LOS delay thresholds were used to report the approximate LOS for each intersection. Delay calculations in VISSIM differ from HCM delay calculations; therefore, the reported LOS is an approximate LOS. The 2040 PM peak hour findings indicate the following SW 10th Street intersections are expected to operate below the LOS D target:

- Waterways Boulevard intersection (LOS F)
- Independence Drive (LOS E)
- Powerline Road intersection (LOS F)
- SW 30th Avenue (LOS E)
- SW 28th Street intersection (LOS F)
- Military Trail intersection (LOS F)
- Newport Center Drive intersection (LOS F)
- I-95 ramps terminal intersections (LOS F)
- Natura Boulevard (LOS F)

During the 2040 PM peak hour, all but one of the study area intersections will operate at LOS E or F. The considerable westbound traffic volume at Powerline Road causes queuing that extends through most of the upstream network. This results in high delay, long queues, and undesirable LOS at other intersections. Both the northbound and southbound I-95 off-ramp terminals operate at LOS F, with queues in excess of 9,500 feet and 13,000 feet, respectively. Such queues indicate a substantial impact upon upstream operations on I-95 in both directions.

These findings confirm that gridlock along SW 10th Street will occur during peak hours under the No Action Alternative. In lieu of additional capacity and safety improvements, the duration and severity of congestion experienced by motorists along SW 10th Street is expected to increase. Overall, the No Action Alternative fails to address existing operational and safety deficiencies.

Table 5-3: 2040 No Action Alternative PM Peak Intersection Performance

Intersection	Approach	Movement	Volume (vph)	Max. Queue (ft)	Delay and Level of Service (sec/veh)		
					Movement	Approach	Intersection
Waterways Blvd	EB	T	2,119	9,645	200+ (F)	200+ (F)	200+ (F)
		R	94	4	200+ (F)		
	WB	L	136	333	88 (F)	8.1 (A)	
		T	2,904	508	4 (A)		
	NB	L	76	217	138 (F)	57.1 (E)	
		R	129	151	10 (A)		
Independence Dr	EB	T	2,203	1,659	174 (F)	171.5 (F)	74.6 (E)
		R	36	0	10 (A)		
	WB	L	28	33	31 (C)	3.5 (A)	
		T	3,021	415	3 (A)		
	NB	L	17	92	92 (F)	74.8 (E)	
		R	50	133	69 (E)		
Powerline Rd	EB	L	406	1,322	200+ (F)	170 (F)	140.5 (F)
		T	1,484	1,324	109 (F)		
		R	324	826	61 (E)		
	WB	L	197	1,645	200+ (F)	200+ (F)	
		T	1,489	2,006	200+ (F)		
		R	242	2,049	186 (F)		
	NB	L	549	603	155 (F)	90.3 (F)	
		T	451	603	48 (D)		
		R	214	667	13 (B)		
	SB	L	296	326	71 (E)	35.3 (D)	
		T	472	290	47 (D)		
		R	1,011	620	20 (B)		
SW 30th Ave*	EB	T	2,040	349	3 (A)	2.6 (A)	43.4 (E)
		R	23	3	2 (A)		
	WB	L	14	72	96 (F)	90.4 (F)	
		T	1,776	1,113	90 (F)		
	NB	L	102	219	71 (F)	43.7 (E)	
		R	109	119	18 (C)		
SW 28th Ave	EB	T	2,037	792	3 (A)	2.6 (A)	98.4 (F)
		R	114	63	2 (A)		
	WB	L	42	175	108 (F)	126.2 (F)	
		T	54	175	112 (F)		
	NB	L	1,732	1,659	127 (F)	200+ (F)	
		R	56	2,522	200+ (F)		
SW 24th Ave*	EB	T	45	2,228	200+ (F)	0.8 (A)	11 (B)
		R	2,049	64	1 (A)		
	WB	U	74	4	1 (A)	22.1 (C)	
		L	10	25	18 (C)		
		T	1,785	540	22 (C)		
	NB	L	47	99	42 (E)	33.4 (D)	
		R	32	119	20 (C)		

* Intersection LOS estimated based on VISSIM node delay results and HCM intersection LOS delay thresholds for signalized intersections and stop controlled intersections.
** Reported maximum queues are capped by the presence of upstream intersection nodes or the extent of the network

Intersection	Approach	Movement	Volume (vph)	Max. Queue (ft)	Delay and Level of Service (sec/veh)		
					Movement	Approach	Intersection
Military Trail	EB	L	148	152	93 (F)	27.7 (C)	200+ (F)
		T	1,334	685	22 (C)		
		R	85	12	2 (A)		
	WB	L	225	241	200+ (F)	200+ (F)	
		T	1,032	2,086	200+ (F)		
		R	254	158	103 (F)		
	NB	L	140	491	200+ (F)	191.3 (F)	
		T	319	359	82 (F)		
		R	251	463	37 (D)		
	SB	L	95	567	71 (E)	200+ (F)	
		T	162	567	200+ (F)		
		R	117	567	200+ (F)		
Newport Center Dr	EB	L	55	121	40 (D)	6.5 (A)	120.1 (F)
		T	1,569	825	5 (A)		
		R	53	2	4 (A)		
	WB	L	32	77	122 (F)	200+ (F)	
		T	700	1,765	200+ (F)		
		R	27	0	25 (C)		
	NB	R	589	322	41 (D)	40.7 (D)	
	SB	R	841	275	53 (D)	52.9 (D)	
I-95 Ramps	EB	L	727	249	11 (B)	17.7 (B)	200+ (F)
		T	864	401	33 (C)		
		R	561	24	2 (A)		
	WB	L	462	776	109 (F)	200+ (F)	
		T	550	776	200+ (F)		
		R	192	502	16 (B)		
	NB	L	100	9,565	200+ (F)	200+ (F)	
		R	118	145	200+ (F)		
	SB	L	46	13,100	200+ (F)	200+ (F)	
		R	110	13,100	200+ (F)		
Natura Blvd	EB	L	140	193	161 (F)	30.1 (C)	200+ (F)
		T	756	173	11 (B)		
		R	132	117	2 (A)		
	WB	L	142	11,793	200+ (F)	200+ (F)	
		T	629	11,791	200+ (F)		
		R	57	132	200+ (F)		
	NB	L	280	3,981	200+ (F)	200+ (F)	
		T	183	3,454	200+ (F)		
		R	199	780	200+ (F)		
	SB	L	201	3,010	200+ (F)	200+ (F)	
		T	232	3,010	200+ (F)		
		R	299	3,067	200+ (F)		

* Intersection LOS estimated based on VISSIM node delay results and HCM intersection LOS delay thresholds for signalized intersections and stop controlled intersections.
** Reported maximum queues are capped by the presence of upstream intersection nodes or the extent of the network

2040 No Action Alternative Travel Times and Average Speeds

The peak hour peak direction travel time for vehicles on SW 10th Street between the Turnpike and I-95 was recorded from the VISSIM model for the 2040 No Action Alternative. The eastbound travel time during the AM peak hour was estimated to take approximately 18 to 19 minutes, while the westbound travel time during the PM peak hour was estimated to take longer than 30 minutes. The long westbound PM peak hour travel time for the No Action Alternative in 2040 is due to significant congestion throughout the network, including at the Powerline Road intersection, 28th Avenue intersection, and where the westbound direct-connect I-95 off-ramp traffic merges into westbound traffic on local SW 10th Street.

The distance of the travel paths measured along SW 10th Street between the Turnpike and I-95 is 3.3 miles. The average travel speed for eastbound traffic during the AM peak hour is estimated to be 11 mph, and less than 5 mph for the westbound PM peak hour travel speed.

VISSIM Network Wide Output

For the No Action Alternative, the network wide VISSIM results were reviewed and reported. The 2040 AM peak period outputs are noticeably high. They are as follows:

- Total Delay = 8,620 hours
- Total Travel Time = 14,184 hours
- Total Stops = 1,078,567
- Latent Demand = 8,238 vehicles
- Average Delay = 6:00 (mm:ss)
- Average Speed = 19 mph

The network wide outputs for the No Action Alternative 2040 PM peak period show even greater delay, travel time, total stops, etc., indicating near gridlock conditions in the network. The outputs are as follows:

- Total Delay = 22,475 hours
- Total Travel Time = 26,552 hours
- Total Stops = 2,856,016
- Latent Demand = 36,292 vehicles
- Average Delay = 19:58 (mm:ss)
- Average Speed = 7 mph

6.0 Build Alternative

6.1 Screening of Preliminary Build Concepts

In the initial stages of the project, multiple sets of managed lane access configurations were considered. These included a north alignment and center alignment for the proposed Connector managed lanes, as well as six different managed lane access configurations. Twelve preliminary build concepts were evaluated considering various criteria. The analysis of all twelve preliminary build concepts using Synchro intersection analysis and volume-to-capacity ratio analysis is documented in the *Tier 1 Traffic Analysis (Volume to Capacity and Vehicle-Miles Traveled), and Tier 2 Traffic Analysis (Intersection and Freeway Operations) Results Memorandum*, dated May 2018, and prepared by RS&H, Inc. A copy of this technical memorandum is provided in Appendix E.

Based on the assessment in the *Tier 1 Traffic Analysis (Volume to Capacity and Vehicle-Miles Traveled), and Tier 2 Traffic Analysis (Intersection and Freeway Operations) Results Memorandum*, preliminary build concept "North Alignment with access configuration 3D-1.3" was determined to be the most advantageous from a traffic perspective. It was shown to provide the lowest total intersection delay; least number of locations along the SW 10th Street corridor where V/C would be greater than 1.0; and the Connector managed lanes freeway performance appeared to be acceptable.

Following the preliminary assessment, two build concepts were analyzed in the *VISSIM Analysis of No-Build Alternative, Build Alternative #1 (managed lanes without local ramp access), and Build Alternative #2 (managed lanes with local ramp access) Technical Memorandum*:

- Build Concept 1 (Non-Depressed, No Managed Lane Access)
- Build Concept 2 (Full Depressed, or Partial Depressed, with Managed Lane Access)

These concepts were analyzed and compared using VISSIM analysis of their 2040 conditions. A copy of the *VISSIM Analysis of No-Build Alternative, Build Alternative #1 (managed lanes without local ramp access), and Build Alternative #2 (managed lanes with local ramp access) Technical Memorandum*, dated September 2019 is provided in Appendix F.

This Tech Memo was an interim deliverable which provided initial insight into the traffic operations of the three potential "build" concepts presented at the Alternatives Public Workshop #2held in November 2018. The results also demonstrated that Build Concept 2 (with access to/from the managed lanes) provided more benefits than Build Concept 1 in terms of less delay at intersections, and lower travel times in the local lanes. Although the concepts analyzed in the Tech Memo are different from the alternatives documented in this PTAR, the Build Alternative incorporates key characteristics from Build Concept 2. The Connector managed lanes ingress and egress ramps proposed in each direction between Powerline Road and Newport Center Drive, from Build Concept 2 were incorporated into the Build Alternative. These ramps provide access between the SW 10th Street local lanes and the Connector managed lanes. They allow a larger amount of traffic to use the Connector managed lanes, including providing an opportunity for traffic to bypass the Military Trail intersection.

6.2 Build Alternative Transportation Network

The Build Alternative, also known as the "Partial Depressed Alternative," represents a significant capacity improvement over the No Action Alternative. Most notably a new Connector managed lane freeway facility is proposed to be constructed along the north side of the corridor from the Sawgrass Expressway / Florida's Turnpike to I-95 (northern alignment). The northern alignment of the managed lanes helps to minimize modifications to access connections along the SW 10th Street local lanes. The Build Alternative consists of two Connector managed lanes in each direction.

The SW 10th Street local lanes are located along the south side of the corridor and consist of the same number of lanes as they do today:

- three lanes in each direction from west of Waterways Boulevard to east of Powerline Road,
- two lanes in each direction from east of Powerline Road to Military Trail, and
- three lanes in each direction from Military Trail to Newport Center Drive.

The SW 10th Street local lanes are planned to accommodate local trips traveling at slower speeds. They are adjacent to improved bicycle lanes and a sidewalk along the corridor. The

speed limit for the 11-foot local lanes is expected to be 35 mph to be consistent with the new design of the local roadway. The primary function of the SW 10th Street local lanes will be to provide access to the adjacent residential developments and businesses, as well as connections to intersecting local roads.

The Connector managed lanes are expected to primarily accommodate longer distance trips. Limited access connections in the form of entrance and exit ramps will be provided and the facility will be designed for traffic to travel at a higher speed. The speed limit for the Connector managed lanes is assumed to be posted at 60 mph. These lanes will be physically separated from the local lanes by a barrier and / or a grade separation.

Four proposed ramps, located between Powerline Road and Newport Center Drive, will provide connections between the SW 10th Street local lanes and the Connector managed lanes. They include an eastbound entrance ramp followed by an eastbound exit ramp, and a westbound entrance ramp followed by a westbound exit ramp.

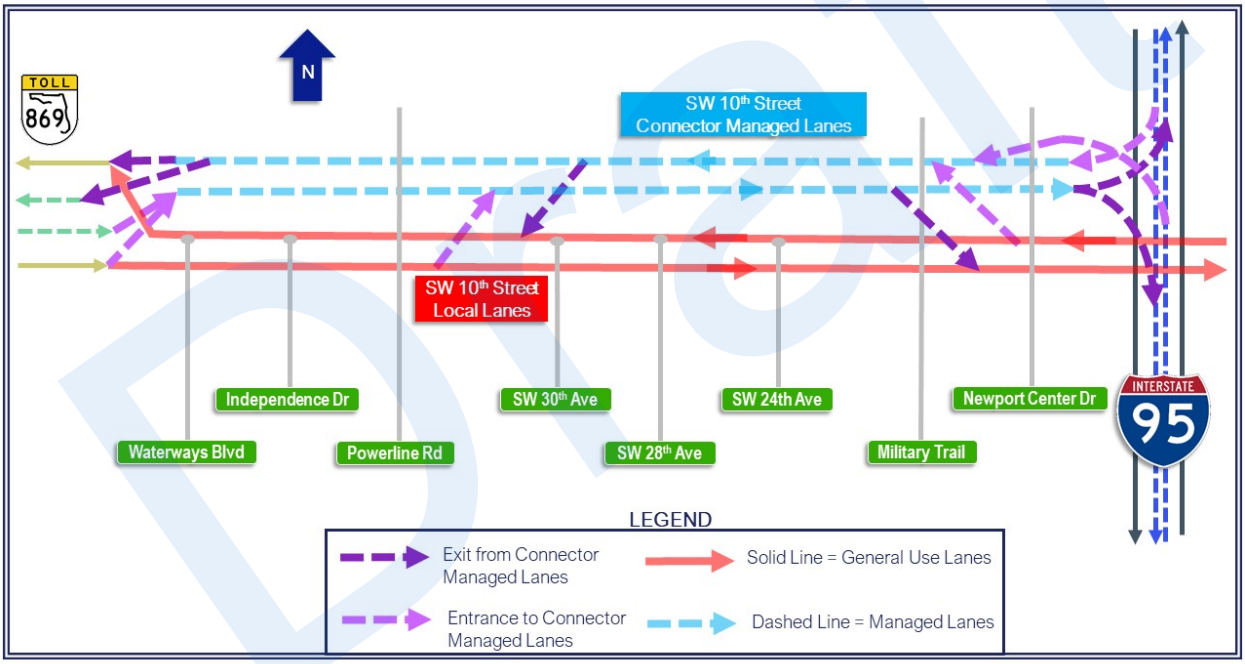
In addition, an eastbound entrance ramp and westbound exit ramp will be provided west of Waterways Boulevard as part of FTE's ongoing Sawgrass Expressway PD&E Study. The entrance and exit ramp west of Waterways Boulevard will provide an important connection between the Sawgrass Expressway general use lanes and the Connector managed lanes. These ramps provide an opportunity for eastbound vehicles to enter the Connector managed lanes prior to the Waterways Boulevard intersection, and for westbound traffic to remain in the Connector manages lanes until west of Waterways Boulevard. This allows additional traffic to use the Connector managed lanes and bypass three more signalized intersections along SW 10th Street (at Waterways Boulevard, Independence Drive, and Powerline Road).

Another discerning characteristic of the Build Alternative is that when the facility is constructed and open to traffic, all vehicle types will be allowed to travel in the SW 10th Street Connector managed lanes, including all types of trucks. Trucks with 3 or more axles are prohibited from accessing the Sawgrass, Turnpike, and I-95 express lane facilities, including the direct connect ramps. Therefore, trucks will be able to enter or exit the Connector managed lanes, beginning from the new entrance and exit ramps west of Waterways Boulevard, to the entrance and exit ramps at Newport Center Drive. In addition, no toll will

be implemented when open to traffic on the Connector managed lanes from the new entrance and exit ramps west of Waterways Boulevard, to the entrance and exit ramps at Newport Center Drive. If it becomes necessary to further manage operations or safety in the Connector managed lane, then tolling and/or vehicle eligibility requirements may be implemented.

Figure 6-1 provides a line diagram representation of the SW 10th Street local lanes, Connector managed lanes, and ramp general locations and configurations. Figure 6-2 presents the number of lanes along the corridor including the intersection turn lane geometry for the Build Alternative.

Figure 6-1: 2040 Build Alternative Transportation Network Line Diagram



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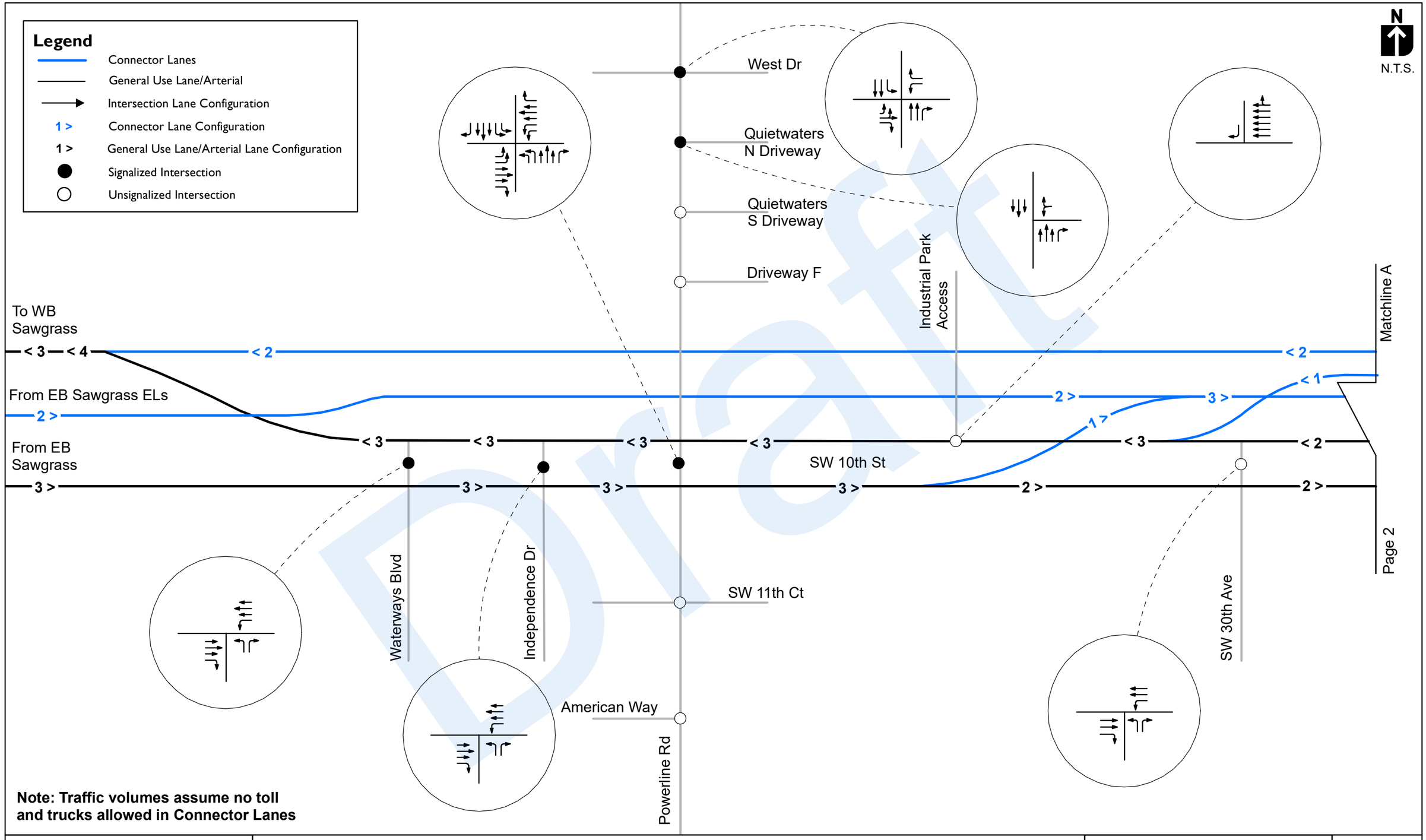

State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	**Figure 6-2** **2040 Build Alternative Lane Geometry**	**Page 1 of 3**

Legend

- Connector Lanes
- General Use Lane/Arterial
- Intersection Lane Configuration
- 1 > Connector Lane Configuration
- 1 > General Use Lane/Arterial Lane Configuration
- Signalized Intersection
- Unsignalized Intersection

N

N.T.S.

Military Trail

East Drive

Matchline A

Matchline B

< 2 | < 1 | 3 > | 2 > | 1 > | < 3

< 2 | < 2 | < 2 | < 2 | < 3

2 > | 2 > | 2 > | 2 > | 2 > | 3 >

SW 10th St

SW 10th St

Page 1

Page 3

SW 28th Ave

SW 24th Ave

W. Driveway

E. Driveway

Palm Trails Plaza

The Lakes at Deerfield Apts Driveway

Horizon Club Driveway

Note: Traffic volumes assume no toll and trucks allowed in Connector Lanes

Legend

- Connector Lanes
- General Use Lane/Arterial
- Intersection Lane Configuration
- 1 > Connector Lane Configuration
- 1 > General Use Lane/Arterial Lane Configuration
- Signalized Intersection
- Unsignalized Intersection

N

N.T.S.

SW 12th Ave

Newport Center Dr

From Hillsboro Blvd

To Hillsboro Blvd

SW Natura Blvd

Matchline B

SW 10th St

Page 2

Newport Center Dr

FAU Research Park Blvd

I-95

Note: Traffic volumes assume no toll and trucks allowed in Connector Lanes

FDOT

SW 10th Street Connector

State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95
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Figure 6-2
2040 Build Alternative Lane Geometry

Throughout the project corridor, pedestrian and bicycle facilities will be improved and upgraded to provide:

- Minimum six-foot sidewalk for the length of the corridor (adjacent to the arterial portion of the roadway);
- Seven-foot buffered bicycle lanes; and
- Crosswalks at all signalized intersections.

The sidewalk along the City-owned property on the south side of SW 10th Street may include a 10-foot wide sidewalk in order to facilitate access to the existing pump facility.

No changes to transit are proposed. Future year 2040 transit service provided by the City and County, which uses SW 10th Street, is expected to be similar to existing conditions. A community bus route will still travel a portion of SW 10th Street, and Broward County bus routes running on adjacent roadways such as Powerline Road. The Broward MPO's 2040 LRTP does not identify future transit improvements on SW 10th Street but does identify planned future transit improvements on Military Trail and Sample Road

Build Alternative Proposed Access Modifications

Existing and proposed access connections along the SW 10th Street local lanes are summarized in Table 6-1.

Table 6-1: Build Alternative – SW 10th Street Local Lanes Access

Intersection/Existing Opening		Mile Post	Existing Opening Type	Existing Spacing (feet)	Recommended Changes	Proposed Spacing (feet)
1	Powerline Road	0.000	Full (Signal)	2,000	None	2,670
2	Quiet Waters Business Park Access Rd	0.381	Full	670	Close	----
3	SW 30th Avenue	0.502	Full	1,030	None	1,030
4	SW 28th Avenue	0.699	Full (Signal)	1,660	None	1,660
5	SW 24th Avenue	1.014	Full	800	None	2,190
6	Frontage Road (Business Park)	1.156	Directional (WB LT)	510	Close	----
7	Frontage Road (Walmart)	1.253	Directional (WB LT)	880	Close	----
8	Military Trail	1.427	Full (Signal)	----	None	----

The proposed managed lanes along the north side of SW 10th Street will be elevated over Powerline Road and will block the Quiet Waters Business Park Access Road full median opening connection on the north side of the SW 10th Street local lanes east of Powerline Road. Access options are proposed as part of the Build Alternative to mitigate the access change. Traffic exiting the driveway and traveling west, and traffic from the east turning right into the driveway, will use a new east-west access road proposed along the south side of the Deerfield Beach Storage property which will connect to SW 10th Street as a right-in-right-out only driveway located approximately 140 feet east of the Powerline Road centerline. For traffic exiting the driveway and desiring to travel east on SW 10th Street, they will be rerouted internally on the business park site to the Quiet Waters Business Park north driveway on the east side of Powerline Road located approximately 760 feet north of SW 10th Street. The

existing driveway is proposed to be relocated approximately 140 feet north of its existing location and signalized in tandem with the existing signalized intersection of Powerline Road and West Drive. This will allow exiting traffic (including large semi-trucks) from the business park to safely make a left turn onto Powerline Road, travel south on Powerline Road, and make a left turn onto SW 10th Street to travel east on SW 10th Street.

The existing driveways located along the south side of SW 10th Street between SW 24th Avenue and Military Trail will also have their access modified as part of the SW 10th Street Connector project, in order to accommodate the Build Alternative. An existing east-west access road along the south side of SW 10th Street connects driveways for 6 buildings including the South Florida Bible College, Walmart, and Palm Trails Plaza. The access road has four connections to SW 10th Street; two inbound driveways and two outbound driveways. The access road will be eliminated as it lies within the right-of-way that is required to reconstruct the SW 10th street local lanes. With local SW 10th Street narrowed in this area, both westbound left turn lanes into the two driveways must be eliminated. Westbound SW 10th Street traffic that turns left here, will be rerouted to SW 24th Avenue or SW 28th Avenue to make a u-turn, and then a right-turn into the properties. At least four right-in-right-out driveway connections will be constructed for traffic to enter and exit the businesses. To travel west on SW 10th Street, traffic exiting these driveways will make a right turn, travel east on SW 10th Street, and make a u-turn at Military Trail.

6.3 Build Alternative 2040 Peak Hour Volumes

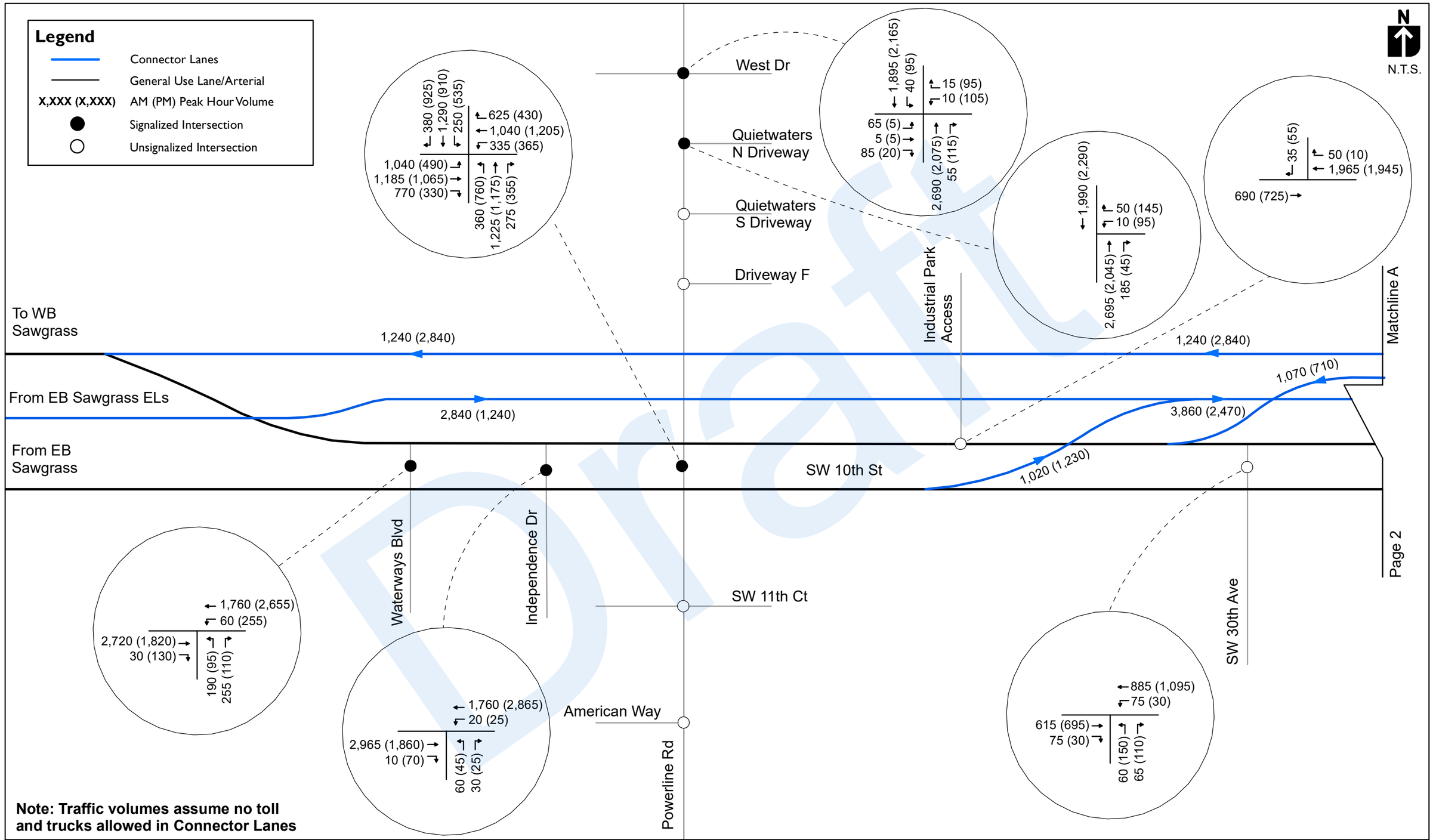
A summary of the forecasting process used to develop 2040 volumes is provided in Section 3.4 Travel Demand Forecasting. The development of the travel demand forecast for the Build Alternative is documented in the *SW 10th Street Connector – Toll-Free Project Traffic Forecast Memorandum, dated July 2019*, prepared by FTE. This Technical Memorandum is attached in Appendix B, as a companion reference document.

As with the No Action Alternative, future volumes developed for the Build Alternative assume adjacent improvements on Sawgrass Expressway, Turnpike, and I-95 are constructed. The forecasted volumes were developed based on the following key assumptions:

- Express lanes on I-95, Turnpike, and Sawgrass Expressway are completed;
- Interchange improvements at Sawgrass Expressway and Turnpike are completed, including new general use lane and express lane ramps;
- Interchange improvements at I-95 and SW 10th Street are completed, including new general use lane and express lane ramps;
- SW 10th Street arterial lanes remain the same number of lanes as existing (2-3 lanes in each direction);
- Proposed new Connector managed lanes (2-3 lanes in each direction) between Sawgrass Expressway, Turnpike and I-95 are constructed;
- All vehicles including trucks are eligible to use the Connector managed lanes, and;
- The Connector managed lanes are not tolled.

The development of design hour traffic followed procedures outlined in the FDOT Project Traffic Forecasting Handbook. Intersection volumes were developed using TMTool, and peak hour traffic forecasts were balanced along the corridor.

Figure 6-3 depicts the 2040 AM and PM peak hour traffic volumes forecasted for the Build Alternative.



Note: Traffic volumes assume no toll and trucks allowed in Connector Lanes

FDOT / SW 10th Street Connector	**State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95** **Financial Project ID: 439891-1-22-02, ETDM No: 14291**	**Figure 6-3** **Build Alternative** **2040 Peak Hour Volumes**	**Page 1 of 3**

Legend

- Connector Lanes
- General Use Lane/Arterial
- X,XXX (X,XXX) AM (PM) Peak Hour Volume
- Signalized Intersection
- Unsignalized Intersection

N

N.T.S.

Military Trail

East Drive

310 (615)
530 (830)
490 (440)
500 (540)
355 (340)
340 (495)
300 (330)
205 (320)
145 (185)
170 (285)
670 (585)
680 (390)

Matchline A

Matchline B

1,240 (2,840)
1,070 (710)
2,310 (3,550)
2,310 (3,550)
3,860 (2,470)
3,860 (2,470)
2,260 (1,120)
2,260 (1,120)

SW 10th St

SW 10th St

Page 1

Page 3

SW 28th Ave

SW 24th Ave

W. Driveway

E. Driveway

580 (645)
70 (150)
70 (190)

Palm Trails Plaza

1,600 (1,350)

The Lakes at Deerfield Apts Driveway

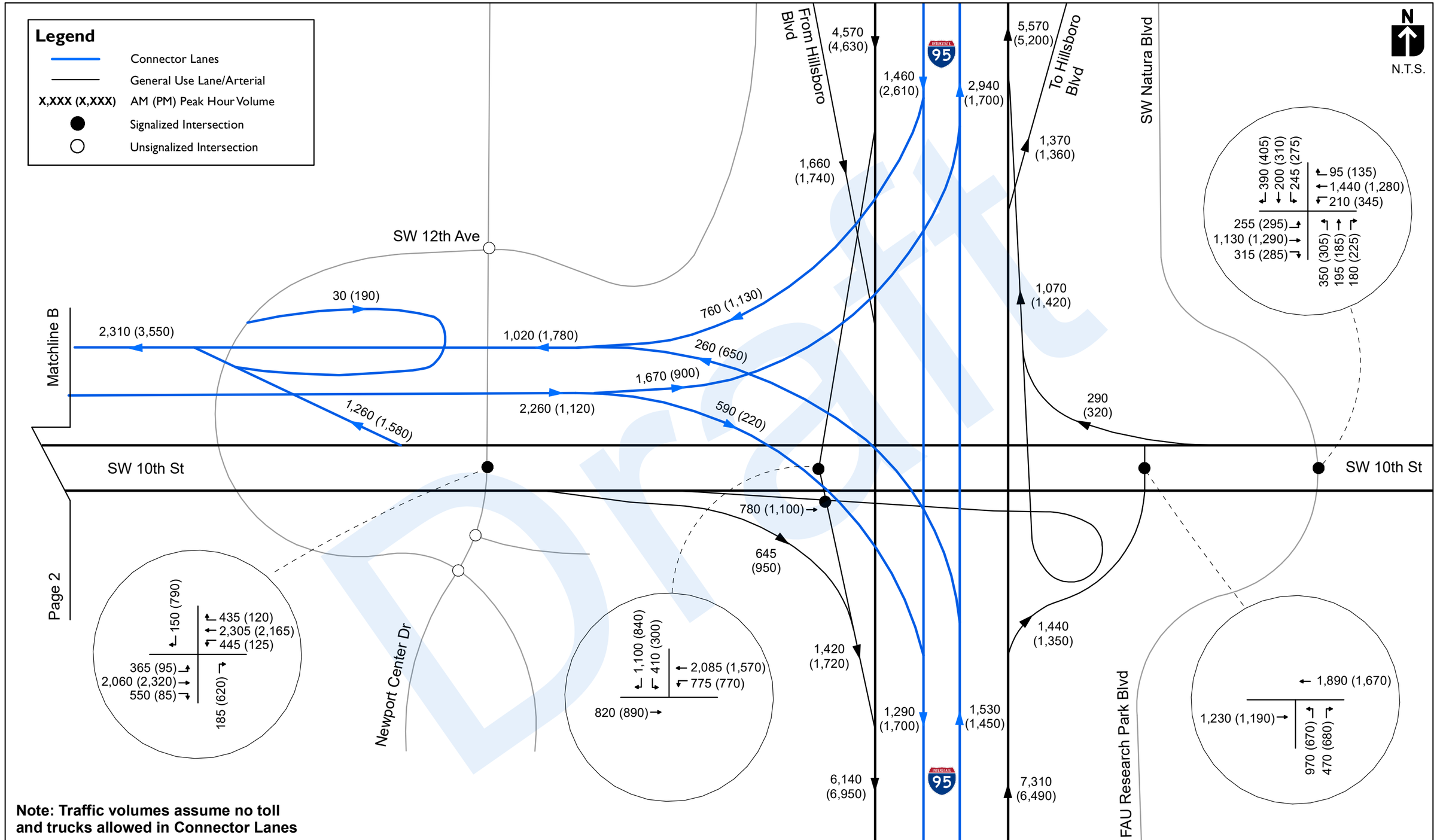
Horizon Club Driveway

740 (1,010)
30 (170)
600 (630)
80 (175)
220 (115)
130 (110)

720 (1,130)
25 (20)
90 (90)
565 (635)
165 (105)
50 (50)
35 (35)

630 (710)
60 (50)
20 (85)

Note: Traffic volumes assume no toll and trucks allowed in Connector Lanes



Note: Traffic volumes assume no toll and trucks allowed in Connector Lanes

State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95
Financial Project ID: 439891-1-22-02, ETDM No: 14291

Figure 6-3
Build Alternative
2040 Peak Hour Volumes

6.4 Build Alternative Traffic Analysis

Traffic analysis of the SW 10th Street corridor was conducted for the Build Alternative given 2040 design year conditions. The road network geometry and peak hour traffic volumes used in the analyses are consistent with the information presented in Figure 6-2 and Figure 6-3, respectively.

Using FDOT's generalized LOS tables, the volume-to-capacity (V/C) and LOS of the SW 10th Street segments was determined. As noted previously, the roadway capacity for the SW 10th Street local lanes is based on the LOS D thresholds for a Class II state signalized arterial (35 mph or less). Capacity thresholds from the Highway Capacity Manual were used to determine the Connector managed lanes V/C ratios.

VISSIM microsimulation analysis software was used to evaluate speeds, queueing, and congestion along the SW 10th Street local lanes. It was also used to evaluate operations in the SW 10th Street Connector managed lanes including speeds and weaving. In addition, intersection LOS, delay, and 95th percentile queues were evaluated using VISSIM, for each of the study intersections along SW 10th Street local lanes between Waterways Boulevard and Natura Park Boulevard / FAU Research Park Boulevard.

6.4.1 Build Alternative- 2040 LOS and V/C Analysis

The directional peak hour volumes were compared to the roadway capacity to assess the 2040 traffic conditions along the corridor under the Build Alternative. The resultant LOS and V/C ratios of the SW 10th Street local lanes are summarized in Table 6-1, while the Connector managed lanes V/C is reported in Table 6-2.

Table 6-2: 2040 Build Alternative – Local Lanes LOS and V/C Analysis

SW 10th Street Local Lane Segments		No. of	Volume		Capacity (1)	LOS(2)		V/C (3)	
	Location Description	Lanes	AM	PM		AM	PM	AM	PM
SW 10th Street Eastbound	West of Waterways Blvd	3	2,750	1,950	2,646	F	D	1.04	0.74
	Waterways Blvd to Independence Dr	3	2,975	1,930	2,646	F	D	1.12	0.73
	Independence Dr to Powerline Rd	3	2,995	1,885	2,646	F	D	1.13	0.71
	Powerline Rd to eastbound Connector managed lanes ingress	3	1,710	1,955	2,646	D	D	0.65	0.74
	Eastbound Connector managed lanes ingress to SW 28th Ave	2	690	805	1,712	C	D	0.40	0.47
	SW 28th Ave to SW 24th Ave	2	730	740	1,712	C	C	0.43	0.43
	SW 24th Ave to Military Trail	2	650	835	1,712	C	D	0.38	0.49
	Military Trail to eastbound Connector managed lanes egress	2	1,375	1,150	1,712	D	D	0.80	0.67
	Eastbound Connector managed lanes egress to Newport Center Dr	3	2,975	2,500	2,646	F	D	1.12	0.94
	Newport Center Dr to I-95 SB On-Ramp	4	2,245	2,940	3,560	D	D	0.63	0.83
	I-95 SB On-Ramp to I-95 NB Off-Ramp	3	1,230	1,190	2,646	D	C	0.46	0.45
	I-95 NB Off-Ramp to Natura Blvd	3	1,700	1,870	2,646	D	D	0.64	0.71
	East of Natura Blvd	3	1,555	1,790	2,646	D	D	0.59	0.68
SW 10th Street Westbound	West of Waterways Blvd	3	1,950	2,750	2,646	D	F	0.74	1.04
	Waterways Blvd to Independence Dr	3	1,820	2,910	2,646	D	F	0.69	1.10
	Independence Dr to Powerline Rd	3	1,780	2,890	2,646	D	F	0.67	1.09
	Powerline Rd to SW 30th Ave / westbound Connector managed lanes egress	3	2,000	2,000	2,646	D	D	0.76	0.76
	SW 30th Ave / westbound Connector managed lanes egress to SW 28th Ave	2	960	1,125	1,712	D	D	0.56	0.66
	SW 28th Ave to SW 24th Ave	2	770	1,180	1,712	D	D	0.45	0.69
	SW 24th Ave to Military Trail	2	835	1,240	1,712	D	D	0.49	0.72
	Military Trail to Newport Center Dr / westbound Connector managed lanes ingress	3	1,195	1,375	2,646	C	D	0.45	0.52
	Newport Center Dr / westbound Connector managed lanes ingress to I-95 SB Off-Ramp	3	3,185	2,410	2,646	F	D	1.20	0.91
	I-95 SB Off-Ramp to west of Natura Blvd	5	2,860	2,340	4,473	D	D	0.64	0.52
	West of Natura Blvd to east of Natura Blvd	3	2,180	1,990	2,646	D	D	0.82	0.75

NOTES
(1) Capacity thresholds from FDOT 2012 Generalized LOS Peak Hour Directional Volumes Table for Urbanized Areas at LOS D for Class II arterial (35 mph or less), with +5% capacity adjustment for right turn lanes. 5LD capacity estimated as 870 additional capacity added to 4LD capacity.
(2) LOS = Level of Service
(3) V/C = Ratio of Volume to Capacity

SW 10th Street Local Lanes

AM Peak Hour

The majority of eastbound traffic in the AM peak hour under the Build Alternative will operate at LOS D or better, except for the segments from west of Waterways Boulevard to Powerline Road, and from the Connector managed lanes egress to Newport Center Drive. Westbound traffic will also operate at LOS D or better except for one segment from Newport Center Drive to the southbound I-95 off-ramp. The eastbound and westbound volume-to-capacity ratios throughout the corridor are all well below 1.0 except in those segments previously noted.

PM Peak Hour

During the PM peak hour, eastbound traffic will operate at LOS D or better throughout the corridor, with volume-to-capacity ratios below 1.0. Westbound traffic will operate at LOS D or better, except between Powerline Road and west of Waterways Boulevard.

The results in Table 6-1 indicate that the SW 10th Street local lanes will generally allow traffic to move freely (at LOS D or better in the peak hours), except for a few segments during the peak hours. However, on those few segments where the volumes exceed capacity, the magnitude is much less than under the No Action Alternative. The additional capacity along SW 10th Street will improve local traffic flow.

SW 10th Street Connector Managed Lanes

Table 6-2 shows the SW 10th Street Connector managed lanes 2040 Build Alternative peak hour directional volume-to-capacity analysis. Under the Build Alternative, all Connector managed lane segments are expected to have a volume-to-capacity ratio less than 1.0. This indicates that the capacity provided by two lanes in each direction, along with a third auxiliary lane between the ingress and egress points, can accommodate the demand forecasted for the connector lanes. The capacity of the one-lane intermediate entrance and exit ramps between Powerline Road and Newport Center Drive will accommodate the forecasted future volumes.

Table 6-3: 2040 Build Alternative – Connector Managed Lanes V/C Analysis

SW 10th Street Connector Lane Segments		No. of	Volume		Capacity (1)	V/C (2)	
	Location Description	Lanes	AM	PM		AM	PM
SW 10th Street Eastbound	From west of Waterways Blvd to on ramp west of SW 30th Ave	2	2,840	1,240	4,000	0.71	0.31
	Eastbound on ramp west of SW 30th Ave	1	1,020	1,230	1,650	0.62	0.75
	From on ramp west of SW 30th Ave to off ramp east of Military Trail	3	3,860	2,470	6,000	0.64	0.41
	Eastbound off ramp east of Military Trail	1	1,600	1,350	1,650	0.97	0.82
	From off ramp east of Military Trail to I-95 direct-connect ramps	2	2,260	1,120	4,000	0.57	0.28
SW 10th Street Westbound	From west of Waterways Blvd to off ramp west of SW 24th Ave	2	1,240	2,840	4,000	0.31	0.71
	Westbound off ramp west of SW 24th Ave	1	1,070	710	1,650	0.65	0.43
	From off ramp west of SW 24th Ave to on ramp west of Newport Center Drive	3	2,310	3,550	6,000	0.39	0.59
	Westbound (loop) on ramp from Newport Center Dr	1	30	190	1,650	0.02	0.12
	Westbound on ramp west of Newport Center Dr	1	1,260	1,580	1,650	0.76	0.96
	From on ramp west of Newport Center Dr to I-95 direct-connect ramps	2	1,020	1,780	4,000	0.26	0.45

NOTES:
(1) Capacity thresholds (pc/h/ln) from HCMV6.0 Exhibit 12-11 for 65 mph FFS Managed Lane Segments.
(2) V/C = Ratio of Volume to Capacity

6.4.2 Build Alternative - 2040 VISSIM Analysis

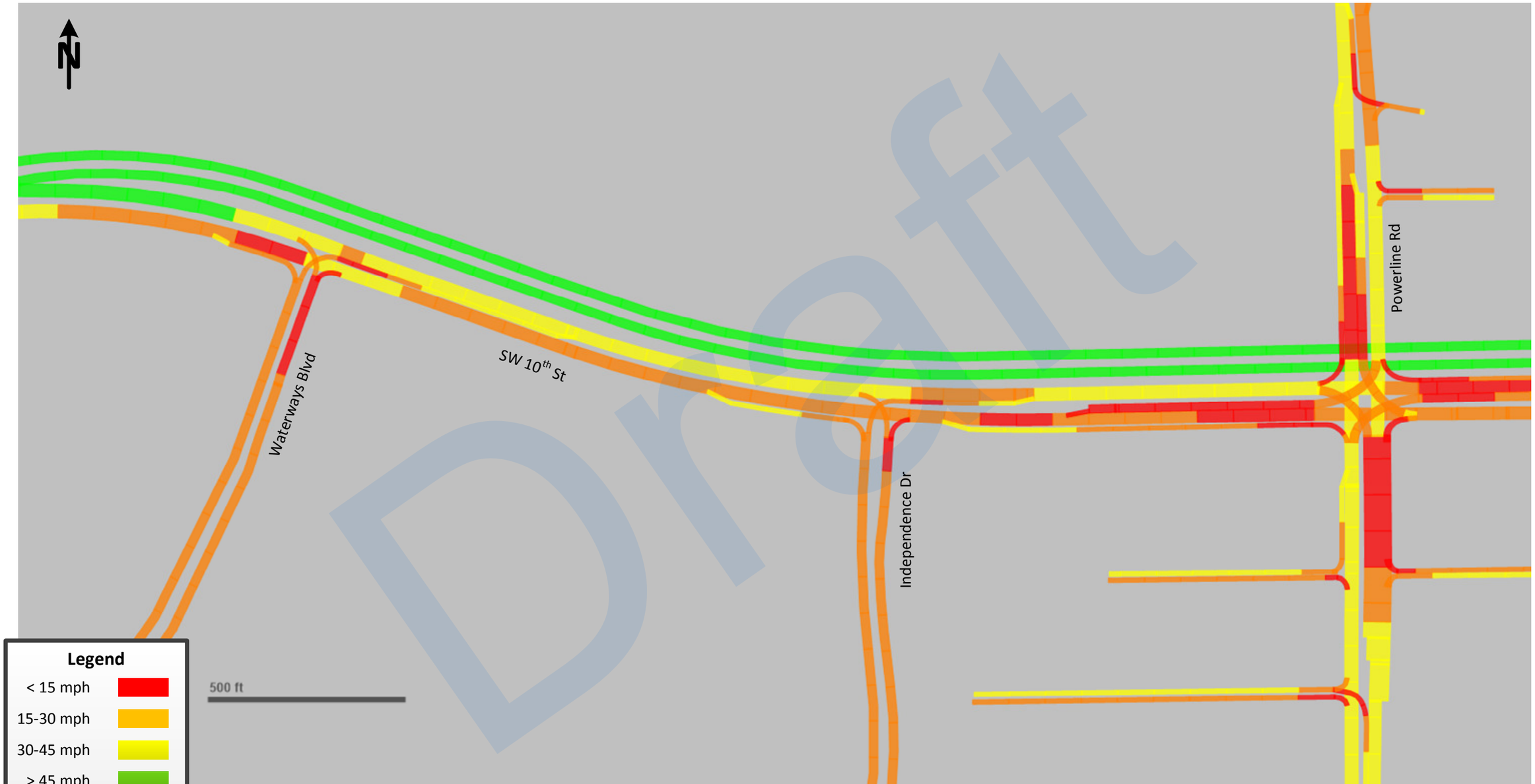
To analyze the design year 2040 AM and PM peak periods for the Build Alternative, a detailed microsimulation analysis using VISSIM 8.0 was conducted.

Estimated 2040 AM and PM peak hour truck percentages used for the 2040 VISSIM analysis are shown in Table 3-1 in Section 3.5 of this report. Two types of trucks were coded into the 2040 VISSIM models to represent 2 axle trucks, and trucks with 3 or more axles. All vehicle types were allowed to travel in the SW 10th Street Connector managed lanes, from the new entrance and exit ramps west of Waterways Boulevard, to the entrance and exit ramps at Newport Center Drive. Trucks with 3 or more axles were prohibited from accessing the Sawgrass, Turnpike, and I-95 express lane facilities, including the direct connect ramps. In addition, no toll was implemented for vehicles choosing to use the Connector managed lanes from the new entrance and exit ramps west of Waterways Boulevard, to the entrance and exit ramps at Newport Center Drive.

The 180 second cycle length implemented in 2018 at all the signalized study intersections along the corridor, was used for the 2040 analysis. Splits were optimized as appropriate using Synchro software. Approved intersection peak hour factors determined in coordination with FDOT District Four and noted in Section 3.5 were used for future conditions analysis. The 2040 Build Alternative VISSIM analysis output is provided in Appendix G. Synchro HCM2000 reports and "Lanes, volumes, timings" reports are provided for additional information in Appendix G.

Overall, the Build Alternative results indicate acceptable network-wide traffic operations during both the AM and PM peak hours. The 2040 link evaluation results, showing speeds along SW 10th Street and the cross streets during 2040 AM and PM peak hours, are summarized in Figures 6-4 and 6-5, respectively. In addition, volume and speed profiles are included in Appendix G.

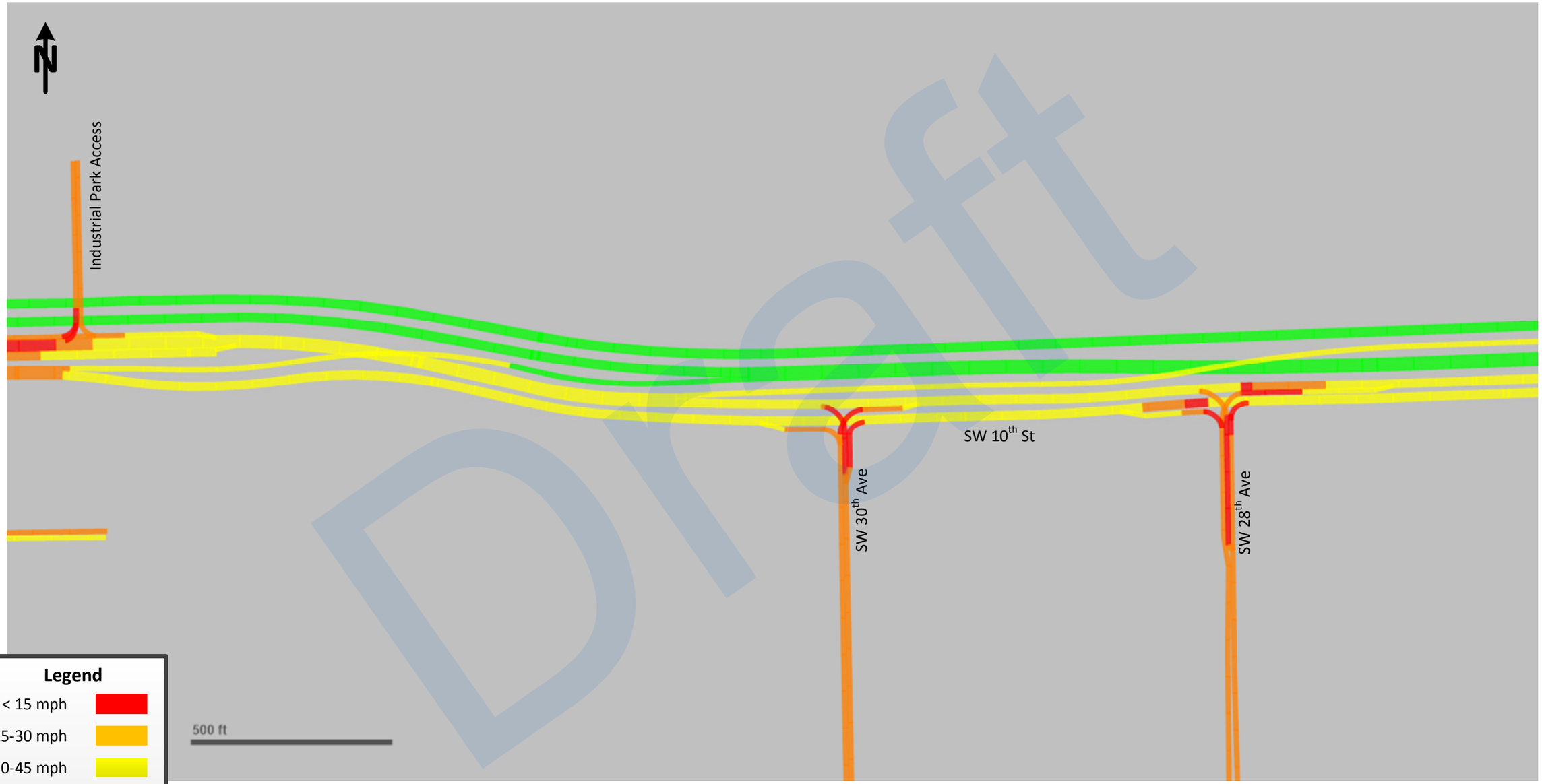
Build Alternative
2040 AM Peak Hour Average Travel Speed (Waterways Blvd to East of Powerline Rd)



Note: Traffic volumes assume no toll and trucks allowed in Connector Lanes

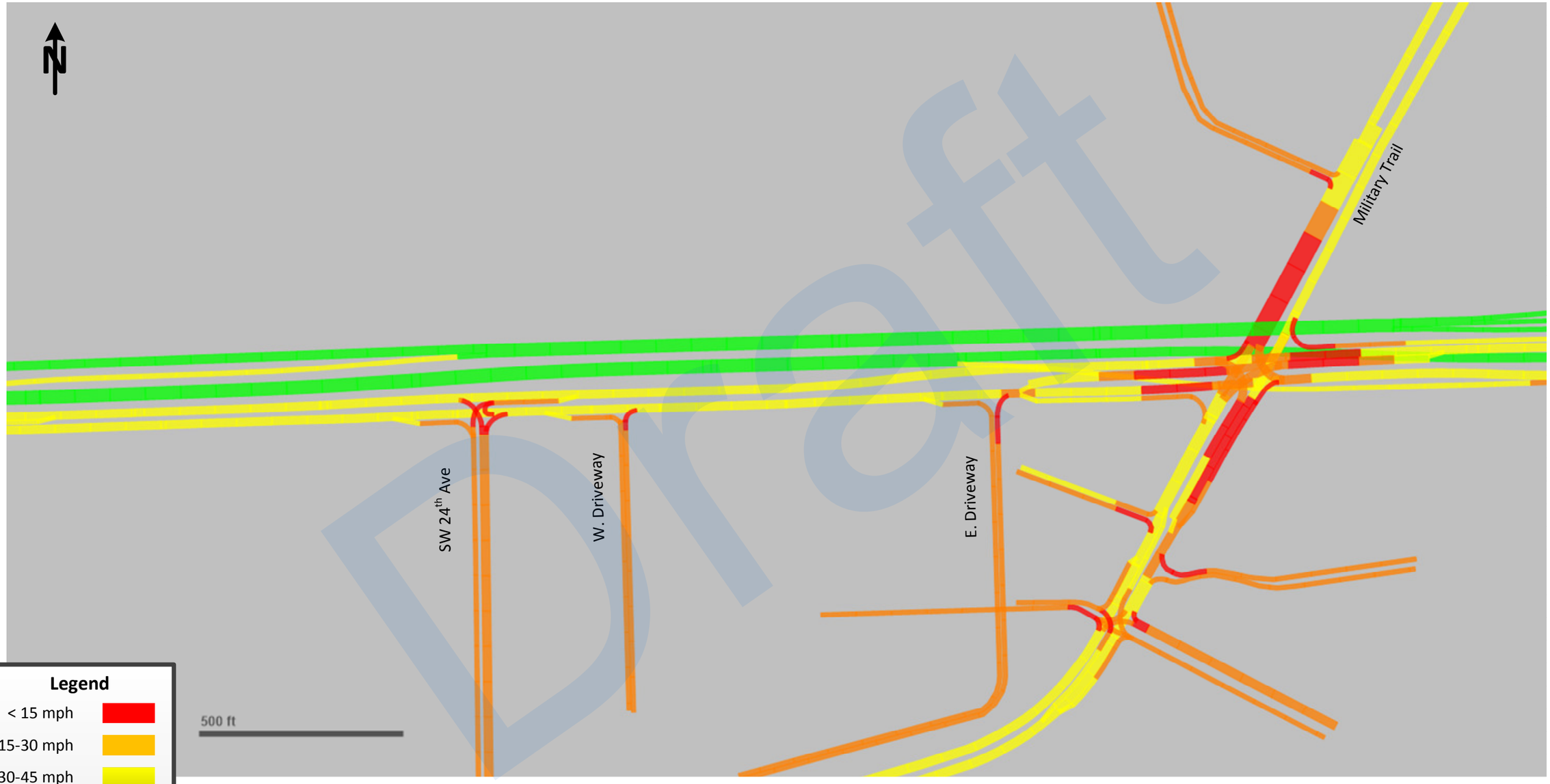
FDOT / SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 6-4 Build Alternative 2040 AM Peak Hour Average Travel Speed	Page No. 1 of 4

Build Alternative
2040 AM Peak Hour Average Travel Speed (East of Powerline Rd to East of SW 28th Ave)



Note: Traffic volumes assume no toll and trucks allowed in Connector Lanes

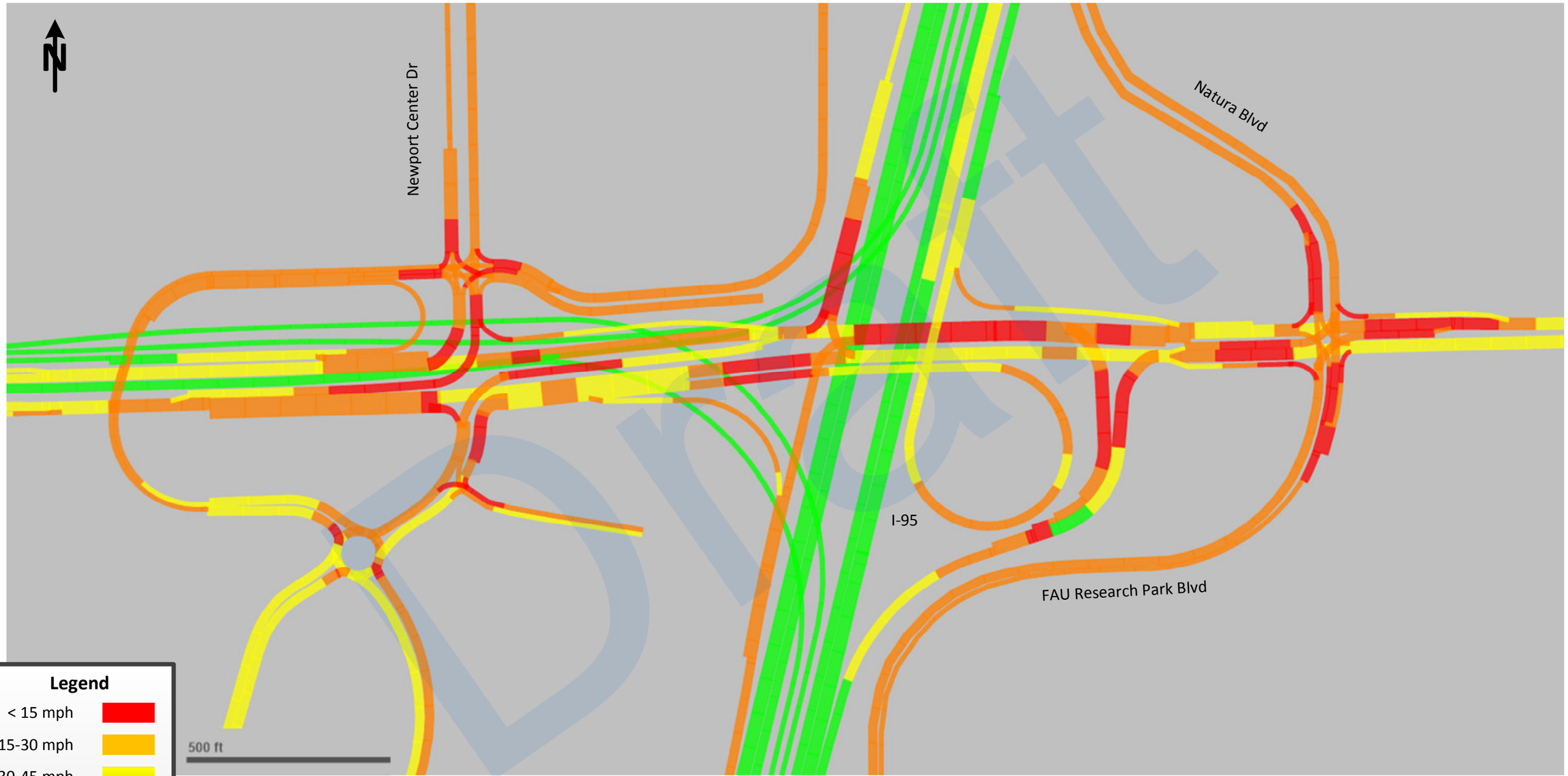
Build Alternative
2040 AM Peak Hour Average Travel Speed (East of SW 28th Ave to East of Military Trail)



Note: Traffic volumes assume no toll and trucks allowed in Connector Lanes

FDOT / SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 6-4 Build Alternative 2040 AM Peak Hour Average Travel Speed	Page No. 3 of 4

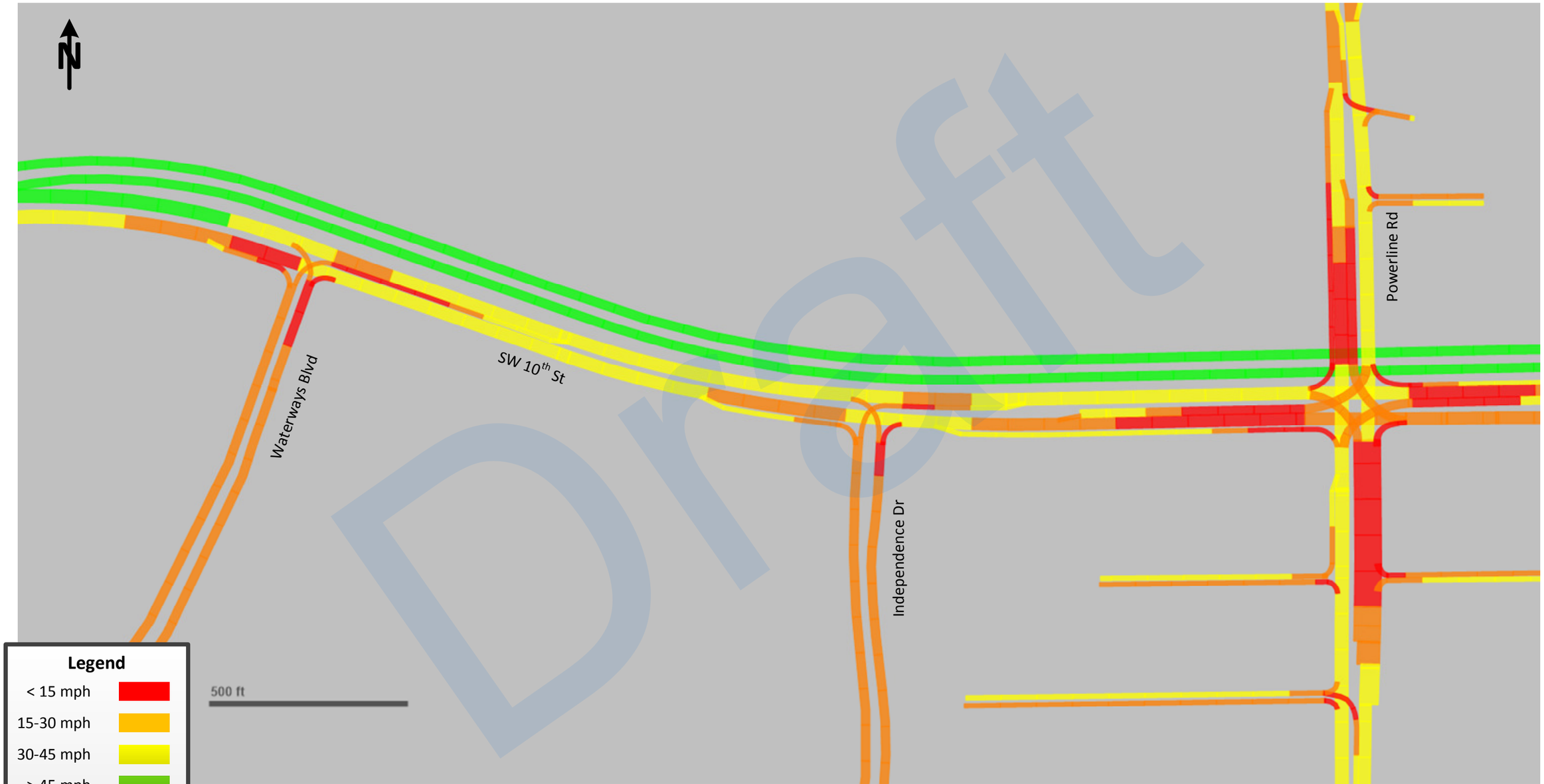
Build Alternative
2040 AM Peak Hour Average Travel Speed (East of Military Trail to FAU Research Park Blvd)



Note: Traffic volumes assume no toll and trucks allowed in Connector Lanes

FDOT / SW 10th Street Connector	**State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95** **Financial Project ID: 439891-1-22-02, ETDM No: 14291**	**Figure 6-4** **Build Alternative** **2040 AM Peak Hour** **Average Travel Speed**	**Page No.** **4 of 4**

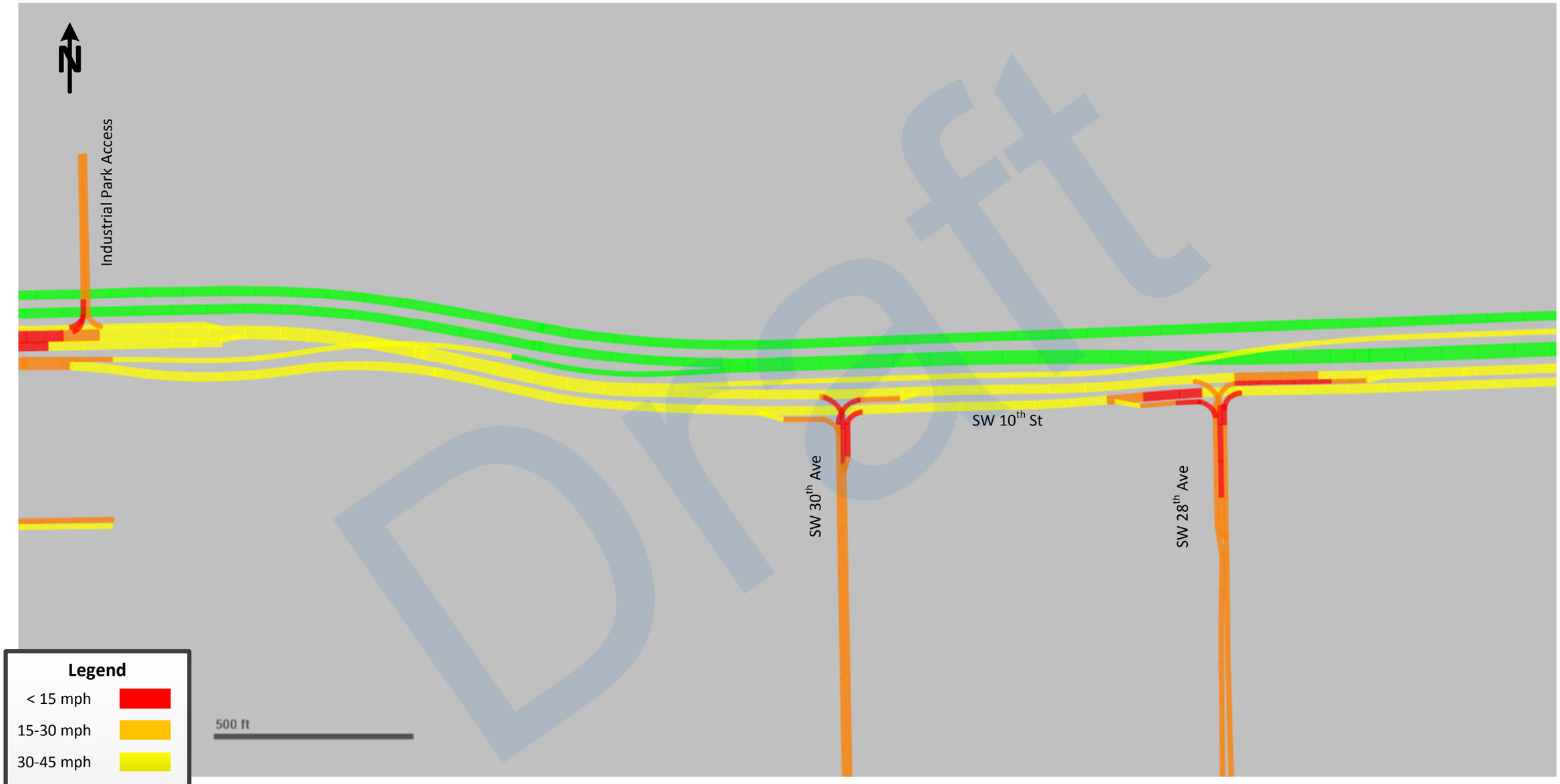
Build Alternative
2040 PM Peak Hour Average Travel Speed (Waterways Blvd to East of Powerline Rd)



Note: Traffic volumes assume no toll and trucks allowed in Connector Lanes

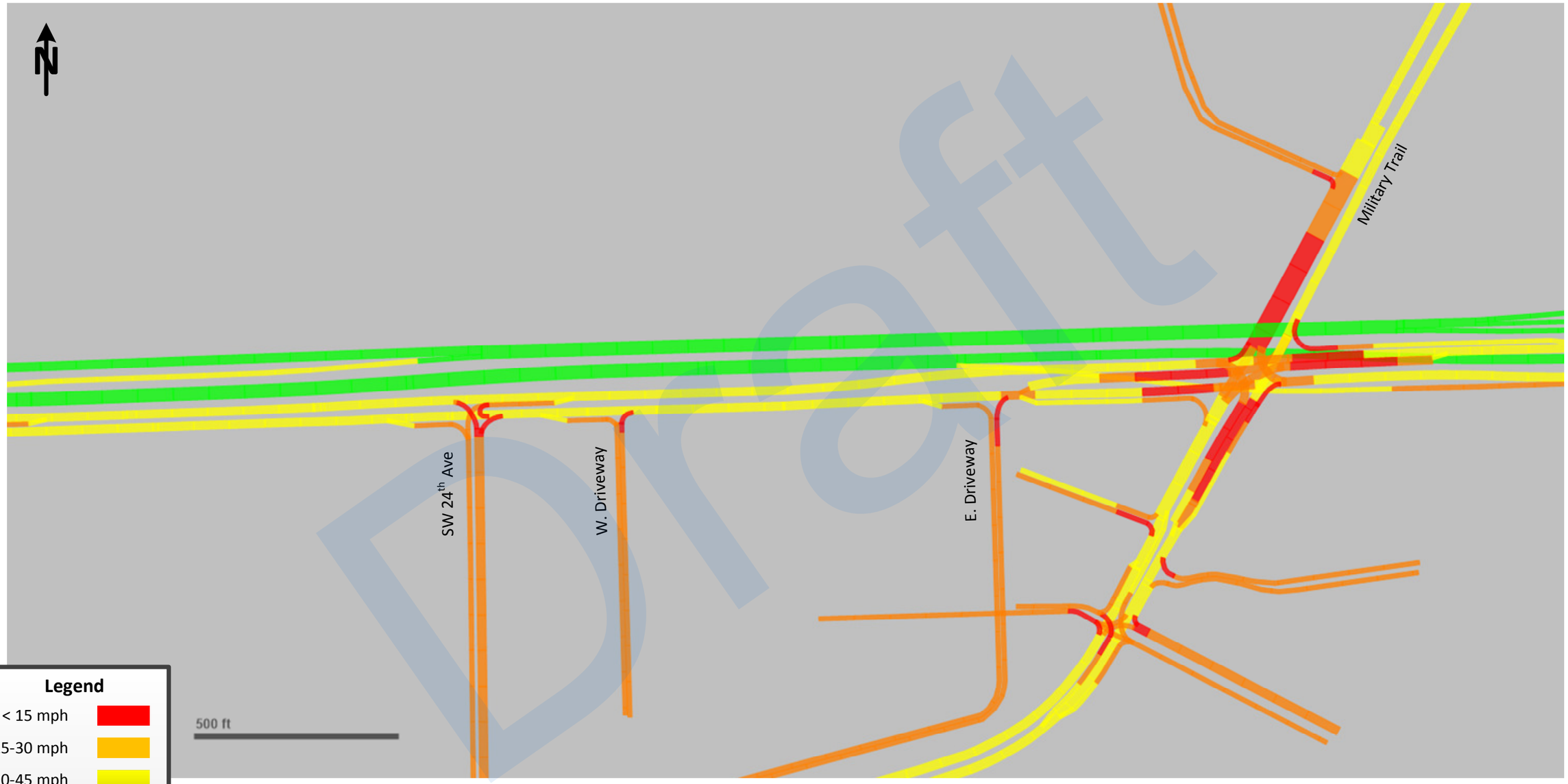
FDOT / SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 6-5 Build Alternative 2040 PM Peak Hour Average Travel Speed	Page No. 1 of 4

Build Alternative
2040 PM Peak Hour Average Travel Speed (East of Powerline Rd to East of SW 28th Ave)



Note: Traffic volumes assume no toll and trucks allowed in Connector Lanes

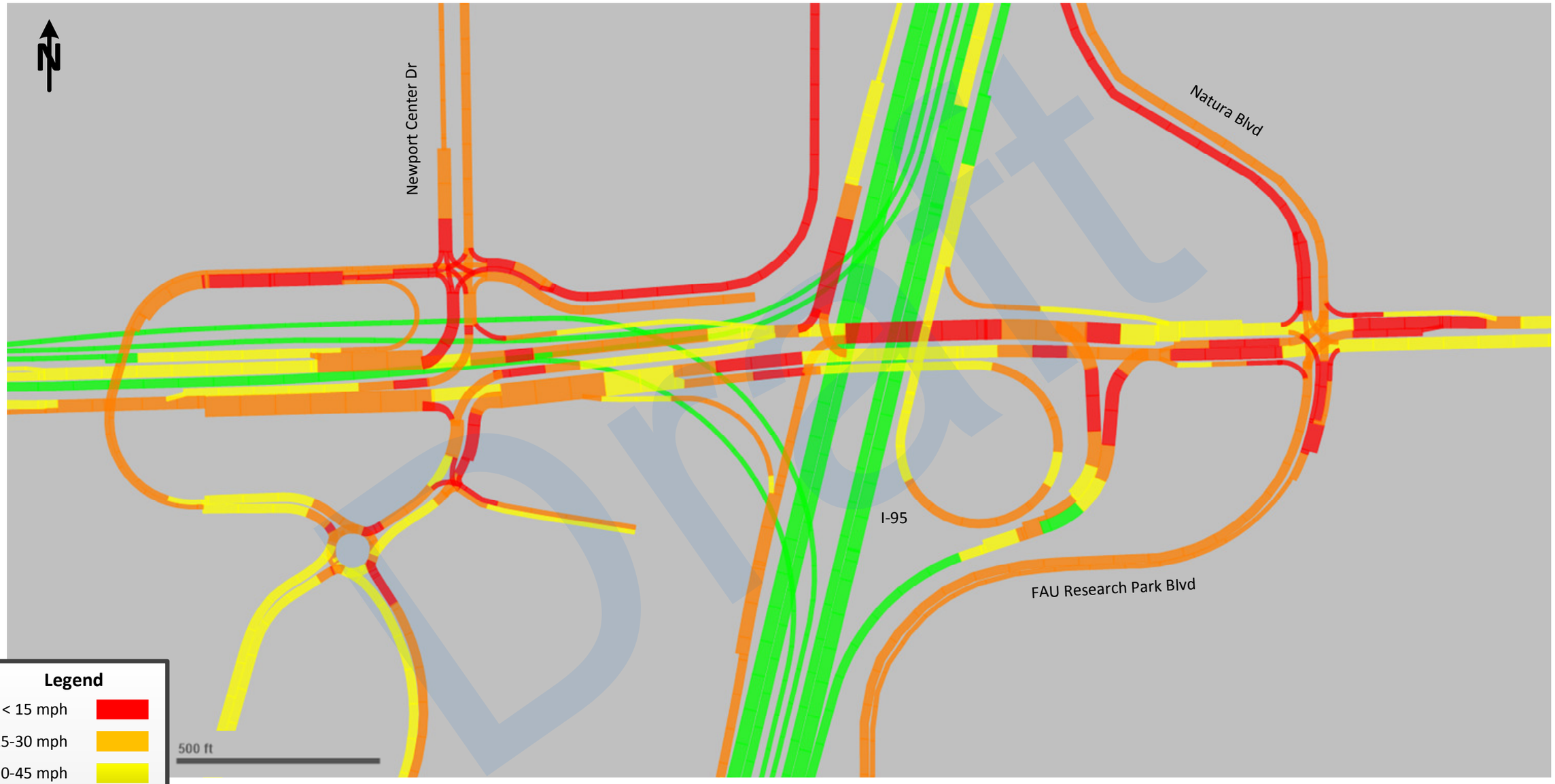
Build Alternative
2040 PM Peak Hour Average Travel Speed (East of SW 28th Ave to East of Military Trail)



Note: Traffic volumes assume no toll and trucks allowed in Connector Lanes

FDOT / SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 6-5 Build Alternative 2040 PM Peak Hour Average Travel Speed	Page No. 3 of 4

Build Alternative
2040 PM Peak Hour Average Travel Speed (East of Military Trail to FAU Research Park Blvd)



Note: Traffic volumes assume no toll and trucks allowed in Connector Lanes

FDOT / SW 10th Street Connector	State Road 869 / SW 10th Street Connector PD&E Study from Florida's Turnpike / Sawgrass Expressway to I-95 Financial Project ID: 439891-1-22-02, ETDM No: 14291	Figure 6-5 Build Alternative 2040 PM Peak Hour Average Travel Speed	Page No. 4 of 4

AM Peak Hour Link Evaluation

VISSIM analysis of SW 10th Street during the AM peak hour revealed that traffic speeds between intersections were between 30 mph and 35 mph along SW 10th Street from Powerline Road to Military Trail. Speeds were mostly between 15 mph and 30 mph between intersections from west of Waterways Boulevard to Powerline Road, and from Military Trail to Natura Boulevard/FAU Research Park Boulevard. With a speed limit of 35 mph on SW 10th Street, the analysis shows acceptable travel speeds and queuing along the corridor.

At Powerline Road, average travel speeds between 30 mph and 45 mph are maintained on both the northbound and southbound legs, and queuing is reasonable such that upstream operations are not significantly disrupted. Likewise, operations on the northbound and southbound approaches of the Military Trail intersection are acceptable, with queues extending no further than the upstream side streets. Modest queuing is anticipated on the northbound and southbound I-95 off-ramps and does not impact the mainline. Average speeds in the SW 10th Street Connector managed lanes are at least 45 mph.

PM Peak Hour Link Evaluation

VISSIM analysis of the 2040 PM peak hour indicated speeds between 30 mph and 35 mph along SW 10th Street from west of Waterways Boulevard to Military Trail. Speeds were mostly between 15 mph and 30 mph from Military Trail to Natura Boulevard/FAU Research Park Boulevard. As with the AM peak hour, the analysis shows acceptable travel speeds along the SW 10th Street local lanes.

On the northbound leg of Powerline Road, average travel speeds between 30 mph and 45 mph are expected, and between 15 mph and 30 mph on the southbound leg. The southbound right-turn lane on Powerline Road will exhibit significant queuing but is constrained to the provided storage length. Simulated 2040 PM peak hour operations on the northbound and southbound approaches to the Military Trail intersection will be acceptable. Queues extend no further than the upstream side streets and do not impact operations. On the northbound and southbound I-95 off-ramps, vehicular queues are retained on the ramps and do not extend onto the mainline. Overall, average speeds in the SW 10th Street Connector managed lanes will be at least 45 mph.

SW 10th Street Connector Managed Lanes Ingress/Egress Weave Evaluation

An analysis of the eastbound and westbound traffic entering and exiting the SW 10th Street Connector managed lanes between Powerline Road and Newport Center Drive was conducted using the 2040 Build Alternative VISSIM model. Based on the Build Alternative design concept, the distance between the eastbound ingress and eastbound egress point is approximately 4,300 feet. The distance between the westbound ingress point and westbound egress point is approximately 2,600 feet. Entering and exiting traffic must change lanes within these distances, resulting in weave sections.

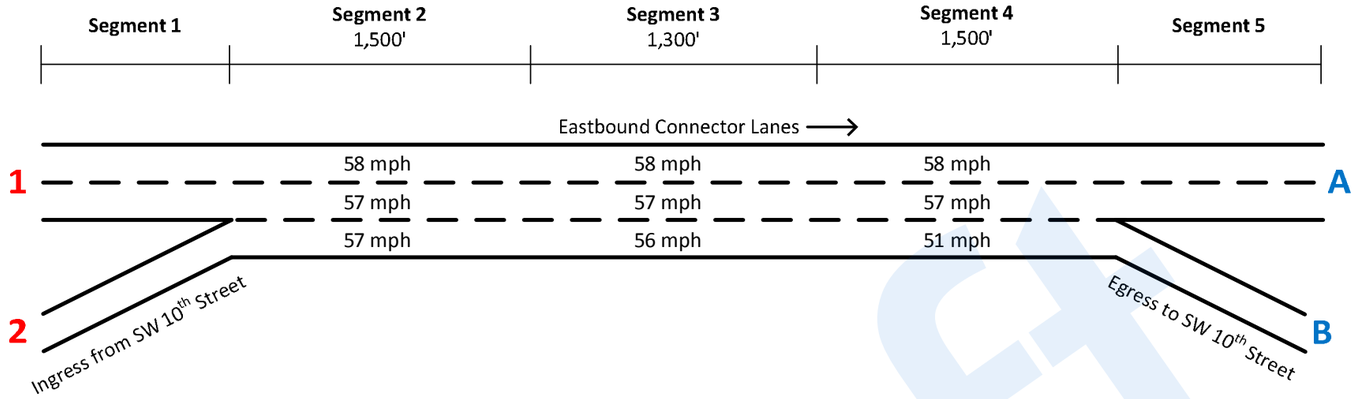
The segment of the SW 10th Street Connector managed lanes between the ingress and egress points spans over Military Trail, and was termed the "Military Trail bypass," because local SW 10th Street traffic can use it to bypass the intersection. The need for an auxiliary lane in each direction between the on and off ramps was evaluated. Speeds were evaluated with and without an auxiliary lane, and the influence of truck traffic was taken into consideration. Without an auxiliary lane, noticeably slower speeds (30-45 mph) were recorded in the 2040 AM peak hour in the eastbound direction at the on-ramp merge point into the two eastbound Connector lanes east of Powerline Road. In addition, slow speeds were recorded in the 2040 PM peak hour in the westbound direction at the on ramp merge point west of Military Trail.

The vertical profile of the Connector lanes in this segment is also important to consider. There is a significant grade change as the Connector lanes are elevated over Military Trail. Although the traffic operational analysis models do not consider it, this is expected to have an influence on the ability for traffic (including large trucks) to accelerate and decelerate, potentially merging and diverging at a slower rate. Therefore, an auxiliary lane (third lane) in each direction was recommended on the Connector between the on-ramp and off-ramp and included in the design concept.

Figure 6-6 presents a summary of the 2040 AM peak hour density and speed-based analysis results. In the eastbound direction, LOS D or better is maintained for all segments, including the two lane segment prior to the ingress point, the three lane segment between the managed lane ingress and egress points, and the two lane segment past the egress point. In the westbound direction, LOS D or better is achieved for all segments as well. All individual lanes in the eastbound and westbound directions experience average speeds higher than 50 mph.

Figure 6-7 graphically illustrates density and speed-based analysis of the managed lane access points during the 2040 PM peak hour. In both the eastbound and westbound directions, LOS D or better is maintained for all segments before, after, and between the managed lane ingress and egress points. The eastbound and westbound individual lanes all have average speeds greater than 50 mph.

Eastbound Connector Lane Access

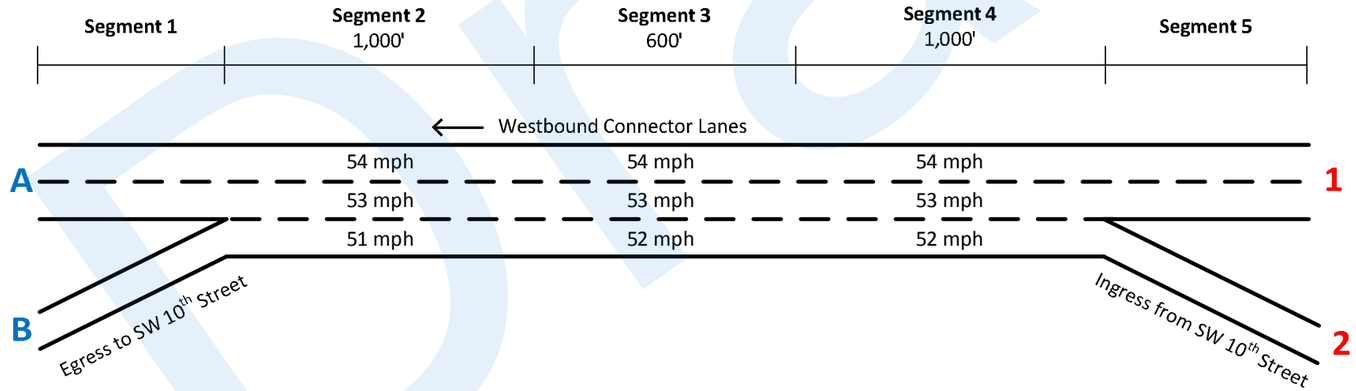


Location	Density (vpmpl) Peak Hour
Eastbound - Segment 1	25
Eastbound - Segment 2	33
Eastbound - Segment 3	22
Eastbound - Segment 4	23
Eastbound - Segment 5	21

O-D Pair	Peak Hour Volume Simulated (Demand)
1-A	1693 (1720)
1-B	1100 (1120)
2-A	526 (540)
2-B	478 (480)

Legend	Density for Freeway Weaving Segments
LOS A & B	0 – 20 pc/mi/ln
LOS C & D	20 - 35 pc/mi/ln
LOS E & F	> 35 pc/mi/ln

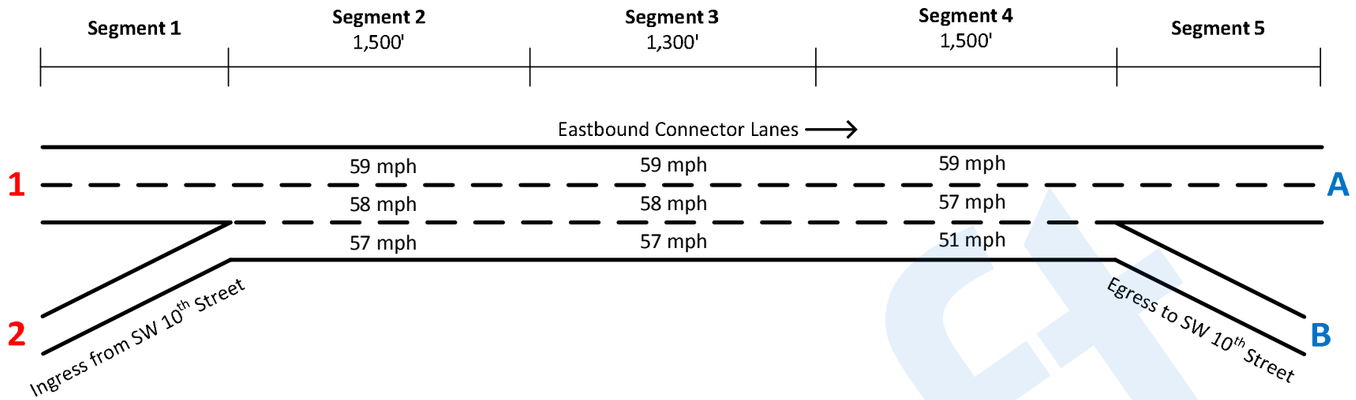
Westbound Connector Lane Access



Location	Density (vpmpl) Peak Hour
Westbound - Segment 1	10
Westbound - Segment 2	14
Westbound - Segment 3	14
Westbound - Segment 4	22
Westbound - Segment 5	11

O-D Pair	Peak Hour Volume Simulated (Demand)
1-A	671 (660)
1-B	363 (370)
2-A	565 (590)
2-B	691 (710)

Eastbound Connector Lane Access

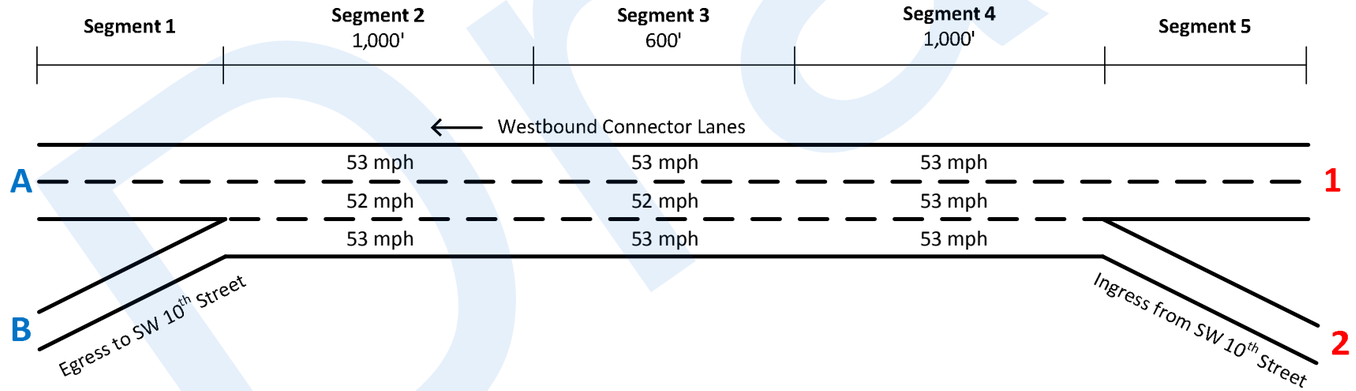


Location	Density (vpmpl) Peak Hour
Eastbound - Segment 1	10
Eastbound - Segment 2	21
Eastbound - Segment 3	14
Eastbound - Segment 4	14
Eastbound - Segment 5	10

O-D Pair	Peak Hour Volume Simulated (Demand)
1-A	717 (730)
1-B	495 (510)
2-A	379 (390)
2-B	832 (840)

Legend	Density for Freeway Weaving Segments
LOS A & B	0 – 20 pc/mi/ln
LOS C & D	20 - 35 pc/mi/ln
LOS E & F	> 35 pc/mi/ln

Westbound Connector Lane Access



Location	Density (vpmpl) Peak Hour
Westbound - Segment 1	17
Westbound - Segment 2	22
Westbound - Segment 3	22
Westbound - Segment 4	33
Westbound - Segment 5	25

O-D Pair	Peak Hour Volume Simulated (Demand)
1-A	1651 (1640)
1-B	143 (140)
2-A	1147 (1200)
2-B	534 (570)

AM Peak Hour Intersection Analysis

VISSIM was also used to analyze the study intersections along the SW 10th Street corridor. Table 6-3 shows the AM peak hour intersection operational results for the Build Alternative. The Build Alternative 2040 AM peak hour results show all study area intersections operating at an acceptable level of service (D or better). AM peak hour maximum queue lengths indicate that vehicles will not back up to the Sawgrass Expressway or I-95. These results are significantly better than the 2040 AM peak hour intersection analysis results for the No Action Alternative, which showed 7 of the 10 intersections would operate below LOS D.

PM Peak Hour Intersection Analysis

The 2040 Build Alternative PM peak hour results are summarized in Table 6-4. As with the AM peak hour results, the PM peak hour results indicate that all study area intersections will operate at an acceptable level of service (D or better). In addition, based on the maximum queue lengths, vehicles will not back up to the Sawgrass Expressway or I-95 during the PM peak hour. In comparison to the No Action Alternative, which showed 9 of the 10 intersections failing in the PM peak hour, results of the 2040 Build Alternative PM peak hour signalized intersection analysis show significantly less delay would be experienced by drivers.

Table 6-4: 2040 Build Alternative AM Peak Intersection Performance

Intersection	Approach	Movement	Volume (vph)	Max. Queue (ft)	Delay and Level of Service (sec/veh)		
					Movement	Approach	Intersection
Waterways Blvd	EB	T	2,683	910	13 (B)	12.9 (B)	13.4 (B)
		R	27	0	7 (A)		
	WB	L	62	161	118 (F)	6.1 (A)	
		T	1,737	111	2 (A)		
	NB	L	183	383	79 (E)	47.3 (D)	
		R	238	408	23 (C)		
Independence Dr	EB	T	2,891	1,015	16 (B)	15.7 (B)	13.1 (B)
		R	10	0	4 (A)		
	WB	L	21	80	71 (E)	6.4 (A)	
		T	1,746	468	6 (A)		
	NB	L	53	147	84 (F)	63.8 (E)	
		R	29	206	27 (C)		
Powerline Rd	EB	L	1,001	1,312	99 (F)	53.3 (D)	53.8 (D)
		T	1,166	777	41 (D)		
		R	747	519	11 (B)		
	WB	L	338	310	94 (F)	46 (D)	
		T	1,043	489	50 (D)		
		R	623	521	14 (B)		
	NB	L	344	509	87 (F)	53.8 (D)	
		T	1,184	509	54 (D)		
		R	272	571	11 (B)		
	SB	L	253	254	78 (E)	62.3 (E)	
		T	1,299	553	75 (E)		
		R	382	264	9 (A)		
SW 30th Ave*	EB	T	610	0	1 (A)	1 (A)	1.5 (A)
		R	76	38	2 (A)		
	WB	L	73	60	3 (A)	0.6 (A)	
		T	897	0	0 (A)		
	NB	L	68	78	12 (B)	10.3 (B)	
		R	65	95	9 (A)		
SW 28th Ave	EB	T	597	239	8 (A)	7.7 (A)	17 (B)
		R	78	69	2 (A)		
	WB	L	30	113	87 (F)	7.9 (A)	
		T	741	260	5 (A)		
	NB	L	228	475	80 (E)	54.1 (D)	
		R	132	138	10 (A)		
SW 24th Ave*	EB	T	567	0	1 (A)	0.7 (A)	1.2 (A)
		R	164	48	1 (A)		
	WB	U	92	97	6 (A)	0.8 (A)	
		L	26	109	4 (A)		
		T	720	0	0 (A)		
	NB	L	49	85	10 (A)	8.9 (A)	
		R	31	88	7 (A)		

* Intersection LOS estimated based on VISSIM node delay results and HCM intersection LOS delay thresholds for signalized intersections and stop controlled intersections.
** Reported maximum queues are capped by the presence of upstream intersection nodes or the extent of the network

Intersection	Approach	Movement	Volume (vph)	Max. Queue (ft)	Delay and Level of Service (sec/veh)		
					Movement	Approach	Intersection
Military Trail	EB	L	294	284	93 (F)	39.7 (D)	47.3 (D)
		T	208	194	41 (D)		
		R	482	443	7 (A)		
	WB	L	322	296	82 (F)	43.8 (D)	
		T	358	220	27 (C)		
		R	149	65	1 (A)		
	NB	L	172	170	80 (E)	48.2 (D)	
		T	684	477	61 (E)		
		R	684	549	27 (C)		
	SB	L	493	421	84 (F)	54.1 (D)	
		T	522	421	53 (D)		
		R	309	421	8 (A)		
Newport Center Dr	EB	L	370	323	104 (F)	22.1 (C)	20.7 (C)
		T	2,039	1,764	11 (B)		
		R	550	1,583	8 (A)		
	WB	L	420	327	73 (E)	17.5 (B)	
		T	2,251	747	10 (A)		
		R	437	80	4 (A)		
	NB	R	178	136	38 (D)	37.8 (D)	
	SB	R	143	102	40 (D)	39.8 (D)	
I-95 Ramps	EB	L	781	317	19 (B)	22.2 (C)	49.4 (D)
		T	799	325	41 (D)		
		R	638	15	2 (A)		
	WB	L	765	402	106 (F)	48.2 (D)	
		T	1,081	402	20 (B)		
		R	283	172	1 (A)		
	NB	L	941	412	104 (F)	93.3 (F)	
		R	469	257	71 (E)		
	SB	L	410	536	64 (E)	50 (D)	
		R	1,084	536	45 (D)		
Natura Blvd	EB	L	252	233	81 (F)	33.6 (C)	41.7 (D)
		T	1,104	403	30 (C)		
		R	319	240	7 (A)		
	WB	L	213	476	108 (F)	45.3 (D)	
		T	1,423	641	38 (D)		
		R	92	108	7 (A)		
	NB	L	330	788	61 (E)	51.2 (D)	
		T	189	526	66 (E)		
		R	184	153	19 (B)		
	SB	L	239	655	49 (D)	42.5 (D)	
		T	183	655	78 (E)		
		R	385	311	22 (C)		

* Intersection LOS estimated based on VISSIM node delay results and HCM intersection LOS delay thresholds for signalized intersections and stop controlled intersections.
** Reported maximum queues are capped by the presence of upstream intersection nodes or the extent of the network

Table 6-5: 2040 Build Alternative PM Peak Intersection Performance

Intersection	Approach	Movement	Volume (vph)	Max. Queue (ft)	Delay and Level of Service (sec/veh)		
					Movement	Approach	Intersection
Waterways Blvd	EB	T	1,802	532	12 (B)	11.7 (B)	11.7 (B)
		R	130	29	4 (A)		
	WB	L	241	467	89 (F)	9.6 (A)	
		T	2,601	206	2 (A)		
	NB	L	88	214	80 (E)	42.3 (D)	
		R	105	239	10 (A)		
Independence Dr	EB	T	1,837	467	4 (A)	3.8 (A)	4.1 (A)
		R	68	0	2 (A)		
	WB	L	22	77	84 (F)	3 (A)	
		T	2,798	427	2 (A)		
	NB	L	42	123	87 (F)	58.8 (E)	
		R	24	182	9 (A)		
Powerline Rd	EB	L	480	449	77 (E)	48.5 (D)	52.7 (D)
		T	1,043	983	48 (D)		
		R	329	63	9 (A)		
	WB	L	362	343	88 (F)	46.9 (D)	
		T	1,179	497	49 (D)		
		R	429	254	7 (A)		
	NB	L	718	528	73 (E)	55.5 (E)	
		T	1,157	528	57 (E)		
		R	349	591	15 (B)		
	SB	L	529	520	109 (F)	58.1 (E)	
		T	914	476	62 (E)		
		R	925	635	25 (C)		
SW 30th Ave*	EB	T	678	0	1 (A)	1.1 (A)	2.3 (A)
		R	31	2	2 (A)		
	WB	L	31	34	3 (A)	0.5 (A)	
		T	1,097	0	0 (A)		
	NB	L	162	126	14 (B)	12.6 (B)	
		R	116	103	10 (A)		
SW 28th Ave	EB	T	618	290	14 (B)	12.5 (B)	17.8 (B)
		R	175	156	6 (A)		
	WB	L	172	346	80 (E)	15.4 (B)	
		T	1,009	267	4 (A)		
	NB	L	119	254	86 (F)	49 (D)	
		R	110	116	9 (A)		
SW 24th Ave*	EB	T	621	0	1 (A)	0.7 (A)	1 (A)
		R	109	25	1 (A)		
	WB	U	92	71	4 (A)	0.4 (A)	
		L	20	75	2 (A)		
		T	1,130	0	0 (A)		
	NB	L	49	87	12 (B)	10.5 (B)	
		R	31	93	8 (A)		

* Intersection LOS estimated based on VISSIM node delay results and HCM intersection LOS delay thresholds for signalized intersections and stop controlled intersections.
** Reported maximum queues are capped by the presence of upstream intersection nodes or the extent of the network

Intersection	Approach	Movement	Volume (vph)	Max. Queue (ft)	Delay and Level of Service (sec/veh)		
					Movement	Approach	Intersection
Military Trail	EB	L	315	294	88 (F)	37.8 (D)	48.8 (D)
		T	295	223	36 (D)		
		R	503	308	8 (A)		
	WB	L	462	366	79 (E)	50.6 (D)	
		T	340	207	38 (D)		
		R	181	78	2 (A)		
	NB	L	286	245	83 (F)	51.3 (D)	
		T	600	416	60 (E)		
		R	388	290	14 (B)		
	SB	L	438	567	79 (E)	53.1 (D)	
		T	833	567	64 (E)		
		R	617	567	19 (B)		
Newport Center Dr	EB	L	97	142	47 (D)	17.1 (B)	20.8 (C)
		T	2,264	1,553	17 (B)		
		R	85	124	11 (B)		
	WB	L	121	124	81 (F)	12.5 (B)	
		T	2,106	623	9 (A)		
		R	118	0	2 (A)		
	NB	R	586	296	32 (C)	31.9 (C)	
	SB	R	695	271	53 (D)	53.4 (D)	
I-95 Ramps	EB	L	1,064	356	17 (B)	21.5 (C)	35.9 (D)
		T	859	404	45 (D)		
		R	927	275	5 (A)		
	WB	L	750	125	60 (E)	33.5 (C)	
		T	863	125	9 (A)		
		R	310	8	1 (A)		
	NB	L	672	303	70 (E)	65.8 (E)	
		R	690	322	61 (E)		
	SB	L	304	390	85 (F)	50.2 (D)	
		R	821	390	38 (D)		
Natura Blvd	EB	L	297	258	76 (E)	35.9 (D)	51.1 (D)
		T	1,276	567	32 (C)		
		R	280	239	10 (A)		
	WB	L	349	603	90 (F)	47.6 (D)	
		T	1,254	610	40 (D)		
		R	132	125	8 (A)		
	NB	L	285	621	54 (D)	44 (D)	
		T	182	259	60 (E)		
		R	224	192	20 (B)		
	SB	L	271	1,622	51 (D)	90.3 (F)	
		T	298	1,622	133 (F)		
		R	384	1,476	91 (F)		

* Intersection LOS estimated based on VISSIM node delay results and HCM intersection LOS delay thresholds for signalized intersections and stop controlled intersections.
** Reported maximum queues are capped by the presence of upstream intersection nodes or the extent of the network

2040 Build Alternative Travel Times and Average Speeds

The 2040 Build Alternative peak hour peak direction travel time for vehicles on SW 10th Street between the Turnpike and I-95 was recorded from the VISSIM model, for both the local lanes and the Connector lanes. The eastbound SW 10th Street local lane travel time during the AM peak hour is estimated to take 8 to 9 minutes, while the westbound travel time during the PM peak hour is estimated to take 7 to 8 minutes. The eastbound AM and westbound PM peak hour travel times in the local lanes are much shorter than the travel times recorded for the No Action Alternative in 2040. The congestion seen throughout the network on the local lanes under the No Action Alternative is addressed with the Build Alternative. The average travel time in the SW 10th Street Connector lanes for eastbound traffic during the AM peak hour is estimated at 3 to 4 minutes, and 3 to 4 minutes for the westbound Connector lanes during the PM peak hour.

The distance of the travel paths is 3.3 miles measured along SW 10th Street between the Turnpike and I-95. The average travel speed for SW 10th Street local lane traffic in the eastbound direction during the AM peak hour is estimated to be 24 mph, and 26 mph travel speed for the westbound traffic during the PM peak hour. The SW 10th Street Connector lane travel speeds are estimated at 57 mph for the eastbound direction during the AM peak hour, and 57 mph for the westbound direction during the PM peak hour.

VISSIM Network Wide Output

The network wide VISSIM results for the Build Alternative were reviewed and reported. The 2040 AM peak period outputs show reasonable results, which are as follows:

- Total Delay = 1,569 hours
- Total Travel Time = 8,060 hours
- Total Stops = 111,393
- Latent Demand = 1 vehicle
- Average Delay = 00:59 (mm:ss)
- Average Speed = 40 mph

The Build Alternative 2040 PM peak period network wide outputs show similar performance as the AM peak hour, which indicate reasonable traffic flow throughout the network. The network wide output are as follows:

- Total Delay = 1,704 hours
- Total Travel Time = 8,824 hours
- Total Stops = 162,669
- Latent Demand = 34 vehicles
- Average Delay = 00:59 (mm:ss)
- Average Speed = 40 mph

6.5 Build Alternative Safety Analysis

The conceptual design plans for the Build Alternative were developed in accordance with the FDOT's Design Manual and FHWA's *Policy on Geometric Design of Highways and Streets*. Adherence to these standards will help facilitate safe operations along the corridor. As discussed under Section 4.5 of the report, the crash analysis of the SW 10th Street corridor and identification of high crash locations indicates a preponderance of rear end collisions. The frequency that crashes are occurring during weekdays and evening hours (6:00 pm to 12:00 pm) and AM and PM peak rush hour periods (6:00 am to 9:00 am and 3:00 pm to 6:00 pm) indicates excessive traffic congestion as a probable causal factor.

With no changes to the SW 10th Street corridor under the No Action Alternative, the frequency of crashes is expected to increase over time due to greater traffic volumes and congestion. To improve safety along the SW 10th Street study corridor, the following improvements are recommended for consideration in the PD&E Study:

- Increase capacity to relieve congestion,
- Deploying active traffic management strategies along the local lanes, and
- Implement active traffic management strategies in concert with the new Connector managed lanes.

Significant modifications to the corridor are part of the Build Alternative, including a redesign of the local SW 10th Street arterial lanes. The resultant design year 2040 traffic volumes in the local lanes will be different than the No Action Alternative. One way to assess the safety benefits of the Build Alternative compared to the No Action Alternative is to identify the modifications that may have an impact. Upon review of available research and crash reduction and crash modification factors, it can be indicated whether crashes may be expected to increase or decrease.

The Highway Safety Manual (HSM) provides information and tools to facilitate decisions based on consideration of safety consequences. One of the tools developed in associated with the HSM are crash modification factors (CMFs). A CMF is a multiplicative factor used to compute the expected number of crashes after implementing a given countermeasure at a specific site. A CMF greater than 1.0 indicates an expected increase in crashes, while a value

less than 1.0 indicates an expected reduction in crashes after implementation of a given countermeasure.

The Build Alternative modifications to the SW 10th Street local lanes were evaluated and expected safety impacts with respect to the No Action Alternative were identified. This included a review of associated crash modification factors where available from the online crash modification factors clearinghouse. Design and traffic changes are listed in Table 6-5 along with the impact that each change is expected to have on crashes and safety.

Table 6-6: Safety Benefits - SW 10th Street Local Lanes

(Build Alternative vs. No Action Alternative)

	Change	Expected Impact	CMF
1	Traffic volume in local lanes is 18% - 60% less along corridor (average 40% less).	Decrease in total crash frequency directly related to decrease in traffic volume, due to less vehicles exposed to contributing causes.	No CMF available. Expect 40% less crashes based on 40% lower traffic volume.
2	Bike lane width increased from 4 feet to 7 feet.	Decrease in all crash types and severity types.	CMF ID# 8699 = 0.032 (equation provided below table)
3	Lower design speed, and lower speed limit from 40mph and 45mph to 35 mph.	Decrease in all crash types and severity types.	CMF ID# 145 = 0.85 for injury crashes, 0.9 for PDO crashes, 0.68 for fatal crashes
4	Width of the eastbound and westbound travel lanes reduced from 12 feet to 11 feet.	Increase in all crash types and severity types.	CMF ID# 8151 Exp(-0.314 + 0.00008 * AADT) Exp(-0.314 + 0.00008 * 45,000) = 26.7

Note: No Action Alternative does not include improvements to the SW 10th Street corridor, but does include I-95 and SW 10th Street interchange and Sawgrass and Turnpike interchange improvements.

The equation for CMF ID # 8699 is shown below.

CMFunction:

$$CMF = \exp\{0.0395 \times (U_{BLW} - Base_{U_{BLW}})\}$$

Where:

$U_{BLW} = \ln\{47.24 + 11.859\,(PropBikeLaneWidth - 7) + 3.7\,(PropBikeLaneWidth - 7)^2\}$

$Base_{U_{BLW}} = \ln\{47.24 + 11.859\,(ExistBikeLaneWidth - 7) + 3.7\,(ExistBikeLaneWidth - 7)^2\}$

Where:

$PropBikeLaneWidth$ = Proposed bicycle lane width in feet

$ExistBikeLaneWidth$ = Base, or existing, bicycle lane width in feet

The number and frequency of crashes along the SW 10th Street local lanes with the Build Alternative improvements in place, is expected to be less than the number and frequency of crashes expected to occur with the No Action Alternative.

7.0 Summary of Analysis Results

7.1 Comparison of Alternatives

Future traffic volumes along the SW 10th Street corridor between Florida's Turnpike and I-95 are expected to increase due to the expected population and employment growth in the region. In addition, the adjacent interchange improvements and new ramps connecting to SW 10th Street on both ends of the corridor will facilitate an increase in traffic along the roadway. Additional systemic capacity along SW 10th Street from the proposed new Connector managed lanes is expected to accommodate between 33% and 68% of the total SW 10th Street corridor traffic in various sections. Removing this traffic from the local lanes by allowing it to use the Connector managed lanes provides a significant benefit to operations along the SW 10th Street local lanes. These benefits include reduced delays and queues experienced by the motoring public.

The results of the local lane and Connector managed lane traffic analysis show that the Build Alternative satisfies the objectives and purpose and need of this project. The Build Alternative improves traffic flow in the local lanes by providing a separate Connector managed lane facility. This reduces the future 2040 traffic volumes in the local lanes when compared to the No Build Alternative and increases capacity throughout the corridor. In addition, allowing all vehicle types to use the Connector managed lanes, and not tolling the lanes, will maximize the volume of vehicles that are eligible and that would choose to use the Connector lanes versus the local lanes. Improving operations in the local lanes will also help address existing corridor safety deficiencies associated with excessive congestion.

VISSIM analysis of the Build Alternative for the 2040 AM and PM peak hours shows substantial benefits when compared to the No Action Alternative. During the future AM peak hour, the No Action Alternative is characterized by high levels of congestion in the eastbound direction on SW 10th Street. This is caused by extensive queueing originating at the Military Trail intersection, which results in low speeds throughout the network. The Build Alternative shows significantly reduced queuing across the entire network. In addition, local lane speeds are able to reach 35 mph in both directions on SW 10th Street between Powerline Road and Newport Center Drive, and the Connector managed lanes will operate at free-flow speeds.

For the No Action Alternative, the PM peak hour results revealed severe queuing and traffic metering along the SW 10th Street corridor in both directions. Queues originating at the Powerline Road intersection cause network-wide gridlock along the corridor. In the westbound direction, this impacts most of the intersecting side streets and arterials along SW 10th Street, as well as mainline operations in both directions on I-95. Additionally, the direct connect ramps from I-95 to SW 10th Street experience congestion, which extends to the southbound express lanes on I-95.

The Build Alternative, however, provides significantly improved performance in both directions on SW 10th Street during the future PM peak hour. Local lane speeds are appropriate, and the Connector managed lanes operate at free-flow speeds. Additionally, the Build Alternative prevents queuing on the I-95 off-ramps and ensures the direct connect ramps do not impact the I-95 mainline or Connector lane performance.

Travel Time Comparison

The 2040 Build Alternative peak hour peak direction travel time for vehicles on SW 10th Street local lanes between the Turnpike and I-95 in the eastbound direction during the AM peak hour is estimated to take 8 to 9 minutes, while the westbound travel time during the PM peak hour is estimated to take 7 to 8 minutes. When compared with the 2040 No Action travel times of 18 to 19 minutes in the eastbound direction during the AM peak hour, and more than 30 minutes in the westbound direction during the PM peak hour, this represents a significant travel time savings. The average travel time is approximately 10 minutes less in the AM for eastbound traffic, and more than 25 minutes in the PM for westbound traffic. The congestion seen throughout the network on the local lanes under the No Action Alternative is addressed with the Build Alternative.

The average travel time savings is even greater for traffic taking the SW 10th Street Connector lanes in the 2040 Build Alternative. Compared with travel times under the No Action Alternative, the Build Alternative Connector lane travel time savings is 14 to 16 minutes for eastbound traffic during the AM peak hour, and more than 30 minutes for westbound traffic during the PM peak hour.

The travel time comparison shown on Figure 7-1 shows the travel time savings is significant for the local lanes and Connector lanes for the Build Alternative compared to the No Action Alternative.

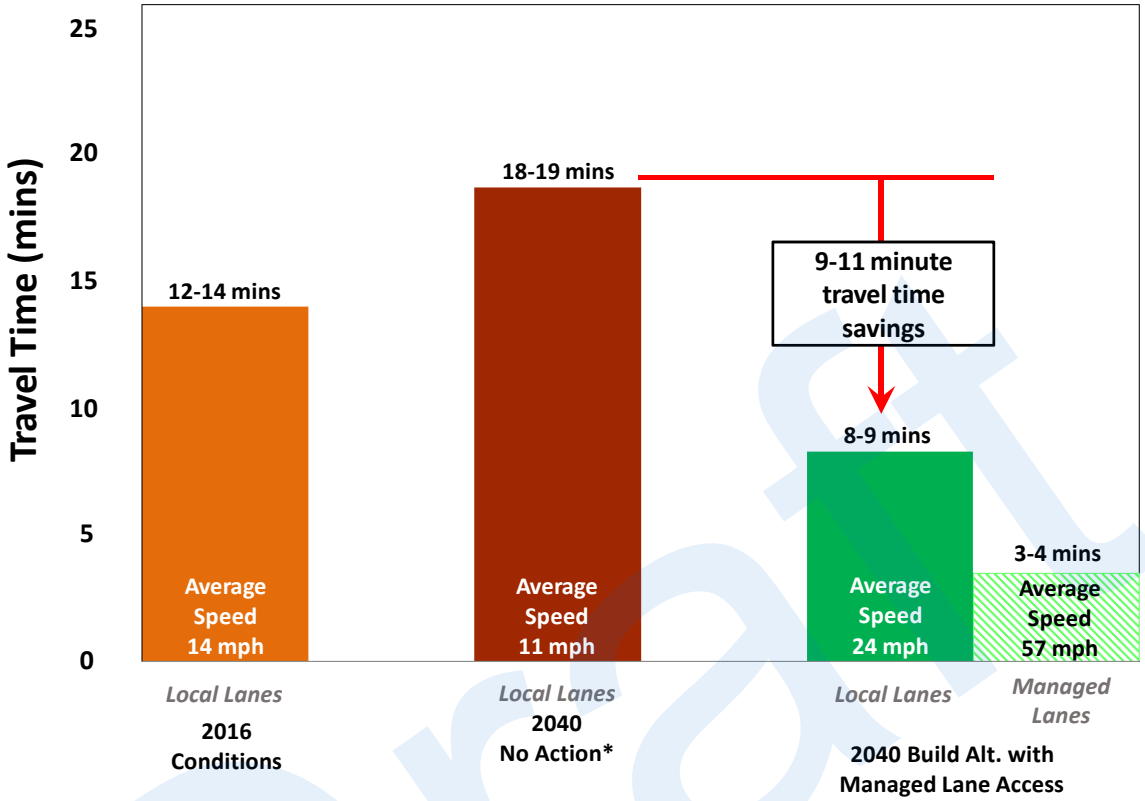
Travel times were previously measured from VISSIM for two other scenarios: a "2040 No Build" concept without the Turnpike/Sawgrass or I-95/SW 10th Street interchange improvements, and a Build concept without managed lane access. The 2040 No Action Alternative travel times documented in this PTAR are longer than travel times for the "2040 No Build" concept documented in the VISSIM Tech Memo. This is because traffic volumes for the "2040 No Build" concept are less along the corridor than traffic volumes for the 2040 No Action Alternative. The traffic volumes are less, because improvements on either end of the corridor are not assumed to be in place. The adjacent improvements are planned and funded, and therefore, analyzed as part of the No Action Alternative in the PTAR.

The 2040 Build concept without managed lane access has slightly higher travel times in the local lanes, than travel times for the 2040 Build Alternative with managed lane access. This is because the 2040 Build Alternative with managed lane access provides more opportunity for traffic in the local lanes to access the Connector lanes and allows traffic to shift from the local lanes to the Connector lanes, which improves travel times and reduces delay in the local lanes. The travel time results for these previous concepts are documented in Attachment 4 of the *VISSIM Analysis of No-Build Alternative, Build Alternative #1 (managed lanes without local ramp access), and Build Alternative #2 (managed lanes with local ramp access) Technical Memorandum*, included in Appendix F.

Figure 7-1: SW 10th Street Travel Time Comparison

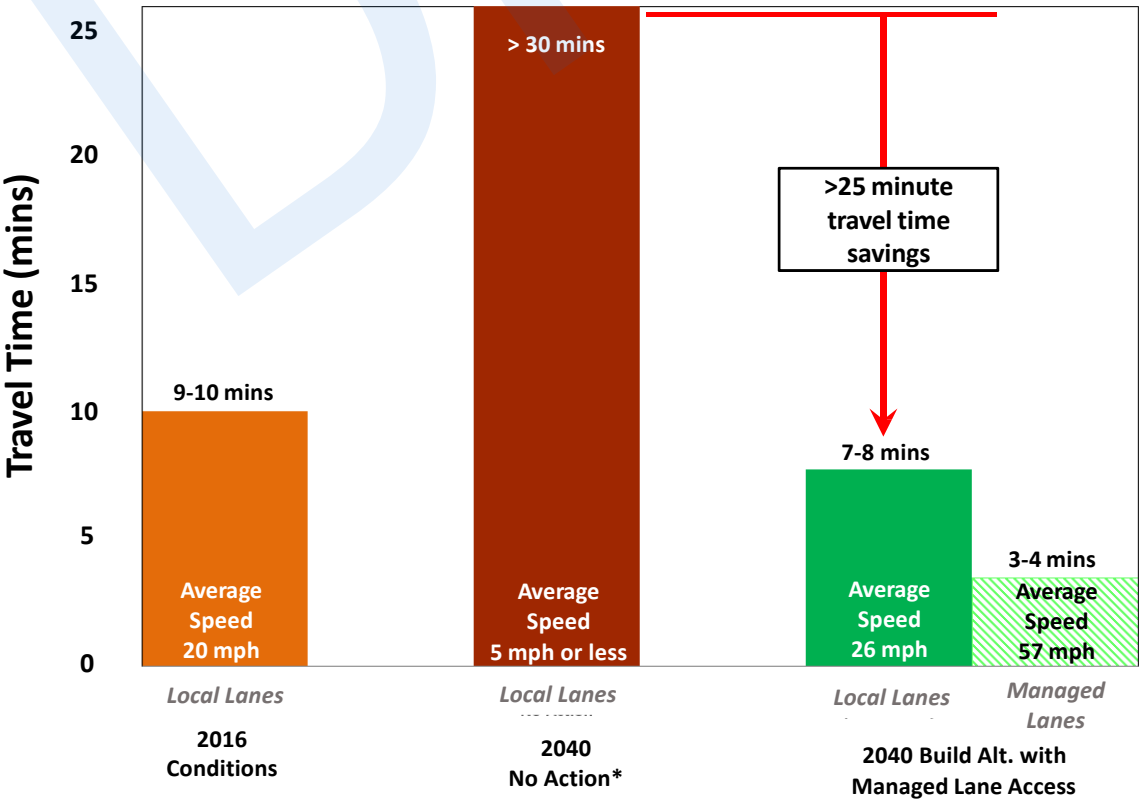
SW 10th Street Eastbound Travel Time (Florida's Turnpike to I-95)

AM Peak Hour



SW 10th Street Westbound Travel Time (I-95 to Florida's Turnpike)

PM Peak Hour



*2040 No Action Alternative assumes adjacent I-95, and Turnpike/Sawgrass interchange and express lane improvements are constructed

9/30/2019

Comparison of VISSIM Network Wide Performance

The network-wide performance, as summarized in Table 7-1, further details the substantial operational improvements provided by the Build Alternative. The addition of the Connector managed lanes removes a significant portion of the demand on SW 10th Street local lanes, allowing the corridor and the surrounding facilities to operate with significantly less delay. The reduction of volume on the SW 10th Street local lanes minimizes bottlenecks that severely impact the I-95 general purpose lanes and I-95 managed lane facilities that are apparent under the No Action Alternative. The Connector managed lanes also provide a more efficient route for a significant portion of regional traffic to get to their destinations.

Table 7-1: 2040 Peak Period Network-Wide Output Comparison

AM PEAK	No Action Alternative	Build Alternative	Difference
Total Delay (hr)	8,620	1,569	-82%
Total Travel Time (hr)	14,184	8,060	-43%
Total Stops	1,078,567	111,393	-90%
Latent Demand	8,238	1	-99.99%
Average Delay (mm:ss)	06:00	00:59	-84%
Average Speed (mph)	19	40	106%
PM PEAK	**No Action Alternative**	**Build Alternative**	**Difference**
Total Delay (hr)	22,475	1,704	-92%
Total Travel Time (hr)	26,552	8,824	-67%
Total Stops	2,856,016	162,669	-94%
Latent Demand	36,292	34	-99.9%
Average Delay (mm:ss)	19:58	00:59	-95%
Average Speed (mph)	7	40	446%

7.1.1 Transportation Systems Management and Operations (TSM&O)

Adaptive traffic signal control is recommended for the SW 10th Street corridor. It is noted as a candidate project in the County's online 2018 Penny Surtax Proposed Mobility Plan Web-Map. Adaptive signal control is expected to help motorists primarily during off-peak hours

travel the corridor with less delay. Since the corridor is over capacity during peak hours, the adaptive traffic signal control can only provide minimal benefit. However, it is a beneficial application that will help traffic flow in the corridor before and after construction of the proposed improvements. The adaptive traffic signal control can be implemented with either the No Action Alternative or Build Alternative.

7.1.2 Transit Facilities

Transit service along the corridor is expected to be unchanged under either the No Action Alternative or Build Alternative.

For the SW 10th Street local lanes under the No Action Alternative or Build Alternative, the existing community bus service is expected to remain. These buses would continue to use the SW 10th Street local lanes to connect to the rest of the route. No changes are planned to the existing bus service, and there will be no impacts upon future bus service as a result of the Build Alternative. The SW 10th Street Connector managed lanes under the Build Alternative were designed to accommodate buses and standard passenger vehicles. Express bus service can be accommodated in the proposed Connector managed lanes.

7.1.3 Pedestrian and Bicycle Facilities

The No Action Alternative will retain the existing pedestrian and bicycle facilities. The Build Alternative, however, will include improved and upgraded facilities throughout the project corridor. These multimodal improvements will enhance safety and mobility for pedestrians and bicyclists. The Build Alternative facilities include:

- Minimum six-foot sidewalk for the length of the corridor (adjacent to the arterial portion of the roadway);
- Seven-foot buffered bicycle lanes; and
- Crosswalks at all signalized intersections.

7.2 Safety

From January 2012 through December 2016, a total of 896 crashes were reported on SW 10th Street from Florida's Turnpike / Sawgrass Expressway to I-95. Overall, the total number of crashes has steadily increased over the last five years. In addition, three segments and five intersections along the SW 10th Street corridor were identified as high crash locations (HCLs) during at least one year between 2012 and 2016. The existing conditions crash analysis of the SW 10th Street corridor indicates a preponderance of rear end collisions due to excessive traffic congestion.

The frequency of crashes is expected to increase over time due to greater traffic volumes and congestion. To improve safety along the SW 10th Street study corridor, the following improvements were recommended:

- Implement the Build Alternative, which will increase capacity and relieve congestion,
- Deploy active traffic management strategies along the local lanes, and
- Implement active traffic management strategies in concert with the new Connector managed lanes.

Significant modifications to the corridor are part of the Build Alternative, including a redesign of the local SW 10th Street arterial lanes. With the Build Alternative improvements in place, the number and frequency of crashes along the SW 10th Street local lanes is expected to be less than the number and frequency of crashes expected to occur with the No Action Alternative.

List of Appendices