INTERCHANGE MODIFICATION REPORT

Project Development & Environment (PD&E) Study

GOLDEN GLADES INTERCHANGE

from SR 826 / Palmetto Expressway Eastbound to I-95 Northbound

Financial Management No.: 428358-1-22-01
Efficient Transportation Decision Making (ETDM) No.: 11300

September 2014

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Stantec Consulting Services Inc., a corporation, authorized to operate as an engineering business (EB 00027013), FEID No. 65-0039493001, by the State of Florida, Department of Professional Regulation, Board of Professional Engineers, and that I have reviewed or approved the evaluation, findings, opinions, conclusions, or technical advice hereby reported for:

Project:	Project Development and Environment (PD&E) Study for Golden Glades Interchange from SR 826/Palmetto Expressway Eastbound to I-95 Northbound
FPID:	428358-1-22-01
ETDM:	11300
FAP:	N/A
Location:	Miami-Dade County, Florida
Client:	Florida Department of Transportation District Six

This Interchange Modification Report contains detailed engineering information that fulfills the purpose and need for the Golden Glades Interchange Project Development and Environment (PD&E) Study (FPID 428358-1-22-01). 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 and planning as applied through professional judgment and experience.

Name: Godfrey Lamptey, P.E., PTOE

Signature:

P.E. Number: 68261

Date: 6/13/2014

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Interchange Modification Report (IMR)

Golden Glades Interchange PD&E Study

From SR 826/Palmetto Expressway Eastbound to I-95 Northbound

FPID: 428358-1-22-01

Determination of Engineering and Operational Acceptability

Acceptance of this document indicates successful completion of the review and the Interchange Access Request is considered acceptable for engineering and operations. Approval is contingent upon compliance with applicable Federal requirements, specifically the National Environmental Policy Act (NEPA) or Department Project Development and Environment (PD&E) Procedures. Completion of the NEPA/PD&E process is considered acceptance of the general project location and concepts described in the environmental document.

Requestor — Dat Huynh, P.E. — *Project Manager* — Florida Department of Transportation - District 6 — 6/20/2014 *Date*

N/A ☒ *Expressway Authority* — _____ — *Date*

Interchange Review Coordinator — Aileen Ramirez-Boucle, AICP — *Intermodal Systems Development Manager* — Florida Department of Transportation - District 6 — 6/20/14 *Date*

☐ *Other* — Randy Fox, AICP — *Planning Manager* — Florida's Turnpike Enterprise — 6/30/14 *Date*

State Interchange Review Coordinator — Tom Byron, P.E. — *State Chief Engineer* — Florida Department of Transportation — 9/30/14 *Date*

☐ *Federal Highway Administration* — Nicholas Finch — *Associate Division Administrator* — 10/6/14 *Date*

EXECUTIVE SUMMARY

Background

The Golden Glades Interchange (GGI) is an interchange of regional importance located in northeastern Miami-Dade County and connecting three major expressways: Interstate 95 (I-95), SR 826/Palmetto Expressway (SR 826), Florida's Turnpike (Turnpike); and three major principal arterials: SR 9, SR 7/US 441 (SR 7) and NW 167 Street. The GGI is one of the heaviest traveled interchanges in south Florida carrying over 400,000 vehicles per day and serving local and regional trips. The interchange is also critical for truck freight transportation. It provides a direct link to the GGI Metrorail Station, Park and Ride (P&R) facility, and an express bus service to Downtown Miami.

Currently, there is no dedicated system-to-system connection from SR 826/Palmetto Expressway eastbound to I-95 northbound. The existing network connection for this system-to-system movement includes the use of surface streets with tight radii, traffic signals, and weaving segments that considerably slow down traffic through this interchange. In addition, southbound Florida's Turnpike connects to I-95 southbound via a two-lane ramp which transitions into a single lane prior to merging with the SR 826/Palmetto Expressway eastbound to southbound movement. The lane drop combined with weaving movements from SR 826/Palmetto Expressway has resulted in peak period backups that extend beyond the Florida's Turnpike Golden Glades Mainline Toll Plaza.

The primary purpose of this Interchange Modification Report (IMR), prepared as part of the Golden Glades Interchange Project Development and Environment (PD&E) Study, is to provide the required technical documentation for obtaining Federal Highway Administration (FHWA) approval of the proposed system-to-system connection from SR 826/Palmetto Expressway eastbound to I-95 northbound and improvements to the Turnpike southbound to I-95 southbound connection in order to address traffic operations, safety and enhance multimodal use for transit and freight. Additionally, the project will also develop interim improvements within the GGI to enhance safety, mobility and circulation, emergency access and incident response times and support the establishment of an Ultimate Master Plan and the development of an implementation program for the interchange.

The Ultimate Master Plan includes a system-to-system connection between new express lanes on SR 826/Palmetto Expressway and the existing I-95 Express Lanes system. It will also provide a direct future connection from southbound Turnpike to the southbound I-95 Express Lanes. The Ultimate Master Plan for the GGI, as well as the addition of future express lanes along SR 826/Palmetto Expressway from I-75 to the GGI is currently being studied as part of the adjacent SR 826/Palmetto Expressway PD&E Study (FPID: 418423-1-22-01, ETDM #11241).

This IMR focuses on the interim improvements identified as part of the Recommended Interim Build Alternative for the GGI. The recommended interim build alternative will provide near term traffic operations and safety improvements within the interchange to

accommodate the 2030 travel demand while the Ultimate build alternative will accommodate the 2040 design year travel demand.

Study Methodology

The traffic demand forecasting task including model and network validation and volume adjustments were performed by the Study Team for the adjacent SR 826 PD&E Study for both the SR 826/Palmetto Expressway corridor and GGI. The traffic projections were developed to establish the basic design requirements for the No-Build and proposed roadway typical sections, intersections and interchange modifications. The adopted Southeast Regional Planning Model (SERPM) Version 6.5 Time-of-Day was used to develop traffic projections. This is the model used to develop the recent 2035 Long Range Transportation Plan (LRTP) for the Metropolitan Planning Organization (MPO). SERPM 6.5 has a 2005 base year and 2035 horizon year. The 2035 horizon year incorporates the MPO approved 2035 Traffic Analysis Zones (TAZ) data and the 2035 cost feasible roadway network.

The traffic operational analysis of existing and future conditions was performed in accordance with the approved Methodology Letter of Understanding (MLOU) that was developed for this PD&E project consistent with FDOT and FHWA guidelines using Highway Capacity Manual (HCM) and micro-simulation. AM and PM peak period analysis were performed for existing year (2010), opening year (2018), interim year (2030) and design year (2040) alternatives. The intersection analysis for existing and future conditions was consistent with the 2000 Highway Capacity Manual (HCM 2000) and was performed using SYNCHRO 8. Freeway segments were evaluated using densities from CORSIM and also using HCS 2010 software that implements the HCM 2010 procedures. The merge and diverge analysis for existing and future conditions were based on volumes, speeds, and density Measures of Effectiveness (MOEs) obtained from an average of ten (10) CORSIM runs. The weaving analysis was performed using HCS 2010 software that implements the HCM 2010 procedures for weaving segments.

Alternatives Considered

The alternatives investigated as part of this IMR include the No-Build or No Project Alternative which maintains the existing facility as-is and provides no improvements and no congestion relief and the TSM&O alternative, which includes the evaluation of low cost, short term improvements within the interchange, was evaluated. However, none of these TSM improvements met the purpose and need for the project.

Four preliminary interim build alternatives were evaluated during the initial phase of the PD&E study based on the concept developed for this interchange under the planning phase to accommodate the 2030 travel demand. These initial interim build alternatives were further refined into the following four interim build alternatives based on the project traffic forecast analysis, to accommodate the travel demand for the 2030 mid-year.

1. Interim Build Alternative 3A
2. Interim Build Alternative 3B
3. Interim Build Alternative 3C
4. Interim Build Alternative 4

All the interim build alternatives provide a three lane off-ramp for SR 826/Palmetto Expressway eastbound to I-95 northbound and southbound and a direct connection flyover from SR 826/Palmetto Expressway eastbound to I-95 northbound. The southbound Turnpike connector lanes will be reconstructed to accommodate a future direct express lane connection from Florida's Turnpike southbound to the 95 Express southbound express lanes. The detailed descriptions of the interim build alternatives are provided in Chapter 6.

The Ultimate Build Alternative which represents the master plan to improve operations, safety and mobility within the GGI was also evaluated for the 2040 design year to ensure that the interim improvements can be accommodated in the ultimate master plan for this interchange. However, documentation for this ultimate master plan together with the feasibility of express lanes along SR 826/Palmetto Expressway will be included in the Systems Interchanges Modification Report (SIMR) currently being prepared for the adjacent SR 826 East-West PD&E Study.

Study Results

The intersection analysis results indicated that the unsignalized intersection of NW 7 Avenue Extension and the Turnpike northbound ramp will benefit from adding signalization and a second left turn lane. Likewise, the intersection of NW 7 Avenue and the Park & Ride (Int. # 9) will improve from LOS D to LOS C or better by 2030 in the AM peak period by constructing the flyover connection between SR 826 eastbound and I-95 northbound that would divert traffic from this intersection; PM peak period shows a decrease of 8% in overall control delay. However, the intersections of NW 167 Street and NW 2 Avenue, and the nearby intersection of NW 167 Street and North Miami Avenue, although show minor improvements in operation, will still not operate at acceptable levels of service with the improvement alternatives considered in this PD&E Study. Also, the intersection of NW 7 Avenue and SB Turnpike Connector Off-Ramp (Int. # 10) is operating at LOS F for all builds except for Build Alternative 4 in 2030; where it improves to a LOS D. Refer to **Figure i** for the intersections within the study area.

An evaluation of traffic operational impacts of the interim Texas U-Turns provided at the NW 17 Avenue and NW 12 Avenue interchanges was performed. These improvements were recommended in order to receive the MPO approval and support for the project. The comparison of the results shows that there is little improvement or impact due to the low peak hour left turn volumes and the linked signal timing plans of these two intersections, which allows for more efficient signal timing coordination to move traffic through the signals.

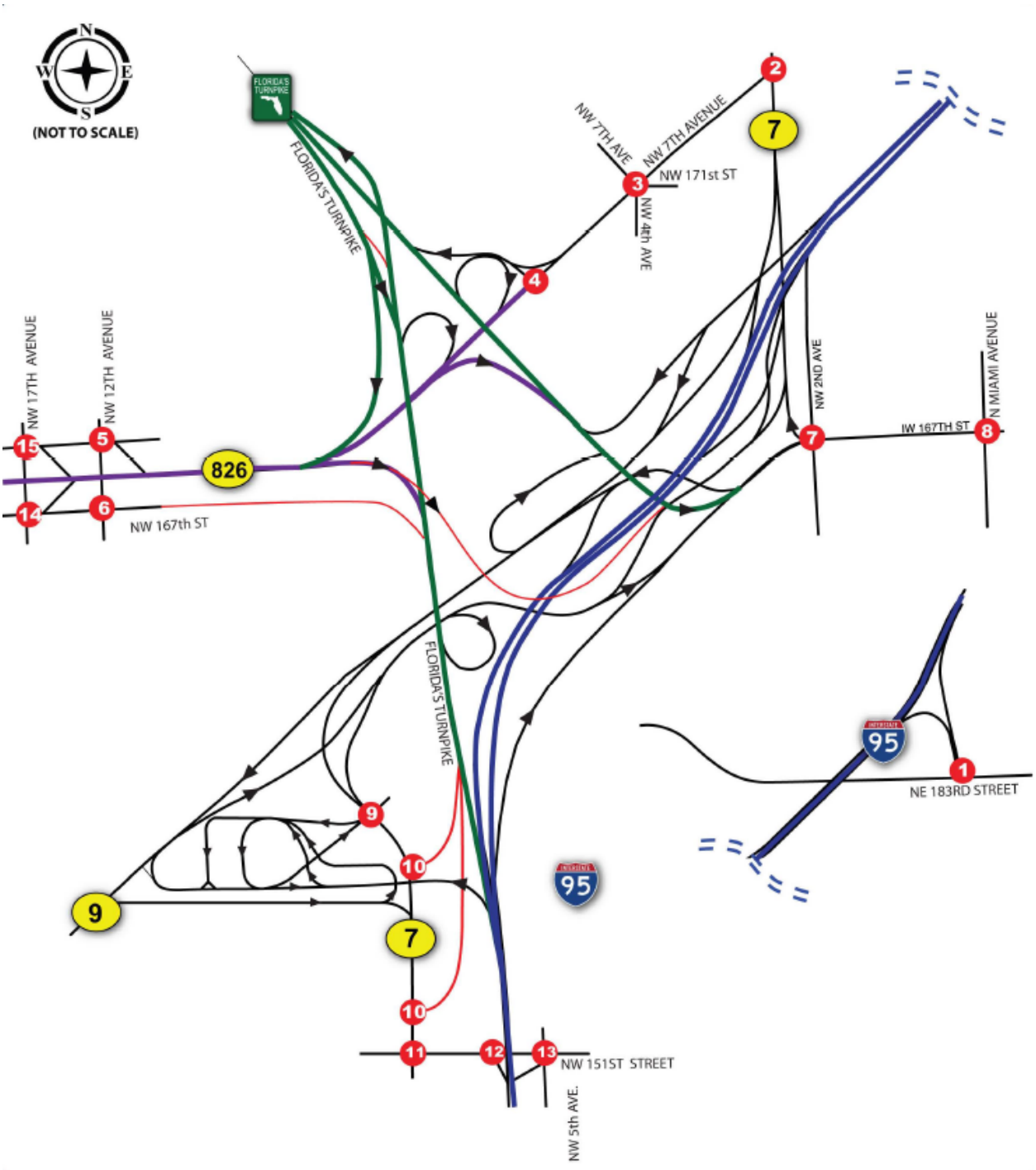

Figure i- Interserctions within the study area

Freeway segments analysis indicated that the No Build Alternatives in 2030 and 2040 resulted in constrained conditions with tens of thousands of vehicles held at the entry nodes and not entering GGI, and therefore densities and LOS for No Build are not valid for the CORSIM analysis. HCS 2010 for the No Build Alternatives indicated that all I-95 segments north and south of the GGI will operate at LOS E or worse in 2040. HCS 2010 analysis indicated that all freeway segments of the 2030 Interim Build Alternatives and 2040 Ultimate Build Alternative will operate at LOS E or better, except for the following:

- I-95 SB south of NW 151 Street, which operates at LOS F during the AM Peak period for all Build Alternatives
- I-95 SB south of NW 151 Street, which operates at LOS F during the PM Peak period for Build Alternatives 3A, 3B and 4
- I-95 NB between GGI and NW 151 Street, which operates at LOS F during the PM Peak period for the Ultimate Build Alternative

However, CORSIM simulations showed different results with high densities exceeding 45 veh/mi/ln at ramps, connectors and several I-95 sections (northbound south of GGI and south of Miami Gardens Drive and southbound south of NW 151 Street). In the 2030 interim build alternatives analysis, the Turnpike freeway segments surpassed the 45 veh/mi/ln threshold for the AM peak in SB direction, however in Interim Build Alternatives 3C and 4 an approximate 30% decrease is observed most likely due to the improvements of an additional express lane connection from Turnpike SB to I-95 Express and the improvements to the intersection of the Turnpike Connector off ramp to SR 7, respectively.

Weaving segments analysis results indicated that the improvements applied to SR 7 in the Build Alternatives are beneficial to operations of the weaving segments along the NB and SB SR 7, decreasing the LOS from LOS F in 2040 No Build to LOS E in 2040 Ultimate Build. In the interim builds 2030, the Turnpike connector SB weaving segment operates at LOS F in the AM peak period and LOS B in the PM peak period in all Build Alternatives except for Build 3C which includes the additional improvement of the direct express lane connection between the Turnpike SB to I-95 SB Express.

Recommended Interim Build Alternative

Based on the evaluation and analysis of several key evaluation parameters including horizontal and vertical alignment, right of way impacts, construction cost, potential utility impacts, bridge analysis, traffic operations and safety, maintenance of traffic, environmental impacts and transit considerations, in addition to extensive discussions with both FDOT and FTE management, the Interim Build Alternative 4 was selected as the Recommended Interim Build Alternative.

The overall network analysis for the No-Build and Recommended Interim Build Alternative for the year 2030 shows significant improvements in travel times and travel speeds for most of the critical routes within the GGI. The proposed new flyover will reduce travel time by 64% and 50% for AM and PM peak periods respectively for the Recommended Interim Build

Alternative compared to the No-Build alternative. The rerouting of the traffic onto the proposed new flyover ramp will also significantly increase the travel speeds for the Turnpike southbound and SR 826 eastbound movements to NW 2 Avenue. The SR 826 eastbound to I-95 southbound however, shows an increased travel time and reduced travel speed for the Recommended Interim Build Alternative compared to the No-Build. This is due to the fact that in the No-Build model, the entry node sustains starvation due to traffic backup at the upstream node, as such, the travel times and speeds appear better than they are due to limited volume throughput in the system.

An analysis of the traffic operations for the recommended Interim Design Build Alternative was performed for the 2040 design year using HCS 2010. The objective of this supplemental analysis was to determine the performance of the freeway and weaving segments during the 2040 design year in case the ultimate design or master plan is never built. The freeway segments analysis results indicate that several segments along I-95 and SR 826/Palmetto Expressway segment will operate at LOS F under the 2040 Recommended Interim Build Alternative. In contrast, all freeway segments for the Ultimate Build Alternative will operate at acceptable LOS E or better, except for the I-95 southbound segment south of NW 151 Street and the northbound segments south of GGI which operate at LOS F during the AM and PM peak periods respectively. The Weaving segments analysis results for the 2040 design year indicate that for the critical Turnpike Connector SB (segment 4), the no-build, interim and ultimate build alternatives will operate at LOS F during the AM peak period. However, the v/c ratios for the build alternatives are significantly less (25% and 42%) than the no-build. For the PM peak period, both the interim and ultimate build alternatives operate at LOS C or better and provide significant mobility improvements over the LOS F under the no-build conditions. These results underscore the need for additional improvements identified in the Ultimate Build Alternative or master plan beyond the Interim Build to accommodate the 2040 traffic demand.

The recommended interim build alternative provides short-term operational and safety improvements through the 2030 design year. The Ultimate Build alternative represents the master plan to improve operations, safety and mobility within the GGI and provide a system-to-system connection between the new SR 826/Palmetto Expressway express lanes and the I-95 express lanes for the 2040 design year. This master plan will also provide improvements to some of the substandard design elements within the GGI.

The nature of the congestion within this interchange can partly be attributed to recurring bottlenecks or hotspots along and along the connecting freeways and arterials which is beyond the limits of this project. As such, both the interim and ultimate build alternatives will not be able to provide all the improvements needed to meet the adopted LOS standards without significant improvements to the expressways system and arterial network. The department has been evaluating various congestion management techniques such as express lanes to help alleviate some of this congestion. The District recently began a planning study along the entire I-95 corridor within Miami-Dade County to determine the future improvements required along this corridor.

Assessment of FHWA's Policy

The eight FHWA requirements for IMR approval documented in the FDOT Interchange Handbook are examined in the following section:

1. Need for the Access Point Revision.

   The access needs cannot be adequately satisfied by existing interchanges and/or local roads and streets in the corridor can neither provide the desired access nor can they be reasonably improved to satisfactorily accommodate the design year traffic demands

   The purpose of this IMR is to (1) provide a system-to-system connection between eastbound SR 826 and northbound I-95, and (2) increase the capacity of the southbound Turnpike to southbound I-95 connection. Both primary objectives cannot be satisfied by existing interchanges, local roads or streets, or implementing other improvements to ramp terminals and intersections.

2. Reasonable Alternatives

   All reasonable alternatives for geometric design options, location and appropriate Transportation Systems Management and Operations (TSM&O) strategies have been considered

   As part of this PD&E Study, the following TSM improvements were considered:

   i. *Widening of the southbound Turnpike Connector between SR 826 and the off-ramp to SR 7/US 441 to provide an additional lane for Turnpike southbound to I-95 southbound movement*
   ii. *Signal timing improvements at the intersection of NW 2 Avenue with NW 167 Street and Turnpike Connector southbound to SR 7/US 441 off-ramp intersection*

   Whereas these TSM improvements are near-term treatments that can improve the efficiency of the interchange, they do not by themselves provide the long-term capacity improvements to accommodate design year traffic volumes.

3. Operational and Safety Analysis

   IAR does not have a significant adverse impact on the safety and operations of the Interstate facility

   The safety analysis performed for the GGI indicated that A total of 1,496 injury and 18 fatal crashes occurred during the five-year analysis period with 19 fatalities. The predominant crashes are rear-end and sideswipe collisions which account for 44% and 18% respectively of the total crashes. Crashes of this type are typically attributed to the congested conditions along the interchange ramps and terminals during the peak periods. In addition, merging and weaving maneuvers between ramps due to the relatively short weaving distance between connecting ramps appear to be contributory causes for the frequent angle and sideswipe crashes.

The proposed improvements are targeted to address problem areas and reduce congestion, weaving and merging. Based on the results of the traffic study, the overall delay within the GGI will decrease by approximately 60% under the Recommended Interim Build Alternative 4 compared to the No-Build for the 2030 design year. Also, the network average speed is projected to increase by approximately 78% under the Recommended Interim Build Alternative 4 compared to the No-Build during the critical AM peak period for the 2030 design year. However, high densities were identified along some freeway segments for the Recommended Interim Build Alternative 4, such as the I-95 segments between NW 151 Street and Miami Gardens Drive. These segments typically represent a merge or weave segment, or traffic backup caused by the intersection of NW 167 Street and NW 2 Avenue.

The densities along some of the freeway segments for the No Build were observed to be lower than those of Recommended Interim Build Alternative 4 for the 2030 analysis year. This is due to the fact that the No Build represents constrained conditions with tens of thousands of vehicles held at the entry nodes and not entering the GGI. Therefore these No Build densities are not representative of the true demand. Nevertheless, these results of the traffic study represent significant operational improvements over the No-Build condition and will potentially help reduce associated crashes on the freeway segments and connector ramps. The proposed improvements will also result in a safer and more efficient interchange with fewer weaving, stop-and-go, queuing and lane change maneuvers.

4. Access Connections and Design

An interchange that connects to a public road, which meets or exceeds design standards and provides for all traffic movements, is provided

The GGI provides full interchange connections to three expressways and three major arterials. All existing and proposed GGI access points connect to public roads and are designed to meet current standards. In addition to the improvements considered in the interim phase, system-to-system express lanes are being considered in the Ultimate Design.

5. Land Use and Transportation Plans

The IAR is consistent with local and regional land use and transportation plans

The SR 826/Palmetto Expressway eastbound to I-95 northbound ramp connection is identified in the Miami-Dade County Metropolitan Planning Organization (MPO) 2035 LRTP Cost Feasible Plan (CFP) with funding for the planning, design and construction phases. It is also identified in the Miami-Dade County approved 2014 Transportation Improvement Program (TIP) (FPID: 428358-1) with funding for the design phase in 2014 and the construction phase in 2017. The proposed improvement along the Turnpike Connector to I-95 southbound is also identified in the Miami-Dade County MPO

2035 LRTP CFP Amendment, the Miami-Dade County approved 2014 TIP (FPID: 423373-2) with funding for the design phase in 2015 and the construction phase in 2017. The right of way phase is partially funded for 2015 and 2016..

6. Future Interchanges

Consistency with corridor and comprehensive network studies and master plans

The GGI improvements are the only interchange improvements considered in this study, though GGI area of influence extends to Miami Gardens Drive to north, Opa-Locka Boulevard to the south, and NE 17 Street to the west. GGI includes many ramps and connectors.

7. Coordination

Coordination with the area's development and other transportation system improvements

Changes to access points are being requested to improve safety and efficiency of GGI and improve collection and dispersion of projected traffic. The No Build Alternatives result in a constrained system with tens of thousands of vehicles backing up at entry nodes and not being able to enter the interchange. The evaluated Build Alternatives result in capacity increases at critical segments and nodes that significantly improve collection and dispersion of projected traffic.

8. Environmental Processes

Consideration and coordination with the NEPA document

The proposed improvements have been included in the GGI PD&E Study that is being conducted simultaneously with this IMR. The PD&E study will address all environmental issues related to the IMR proposed improvements.

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K Conceptual Signing Master Plan

* All HCS 2010 Files, CORSIM Models and Outputs, and SYNCHRO Models for Existing and Future Alternatives will be available on an accompanying CD within the corresponding Appendices Folders.

Also supplied on the accompanying CD will be all the referenced documents, including:

Methodology Letter of Understanding (MLOU)

MLOU - Administrative Amendment #1

Preliminary Engineering Report (PER)

Categorical Exclusion Type II Report (Cat-Ex Report)

Preliminary Concept Plans (w/ Signing Plans)

1. INTRODUCTION

1.1 Background

The Golden Glades Interchange (GGI), located in northeastern Miami-Dade County in Florida, is of regional importance providing connectivity to six major principal arterials and/or limited access expressway facilities. Given the nature of the GGI, the approximate equivalent length of the ramp and mainline components within the interchange area equate to over ten (10) miles of roadway. The GGI also supports the I-95 Express Lanes system and the Golden Glades Multimodal Facility, which provides access to inter-county transit service including the existing GGI to Downtown Miami-Dade express bus service. The GGI is a critical link for regional travel between Broward and Palm Beach Counties and Miami-Dade County. It is also the backbone for the transportation of goods and services, as well as passenger trips in the northeast region of Miami-Dade County.

Currently, there is no dedicated system-to-system connection from SR 826/Palmetto Expressway eastbound to I-95 northbound. The existing network connection for this system-to-system movement includes the use of surface streets with tight radii, traffic signals, and weaving segments that considerably slow down traffic through this interchange. In addition, southbound Florida's Turnpike connects to I-95 southbound via a two-lane ramp which transitions into a single lane prior to merging with the SR 826/Palmetto Expressway eastbound to southbound movement. The lane drop combined with weaving movements from SR 826/Palmetto Expressway has resulted in peak period backups that extend beyond the Florida's Turnpike Golden Glades Mainline Toll Plaza.

Over the years, this interchange and the surrounding multimodal facilities have been studied for the purpose of improving traffic operations and increasing user benefits by reducing congestion, increasing connectivity and improving travel delay caused by the circuitous routes in existence today. As part of the planning process, a Conceptual Ultimate Plan was prepared and approved by the Florida Department of Transportation (FDOT) District Six Interchange Review Committee (DIRC) in 2007. This preferred Conceptual Ultimate Plan for the interchange included seven main components as reflected below.

- A new, two-lane ramp directly connecting SR 826/Palmetto Expressway eastbound and SR 7/US 441/SR 9 northbound with I-95 northbound
- SR 7/US 441 northbound realignment and widening (one to two lanes);
- I-95 northbound to SR 7/US 441 northbound ramp realignment;
- SR 9/SR 7/US 441 intersection improvements;
- SR 7/US 441/Park-n-Ride lot intersection improvements;
- SR 7/US 441/Turnpike Connector southbound off-ramp intersection improvements;
- Turnpike Connector southbound off-ramp realignment to southbound I-95.

Some of the concepts developed as part of the Conceptual Ultimate Plan were no longer supported and/or found to be in conflict with changed priorities. These changed priorities

included the potential introduction of managed lanes along SR 826/Palmetto Expressway and improvements to the connection between southbound Turnpike and southbound I-95 and removal of the Turnpike southbound to northbound I-95 direct connection.

This Interchange Modification Report (IMR) prepared as part of the Golden Glades Interchange Project Development and Environment (PD&E) Study will focus on the development and evaluation of alternatives for a new system-to-system connection from SR 826/Palmetto Expressway eastbound to I-95 northbound and the feasibility of increasing the capacity of the southbound movement of Florida's Turnpike to I-95 southbound to address traffic operations and safety issues and enhance multimodal (transit and freight) use. The study will also accommodate the connectivity of a potential express lanes system for SR 826/Palmetto Expressway and how it will connect to the existing I-95 Express Lanes system. The express lanes along SR 826/Palmetto Expressway are currently being evaluated under a separate adjacent PD&E Study (FPID: 418423-1-22-01). The PD&E concepts developed will be utilized to support the express lanes concepts being developed under the SR 826/Palmetto Expressway mainline PD&E Study, as well as to establish an Ultimate Master Plan for the interchange.

1.2 Purpose

The primary purpose of this project is to provide a system-to-system connection for the SR 826/Palmetto Expressway eastbound to I-95 northbound movement and to improve the Florida's Turnpike southbound to I-95 southbound connection in order to address traffic operations and safety issues and enhance multimodal use for both transit and freight. The ultimate phase will evaluate a system-to-system connection between new express lanes on SR 826/Palmetto Expressway and the existing I-95 Express Lanes system. It also considers a direct future connection from southbound Florida's Turnpike to the southbound I-95 Express Lanes. The feasibility of express lanes along SR 826/Palmetto Expressway is currently being evaluated under a separate adjacent PD&E Study (FPID: 418423-1-22-01, ETDM #11241). In addition, interim operational improvements will also be identified within the GGI to be developed as integral components of an Ultimate Master Plan to be established for this interchange. The overall objectives of this PD&E Study include the following elements:

- Improve critical access to the Strategic Intermodal Systems (SIS) Facilities, Freight Activity Centers, Local and Regional Businesses / Hubs of Economic Importance
- Enhance safety, mobility and circulation
- Incorporate express lanes, bus rapid transit and multimodal options
- Address Transportation Systems Management and Operation concerns
- Address operational and physical deficiencies of the interchange
- Establish an Ultimate Master Plan
- Incorporate anticipated improvements into the Local Comprehensive Plan

- Maximize operational benefits with limited funds through a Master Plan
- Develop an implementation program
- Obtain Location Design Concept Acceptance (LDCA) from FHWA for the Interim Improvements

This IMR focuses on the interim improvements identified as part of the Recommended Interim Build Alternative for the GGI. The recommended interim build alternative will provide near term traffic operations and safety improvements within the interchange to accommodate the 2030 travel demand while the Ultimate build alternative will accommodate the 2040 design year travel demand.

1.3 Project Location

The Golden Glades Interchange (GGI) is the confluence point for three expressways (I-95, Florida's Turnpike and SR 826/Palmetto Expressway) and three principal arterials (SR 7/US 441, SR 9 and NW 167 Street) in northeastern Miami-Dade County. This interchange is bordered by the City of Miami Gardens to the north and west, the City of North Miami Beach to the east and the Golden Glades Census Designated Place (CDP) to the south (see **Figure 1-1 Project Location Map**). The GGI influence area is located within the City of Miami Gardens Transportation Concurrency Management Areas (TCMA) as well as the Transportation Concurrency Exemption Area / Urban Infill Area (TCEA/UIA) established by the City of North Miami Beach. The South Florida Rail Corridor (SFRC) also traverses the interchange area. The project study area shown in **Figure 1-1** encompasses the following roadway sections and limits:

1. SR 9A/I-95 (Roadway ID: 87270000) from north of Opa-Locka Boulevard (MP 10.90) to Miami Gardens drive (MP 14.30)
2. SR 826/Palmetto Expressway (Roadway ID: 87260000) from NW 17 Avenue (MP 23.00) to intersection with SR 7/US 441 at Golden Glades Interchange (MP 24.708)
3. Florida's Turnpike (Roadway ID: 87470000) from SR 826/Palmetto Expressway and I-95 to (MP 0.00) to Golden Glades Toll Plaza (MP 0.584)
4. SR 7/US 441 (Roadway ID: 87140000) from NW 155 Lane/N Biscayne River Drive (MP 10.48) to NW 171 Street (MP 11.88)
5. SR 9 (Roadway ID:87240000) from ramp to Park and Ride (MP 13.22) to connection with SR 7/US 441 at Golden Glades Interchange (MP 13.69)
6. SR 826/NW 167 Street ((Roadway ID: 87170000) from Florida's Turnpike (MP 0.00) to North Miami Avenue (MP 0.73).

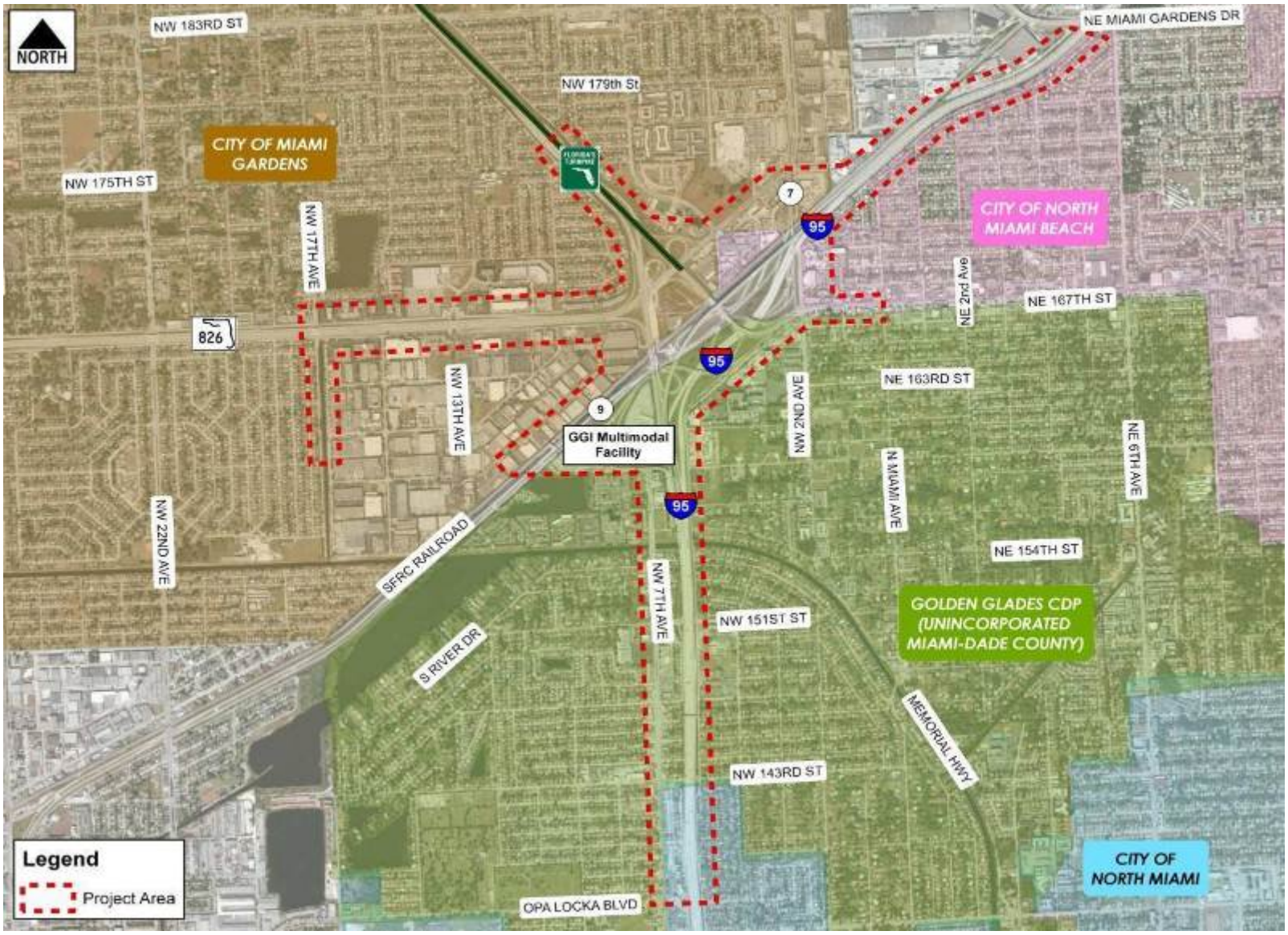


Figure 1-1 Project Location Map

2. METHODOLOGY

2.1 Area of Influence

The GGI influence area is bordered by I-95 ramp signals at NW 135 Street to the south, the SR 826/Palmetto Expressway diamond interchange at NW 17th Avenue to the west, the Turnpike Golden Glades Toll Plaza to the northwest, the I-95 off-ramp at NE 183rd Street (Miami Gardens Drive) to the northeast, and the intersection of NW 167th Street and Miami Avenue to the east. The signalized intersection of NW 167th Street and Miami Avenue is included in the influence area because its operation affects traffic progression at the intersection of NW 167th Street and NW 2nd Avenue. Likewise, the signalized intersection of NW 135th Street and NW 7th Avenue is included in the influence area because its operation affects traffic progression at the ramp intersections along NW 135th Street. The GGI influence area includes all the ramps within GGI, thirteen signalized intersections and three unsignalized intersections.

2.2 Analysis Years

The analysis years proposed for this project are as follows:

- Existing Year: 2010
- Opening Year: 2018
- Interim Year: 2030
- Design Year: 2040

2.3 Travel Demand Forecasting

Traffic forecasts were developed for both the PD&E and IMR studies. The traffic demand forecasting task including model and network validation and volume adjustments were performed by the Study Team for the adjacent SR 826 PD&E Study for both the SR 826/Palmetto Expressway corridor and GGI. The traffic projections were developed to establish the basic design requirements for the No-Build and proposed roadway typical sections, intersections and interchange modifications. The adopted Southeast Regional Planning Model (SERPM) Version 6.5 Time-of-Day was used to develop traffic projections. This is the model used to develop the recent 2035 Long Range Transportation Plan (LRTP) for the Metropolitan Planning Organization (MPO). SERPM 6.5 has a 2005 base year and 2035 horizon year. The 2035 horizon year incorporates the MPO approved 2035 Traffic Analysis Zones (TAZ) data and the 2035 cost feasible roadway network. **Table 2-1** shows the travel demand models to be developed for the GGI IMR and how it relates to the SR 826/Palmetto Expressway System Interchange Modification Report (SIMR).

Table 2-1
Travel Demand Models

Analysis Years	GGI PD&E		SR 826 East - West		SR 826 North - South	
	No Build Model	**Build Models**	**No Build Model**	**Build Models**	**No Build Model**	**Build Models**
2010 - Model Base Year for validation checks and Existing Year for GGI PD&E	Road network per year 2010 conditions.	Not Applicable	Road network per year 2010 conditions	Not Applicable	Road network per year 2010 conditions	Not Applicable
2011 - Existing Year SR 826 E-W and N-S projects.	No Model Development. No 2011 operations analyses.	Not Applicable	No Model Development. Operations analyses per 2011 counts.	Not Applicable	No Model Development. Operations analyses per 2011 counts.	Not Applicable
2016 - Opening Year SR 826 N-S	Road network per existing + committed projects through year 2016. This network will exclude SR 826 Express Lanes.	Road network per GGI 2016 No Build + Interim connections for EB SR 826 to NB I-95 + SR 826 Express Lanes.	Road network per existing + committed projects through year 2016 + Interim connection for EB SR 826 to NB I-95 per GGI PD&E + SR 826 N-S Express Lanes.	Road network per SR 826 PD&E 2016 No Build + SR 826 E-W Express Lanes	Road network per existing + committed projects through year 2016. This network will exclude SR 826 Express Lanes	Road network per SR 826 N-S 2016 No Build + SR 826 Express Lanes + Interim connection for EB SR 826 to NB I-95 per GGI PD&E.
2018 - Opening Year SR 826 E-W and GGI	No Model Development. Traffic Forecast interpolated from 2016 and 2030 Models.	No Model Development. Traffic Forecast interpolated from 2016 and 2030 Models.	No Model Development. Traffic Forecast interpolated from 2016 and 2030 Models.	No Model Development. Traffic Forecast interpolated from 2016 and 2030 Models.	No Model Development. Traffic Forecast not required.	No Model Development. Traffic Forecast not required.
2030 - Interim Year, All Projects	Road network per 2035 Cost Feasible LRTP + Amendments. This network will exclude SR 826 Express Lanes.	Road Network per GGI PD&E 2030 No Build + Interim connection for EB SR 826 to NB I-95 + SR 826 Express Lanes .	Road network per 2035 Cost Feasible LRTP + Amendments + Interim connection for EB SR 826 to NB I-95 per GGI PD&E + SR 826 N-S Express Lanes.	Road network per SR 826 PD&E 2030 No Build + SR 826 E-W Express Lanes	Road network per 2035 Cost Feasible LRTP + Amendments. This network will exclude SR 826 Express Lanes.	Road network per SR 826 PD&E 2030 No Build + SR 826 Express Lanes + Interim connection for EB SR 826 to NB I-95 per GGI PD&E.
2040 - Design Year, All Projects	Road network per 2035 CF LRTP + Amendments + other anticipated projects as agreed with D6. This network will exclude SR 826 Express Lanes.	Road network per GGI PD&E 2040 No Build + SR 826 Express Lanes + system to system connection for SR 826 Express Lanes to/from I-95 NB Express Lanes + other ultimate ramp improvements per GGI PD&E. Manual adjustments will be applied to develop 2040 volume estimates for build alternatives incorporating only interim GGI improvements (or other limited improvements) as necessary for operations analyses.	Road network per 2035 CF LRTP + Amendments + other anticipated projects as agreed with D6 + Interim connection for EB SR 826 to NB I-95 per GGI PD&E + SR 826 N-S Express Lanes.	Road network per SR 826 E-W 2040 No Build + SR 826 E-W Express Lanes + system to system connection for SR 826 Express Lanes to/from I-95 NB Express Lanes + other ultimate ramp improvements per GGI PD&E. In addition other models will be developed for project specific system alternatives. These will include: 1. 8 GP Lanes w/o Express Lanes system-to-system connection 2. 6 GP + 4 Express Lanes w/o system-to-system connection for Express Lanes	Road network per 2035 CF LRTP + Amendments + other anticipated projects as agreed with D6. This network will exclude SR 826 Express Lanes.	Road network per SR 826 N-S 2040 No Build + SR 826 Express Lanes + system to system connection for SR 826 Express Lanes to/from I-95 NB Express Lanes + other ultimate ramp improvements per GGI PD&E.

Note: 1. Limits for SR 826 N-S Express Lanes extend from SR 836 to I-75 and continuing along I-75 to NW 170 Street.
2. Limits for SR 826 E-W Express Lanes extend from I-75 to GGI

2.4 Traffic Factors

Factors were used and/or developed for adjusting field collected data and for calculating DDHV for each of the analysis years consistent with the following documents:

- *Project Traffic Forecasting Handbook*, Topic No. 525-030-120 Published by the FDOT, October 2002;
- *Technical Resource Document for the Interchange Handbook*, published by the FDOT, January 2002; and
- *2010 Florida Traffic Information DVD*, Published by the FDOT (2010 FTI).

Peak Season Conversion Factors (PSCF) were obtained from the 2010 FTI and applied to peak hour volumes that will be used in the operation analysis of existing conditions.

Axle factors were applied to the collected counts as appropriate, and will be obtained from the 2010 FTI.

Peak Hour Factor (PHF) was based on Table 10.1 of the Technical Resource Document 10 for the Interchange Handbook. The default PHFs for urban uninterrupted and interrupted flow facilities are 0.95 and 0.925, respectively.

It should be noted that the CORSIM models were initially developed to simulate 2 hours in the AM and PM periods using eight 15-minute increments considering the constrained traffic conditions in the AM and PM peak periods. This model structure was maintained for model calibration; however, for existing conditions analysis the CORSIM simulation period was expanded to 4 hours for each of the AM (6:00 AM to 10:00 AM) and PM (3:00 PM to 7:00 PM) periods to include shoulder hours. For the existing conditions, the additional hours were added onto the initial and final simulation time periods, which allows for a more conservative estimate of traffic volume. This allowed CORSIM to more accurately model traffic conditions, and identify causes and durations of congestion.

Since the model was developed with 4-hour AM and 4-hour PM peak periods (6:00 AM to 10:00 AM and 3:00 PM to 7:00 PM), the peak hour factors were not utilized, but Erlang random distribution was selected at entry nodes to account for traffic variation within the hour. Future conditions were also modeled using shoulder hours with 1 time period duration equaling 1 hour, the volumes for the shoulder hours were calculated on an hourly basis as a percent of the peak hour.

Design Hour Factor (K_{30}), Directional Distribution (D_{30}) and Truck Daily Percent (T_{24}) Factors were generally based on the latest values obtained from the 2010 FTI. **Table 2-2** provides the K_{30}, D_{30} and T_{24} factors as well as the standard K factors adopted by FDOT which will be used in the analysis. The majority of count stations are directional (D_{30}=1); the K_{30} factors for I-95, SR 826/Palmetto Expressway and their ramps are generally lower than 8%; some locations have significant difference between their K_{30} assigned factor and their peak-to-daily ratio; and slightly less than half the locations peak during the AM peak period. The percent of heavy vehicles (i.e., truck percentage) was estimated based on:

- Half of the daily truck factor (T_{24}) reported for the most recent three years of data obtained from the 2010 FTI.
- Estimated truck percentages from intersection turning movement counts.
- Assumed 2% at locations where no data is available, such as for minor roadways.

All factors were checked for reasonableness. The standard K as well as the recommended D_{30} and T_{24} factors for the main freeway sections and arterials are provided in **Table 2-2**.

Table 2-2
Traffic Factors

Road Segment	Standard K	K_{30}	D_{30}	T_{24}
I-95 from NW 151 Street to Miami Gardens Drive	8.0	7.2	50.5	4%
SR 826/Palmetto Expressway west of GGI	8.0	7.6	54.6	6%
Florida's Turnpike north of GGI	9.5	9.7	58.0	7%
NW 167 Street east of GGI	9.0	9.0	54.0	3%
SR 7/US 441	9.0	9.0	N/A	7%
SR 9	9.0	9.0	54.0	9%
Miami Gardens Drive	9.0	9.0	54.0	3%

2.5 Operational Analysis Procedures

The operational analysis procedures for the IMR and PD&E were developed in coordination with SR 826 PD&E Study and are generally consistent for both PD&Es. The future AADTs were obtained from the SR 826 study. Traffic operational analyses for existing and future conditions were performed using Highway Capacity Manual (HCM) and micro-simulation. AM and PM peak period analysis were performed for existing year (2010), opening year (2018), interim year (2030) and design year (2040) alternatives. Evaluating operational results were generally based on HCM 2000 procedures for CORSIM (freeways and ramps) and SYNCHRO (intersections), except for weaving analysis which was performed using the HCM 2010 procedures.

Due to the location of the interchange, the close spacing of interchanges and intersections, and complexity of the GGI interchange in conjunction with the saturated urban conditions of the area, CORSIM was the primary software used to evaluate the operating conditions of the main freeway sections and ramps. Ten (10) CORSIM runs were performed and the results averaged. Highway Capacity Software (HCS) 2010 was also used to evaluate main freeway sections and weaving segments. It should be noted that HCS analysis is only valid for freeway sections operating in an uncongested environment. As such, when the HCS results are in conflict with CORSIM, the CORSIM analysis prevails. The CORSIM model limits generally include all the freeways, ramps and intersections in the IMR influence area to account for traffic backup from ramp intersections into the freeway facilities. However, intersections were analyzed using SYNCHRO 8 consistent with the scope of this PD&E Study.

The CORSIM calibration was performed for the 2-hour AM and 2-hour PM peak periods using volumes per 15-min increments. Existing and future conditions analyses were performed for the peak period and shoulder hours for a total of 4-hour AM and PM periods; using hourly input volumes for future conditions. Future volumes were derived from AADTs using the recently adopted standard K factors and D_{30}.

2.5.1 Traffic Analysis of Existing Conditions

Existing traffic operating conditions were evaluated using a combination of field observations, crash data analysis, and traffic micro-simulation analysis. Field reviews were conducted in the AM and PM peak periods to document typical conditions such as delays, queues, unsafe weaving and safety concerns.

The calibrated AM peak period CORSIM model developed by Kittelson and Associates, Inc. (KAI) and expanded by Florida Turnpike Enterprise (FTE) was be used to perform the operational analysis of freeways and ramps for the year 2010. The DIRC approved CORSIM model does not include southbound I-95 and I-95 elevated northbound and southbound managed lanes because it was determined during the planning study that they have negligible impact on the eastbound SR 826 to northbound I-95 traffic movements that are the focus of this IMR/PD&E. However, the southbound merging of the managed lanes with the general purposes lanes was included in the model to evaluate the Turnpike improvement alternative that connects with the elevated bridge of the managed lanes. The CORSIM model was revised to incorporate southbound I-95 to evaluate the turnpike improvements. However, the northbound and southbound managed lanes were not included in the expanded CORSIM network because they have no impacts on IMR improvements. This simplification of the CORSIM network was maintained for future conditions.

A CORSIM model for existing conditions was developed for the PM peak period using 15-minute traffic counts from the KAI 2010 traffic counts and the synopsis reports from the 2010 FTI DVD. The AM and PM periods were expanded to 4 hours by adding the shoulder hours. Volumes for the shoulder hours were calculated on an hourly basis as a percent of the peak hour. The travel time runs performed by F.R. Aleman in April 2010 and field observations were used to calibrate CORSIM model for the PM peak period. Additional travel time runs and origin-destination data were provided by FTE.

SYNCHRO 8 was used for intersection analyses for the AM and PM peak hours using 2010 turning movement counts collected for the KAI study and 2010 signal timings. Average delays and LOS were estimated using the HCM 2000 module of SYNCHRO 8.

2.5.2 Design Hour Traffic Development

For typical interchanges, future DDHVs of main freeway segments are developed by applying AADT x K x D, while future ramp volumes are generally developed as a percent split at departing ramps. GGI is a complex interchange where main freeway segments split into system-to-system connecting ramps, in addition to ramps that connect with the arterial network. Future DDHVs for system-to-system ramps were primarily estimated using AADT x K. The percent split at departing ramp were also estimated for comparison to insure reasonable and consistent growth rates within the system for the AM and PM peak periods.

DDHVs for ramps connecting with the arterial network were primarily estimated as a percent split at departing ramps. All future DDHVs were checked for reasonableness and to smooth out unjustifiable growth rates. Of the 40 count locations within GGI, 33 are directional (D factor=1) located on ramps. About half the system-to-system ramps peak in the morning, and the other half in the afternoon. The existing ratios of AM to PM peak hour volumes were maintained for future years. The existing ratios of the peak period and shoulder hour volumes to daily volumes were also maintained for future years. Therefore, if the highest traffic volume on a system-to-system ramp is in the PM, future PM peak hour volume was calculated by multiplying the future AADT by K, and the future AM peak hour volume was calculated by multiplying the future PM peak hour volume with the ratio of existing AM to PM peak hour volumes. Future ramp volumes were generally derived as a percent of the main freeway movement.

The K factor and AM to PM peak hour ratio were calculated for each count station located on a system-to-system ramp. The large proportion of directional counts necessitate rebalancing traffic volumes for the AM and PM peak hours within GGI influence area even if AADT volumes are balanced. Future peak period volumes were developed per 60-min increments from 6:00 AM to 10:00 AM and from 3:00 PM to 7:00 PM based on existing hourly traffic variation within the peak period as described in this document. The peak period for CORSIM analysis includes shoulder hours for a total of 4 hours for the AM and 4 hours for the PM simulations. Future traffic variation within the hour was accounted for in CORSIM by selecting Erlang distribution for headways and setting curve shape parameter to 1.

The shoulder hour volume at each entry node will be estimated as a percent of that hour to the peak hour based on existing counts. The hourly volume ratios expressed as a percentage of the peak hour of each of the 4-hour AM and PM period at each entry node are shown in **Table 2-3**. It should be noted that while the CORSIM total traffic simulations were for a 4 hour period for each of the AM and PM periods, MOEs (i.e., volumes, speed, density, delay) were summarized for the 2-hour peak period only. Microsimulation analyses for the AM and PM periods were performed for freeways and ramps using CORSIM 6.2 and applying HCM 2000 procedures to determine densities and LOS, and HCM 2010 procedures to evaluate weaving. TMTOOL was used to balance turning movement volumes at intersections. Intersection analysis was performed using the HCM 2000 module of SYNCHRO 8.

2.5.3 Traffic Analysis of Future Years and Design Alternatives

The traffic analysis for future years will be performed using the process illustrated in **Figure 2-1** and described below:

1. Obtain balanced AADTs from SR 826 PD&E Study
2. Check AADTs for reasonableness
3. Apply traffic diversion if needed for a design alternative
4. Apply Standard K and D factors and AM/PM ratios to calculate AM and PM peak hour volumes for main sections and apply K and AM/PM ratio for system-to-system ramps

Table 2-3
Volume Traffic Variation at Major Entry Approaches

YEAR 2010	1. SR 826 (EB) #87-2114		2. SR 826 (WB) #87-0366		3. I-95 (NB) #87-2134		4. I-95 (SB) #87-2137		5. SR-7 (SB) #87-0021		6. SR-9 (EB) #87-0607		7. TPK (SB) #6300		ALL ENTRY NODES TO GGI	
START TIME	3-DAY AVERAGE	Peak hour: 04:15~5:15 PM	3-DAY AVERAGE	Peak hour: 04:30~5:30 PM	3-DAY AVERAGE	Peak hour: 03:45~4:45 PM	3-DAY AVERAGE	Peak hour: 07:45~8:45 AM	3-DAY AVERAGE	Peak hour: 07:15~8:15 AM	3-DAY AVERAGE	Peak hour: 05:00~6:00 PM	3-DAY AVERAGE	Peak hour: 07:30~8:30 AM	ALL ENTRY NODES	Peak hour: 04:00~5:00 PM
12:00 AM	1,234	22.4%	371	15.8%	2,348	25.7%	683	12.5%	349	17.0%	109	9.1%	340	9.1%	5,434	20.5%
1:00 AM	741	13.5%	212	9.0%	1,279	14.0%	598	11.0%	238	11.6%	76	6.4%	233	6.2%	3,377	12.7%
2:00 AM	540	9.8%	142	6.1%	883	9.7%	561	10.3%	185	9.0%	62	5.2%	150	4.0%	2,523	9.5%
3:00 AM	528	9.6%	101	4.3%	838	9.2%	768	14.1%	181	8.8%	84	7.0%	194	5.2%	2,694	10.2%
4:00 AM	859	15.6%	95	4.1%	988	10.8%	1,471	27.0%	304	14.9%	123	10.3%	258	6.9%	4,098	15.5%
5:00 AM	1,907	34.7%	458	19.5%	1,987	21.8%	3,075	56.3%	680	33.2%	215	18.0%	799	21.3%	9,121	34.4%
6:00 AM	**4,291**	**78.1%**	**1,038**	**44.3%**	**3,992**	**43.7%**	**3,798**	**69.6%**	**1,364**	**66.6%**	**524**	**43.8%**	**2,450**	**65.3%**	**17,457**	**65.8%**
7:00 AM	**5,435**	**98.9%**	**1,513**	**64.5%**	**6,584**	**72.1%**	**4,829**	**88.5%**	**1,996**	**97.5%**	**892**	**74.6%**	**3,596**	**95.9%**	**24,845**	**93.7%**
8:00 AM	**5,105**	**92.9%**	**1,819**	**77.6%**	**7,566**	**82.9%**	**5,394**	**98.8%**	**1,950**	**95.3%**	**903**	**75.5%**	**3,547**	**94.6%**	**26,284**	**99.1%**
9:00 AM	**4,665**	**84.9%**	**1,828**	**78.0%**	**6,378**	**69.8%**	**4,807**	**88.1%**	**1,618**	**79.0%**	**731**	**61.1%**	**2,809**	**74.9%**	**22,836**	**86.1%**
10:00 AM	4,387	79.8%	1,902	81.1%	6,241	68.3%	5,097	93.4%	1,501	73.3%	629	52.6%	2,182	58.2%	21,939	82.7%
11:00 AM	4,521	82.2%	1,984	84.6%	6,731	73.7%	5,257	96.3%	1,571	76.7%	681	56.9%	1,987	53.0%	22,732	85.7%
12:00 PM	4,799	87.3%	2,049	87.4%	6,938	76.0%	5,068	92.9%	1,617	79.0%	782	65.4%	1,770	47.2%	23,023	86.8%
1:00 PM	4,799	87.3%	2,133	91.0%	7,173	78.6%	5,040	92.3%	1,687	82.4%	792	66.2%	1,869	49.8%	23,493	88.6%
2:00 PM	4,948	90.0%	2,101	89.6%	8,033	88.0%	5,269	96.5%	1,699	83.0%	854	71.4%	1,886	50.3%	24,790	93.5%
3:00 PM	**5,100**	**92.8%**	**2,187**	**93.3%**	**8,811**	**96.5%**	**5,112**	**93.7%**	**1,738**	**84.9%**	**1,045**	**87.4%**	**1,947**	**51.9%**	**25,940**	**97.8%**
4:00 PM	**5,332**	**97.0%**	**2,329**	**99.3%**	**9,068**	**99.3%**	**4,971**	**91.1%**	**1,688**	**82.5%**	**1,067**	**89.2%**	**2,069**	**55.2%**	**26,524**	**100.0%**
5:00 PM	**5,185**	**94.3%**	**2,232**	**95.2%**	**9,041**	**99.0%**	**4,477**	**82.0%**	**1,744**	**85.2%**	**1,196**	**100.0%**	**2,442**	**65.1%**	**26,317**	**99.2%**
6:00 PM	**4,669**	**84.9%**	**2,002**	**85.4%**	**8,618**	**94.4%**	**4,225**	**77.4%**	**1,537**	**75.1%**	**1,044**	**87.3%**	**2,441**	**65.1%**	**24,536**	**92.5%**
7:00 PM	4,227	76.9%	1,368	58.3%	7,266	79.6%	3,870	70.9%	1,258	61.5%	783	65.5%	1,615	43.1%	20,387	76.9%
8:00 PM	3,546	64.5%	1,003	42.8%	5,851	64.1%	3,282	60.1%	1,052	51.4%	578	48.3%	1,245	33.2%	16,557	62.4%
9:00 PM	3,408	62.0%	889	37.9%	4,960	54.3%	2,818	51.6%	948	46.3%	435	36.4%	1,102	29.4%	14,560	54.9%
10:00 PM	2,936	53.4%	727	31.0%	4,345	47.6%	2,481	45.5%	791	38.6%	313	26.2%	992	26.4%	12,585	47.4%
11:00 PM	2055	37.4%	578	24.6%	3909	42.8%	1343	24.6%	497	24.3%	222	18.6%	634	16.9%	9238	34.8%
TOTAL	85,217	**5,497**	31,061	**2,345**	129,828	**9,131**	84,294	**5,458**	28,193	**2,047**	14,140	**1,196**	38,557	**3,751**	14,140	**26,524**

5. Apply Standard K and D factors and AM/PM ratios to calculate AM and PM peak hour volumes for main sections and apply K and AM/PM ratio for system-to-system ramps
6. Apply percent splits at departing ramps connecting with the arterial network and perform traffic balancing for the AM and PM peak hours
7. Use TMTOOL to balance turning movement volumes at intersections
8. Perform SYNCHRO analysis at study intersections
9. Optimize signal timing and identify geometric improvements if needed
10. Develop 4-hour AM and 4-hour PM peak period volumes per 60-minute increments that include the 2-hour peak period and the shoulder hours. The ratio of the peak period and shoulder hours to the peak hour will be based on existing counts (entering volumes) as provided in **Table 2-3**.
11. Perform CORSIM analysis for the AM and PM peak periods
12. Calculate segment densities and LOS for freeway, merge/diverge ramps and weaving segments
13. Compare calculated LOS with adopted LOS to identify failing facilities
14. Summarize MOE and operational results for each future scenario
15. Develop an evaluation matrix to compare alternatives and select preferred improvements.

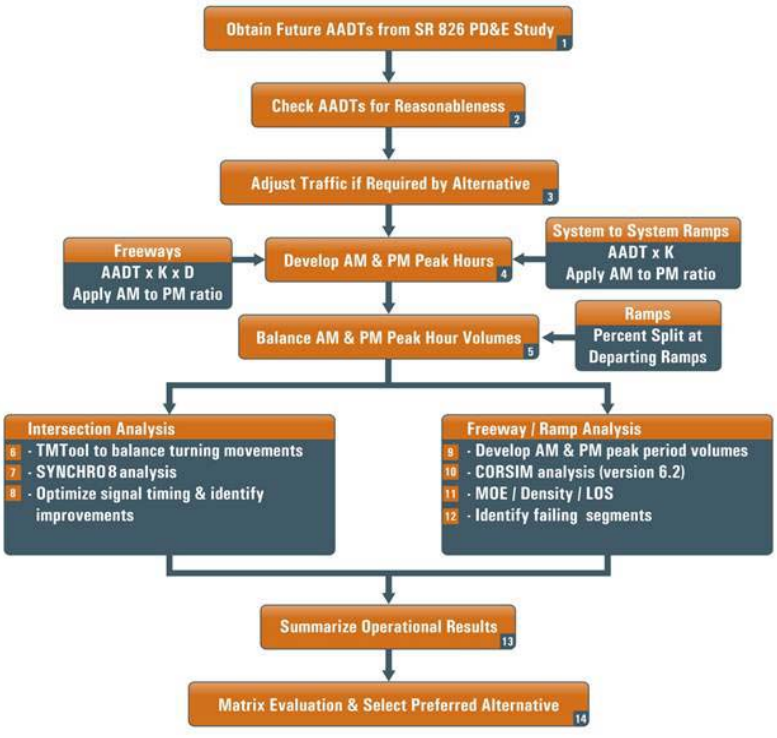


Figure 2-1 Flowchart for Future Years Traffic Operational Analysis

3. EXISTING CONDITIONS

3.1 Demographics

The population within the study area is predominantly Black or Hispanic. **Table 3-1** shows the racial distribution of the population within the study area, based on the information from the US Census Bureau's American Fact Finder web site for the eight census tracts within the project study area. The estimated household incomes for the eight census tracts are provided in **Table 3-2**. The detailed data sources from the US Census Bureau are included in **Appendix A**.

Table 3-1
Summary of Population Distribution by Race

Census Tract	Tract Population	# of House-holds	Non-Hispanic White	American Indian and Alaska Native	Asian, Hawaiian, Pacific Islander	Black	Hispanic	Other 2 or more Races	Tract Minority Population
2.04	4,701	1,382	269	0	184	2,849	1,344	55	4,432
3.01	6,383	2,438	688	0	117	4,316	1,215	47	5,695
3.02	2,617	681	344	0	167	1,200	680	226	2,273
3.07	4,829	1,329	480	0	121	2,821	1,370	37	4,349
4.13	4,623	1,436	327	0	0	3,323	874	123	4,320
4.14	5,039	1,993	361	0	97	4,149	355	77	4,678
95.01	4,800	1,921	81	0	67	4,095	531	33	4,726
95.04	4,698	1,398	52	0	0	4,187	447	12	4,646

Table 3-2
Summary of Household Income

Census Tract	2010 Estimated County-Wide Median Household Income	Census Tract Median Household Income	Census Tract Median Income Percent (%)
2.04	$43,957	$52,222	118.80%
3.01	$43,957	$46,410	105.58%
3.02	$43,957	$63,162	143.69%
3.07	$43,957	$50,609	115.13%
4.13	$43,957	$33,542	76.31%
4.14	$43,957	$35,453	80.65%
95.01	$43,957	$45,071	102.53%
95.04	$43,957	$51,778	117.79%

The proposed interim improvements involve relocations to commercial properties and do not impact any residential properties. Hence, no adverse effect to any particular race is anticipated. The median household income in the study area ranges from $33,542 to $63,162 and is generally higher than the Miami-Dade County median household income of $43,957 with the exception of Census Tracts 4.13 and 4.14.

3.2 Existing Land Use

The project study area traverses a region of diverse land use designations such as low and medium-high density residential communities, business, industrial, office, institution and transportation land uses (see **Figure 3-1**). Along the SR 826/ Palmetto Expressway, corridor, the primary land uses are business and office to the north and industrial and office to the south. As SR 826/Palmetto Expressway converges with I-95 heading north, the land uses to the northwest are industrial and office and to the southeast are low density residential with pockets of medium density residential, transportation-related businesses, office, institution, utilities, and communication facilities.

A single, comprehensive future land use map for the study area is not available from Miami Dade County due to the presence of cities and municipalities which govern their own land use designations. Individual future land use maps were obtained from the City of Miami Gardens, North Miami Beach, North Miami and Miami Dade County. These future land use maps were evaluated and they indicate that the existing commercial, industrial, office and single-family residential will retain their same land use designations.

Figure 3-1 Land Use Designation

3.3 Existing Roadway Network

The roadway network within the project study area is comprised of state roads, county roads and local roads which provide access and traffic circulation within residential, commercial and industrial areas. The Golden Glades Interchange is also an important transportation hub within southeast Florida that provides inter-regional connection for Miami-Dade, Broward and Palm Beach Counties. There are six major regional transportation corridors that converge within this interchange and are functionally classified as follows:

- SR 826/Palmetto Expressway (Roadway ID: 87260000, MP 23.00 to 24.708) is functionally classified as an urban freeway/expressway. It is also designated as a Strategic Intermodal System (SIS) highway and part of the Florida Intrastate Highway System (FIHS).
- SR 9A/I-95 (Roadway ID: 87270000, MP 10.90 to MP 14.30) is functionally classified as an urban interstate. SR 9A/I-95 is an integral part of the Strategic Intermodal System (SIS) highway and the Florida Intrastate Highway System (FIHS).
- SR 91/Florida's Turnpike (Roadway ID: 87470000, MP 0.00 to MP 0.584) falls under the roadway functional class of urban freeways/expressways. It is also designated as both a Strategic Intermodal System (SIS) highway and Florida Intrastate Highway System (FIHS) highway.
- SR 7/US 441 (Roadway ID: 87140000, MP 10.48 to MP 11.88) is functionally classified as an urban minor arterial from MP 10.48 to 11.429, and an urban freeway/expressway from MP 11.429 to 11.88 within the interchange. North of the interchange, it is classified as an urban principal arterial. It is designated as a Strategic Intermodal System (SIS) highway within the interchange area between the Park and Ride facility and NW 2 Avenue.
- SR 9 (Roadway ID: 87240000, MP 13.22 to MP 13.69) falls under the roadway functional class of urban principal arterial from its terminus at NW 27 Avenue to the Golden Glades Interchange.
- SR 826/NW 167 Street (Roadway ID: 87170000, MP 0.000 to MP 0.73) is functionally classified as an urban principal arterial from the Golden Glades Interchange to its terminus at SR A1A. It is also on the state highway system designated as SR 826.

The street network which provides access to surrounding land uses within the project limits consists of urban collectors or local roads under the jurisdiction of the municipality they traverse. **Figure 3-2** shows the functional classifications of the different roadways within the project study area.

Figure 3-2 Functional Classifications

3.4 Alternative Travel Modes

The Golden Glades Interchange includes a Park and Ride (P&R) facility located east and west of SR 7/US 441. It is designated as a SIS intermodal hub and provides connections to other SIS and FIHS facilities, such as I-95 and SR 826 (Palmetto Expressway) and Florida's Turnpike. Within the footprint of the existing Golden Glades Interchange, there are a variety of transit systems interacting within the surface Park and Ride lots and supporting regional connectivity to the Tri-Rail and extensive bus services via Miami-Dade Transit, Greyhound and Broward County Transit.

The west P&R lot is situated to provide surface parking in front of the pedestrian walkway connecting to the Golden Glades Tri-Rail Station over SR-9 on the western side of the lot. The west P&R lot hosts a central covered bus stop for three long-side buses loading locations via bus only lanes, with a drop off/pick up lane opposite the bus only side for individual cars. The central covered stop includes benches, bicycle stands, and newspaper stands for waiting passengers. The east P&R lot also hosts a covered bus stop along the northeastern boundary of the lot with similar supportive infrastructure. Additionally, a portion of the east P&R lot also is signed as a Tandem Staging Area to accommodate load switching of freight trucks. The following transit agencies provide service within the project study area.

3.4.1 Miami-Dade Transit

The Metrobus system operated by Miami-Dade Transit (MDT) provides bus service throughout Miami-Dade County. For the most part, the routes are designed to intersect with Metrorail and Metromover and serve all major business, shopping, entertainment, and cultural centers, as well as major hospitals and schools. MDT has over 850 buses which service 100 routes with over 30 million scheduled miles each year and an annual ridership of over 75 million passengers. All buses are wheelchair accessible. The following MDT Metrobus routes provide service to and from the Golden Glades Interchange Park & Ride area:

- Route 22: City of North Miami Beach, The Mall at 163 Street, Golden Glades Park & Ride, NW 22 Avenue, Earlington Heights Metrorail station, Clinics, Coconut Grove Metrorail station, Sunshine State Industrial Park
- Route 77: NW 199 Street/2 Avenue (SR441), Golden Glades Park & Ride, NW 7 Avenue, Liberty City, Culmer Metrorail Station, Government Center Metrorail Station, Main Library, Historical Museum of South Florida, Miami Art Museum, Downtown (Miami) Bus Terminal
- Route 95 Golden Glades: Golden Glades Park & Ride lot, Civic Center, Veterans Hospital, Jackson Memorial Hospital, Norwood, Earlington Heights Metrorail Station, Downtown Miami, and Brickell.

- Route E/105 Golden Glades: Golden Glades Park & Ride, Jackson North, The Mall at 163 Street, City of North Miami Beach, Eastern Shores, Winston Towers, Aventura Mall, Turnberry Isle, Diplomat Mall/Hallandale
- Route 246 Night Owl: The Mall at 163 Street, Downtown Miami, Government Center Metrorail Station, Overtown, Civic Center Metrorail station, University of Miami/Jackson Memorial Hospitals and clinics, Allapattah Metrorail station
- Route 277 NW 7 Avenue MAX: Downtown Miami, Government Center Metrorail Station, Culmer Metrorail Station, NW 7 Avenue, Lindsey Hopkins, Edison Center, North Miami, Biscayne Gardens, Golden Glades Park & Ride.
- Route 95 Dade-Broward Express: Southbound AM - 95 Dade-Broward Express, Downtown Miami. Northbound PM - 95 Dade-Broward Express, Sheridan Street (serving Sheridan Street Tri-Rail Station) and 95 Dade-Broward Express, Broward Boulevard (serving Ft. Lauderdale Tri-Rail Station.

3.4.2 Broward County Transit

Broward County Transit (BCT) is the primary public transportation operator in Broward County. BCT provides bus service throughout Broward County – work, schools, shopping, libraries, parks, cultural and civic activities, and other places of interest. BCT also provide links to Miami-Dade and Palm Beach counties transit systems. The following BCT routes provide service to and from the Golden Glades Interchange Park & Ride area:

- Route 18: Golden Glades Park and Ride to Sandalfoot Cove Boulevard and US 441
- Route University Breeze: Glades/Tri-Rail Park and Ride to Westview Drive and University Drive via University Drive.
- Route 441 Breeze: Golden Glades/Tri-Rail Park and Ride to Sample Road and US 441.
- Route 95 Express Pembroke Pines: CB Smith Park and Ride to downtown Miami.
- Route 95 Express Miramar: Miramar Civic Center to downtown Miami.

Both 95 Express routes operated by BCT traverse the Golden Glades Interchange but do not stop at the Golden Glades Interchange Park and Ride facility.

Figure 3-3 depicts the MDT Metrobus routes.

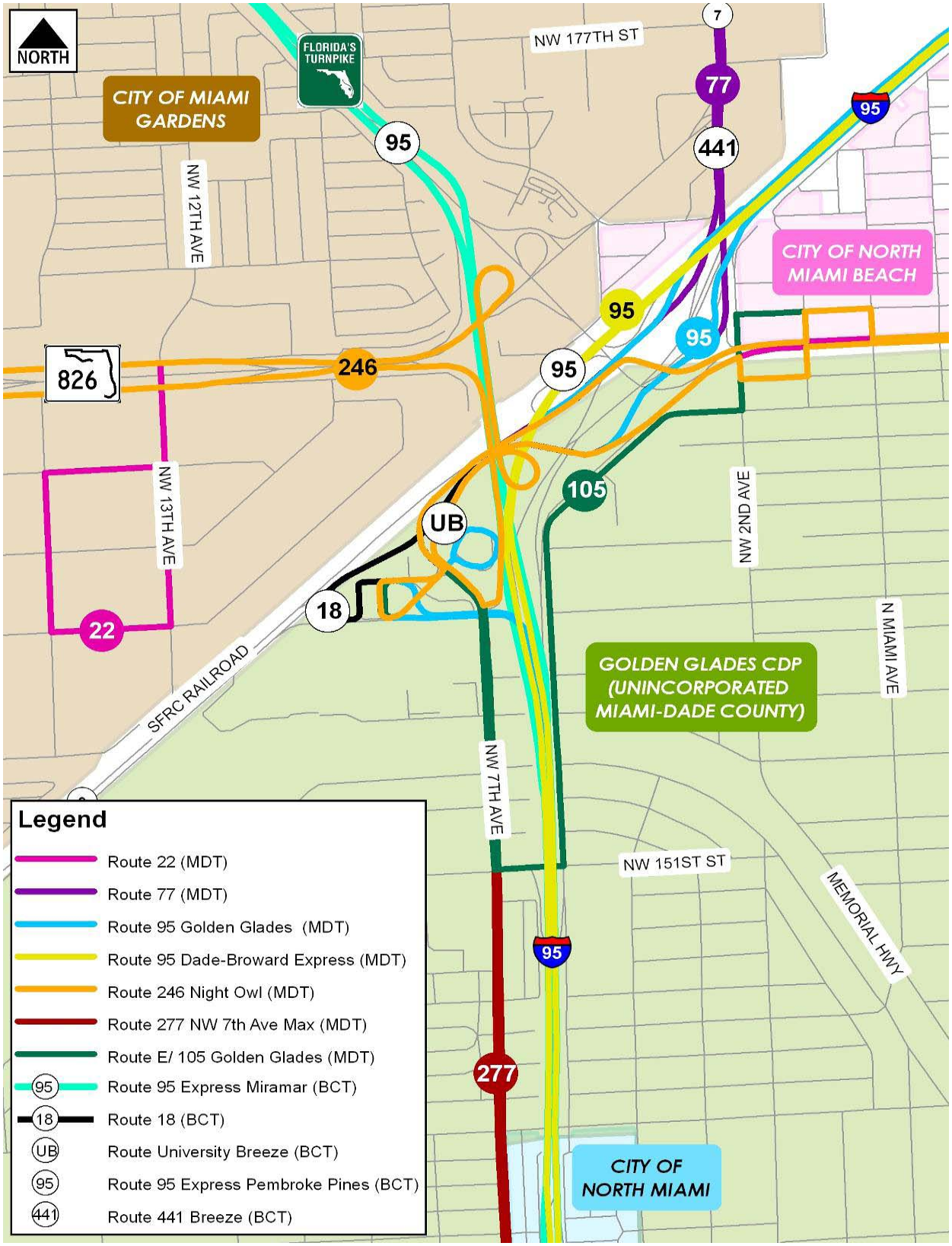


Figure 3-3 Miami-Dade Transit Metrobus Routes

3.4.3 Tri-Rail

Tri-Rail is the tri-county commuter train service that operates along the South Florida Rail Corridor with station stops in Miami-Dade, Broward, and Palm Beach Counties. The Main Stations include: Miami International Airport, Metro-Rail Transfer, Golden Glades Park and Ride, Fort Lauderdale-Hollywood International Airport, and Palm Beach International Airport. South of the Golden Glades Interchange, Tri-Rail also connects with the Miami-Dade Transit Metrorail transfer Station located at 2567 East 11 Avenue, Hialeah 33013.

3.4.4 Amtrak

The name "Amtrak" is the blending of the words "America" and "track" With 21,000 route miles in 46 states, the District of Columbia and three Canadian provinces, Amtrak operates more than 300 trains each day at speeds up to 150 mph to more than 500 destinations. The Amtrak system utilizes the same tracks as Tri-Rail in this location. There is no actual stop at Golden Glades Park and Ride; however the nearest Amtrak Station is located at 8303 Northwest 37 Avenue, Miami, FL 33147, approximately 9 miles (20 Minutes) away from the Golden Glades Park and Ride Facility. The Amtrak Station is the southernmost stop within the Amtrak system and operates from 7:00 AM to 9:00 PM, seven days a week.

3.4.5 Greyhound

Greyhound is the largest provider of intercity bus transportation, serving more than 2,300 destinations with 13,000 daily departures across North America. Amtrak passengers use Greyhound to make connections to cities not served by rail on Amtrak Thruway service. Greyhound uses the west Golden Glades Park and Ride stop located at 16000 NW 7 Avenue Miami North, FL 33169, and operates 20 hours per day from 5:00 AM to 1:00 AM, seven days a week.

3.5 Interchange

The existing geometric elements for the major transportation corridor and interchange ramps were obtained from the existing as-built plans obtained from the FDOT District 6. Since the original construction of the GGI in 1964, most of the ramps within the interchange have not been geometrically modified. The original as-built construction plans obtained for the interchange area are barely legible; consequently, the geometric alignments of most of the interchange ramps as well as SR 7/US 441 and SR 9 could not be verified. The geometric evaluation for the ramps that have been modified as well as the major roadways, connectors and flyover ramps are discussed in the following sections.

3.5.1 Horizontal Alignment

A review of the existing horizontal geometry for the major roadway segments and ramps was performed as part of the PD&E Study. The evaluation of the horizontal geometry for the roadway and ramps compared the existing alignments to current design standards and were focused on the following design elements:

1. Radius of Curvature
2. Superelevation
3. Horizontal Curve Length
4. Horizontal Stopping Sight Distance

Several of the horizontal alignment design elements along the roadway or ramp segments either do not meet the FDOT Plans Preparation Manual (PPM) 2013 standards but satisfy the American Association of State Highway and Transportation Officials (AASHTO) 2011 requirements (Design Variation) or do not meet both the FDOT PPM 2013 and AASHTO 2011 standards (Design Exception) as identified below:

- Radius of Curvature
- I-95 mainline - 1 design variation

- Superelevation
  - I-95 mainline - 6 design exceptions
  - Ramp B from EB SR 826 to SB Turnpike Connector – 1 design exception
  - Ramp M from NB SR7/ US441 to NB I-95 – 2 design exceptions

- Horizontal Curve Length
  - I-95 mainline - 6 design variations
  - 95 Express Flyover – 1 design variation
  - SR 826 Connector – 1 design variation
  - Ramp F from NB Turnpike Connector to WB SR 826 – 2 design variations
  - Ramp M from NB SR7/ US441 to NB I-95 – 2 design variations
  - Ramp T from NB I-95 to EB NW 167 street– 1 design variation

- Horizontal Stopping Sight Distance
  - I-95 mainline - 1 design exception and 3 variations
  - SR 826 Mainline – 1 design exception
  - SR 826 Connector – 2 design exceptions
  - Ramp U from NB SR 7/ US 441 to NB Turnpike – 1 design exception

A search of the FDOT District Six design database did not find any documentation for the existing horizontal alignment deficiencies on file. **Figure 3-4** shows the locations of the existing horizontal alignment deficiencies.

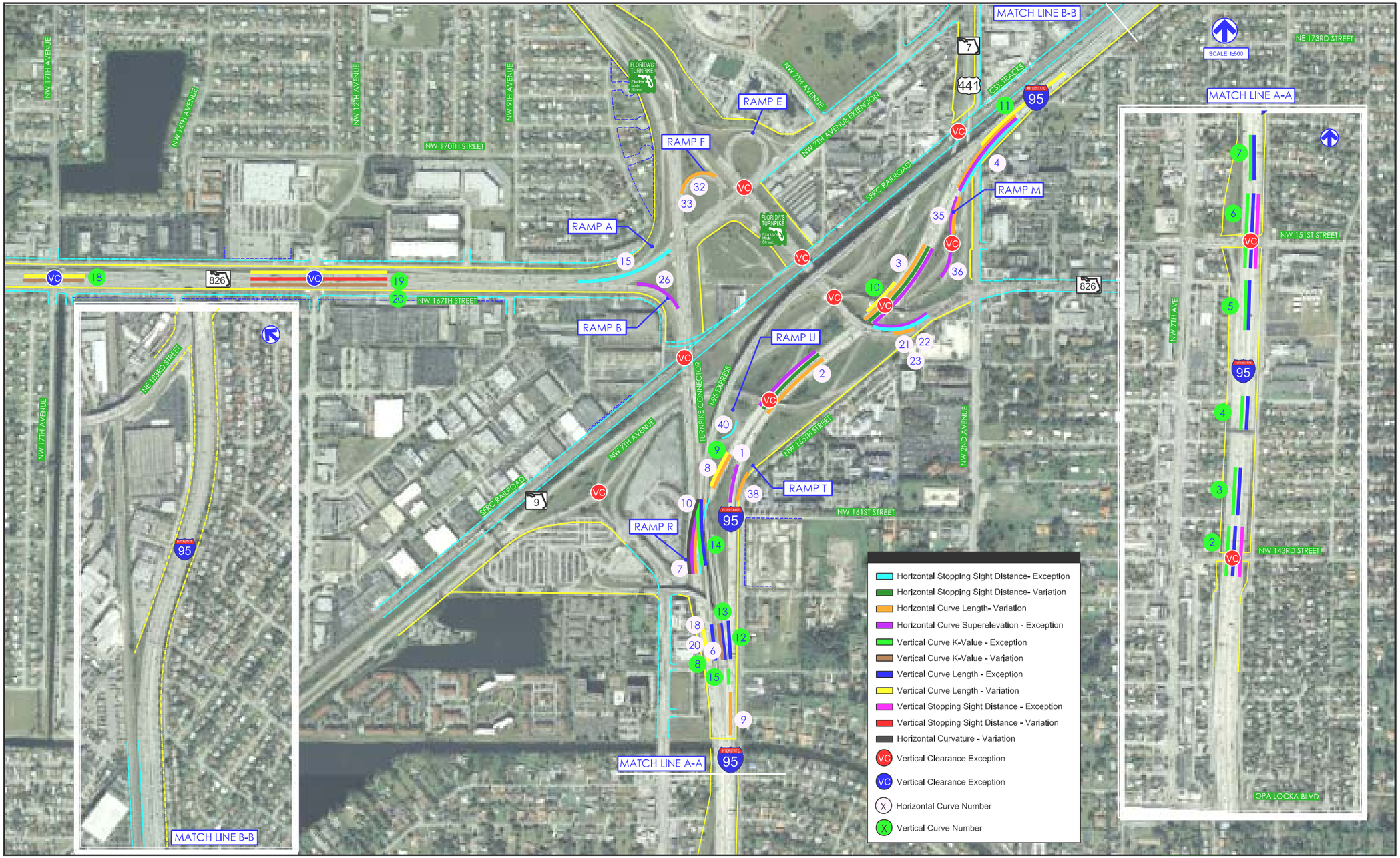


Figure 3-4 Existing Geometric Deficiencies

3.5.2 Vertical Alignment

Overview of the existing vertical geometry for the major roadway segments and ramps within the study area was also performed as part of the PD&E Study. The evaluation of the existing vertical geometry focused on the review of the following design elements:

1. Grades
2. Vertical Curve K-Values
3. Vertical Curve Length
4. Stopping Sight Distances

The results of the vertical alignment evaluation identified several deficiencies along the roadways and ramp segments as follows:

- Grades
  - The maximum grade for the vertical curves along the major roadway segments and interchange ramps within the study limits meets minimum FDOT standards for the design speed of each facility

- K-Values
  - I-95 mainline - 5 design exceptions
  - 95 Express Flyover – 3 design exceptions and 1 variation
  - SR 826/ Palmetto Expressway mainline – 3 design variations

- Vertical Curve Length
  - I-95 mainline - 5 design exceptions and 5 variations
  - 95 Express Flyover – 3 design exceptions and 1 variation
  - SR 826/Palmetto Expressway mainline – 3 design variations
  - Ramp E from NB SR 826 connector to WB SR 826 – 1 design exception

- Vertical Stopping Sight Distance
  - I-95 mainline - 2 design exceptions
  - SR 826/Palmetto Expressway mainline – 2 design variations

A search of the FDOT District Six design database identified documentation for the existing vertical deficiencies along I-95 mainline between NW 135th Street and NW 151st Street that were obtained as part of the 95 Express Phase I project. No other documentation was found for the remaining identified vertical alignment deficiencies. . **Figure 3-4** shows the locations of the existing vertical alignment deficiencies.

3.5.3 Vertical Clearance

The primary function of vertical clearance to structures going over roadways or railroads consists of providing safe passage to tall design vehicles and rail cars beneath these structures. The FDOT PPM specifies that the highest point on the roadway below a bridge structure has to measure a minimum of 16.5-ft to the lowest point (low member) beneath the structure. This includes provisions for a future underpass resurfacing of 6" over the existing pavement elevation. For railroad underpasses, a minimum 23.5-ft vertical clearance is recommended which includes allowance for 12" of railroad track adjustments. The South Florida Rail Corridor (SFRC) however, has a greater clearance requirement set at 24.25-ft.

AASHTO requires a minimum vertical clearance of 16-ft for structures passing over roadway including auxiliary lanes and the usable width of shoulders. Further guidance allows a minimum vertical clearance of 14-ft in highly urbanized areas provided there is an alternate facility with the minimum 16-ft clearance. For railroad underpasses, AASHTO recommends a minimum vertical clearance of 23-ft.

With respect to the vertical clearance above water for bridges over canals, the FDOT Drainage Manual in Section 4.6 suggests a minimum 6.0-ft clearance above the optimal water elevation to accommodate small boat traffic and 2-ft minimum clearance over the design high water elevation. There is one existing bridge (870348), which crosses over South Florida Water Management District (SFWMD) C-8 (Biscayne Canal), preliminary coordination with SFWMD indicated that any widening of the structure had to maintain the existing vertical clearance.

An evaluation of the existing bridges within the project limits indicates that 20 of the 28 existing bridge structures do not meet the FDOT minimum vertical clearance requirements. With the exception of the Turnpike connector northbound bridges over SR 826 (870601), South Florida Rail Corridor (SFRC) (870380) and SR 7/US 441 & SR 9, which were recently widened or upgraded, no documentation of the existing bridge vertical clearance deficiencies were found in the FDOT District Six design database. **Figure 3-4** shows the locations of the existing vertical clearance deficiencies.

3.5.4 Horizontal Clearance

The horizontal clearance underneath the existing bridges is the lateral distance from the roadway edge of travel lane to the bridge abutment or piers. The horizontal clearance requirements for most roadside features and objects are based on providing the required clear zone.

Both the FDOT Plans Preparation Manual (PPM) and AASHTO require bridge piers and abutment walls to be placed outside the clear zone unless shielded by a crash worthy barrier. For roadway over railroads, the FDOT PPM requires 18-ft horizontal clearance with

crash walls or 25-ft if no crash walls are provided from the centerline of the outside tracks to the face of pier cap, bent cap, or any other adjacent structure.

A field review of the project corridor indicated that most the bridge abutment or piers are adequately protected by either guardrail or barrier wall system with the exception of the Turnpike connector bridges over the SFRC. The minimum horizontal clearance at this location is 8.96-ft which is less than the required 18-ft with crash walls. This existing horizontal clearance deficiency was documented during the recent widening of the northbound bridge and a design variation obtained.

4. EXISTING OPERATIONAL PERFORMANCE

4.1 Existing Traffic Data

4.1.1 Field Observations

A field review was conducted to observe the operational conditions of GGI during AM peak hours. Minor congestion was observed along northbound SR 7 after the park & ride lots as shown in **Figure 4-1**. Severe congestion and long queues were also observed at NW 2 Avenue intersection. Since, this intersection works like a control valve, very long queues were observed for the eastbound left (toward SR 7 northbound and I-95 northbound on ramp via NW 2 Avenue north approach) and northbound through movements as illustrated in **Figure 4-1**. Heavy congestion was also observed along the Turnpike connector SB lanes due to the bottleneck caused by the lane drop from two to one lane.

Figure 4-1 Field Observations

4.1.2 Data Collection

Traffic data was collected in 2010 for the planning study performed by Kittelson and Associates, Inc. (KAI). The data was collected in accordance with FDOT and FHWA guidelines. Traffic counts included 72-hour weekday counts at or near FDOT count stations located within the GGI influence area, intersection turning movement counts, travel time runs, and selective origin-destination surveys used to calibrate the CORSIM model. The 72-hour counts were collected between Tuesday and Thursday and adjusted for peak season and axle factor.

In addition to the 2010 KAI counts, traffic counts were obtained from FDOT's 2010 Florida Traffic Information (FTI) as well as raw data collected by FDOT in 2011. Furthermore, traffic volumes per 15-min increments were provided by the Turnpike for the Golden Glades Toll Plaza. The planning study included extensive review of traffic data to develop balanced AM and PM peak period volumes from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. These volumes were balanced per 15 minute increments and used to calibrate CORSIM.

The locations of the daily traffic counts and turning movement counts as well as FDOT count stations are shown in **Figure 4-2.** The data collection report prepared by KAI is provided in **Appendix B.**

Traffic data from the various sources (KAI, FTI 2010, and FDOT 2011 counts) were compared to identify inconsistencies. The comparison indicated that KAI data was reasonable and consistent for all locations except SR 826/NW 167 Street. Traffic adjustments necessitated rebalancing the 15-minute volume increments for the entire CORSIM model for the AM and PM peak periods and recalibrating the CORSIM model. Efforts were made to preserve the integrity of the initial CORSIM calibration for the AM period that was performed by both KAI and the Turnpike by making only necessary changes to the network, parameters, and input data.

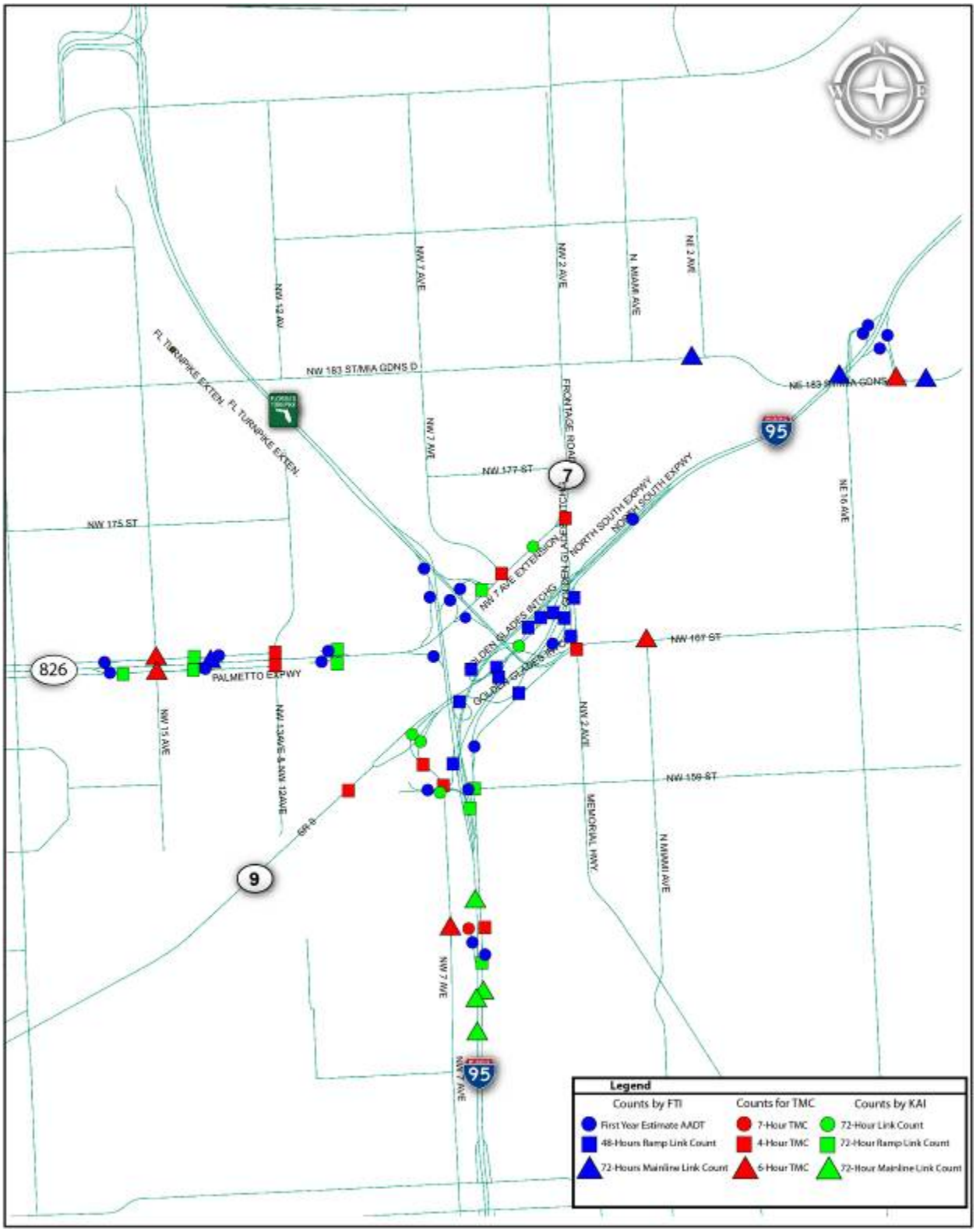


Figure 4-2 Traffic Count Locations

4.1.3 CORSIM Calibration

The CORSIM model was calibrated by KAI for the AM peak period during the planning phase of the GGI study. Subsequently, the CORSIM Model was expanded by the Florida's Turnpike Enterprise Planning Department to incorporate I-95 southbound and I-95 Express lanes. For this IMR study, the CORSIM Model was further expanded to include the on and off ramps to Opa-Locka Blvd. Based on the review of the Turnpike expanded CORSIM model, the following major modifications were added

1. Nodes have been moved to coincide with travel time data locations; Nodes 70 (for I-95 NB to SR 7 NB) and 72 were inserted (for 826 EB to I-95 NB).
2. TPKE SB to I-95 SB links (305, 306) and exit ramp to PNR and SR 7 (305, 7017) were modeled as "Mainline" and "Ramp" in the Turnpike model. These configurations cause Leader-Follower chain errors. Therefore, these links were remodeled as "Ramp" for (305, 306) and "Mainline" (305, 7017).
3. Links between SR 7 NB from GGI PNR intersections to the SR 9 merge point were modified to freeway links and a right lane drop condition.
4. Links between TPKE SB and 826 EB to NE 167 ST were modified to freeway links.

Since volumes along SR 826/NW 167 Street had to be adjusted and the entire network volumes rebalanced, a new calibration was performed for the AM peak period and for the expanded network that also included southbound I-95 and I-95 Express entry and exit nodes. Model calibration was also performed for the PM peak period for the expanded CORSIM network consistent with FHWA guidelines documented in *Traffic Analysis Toolbox Volume IV: Guidelines for Applying CORSIM Microsimulation Modeling Software, January 2007*.

Considering the extensive calibration efforts that were performed during the planning study for the AM peak period, only necessary changes explained above were implemented in order to maintain the integrity and consistency of the initial calibration and minimize re-calibration efforts considering the calibration data (traffic counts, travel times and origin-destination) is essentially the same. The local calibration parameters adjusted as part of this IMR study include: link free flow speeds, link lengths, off-ramp reaction point, mean startup delay, mean discharge headway, minimum recall for signals

The CORSIM re-calibration document is provided in **Appendix C**. It should be noted that although the model was expanded to evaluate the impacts of I-95 express lanes, only the entry and exit links to and from the express lanes were coded into the CORSIM model.

4.2 Existing Conditions Analysis

An existing traffic operational analysis was performed as part of this study to document existing operating conditions and identify intersections, freeways, connectors, and ramps operating at failing levels of service. As explained in previous sections, GGI system-wide analysis was performed using CORSIM. Intersection analysis was performed using the HCM module of SYNCHRO 8. Basic freeway segment analysis was performed using both HCS 2010 and CORSIM simulation. Ramp merge and diverge analysis was performed using CORSIM simulation only. Weaving analysis was based on HCM 2010 procedures using HCS 2010. Traffic data was collected in 2010 in accordance with FDOT guidelines during the planning phase of the GGI study. Collected traffic data included 72-hour weekday counts at all FDOT count stations located within the GGI influence area, as well as intersection turning movement counts, travel time runs and selective origin-destination surveys that were used to calibrate the CORSIM model. Additional toll plaza counts and origin-destination data was provided by the Turnpike.

4.2.1 Existing Intersection Operations

There are sixteen (16) intersections within the project study area as shown in **Table 4-1** below. Thirteen are signalized intersections and the remaining three are unsignalized intersections.

Table 4-1
Existing Intersections

#	Description	Control Type
1	NE 183 Street (Miami Gardens Drive) & NB I-95 ramps	Signalized
2	NW 2 Avenue (SR-7) and NW 7 Avenue Extension	Signalized
3	NW 171 Street & NW 7 Avenue Extension & NW 4 Avenue	Signalized
4	Turnpike NB Ramp & NW 7 Avenue Extension	Unsignalized
5	SR 826 (WB) & NW 12 Avenue	Signalized
6	SR 826 (EB) & NW 12 Avenue	Signalized
7	NW 167 Street & NW 2 Avenue	Signalized
8	NW 167 Street & N. Miami Avenue	Signalized
9	SR 7/NW 7 Avenue & Park & Ride (16000 Block)	Signalized
10	SR 7/NW 7 Avenue and NW 15900 Block (south of the P&R Lot)	Signalized
10A	SR7/US 441 SB to NW 167 Street EB Ramp and SR 826 Connector	Unsignalized
11	NW 151 Street & NW 7 Avenue	Signalized
12	NW 151 Street & I-95 SB on-ramp	Unsignalized
13	NW 151 Street & I-95 NB off-ramp	Signalized
14	SR 826 and NW 17 Avenue, diamond interchange intersection south of SR 826	Signalized
15	SR 826 and NW 17 Avenue, diamond interchange intersection north of SR 826	Signalized

The intersection of SR7/US 441 SB to NW 167 Street EB Ramp and SR 826 Connector (10A) is a one-way stop-controlled intersection; however due to the intersection location and the limitations of the modeling software this intersection was analyzed as a ramp junction.

The intersection analysis was performed for the AM and PM peak hours using HCM outputs from SYNCHRO 8. The intersection turning movement volumes used in SYNCHRO 8 are consistent with the balanced volumes developed for the peak period. For CORSIM system-wide analysis, intersection turning movement volumes were adjusted for the peak season and balanced per 15-minute increments. Traffic counts indicated that the global AM and PM peak hours for GGI in 2010 were from 7:30 AM to 8:30 AM and from 4:15 PM to 5:15 PM. The adjusted peak hour turning movement volumes are depicted in **Figure 4-3.** The signal timing sheets obtained from Miami-Dade County are included in **Appendix D**.

The intersection analysis of existing conditions in 2010 identified significant traffic delays and queuing at the signalized intersections of NW 167 Street/NW 2 Avenue, NW 167 Street/North Miami Avenue, and NW 7 Avenue/GGI Park and Ride. For the intersections of NW 167 Street/NW 2 Avenue and NW 167 Street/North Miami Avenue the adopted LOS is dependent on the v/c ratio being less than 120%. For NW 167 Street/NW 2 Avenue the NB Left in the AM peak period and the NB Left and SB Thru exceed the 120% v/c threshold. For NW 167 Street/ North Miami Avenue the EB Left in the AM and the EB Left, NB Left, and SB Thru exceed the 120% v/c threshold.

Furthermore, the analysis identified a number of intersections with inadequate turning movement storage lengths, including the intersections of NW 2 Avenue/NW 7 Avenue Extension, Turnpike Eastbound to I-95 SB/SR 7, NW 7 Avenue/Park and Ride entrance, NW 167 Street (Frontage Rd)/NW 12 Avenue (SR 826 EB Off-ramp), and NW 151 Street/NW 6 Avenue. The unsignalized intersection of NW 7 Avenue Extension and NB ramps to turnpike also showed deficiencies in the EB approach. The intersection analysis results including delays and LOS for the AM and PM peak hours are provided in **Table 4-2 and Figure 4-4.** Queue lengths are summarized in **Table 4-3**.

Table 4-2
Existing 2010 Intersections LOS

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS				Control Delay (s/veh)/ LOS
				EB	WB	NB	SB	
1	Miami Gardens Dr/I-95 NB Exit	D	AM	51/D	47.8/D	0.8/A	43.8/D	31.7/C
			PM	50.2/D	85.9/F	0.7/A	45.3/D	49.7/D
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	E	AM	89.5/F	-	12.2/B	59.9/E	51.9/D
			PM	112.8/F	-	16.7/B	21.9/C	35.3/D
4	NW 7 Ave Ext/NB Ramps to Turnpike* (EBL App)	E	AM	(631/F)	-	-	-	-
			PM	(876/F)	-	-	-	-
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	E	AM	0.0/A	53.4/D	12.6/B	9.0/A	30.5/C
			PM	0.0/A	54.6/D	3.9/A	8.5/A	22.4/C
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	E	AM	257.6/F	0.0/A	10.1/B	3.7/A	136.7/F
			PM	59.1/E	0.0/A	7.3/A	7.7/A	14.5/B
7	NW 167 St/NW 2 Ave	v/c<120 %	AM	68.9/E	56.6/E	351.2/F	-	97.4/F (v/c 1.19)
			PM	37.2/D	65.1/E	385.6/F	-	117.9/F (v/c 1.22)
8	NW 167 St/N Miami Ave	v/c<120 %	AM	92.5/F	30.0/C	46.4/D	60.3/E	67.1/E (v/c 1.49)
			PM	133.3/F	36.6/D	216.9/F	166.7/F	102.2/F (v/c 2.10)
9	NW 7 Ave/GGI Park and Ride**	D	AM	62.1/E	72.9/E	69.7/E	103.3/F	86.2/F
			PM	77.2/E	68.4/E	158.1/F	17.7/B	114.8/F
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	D	AM	-	35.0/C	22.3/C	12.2/B	27.4/C
			PM	-	10.8/B	234.0/F	9.2/A	109.7/F
11	NW 151 St/NW 7 Ave	D	AM	45.8/D	13.5/B	24.4/C	27.0/C	25.1/C
			PM	44.5/D	43.6/D	17.0/B	8.9/A	19.3/B
12	NW 151 St/I-95 SB On Ramp* (WBL App)	D	AM	-	(1.1/A)	-	-	-
			PM	-	(3.6/A)	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	D	AM	129.7/F	61.6/E	47.1/D	15.2/B	62.0/E
			PM	1274/F	154.9/F	40.9/D	17.9/B	446.6/F
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	E	AM	60.4/E	45.1/D	38.1/D	12.2/B	42.9/D
			PM	69.2/E	30.0/C	42.4/D	2.2/A	41.0/D
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	E	AM	-	302.1/F	1.2/A	39.2/D	161.8/F
			PM	-	42.5/D	9.5/A	42.9/D	33.5/C

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS					Control Delay (s/veh) /LOS
				NW 171 ST	NW 4 Ave	NW 7 Ave	NW 7 Ave Ext		
							NB	SB	
3	NW 7 Ave Ext/NW 171 ST	E	AM	65.2/E	71.0/E	69.8/E	18.2/B	18.0/B	27.2/C
			PM	68.0/E	81.3/F	86.1/F	18.0/B	24.0/C	32.4/C

*Notes: * Unsignalized Intersection, ICU LOS.*
*** EB, WB, NB and SB for SEB, NWB, NEB, and SWB*

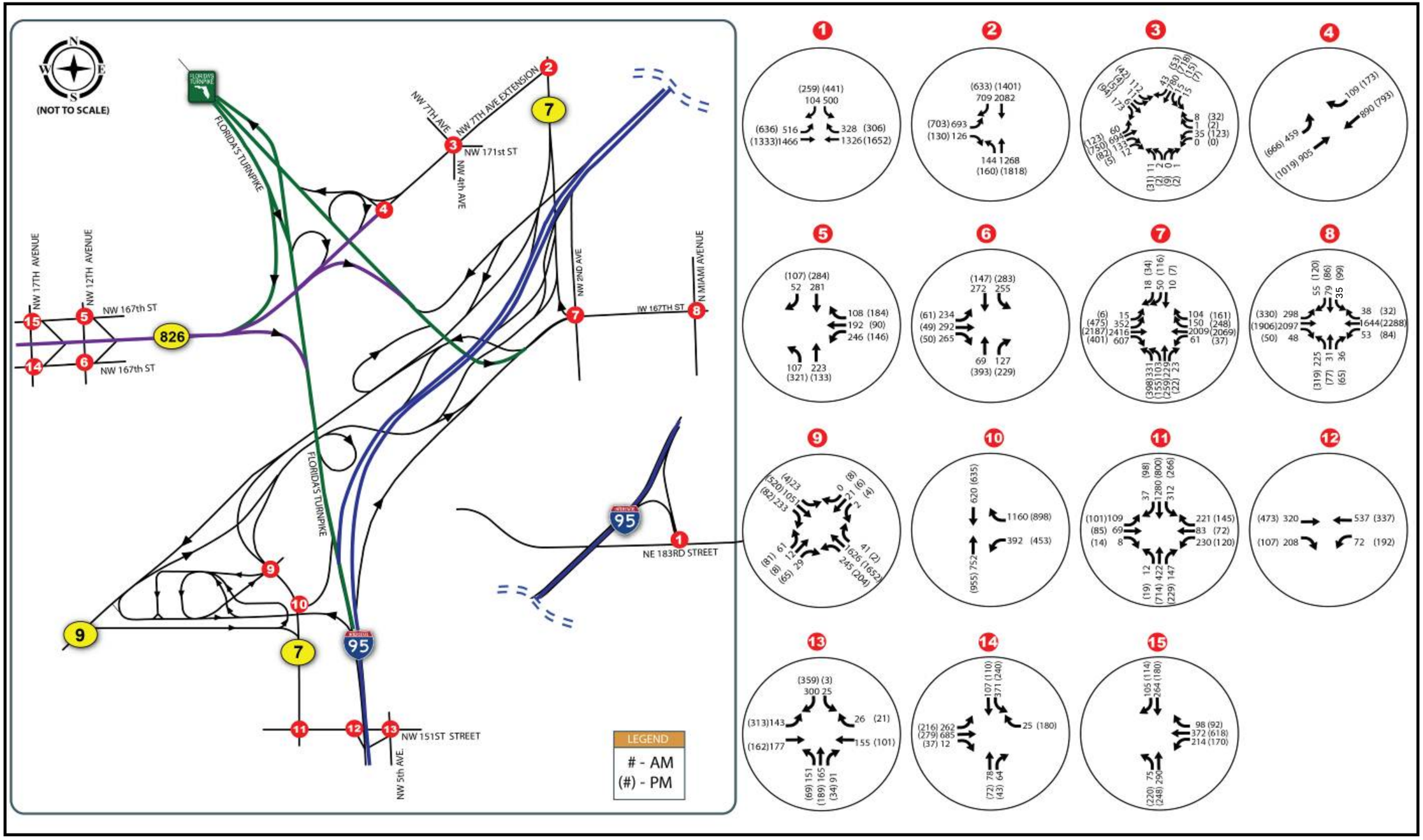


Figure 4-3 Lane Configuration and Turning Volume

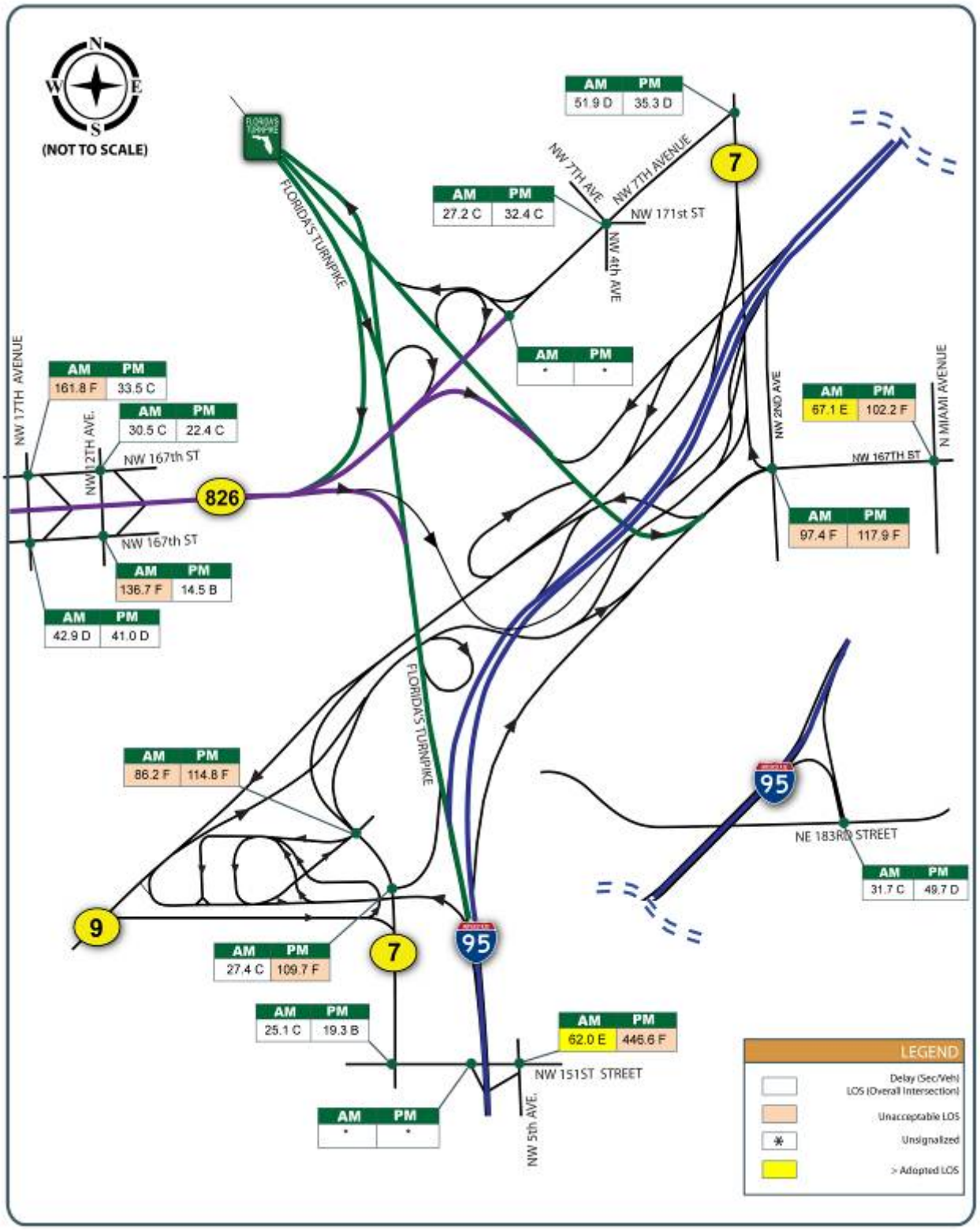


Figure 4-4 Intersection Delay and LOS (Existing 2010)

Table 4-3
Existing 2010 Queuing Analysis at Study Intersection

No	Intersection	Time	95 % Queue Length (ft) / Link Length (ft)											
			EB			WB			NB			SB		
			L	T	R	L	T	R	L	T	R	L	T	R
1	Miami Gardens Dr/I-95 NB Exit	AM	258/425				#792/322	210/230				257/325		37/325
		PM	319/425				#975/322	#274/230				225/325		76/325
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	AM	#283/200		56/250				134/120	276/845			#1297/912	313/912
		PM	334/200		m115/250				176/120	709/845			675/912	228/912
3	NW 171 St/NW 7 Ave Ext	AM	46/275	402/330		29/200	363/1555	0/160		0/681		101/731	0/731	
		PM	83/275	346/330		26/200	384/1555	5/160		112/681		62/731	0/731	
4*	NW 7 Ave Ext/NB Ramps to Turnpike	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	AM				230/276	202/726		m49/167	m102/167			66/907	
		PM				195/276	53/726		9/167	5/167			69/907	
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	AM		#562/879						22/757		55/167	20/167	
		PM		88/879						152/757		50/167	12/167	
7	NW 167 St/NW 2 Ave	AM	326/200	#1384/309	552/260	123/230	1154/327	62/327	#1154/260	207/541			90/586	
		PM	443/200	795/309	163/260	99/230	#1333/327	109/327	#1515/260	265/541			#207/586	
8	NW 167 St/N Miami Ave	AM	#464/250	#765/815		35/275	498/1241		238/150	58/1221		44/100	190/1197	
		PM	#669/250	656/815		71/275	764/1241		#629/150	#234/1221		131/100	#357/1197	
9	NW 7 Ave/GGI Park-N-Ride	AM	69/100	103/259	0/50	11/257	55/257		#522/200	828/491	0/250	11/150	806/215	
		PM	68/100	#209/259	34/50	17/257	24/257		#149/200	736/491	0/250	4/150	177/215	
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	AM				164/604		0/550		568/240			160/491	
		PM				123/604		0/550		#947/240			178/491	
11	NW 151 St/NW 7 Ave	AM	138/120	46/837		160/220	m52/265	6/265	18/100	129/981		#277/100	317/1900	
		PM	116/120	49/837		m99/220	m64/265	m39/265	25/100	219/981		136/100	125/1900	
12*	NW 151 St/I-95 SB On Ramp	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	AM	m#243/240	m198/240			#228/617		176/584	173/584	29/584		0/348	
		PM	#595/240	145/240			93/617		73/584	182/584	0/584		0/348	
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	AM	232/658	#972/658						47/89		m46/159	m14/159	
		PM	299/658	#523/658						53/89		61/159	m3/159	
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	AM					#731/728		5/159	17/159			149/361	33/220
		PM					402/728	57/160	83/159	93/159			119/361	54/220

***** Unsignalized Intersection
Queue shown is maximum after two cycles

m=Volume for 95th percentile queue is metered by upstream signal
#=95th Percentile volume exceeds capacity, queue may be longer

4.2.2 Freeway Segment Analysis

Basic freeway sections were analyzed using both HCS 2010 and ten (10) CORSIM runs density averages. The analysis indicated that a number of freeway segments within GGI operate at a failing LOS. The HCS analysis results identifying failing freeway segments and their corresponding LOS are shown in **Table 4-4**. The CORSIM analysis results identifying high density freeway segments are shown in **Table 4-5**.

Table 4-4
Existing 2010 Basic Freeway Segment HCS 2010 Analysis

SEGMENT	Period	Direction	Volume (vph)	PHF	Speed (mph)	Density (pc/mi/ln)	Adopted LOS	LOS
I-95 B/W GGI and NW 151 St	AM	NB	8096	0.94	54.0	40.3	E	E
I-95 B/W GGI and NW 151 St	AM	SB	8156	0.97	55.0	38.6	E	E
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	EB	5644	0.91	60.0	26.2	D	D
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	WB	5255	0.97	60.0	22.6	D	C
Turnpike at Toll Plaza	AM	SB	3611	0.96	60.0	21.3	D	C
Turnpike at Toll Plaza	AM	NB	2725	0.92	60.0	16.8	D	B
I-95 B/W GGI and Miami Gardens Dr	AM	SB	6429	0.92	49.7	47.3	E	F
I-95 B/W GGI and Miami Gardens Dr	AM	NB	6426	0.94	51.1	45.1	E	F
I-95 South of NW 151 St	AM	NB	7550	0.95	57.0	26.8	E	D
I-95 South of NW 151 St	AM	SB	6637	0.95	59.5	29.6	E	D
I-95 B/W GGI and NW 151 St	PM	NB	7197	0.94	58.0	33.3	E	D
I-95 B/W GGI and NW 151 St	PM	SB	7658	0.97	57.2	34.8	E	D
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	EB	5017	0.91	60.0	23.3	D	C
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	WB	5481	0.97	60.0	23.9	D	C
Turnpike at Toll Plaza	PM	SB	2542	0.96	60.0	15.0	D	B
Turnpike at Toll Plaza	PM	NB	4470	0.92	60.0	27.6	D	D
I-95 B/W GGI and Miami Gardens Dr	PM	SB	6611	0.92	47.8	50.6	E	F
I-95 B/W GGI and Miami Gardens Dr	PM	NB	6435	0.94	51.0	45.2	E	F
I-95 South of NW 151 St	PM	NB	6316	0.95	59.9	22.4	E	C
I-95 South of NW 151 St	PM	SB	6158	0.95	60.0	27.3	E	D

Table 4-5
Existing 2010 Basic Freeway Segment CORSIM Analysis

SEGMENT	Period	Direction	CORSIM Node	Volume (vph)	Speed (mph)	Density (veh/mi/ln)
I-95 B/W GGI and NW 151 St	AM	NB	70	6489	53.9	27.9
I-95 B/W GGI and NW 151 St	AM	SB	52	7367	50.8	37.7
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	EB	502	5191	42.8	34.9
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	WB	704	5946	56.3	25.7
Turnpike at Toll Plaza	AM	SB	63	4163	26.6	63.2
Turnpike at Toll Plaza	AM	NB	127	2959	25.7	26.4
I-95 B/W GGI and Miami Gardens Dr	AM	SB	28	5373	55.0	25.0
I-95 B/W GGI and Miami Gardens Dr	AM	NB	48	6846	55.7	29.1
I-95 South of NW 151 St	AM	NB	42	5556	50.6	28.8
I-95 South of NW 151 St	AM	SB	101	6038	56.5	24.9
I-95 B/W GGI and NW 151 St	PM	NB	70	5762	53.1	27.2
I-95 B/W GGI and NW 151 St	PM	SB	52	6213	52.1	28.7
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	EB	502	4720	54.6	21.6
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	WB	704	5500	57.4	24.2
Turnpike at Toll Plaza	PM	SB	63	2661	40.0	15.5
Turnpike at Toll Plaza	PM	NB	127	4471	24.9	43.2
I-95 B/W GGI and Miami Gardens Dr	PM	SB	28	5161	55.5	23.4
I-95 B/W GGI and Miami Gardens Dr	PM	NB	48	6080	55.9	27.4
I-95 South of NW 151 St	PM	NB	42	5348	51.7	24.6
I-95 South of NW 151 St	PM	SB	101	5054	57.0	22.0

4.2.3 Ramp Merge and Diverge Analysis

Ramp merging and diverging segments were identified at 42 node locations within GGI. Of these, 13 individual locations were identified as being part of weaving segments. Those sections were evaluated separately in accordance with HCM 2010 weaving guidelines.

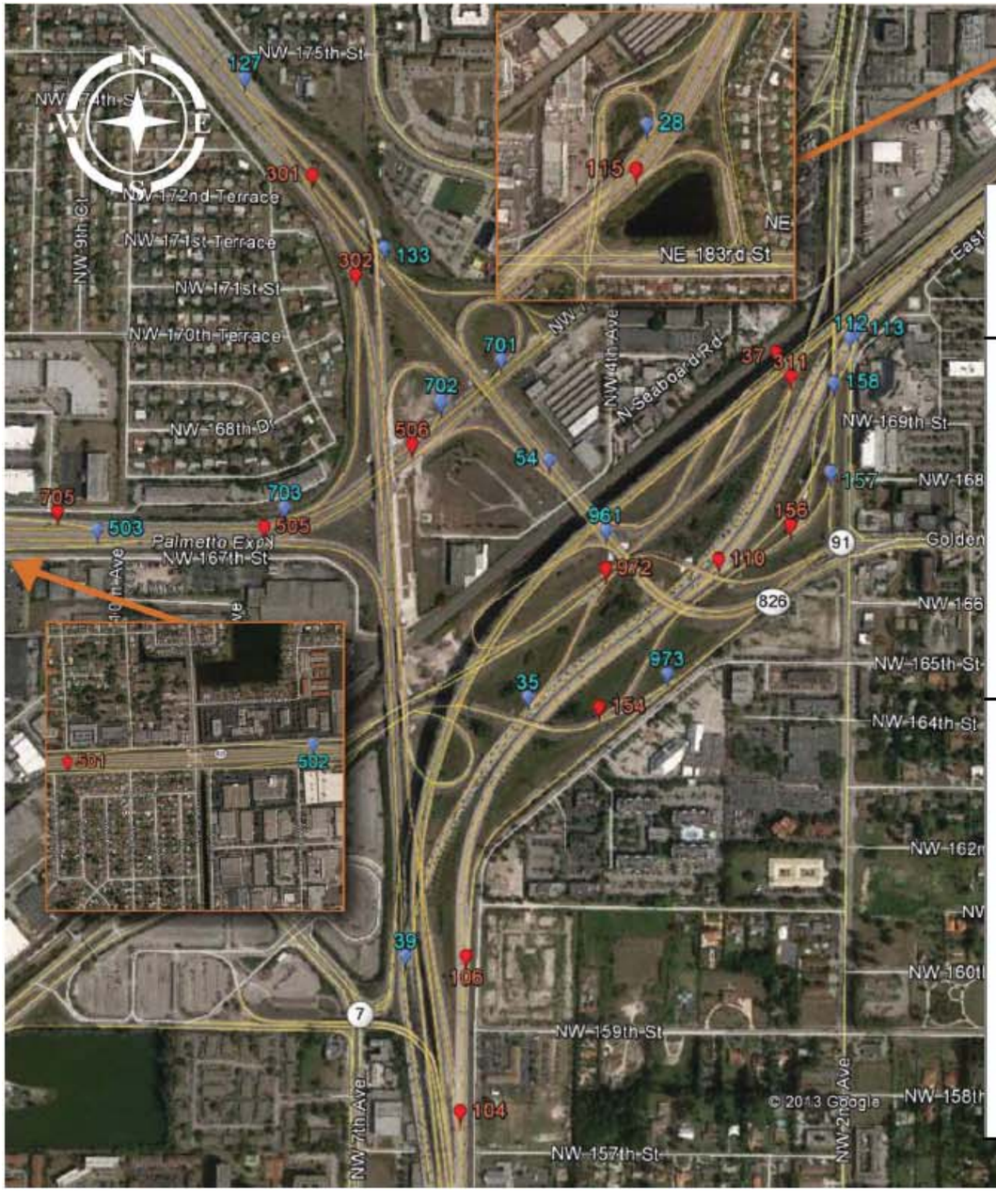
The merge and diverge analysis was performed by extracting speed and densities calculated by CORSIM for the ramp segment and the 1500-feet influence area after or before the merge or diverge segments. It should be noted that CORSIM density is based on number of vehicles instead of equivalent passenger car. However, since peak hour truck percentages are relatively low within GGI, no adjustments were necessary.

HCM states that currently there is no reliable empirical model for analyzing Major Merge and Major Diverge ramp junctions. As such, only CORSIM results will be used for all types of merge and diverge ramp analysis. The ramp analysis was conducted on the remaining 28 ramp junctions.

The merge and diverge analysis results are summarized in **Figure 4-5**. The merge/diverge analysis indicates that the majority of the key ramps operated at acceptable densities; however few locations operated at high density and were observed to be congested in the CORSIM simulation. The critical ramps merge/diverge sections operating at high traffic densities (>35 veh/mi/ln) include:

- Turnpike SB Connector Merge to I-95 SB (Node 39)
- Turnpike SB to NW 167 Street After SR 826 EB On-Ramp Merge (Node 54)
- Turnpike NB Connector Merge with NW 167 Street/Turnpike NB (Node 127)
- SR 7 NB Diverge to 167 Street on ramp (Node 154)
- SR 7 NB Diverge to I-95 NB ramp (Node 156)
- Turnpike SB Diverge to Turnpike SB Connector and NW 167 Street (Node 301)
- Turnpike SB Connector Diverge to SR 826 WB (Node 302)
- SR 826 EB Diverge to NW 7 Avenue Extension / SB Turnpike Connector (Node 505)

It should be noted that the proposed Turnpike AET Phase 4 project that converts the existing mixed cash toll plaza to an all-electronic toll plaza will improve traffic operations from southbound Turnpike to westbound SR 826 and NW 167 Street off-ramps.



	CORSIM NODES	AM			PM		
		Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)	Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)
DIVERGE	154	1189	39	30	1236	45	28
	156	2056	61	33	2148	65	33
	311	1109	28	40	768	18	42
	37	1066	29	37	937	26	36
	302	1322	150	11	680	16	44
	301	1041	106	14	665	17	40
	506	907	27	34	975	29	35
	501	1421	25	56	1185	21	58
	505	1403	39	38	1325	31	43
	106	1645	33	50	1172	23	52
	104	1622	30	53	1440	27	53
	110	1525	30	50	1082	21	50
	115	1711	33	51	1520	29	52
	972	826	N/A	29	888	N/A	29
MERGE	157	529	14	37	856	24	36
	158	746	17	43	1036	24	43
	39	1746	36	49	1476	29	51
	127	740	29	26	1118	45	25
	54	1048	42	26	1028	47	25
	133	681	16	42	1022	25	42
	702	1502	34	44	1435	32	44
	701	1200	34	35	1127	32	35
	503	1313	34	41	1242	28	45
	35	1250	23	55	1334	25	54
	112	1353	28	48	942	20	48
	113	1432	26	55	1119	20	55
	28	1343	24	55	1290	23	56
	703	1486	27	56	1375	24	56
	502	1298	28	49	1180	22	54
	961	2571	N/A	19	2348	N/A	22
	973	910	N/A	24	762	N/A	19

Figure 4-5 Existing 2010 Ramp Analysis

4.2.4 Weaving Analysis

Weaving analysis was performed using HCS 2010 software for freeway sections where an on-ramp was followed closely by an off-ramp and the distance between the ramps was within the maximum weaving length (Lmax) estimated using HCM 2010 procedure. Six segments in total were identified as weaving. A summary of the weaving results is show in **Table 4-6** and **Figure 4-6**.

Table 4-6
Existing 2010 Weaving Operational Analysis Results

#	Mainline	CORSIM Nodes	Weave Length (ft)	AM				PM			
				v/c Ratio	Speed (mph)	Density pc/mi/ln	LOS	v/c Ratio	Speed (mph)	Density pc/mi/ln	LOS
1	SR 7 NB	150-151	350	0.51	33.5	20.8	B	0.74	31.4	36.7	E
2	SR 7 SB	312-314	1387	0.723	40.6	33.6	D	0.417	41.4	17.8	B
3	SR 7 SB	315-316	800	0.776	41.7	32.6	D	0.435	39.6	19.8	B
4	Turnpike SB	303-305	1530	0.968	55.9	26.9	C	0.883	56.8	23.5	B
5	NW 167 Street to Turnpike	131-132	1130	0.713	59.0	20.0	B	0.85	54.4	25.8	C
6	Turnpike Connector NB	123-124	1800	0.713	59.0	18.2	B	0.732	58.4	22.3	B

The results of the weaving analysis shown above indicate that all the weaving segments within the project study area operate at LOS D or better during either the AM or PM peak hours, with the exception of the NB segment of SR 7 which operates at LOS E. However, based on field observations and CORSIM simulation files, the critical weaving segments were determined to include the following segments:

- 7 between SR 9 merge ramp to NB Turnpike Loop Ramp in the PM peak period. This roadway segment is part of the signed route for SR 826 EB and Turnpike SB to I-95 NB (Node 150 -151)
- SR 7 SB between I-95 SB and the Golden Glades Park and Ride, in the AM peak period (Node 312-314 and 315-216)
- Turnpike connector NB between the SR 7 on-ramp and the off-ramp to SR 826 WB. FDOT District 6 recently completed at project along the Turnpike Connector Ramp northbound segment that provided an auxiliary lane between the SR 7 on-ramp and the off-ramp to SR 826 WB to improve the weaving operations within this segment (Node 123-124)

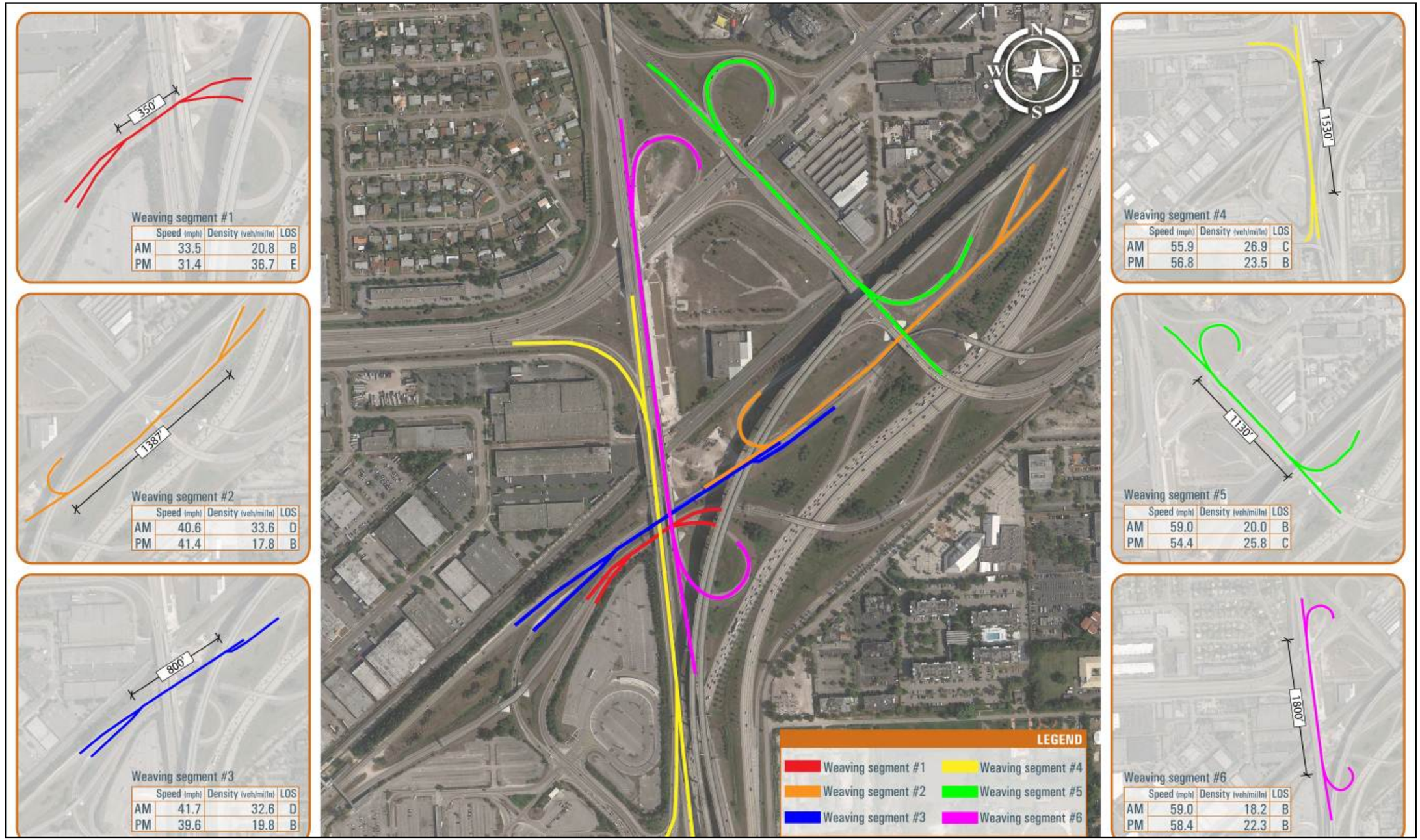


Figure 4-6 Existing 2010 Weaving Segment Analysis

4.2.5 Existing Traffic Operations Summary

The existing conditions analysis of intersections, ramps and freeway segments located within GGI area of influence indicates that the main freeway segments generally had adequate capacity to accommodate the AM and PM peak hour traffic; however several merging and diverging segments did not have adequate capacity to handle the peak hour volumes. Furthermore, the intersections of NW 167 St/SR 826 EB exit/NW 12 Avenue, NW 167 Street/NW 2 Avenue, NW 167 Street/North Miami Avenue, NW 151 street/ NW 6 Avenue/I-95 Exit, NW 167 Street/SR 826 WB exit/ NW 17 Avenue as well as the intersections of SR 7/Park and Ride lot entrance and SR 7/SB Turnpike Connector off-Ramp operated at LOS F.

CORSIM analysis indicates that several network segments were operating with densities exceeding 45 veh/mi/lane for main sections. The highest densities calculated by CORSIM were at the connector segments linking eastbound SR 826 and southbound Turnpike to southbound I-95. These densities, as observed in the CORSIM output files, ranged from 60 to 120 veh/mi/lane in the AM peak period and from 60 to 103 veh/mi/lane in the PM peak period. CORSIM analysis also identified a high traffic density of 118 veh/mi/lane during the AM peak period on the southbound Turnpike segment before merging with southbound SR 826 connector. Furthermore, the western loop ramp within GGI connecting northbound Turnpike to westbound SR 826 operated at a density exceeding 60 veh/mi/lane.

The basic segment bound by 183 Street (Miami Gardens Drive) and the Northeast entrance to the Golden Glades interchange operated at Level of Service F during both AM and PM peak hours. Moreover, the entrance ramp to I-95 located just north of Miami Gardens Drive operated at LOS F during the AM Peak Period, when volume exceeded capacity. Additionally, the basic segment just south of GGI on I-95 operated at LOS E in both directions during the AM Peak Period.

The weaving segments connecting I-95 through the use of SR 7 signed route are operating at deficient LOS E. SR 7 between SR 9 merge Ramp to NB Turnpike Loop Ramp operates at LOS E in the PM peak period. All other weaving segments operated at LOS D or better for both AM and PM peak periods.

The study results indicate that the highest priority improvements within GGI are to increase the capacity of both the I-95 mainlines and the connector segments linking eastbound SR 826 and southbound Turnpike to northbound I-95; and to increase the capacity of the Turnpike southbound connector to southbound I-95. This is consistent with the objectives of this PD&E project which are to provide a system-to-system connection for the SR 826 eastbound to I-95 northbound movement and improve the connection from Turnpike southbound to I-95 southbound. The study findings are illustrated in **Figure 4-7.**

Existing Conditions output files for both HCS and SYNCHRO analysis can be found in **Appendix E.**

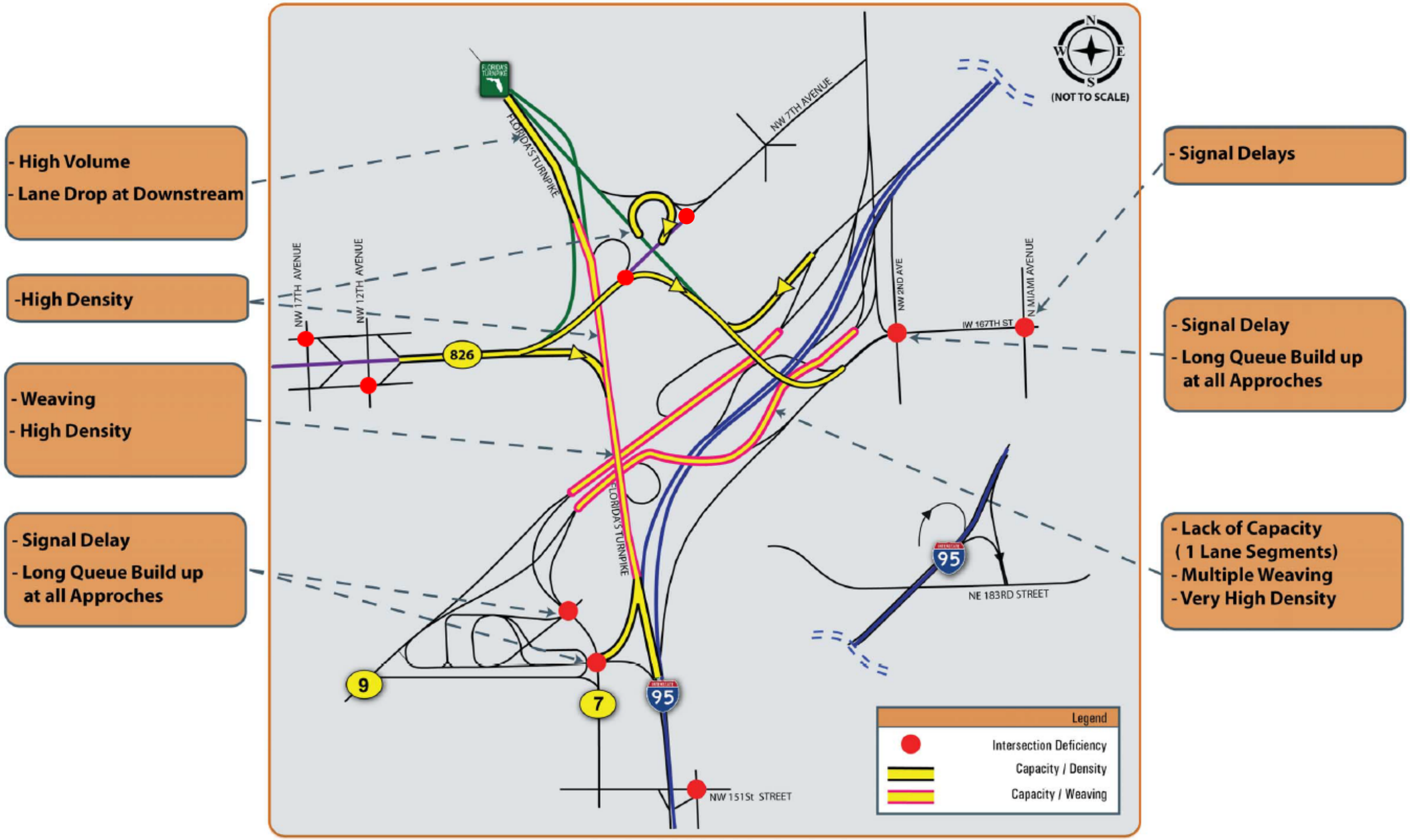


Figure 4-7 Existing Analysis Summary

4.3 Safety Analysis

Safety analysis was carried out as part of the Golden Glades Interchange PD&E study to identify crash patterns, probable contributing causes, countermeasures and to provide recommendations for further studies, if needed. Crash analysis was performed for signalized intersections, arterial segments, ramps and freeway segments within the influence area of the GGI. The following sections summarize the safety analysis performed as part of this study. The detailed Safety Analysis Report is provided in **Appendix F**.

4.3.1 Crash Data Summary

Crash data for different roadway segments and intersections within the GGI was obtained from the FDOT Crash Analysis Reporting System (CARS) database from January 2006 to December 2010. The database provides roadway, environmental and driver characteristics that were existent at the time of each crash. This database provides the basis for the safety analysis.

Table 4-7 and Figure 4-8 shows a summary of the crash frequency, severity and historical trend for the different road classes within the project study area.

Table 4-7
Crash Frequency by Severity

Roadway Type	Severity	2006	2007	2008	2009	2010	5 Year Total	Mean Crashes Per Year
Freeway Segments (I-95, SR 826, Florida's Turnpike)	Fatal	3	1	4	2	0	10	2
	Injury	161	181	156	139	205	842	168
	PDO	183	188	173	184	246	974	195
	Total	***347***	***370***	***333***	***325***	***451***	***1826***	***365***
	Fatalities	***3***	***2***	***4***	***2***	***0***	***11***	**-**
Arterial Segments (SR 7, SR 9, NW 167th Street)	Fatal	0	1	1	0	0	2	1
	Injury	33	27	25	27	45	157	31
	PDO	40	36	41	31	42	190	38
	Total	***73***	***64***	***67***	***58***	***87***	***349***	***70***
	Fatalities	***0***	***1***	***1***	***0***	***0***	***2***	**-**
Interchange Ramps	Fatal	1	1	2	0	1	5	1
	Injury	34	37	45	41	56	213	43
	PDO	56	50	56	35	53	250	50
	Total	***91***	***88***	***103***	***76***	***110***	***468***	***94***
	Fatalities	***1***	***1***	***2***	***0***	***1***	***5***	**-**
Signalized Intersections	Fatal	0	0	0	1	0	1	0
	Injury	55	54	63	41	71	284	57
	PDO	50	67	77	58	58	310	62
	Total	***105***	***121***	***140***	***100***	***129***	***595***	***119***
	Fatalities	***0***	***0***	***0***	***1***	***0***	***1***	**-**
Total		**616**	**643**	**643**	**559**	**777**	**3,238**	**648**

PDO =Property Damage Only

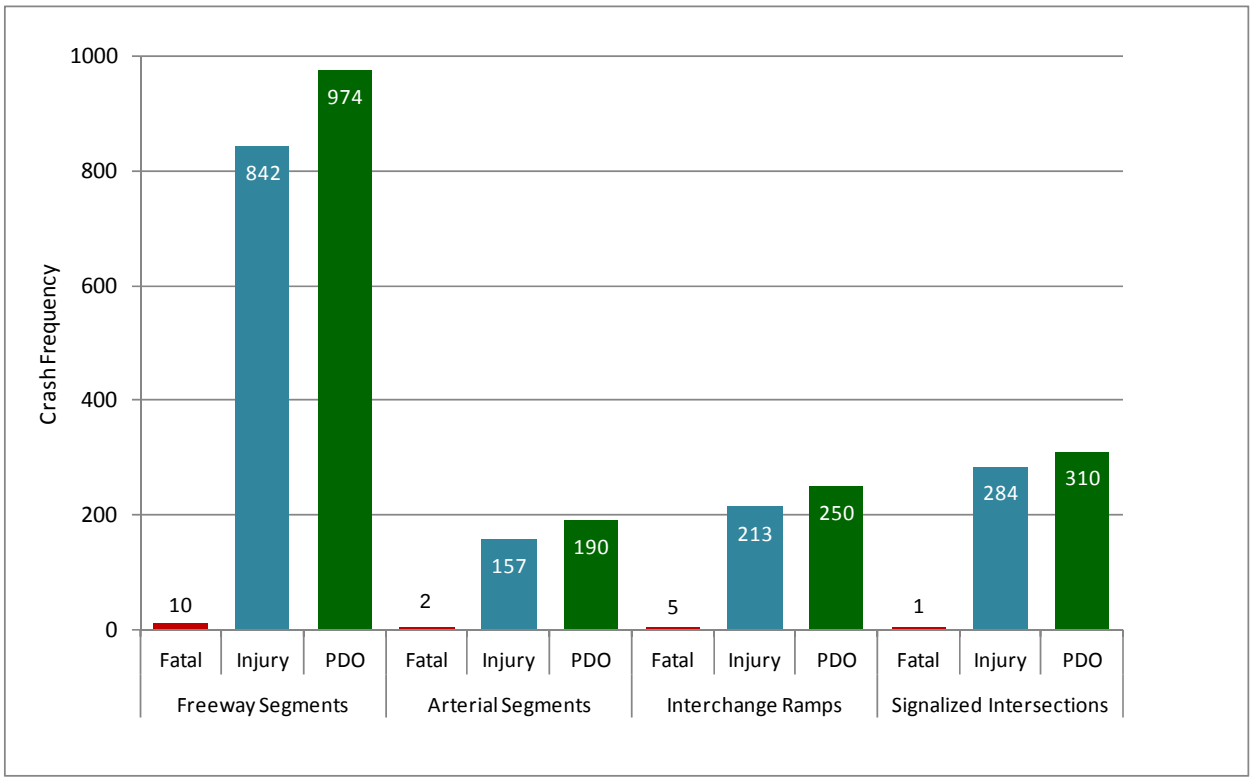


Figure 4-8 Crash Summary by Frequency and Severity

As indicated in the **Table 4-7**, a total of 3,238 crashes occurred within the study area over the five year analysis period. The majority of the crashes (56%) occurred within the freeway segments followed by the signalized intersections with 18% of the total crashes. This is indicative of the congested conditions along the freeways segments and signalized intersections within the study area.

A total of 18 fatal crashes with 19 fatalities occurred within the project study area during the five year analysis period. The details of the fatal crashes are provided below

- 4 fatal crashes occurred along the SR 826 freeway segment with 3 in the eastbound and one in the westbound directions. Most of the fatal crashes occurred during nighttime with street light. The crashes were generally attributed to careless driving with alcohol involvement in 2 out of the 4 fatal crashes.
- 6 fatal crashes occurred along I-95 freeway segment with 4 in the southbound direction and 2 in the northbound direction. 3 of the fatal crashes involved collision with a fixed object and one with a pedestrian. Most of the fatal crashes occurred during nighttime with street light. The crashes were generally attributed to careless driving with alcohol involvement in 2 out of the 6 fatal crashes.
- 5 fatal occurred along the interchange ramps. Most of the fatal crashes occurred during nighttime with street light. The crashes were generally attributed to careless driving with alcohol and/or drug involvement in 4 out of the 5 fatal crashes.

- 2 occurred along the SR 826/NW 167th Street arterial segments. One of these crashes involved collision with a pedestrian in the westbound direction. Both crashes occurred under dark conditions within the within the vicinity of NW 1 Avenue where bus stops are provided both sides of the road.
- One fatal crash occurred at the intersection of NW 2 Avenue and NW 7 Avenue Extension. This crash involved collision with a pedestrian in the northbound direction during nighttime with no street light.

Figure 4-9 shows the locations of the fatal crashes within the project study area. The detailed safety analysis together with the probable causes and potential countermeasures are provided in the safety analysis report in **Appendix F.**

Based on the Safety Analysis report, rear end, angle, and sideswipe type crashes were identified as the major crash types at intersections. On the freeway segments the predominant types of crashes were rear end followed by sideswipe crashes. Two high crash locations within the study area are located on SR 826/Palmetto Expressway east of NW 13 Avenue and on the SR 826/Palmetto eastbound ramp connector to the Florida Turnpike connector to southbound I-95.

Three of the fatal crashes were reported to have occurred under dark conditions. The interchange and connecting roadways currently have lighting. A review of the locations of these crashes indicated that there is lighting present at these two intersections. As such, the information obtained from the FDOT CARS database may have been coded incorrectly. However, it is recommended that the existing lighting conditions within the interchange and adjacent roadways should be evaluated as part of the design phase to ensure that the illumination levels meet the current FDOT requirements.

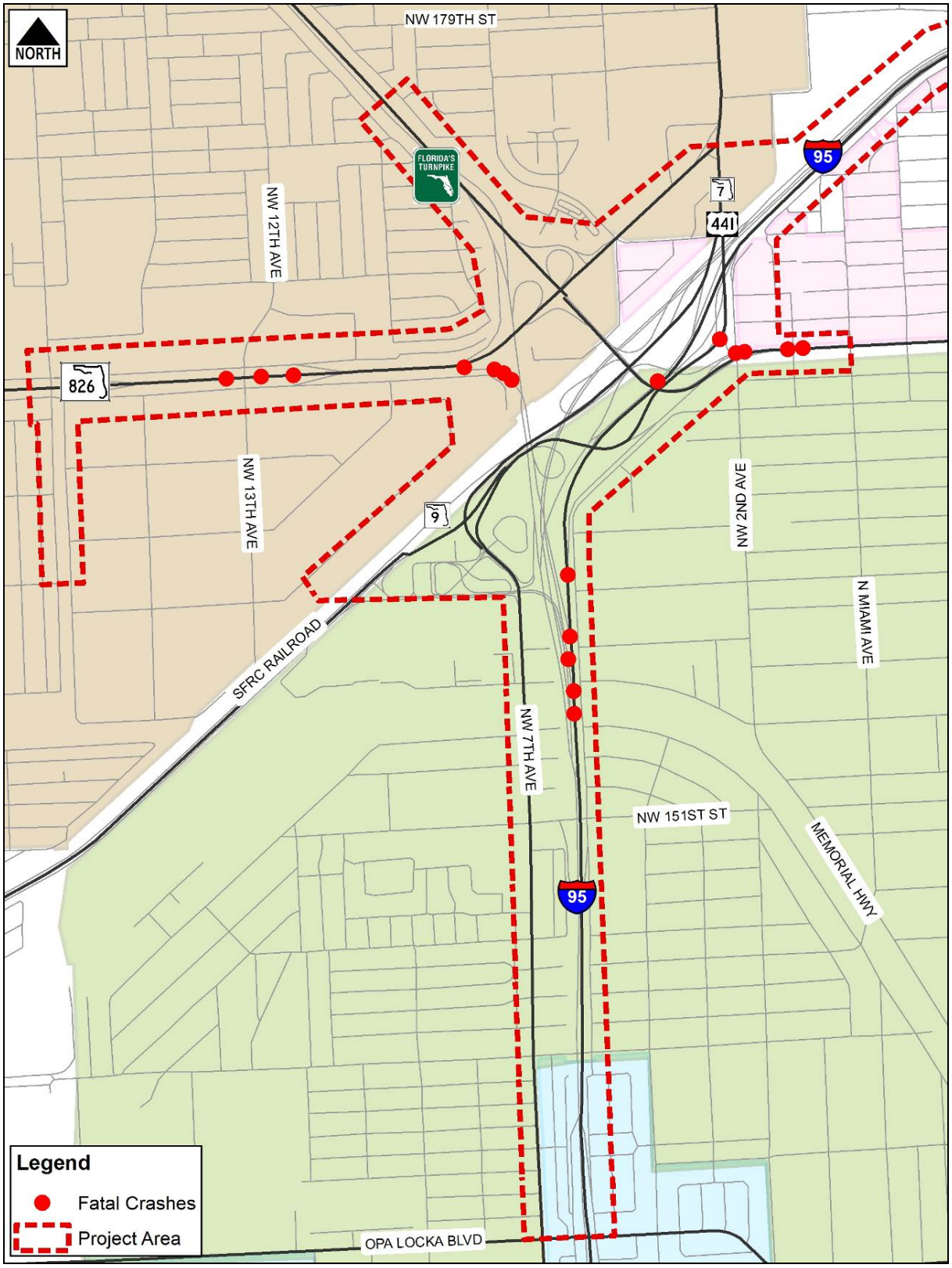


Figure 4-9 Fatal Crash Locations

4.4 Existing Environmental Constraints

A Contamination Screening Evaluation Report (CSER) was prepared in accordance with the FDOT PD&E Manual, Part 2, Chapter 22, and is on file at the FDOT District Six ISP Office. For the overall project, there were nine sites with a contamination history which indicated High risk potential involvement with the proposed project, and six sites with Medium risk. Thirty-five sites were assigned a Low risk rating and 68 facilities were rated No risk. For the recommended Interim Build Alternative 4, there were three High risk, three Medium risk, 35 Low risk and 54 No risk sites. Twenty-three sites were not applicable to Interim Build Alternative 4 since no work is occurring in the area. No right of way acquisition is anticipated from these properties; however, work is proposed to occur adjacent to most of the high and medium risk sites.

One of the High Risk sites, Anodyne, Inc. is a designated EPA Superfund Site. The CSER confirmed that a groundwater contamination plume consisting of organic compounds, inorganic compounds, and metals is known to extend into the SR 826/Palmetto Expressway right of way from this site. The former Anodyne, Inc. site is located in the southeast quadrant of the NW 165 Street and NW 13 Avenue intersection, approximately 1,000 ft southwest of the proposed project. The contamination plume, as estimated in 2010, extends north to SR 826, east to I-95, south to SR 7/US 441 and the C-8/Biscayne Canal, and west to the residential area. This site has a history of soil and groundwater contamination, with a groundwater plume that extends off-site and continues to expand due to influences of groundwater recharge and local area wellheads. Although no right of way acquisition is anticipated from this property, the documented plume could be a risk to the construction of the project's Build Alternatives, including the Recommended Alternative.

Because a High or Medium Risk for soil and/or groundwater contamination has been documented for six sites within the project influence area, a Level II Contamination Assessment investigation is warranted during the final design phase for the High and Medium Risk sites adjacent to the proposed construction areas of the Recommended Alternative, including any proposed drainage areas outside the FDOT right of way, to confirm the existence of soil and/or groundwater contamination at these sites. Additionally, these sites pose a dewatering concern based on their proximity to the project corridor. **Figure 4-10** shows the locations of the potential high and medium risk contamination sites within the project area.

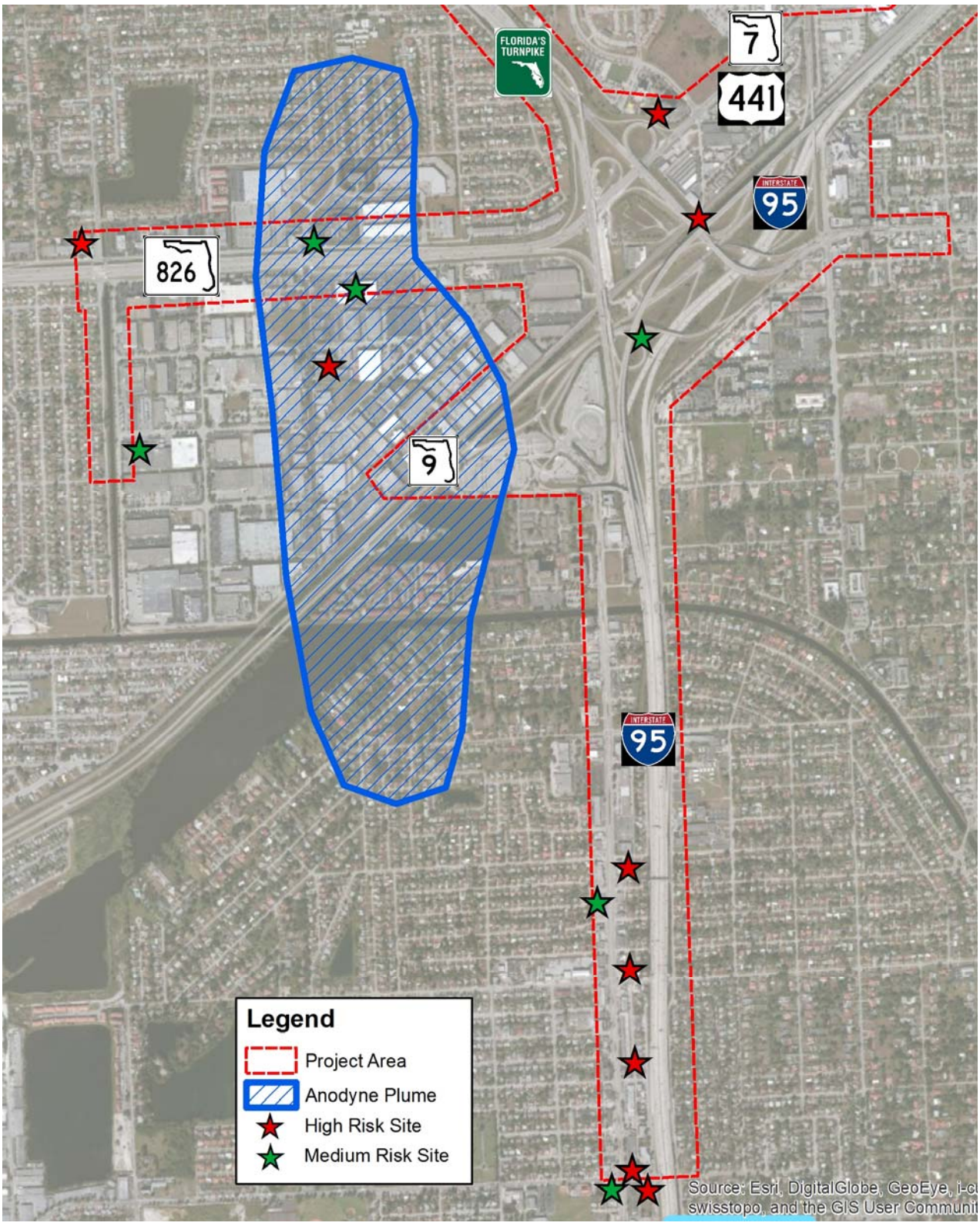


Figure 4-10 Potential Contamination Sites

5. NEED FOR THE PROJECT

5.1 Transportation Demand

The GGI connects major freeways and arterials including I-95, SR 826/Palmetto Expressway, Turnpike, SR 9, SR 7/US 441 and NW 167 Street. It carries over 400,000 vehicles per day and has a direct impact on inter-county travel between Miami-Dade, Broward and Palm Beach Counties. It is the backbone for the transportation of goods and services, as well as passenger trips in the northeastern region of Miami-Dade County. The GGI also supports the I-95 Express Lanes system and the Golden Glades Multimodal Facility, which provides access to inter-county transit service including the existing GGI to Downtown Miami-Dade express bus service.

In the last five decades, Miami-Dade and Broward counties have experienced significant population growth from 935,047 persons and 333,946 persons in 1960 to 2,496,435 persons and 1,748,066 persons in 2010, respectively. This represents an average annual growth rate of 1.98% for Miami Dade County and 3.37% for Broward County. The rapid population growth has resulted in a significant increase in surface transportation demand, particularly along the major freeways and arterials linking the three counties. The population of Miami-Dade County is projected to increase by approximately 18% from 2010 to 2035 while that of Broward County is projected to increase by 11% within the same period (Source: Bureau of Economic and Business Research). As the population in these counties increase over time, transportation demand will continue to grow thereby increasing the amount of vehicular traffic using the interchange for both local and regional trips.

5.2 Capacity

The GGI influence area is located within the City of Miami Gardens Transportation Concurrency Management Areas (TCMA) as well as the Transportation Concurrency Exemption Area / Urban Infill Area (TCEA/UIA) established by the City of North Miami Beach. These transportation concurrency areas influence the Level of Service (LOS) requirements and standards adopted for the roadway links within the GGI influence area. Based on field observations as well as results from the previous planning study prepared by the District Six Planning Department, the existing roadway capacity within the interchange study area is deficient at several locations along SR 826/Palmetto Expressway eastbound, Florida's Turnpike southbound, SR 7/US 441, SR 9 and I-95 at merge, diverge, weave and/or intersection locations within the interchange area. Queues at these deficient locations extend upstream, creating additional mobility issues at nodes that would otherwise operate at acceptable levels of service. The SR 826/Palmetto Expressway eastbound to I-95 northbound and the Turnpike southbound to I-95

Extended queues on SR 826 EB to I-95 NB

southbound movements are the two most critical links that are currently experiencing heavy congestion during the peak hours with insufficient link capacity. Currently, there is no dedicated system-to-system connection from SR 826/Palmetto Expressway eastbound to I-95 northbound. The existing network connection for this system-to-system movement includes the use of surface streets with tight radii, traffic signals, and weaving segments that considerably slow down traffic through this system interchange. In addition, the Turnpike's ramp to I-95 southbound is currently two lanes that transitions to a single lane prior to the merge with SR 826/Palmetto Expressway eastbound to I-95 southbound movement. The lane drop combined with weaving movements from SR 826/Palmetto Expressway has resulted in peak period backups that extend beyond the Florida's Turnpike Golden Glades Mainline Toll Plaza. The congestion has also contributed to a significant number of crashes in the southbound direction in the vicinity of the toll plaza.

Weaving condition between NB Turnpike and NB SR 7/I-95 Traffic

Over the years, this interchange and the surrounding multimodal facilities have been studied for the purpose of improving traffic operations and increasing user benefits by reducing congestion, increasing connectivity and improving travel delay caused by the circuitous routes in existence today. FDOT District Six has also been evaluating, and in some cases implementing, modifications to existing ramp configurations to improve traffic operations within the GGI. Recent improvements include the auxiliary lane addition for I-95 northbound connector to Florida's Turnpike and westbound SR 826/Palmetto Expressway (FPID: 415456-4) and other planned operational and safety improvements along various interchange ramps (FPID: 425637-1 & 429134-1). However, these projects have not alleviated the chronic congestion on the SR 826/Palmetto Expressway eastbound to I-95 southbound and the Turnpike southbound to I-95 southbound movements during the peak periods.

The proposed improvements at the GGI will provide additional capacity to accommodate the anticipated transportation demand, improve connectivity for traffic destined to northbound and southbound I-95 from SR 826/Palmetto Expressway and Turnpike respectively and ultimately improve safety, circulation and mobility for both commuter and multimodal (transit and freight) travel within both local and regional transportation networks.

5.3 Plan Consistency

The SR 826/Palmetto Expressway eastbound to I-95 northbound ramp connection and the proposed improvement along the Turnpike Connector to I-95 southbound are identified in the Miami-Dade County Metropolitan Planning Organization (MPO) 2035 LRTP Cost Feasible Plan (CFP) and amendments with funding for the planning, design and construction phases.

The project is also identified in the Miami-Dade County approved 2015 Transportation Improvement Program (TIP) (FPIDs: 423858-1, 423373-2) with full funding for all the project phases as follows in **Table 5-1** below:

Table 5-1
Project Phase Funding Amount, Year and Sources

FPID	Funding	Project Phase			Total
		Design	ROW	Construction	
425358-1	Amount	$7,676,000	$45,926,000	$113,914,000	$167,516,000
	Year	2014-2015	2014-2016	2017-2018	
	Source	State Funds	State Funds	Federal Funds	
423373-2	Amount	$6,337,000	$6,743,000	$61,368,000	$74,448,000
	Year	2015, 2017	2016	2017	
	Source	State Funds	State Funds	State Funds	
Total Project Cost		**$14,013,000**	**$52,669,000**	**$175,282,000**	**$241,964,000**

The project is consistent with the Miami-Dade County Comprehensive Development Master plan (CDMP) as amended and the 2009 update of the MPO-approved Congestion Management System, which is federally required as an integral part of the metropolitan planning process in Transportation Management Areas. Additionally, the project is included in the FDOT 2035 SIS CFP, as well as the current 2015 Transportation Improvement Program (STIP) with funding for the design and construction phases.

5.4 Social Demands and Economic Development

Evacuation and Emergency Response: The GGI serves as a critical transportation hub for the evacuation network established by the Florida Division of Emergency Management for Miami-Dade County. It plays an important role in facilitating traffic movement during emergency evacuation periods between three freeways (I-95, SR 826/Palmetto Expressway, and Florida's Turnpike) and two major principal arterials (SR 9 and SR 7/US-441), all of which are designated evacuation routes for Miami-Dade County residents. In addition, the GGI provides access to the emergency entrance for the Jackson North Medical Center.

Economic Development: The GGI is a regional transportation hub linking residents and businesses of Miami-Dade and Broward Counties, with many residents commuting between these two counties for work. According to the 2000 Census, approximately 6.5% of Miami-Dade residents commute to Broward County, while 15.5% of Broward County residents and 1% of Palm Beach County residents commute to Miami-Dade County. The proposed

improvements will enhance mobility within the GGI and promote economic growth and development within the three counties, as well as the South Florida region by reducing congestion and enhancing the movement of goods and services.

The City of Miami Gardens has identified planned developments including two residential developments (Legacy Pointe-Sola Bella and Lakeside Point Townhomes) adjacent to the interchange area. In addition, a 40 acre world-class water park is proposed to be developed adjacent to the Sun Life Stadium with direct access to the Florida Turnpike. These future potential residential and commercial developments will increase the traffic demand through this interchange and exacerbate the current congestion problem. The proposed improvements within the GGI will improve mobility and support the economic development of the area, as well as stimulate major construction activities that will contribute to economic growth within the South Florida Region.

5.5 System Linkage

The GGI is a vital transportation hub within southeast Florida, providing an inter-regional connection for Miami-Dade and Broward Counties. It serves as a confluence point for five major regional transportation corridors SR 826/Palmetto Expressway, I-95, Florida's Turnpike, SR 7/US 441 and SR 9. SR 826/Palmetto Expressway is one of the principal north-south corridors across the heart of Miami-Dade County which feeds traffic to Florida's Turnpike and I-95 via the GGI. The I-95 corridor carries local residents and serves millions of regional travelers along the eastern seaboard from Maine to Miami. The Florida's Turnpike mainline begins at the GGI and extends northwest linking Miami to Orlando. The two major arterials, SR 9 and SR 7/US 441, also funnel tens of thousands of commuters daily from neighboring residential and commercial areas into the GGI to connect to the expressways. These regional transportation corridors constitute major elements of the surface transportation system in Southeast Florida and facilitate the movement of goods and people between airports, seaports, and major employment centers, residential and recreational areas.

The GGI also provides connections to several SIS highways and hubs. Established by the Florida Legislature in 2003, the SIS is a network of high-priority transportation facilities that are the workhorses of Florida's air, water and ground transportation system. SR 826/Palmetto Expressway, I-95 and Florida's Turnpike are designated as SIS highways. The GGI Park-n-Ride facility located within the interchange area is a SIS intermodal facility which provides connections to South Florida Regional Transportation Authority (SFRTA) commuter trains; Miami-Dade Transit (MDT) express and local buses, Broward County Transit (BCT) express and local buses, Greyhound intercity buses and carpool commuters. In addition, the interchange facilitates connections to the Miami International Airport and the Fort Lauderdale-Hollywood International Airport, both designated SIS commercial service airport hubs, via I-95.

The GGI is also the current end terminus of the I-95 Express lanes in Miami-Dade County and will serve as a begin terminus for the proposed I-95 Express lanes in Broward County.

The interchange will also facilitate connection between the potential express lanes along SR 826/Palmetto Expressway and the I-95 Express lanes along I-95.

Consequently, the proposed capacity and mobility improvements within the GGI are critical in order to improve access to these major transportation facilities, as well as enhance mobility within the South Florida Region.

5.6 Traffic Safety

A review of crash data for the 2006 to 2010 period indicates that 3,238 crashes occurred along the roadway segments within the study area. A total of 1,496 injury and 18 fatal crashes occurred during the five-year analysis period with 19 fatalities; ten of these fatal crashes were located along the existing SR 826/Palmetto Expressway eastbound mainline and ramp to I-95 northbound and southbound. In addition, four freeway segments, three arterial segments and four signalized intersections are identified in the FDOT's list of High Crash Locations (HCL).

The predominant crashes are rear-end and sideswipe collisions which account for 44% and 18% respectively of the total crashes. Crashes of this type are typically attributed to the congested conditions along the interchange ramps and terminals during the peak periods. In addition, merging and weaving maneuvers between ramps due to the relatively short weaving distance between connecting ramps appear to be contributory causes for the frequent angle and sideswipe crashes.

In general, the proposed direct connection flyover ramp from SR 826/Palmetto Expressway eastbound to I-95 northbound as well as the widening of the Turnpike Connector southbound lanes will alleviate traffic congestion and improve mobility for these critical movements. This will potentially mitigate the crash rate and enhance overall public safety within the interchange.

5.7 Roadway Deficiencies

The GGI was originally constructed in 1964 consistent with the 1954 American Association of State Highway and Transportation Officials (AASHTO) publication "A Policy on Geometric Design for Rural Highways" (also known as the Blue Book) that was in place when the facility was designed in the early 1960s. In almost five decades of its existence, the only major geometric changes that have occurred are the construction of the flyover ramps to the Golden Glades Park-n-Ride Facility in the 1970s and the construction of the elevated HOV lanes in 1995. As such, several geometric elements such as vertical clearance, sight distance, curve length, superelevation and shoulder widths, do not meet the current FDOT design standards or AASHTO requirements. The proposed project would evaluate these deficiencies and provide recommendations for roadway improvements that satisfy the current design standards and enhance safety within the project area.

5.8 Modal Interrelationships

The GGI encompasses the Golden Glades Intermodal Center located in the southwest quadrant, which consists of a Park-n-Ride Lot, an adjacent vacant parcel east of the Park-n-Ride Lot, and the connecting roadways and ramps. The Park-n-Ride Lot currently accommodates the following transportation modes: SFRTA commuter trains, MDT express and local buses, BCT express and local buses, Greyhound intercity buses, and carpool commuters. The FDOT plans to redevelop the existing Golden Glades Park-n-Ride Lot into a Multimodal Facility with improved access. The proposed improvements will facilitate this goal by removing the SR 826/Palmetto Expressway eastbound to I-95 northbound traffic from SR 7/US 441. This will provide additional capacity for the multimodal traffic along SR 7/US 441, thereby improving access and mobility to the multimodal facility.

The Miami-Fort Lauderdale region is creating a 21-mile express-lane facility on I-95, between I-395 and I-595, with a long-term goal of providing a network of express lanes throughout the region. On-going studies are also considering extending the express lanes further north to the Martin County Line. The GGI will serve as one of the main access points for ingress and egress to the existing I-95 Express lanes in Miami Dade County, the proposed I-95 Express lanes in Broward County and the future potential express lanes along SR 826/Palmetto Expressway currently under evaluation. The express lane network will also serve as the back-bone of a proposed bus rapid transit (BRT) system with express feeder bus services running north-south along SR 7/US 441 and SR 817 (University Drive), and east-west along SR 820 (Hollywood/Pines Boulevard). Therefore, the proposed improvements will benefit multimodal uses and congestion management throughout the South Florida region.

The Miami-Dade Parks and Open Space Master Plan and North-Dade Greenways Master Plan identify the opportunity to develop the Gold Coast Trail. This trail consists of a 20 mile path occupying the easement of the SFRC. It provides an opportunity to create a multimodal access point at the GGI Park-n-Ride facility. The proposed interchange improvements will provide a clear envelope when placing bridge piers in order to accommodate the future planned trail.

6. ALTERNATIVES

The alternatives considered as part of the Golden Glades Interchange PD&E Study include a No Build Alternative, Transportation System Management (TSM) Alternative, four Interim Build Alternatives and an Ultimate Build Alternative. The Alternatives are described as follows:

6.1 No Build Alternative

The No Build Alternative assumes no proposed improvements and serves as a baseline for comparison against the other alternatives. It however, includes on-going construction projects and all funded or programmed improvements scheduled to be opened to traffic in the analysis years being considered. These improvements must be part of the Department's adopted Five-Year Work Program, Miami-Dade County Metropolitan Planning Organization (MPO) cost feasible Long Range Transportation Plan (LRTP), transportation elements of Local Government Comprehensive Plans (LGCP), or developer-funded transportation improvements specified in approved development orders.

6.2 Transportation System Management (TSM) Alternative

The TSM Alternative considers minor improvements to enhance operations and safety without the addition of through lanes. TSM includes low-cost improvements such as adding auxiliary lanes along freeways, adding turn lanes at intersections, adjusting signal phasing and timings, and considering opportunities to enhance alternative travel modes and implement intelligent transportation systems (ITS). Another TSM improvement that will be considered is the widening of the southbound Turnpike Connector between SR 826/Palmetto Expressway and the off-ramp to SR 7/US 441 to provide an additional lane for Turnpike southbound to I-95 southbound movement.

6.3 Build Alternatives

As part of the alternatives analysis for this PD&E Study, both Interim and Ultimate Build improvements were developed and evaluated; however, this PD&E Study focuses on the Interim Build improvements while the Ultimate Build improvements will be studied and included as part of a separate and adjacent SR 826/Palmetto Expressway PD&E Study.

6.3.1 Interim Build Alternatives

Four preliminary interim build alternatives (1A, 1B, 2A and 2B) were evaluated during the initial phase of the PD&E study and presented at the initial Alternatives Public Workshop held on May 3, 2012. These initial interim build alternatives were based on the concept developed for this interchange under the planning phase of this project which provided a two-lane off-ramp from SR 826 eastbound to I-95 northbound and southbound and maintained the NW 12 Avenue on-ramp. However, with the potential incorporation of express lanes along SR 826/Palmetto Expressway, the ultimate build alternative eliminated the NW 12 Avenue on-ramp. Consideration for alternative access was provided through the

incorporation of a Texas U-Turn at NW 17 Avenue interchange due to the right of way constraints.

Based on the traffic forecast analysis performed for this study, the initial interim build alternatives were refined into three interim build alternatives (3A, 3B, and 3C) and presented at the Alternatives Public Workshop Update held on August 23, 2012. The refined alternatives provided a three-lane off-ramp from SR 826 eastbound to I-95 northbound and southbound in order to accommodate the projected traffic volume in 2030 (mid-design year) as well as 2040 (design year). Consequently, the NW 12 Avenue on-ramp was now eliminated as part of the refined interim build alternatives due to the right of way constraints as well as the adverse operational and safety impacts.

As part of the of the public involvement process, several meetings and discussions were held with the residents and businesses who may be potentially impacted by the closure of the NW 12 Avenue on-ramp. Both the business owners and residents recommended the study team to evaluate additional alternatives to maintain the on-ramp since its closure could inconvenience their operations and travel patterns. As such, an additional improvement alternative (Interim Build Alternative 4) was developed to maintain the NW 12 Avenue on-ramp as well as provide a three-lane off-ramp from SR 826/Palmetto Expressway eastbound to I-95 northbound and southbound. The interim Build Alternatives are described below:

6.3.1.1 Interim Build Alternative 3A

Interim Build Alternative 3A provides a three lane off-ramp for SR 826/Palmetto Expressway eastbound to I-95 northbound and southbound. The new flyover ramp begins from the SR 826/Palmetto Expressway eastbound to I-95 southbound ramp and continues over the Turnpike Connector and underneath the I-95 express flyover ramps. It then goes over I-95 and merges with the existing SR 7/US 441 northbound to I-95 northbound ramp before joining I-95 using the existing on-ramp alignment. The Turnpike Connector southbound lanes will be reconstructed to shift the alignment to the west in order to accommodate a future direct express lane connection from the Turnpike southbound to the I-95 express southbound lanes.

The proposed three-lane off-ramp for SR 826/Palmetto Expressway eastbound to I-95 northbound and southbound movements removes the NW 12 Avenue eastbound on-ramp to SR 826 eastbound and provides a connection from NW 165 Street to NW 17 Avenue across the NW 17 Avenue Canal. It requires widening of NW 17 Avenue from two to four lanes between NW 165 Street and SR 829/Palmetto Expressway. The existing unsignalized single left turn lane from SR 826/eastbound to Florida's Turnpike northbound will also be upgraded to a signalized intersection with double left turn lanes. **Figure 6-1** illustrates the conceptual layout for Interim Build Alternative 3A.

6.3.1.2 Interim Build Alternative 3B

This build alternative also involves the construction of a three lane off-ramp for SR 826/Palmetto Expressway eastbound to I-95 northbound and southbound movements and the provision of a direct connection flyover from SR 826/Palmetto Expressway eastbound to I-95 northbound similar to Interim Build Alternative 3A. The main differences are the improvements to the Turnpike Connector southbound and I-95 southbound movements.

Under this alternative, the southbound Turnpike connector lanes will be reconstructed to shift the alignment to the west in order to accommodate a future direct express lane connection from Florida's Turnpike southbound to the 95 Express southbound express lanes. The Turnpike Connector southbound off-ramp to SR 7/US 441 is relocated approximately 1,150-ft south along SR 7/US 441 to Biscayne River Drive. The Turnpike connector then merges with the I-95 southbound mainline lanes further south just after the Biscayne Canal Bridge. The I-95 southbound mainline lanes will also be reconstructed and realigned.

The removal of the NW 12 Avenue eastbound on-ramp to SR 826 eastbound and the provision of new a connection from NW 165 Street to NW 17 Avenue across the NW 17 Avenue canal as well as the widening of NW 17 Avenue from two to four lanes between NW 165 Street and SR 826/Palmetto Expressway and provision of a new signalized intersection with double left turn lanes for SR 826/Palmetto Expressway eastbound to Turnpike northbound is similar to that of Interim Build Alternative 3A. **Figure 6-2** illustrates the conceptual layout for Interim Build Alternative 3B.

6.3.1.3 Interim Build Alternative 3C

The proposed improvements along SR 826/Palmetto Expressway and the Turnpike Connector under Interim Build Alternative 3C are similar to Interim Build Alternative 3B. The main difference is the provision of a third-level single-lane flyover ramp from Turnpike southbound to the I-95 express southbound lanes. The single-lane flyover merges with the existing single-lane I-95 express flyover south of the Biscayne Canal Bridge to provide two express lanes south of the merge location. The improvements along the Turnpike Connector and I-95 southbound express lanes together with the direct connection flyover ramps from Florida's Turnpike to I-95 southbound express lanes represent the ultimate configuration necessary to accommodate the design year travel demand. **Figure 6-3** illustrates the conceptual layout for Interim Build Alternative 3C.

6.3.1.4 Interim Build Alternative 4

The proposed improvements along SR 826 and the Turnpike Connector under Interim Build Alternative 4 are similar to Interim Build Alternative 3A and 3B. Under this alternative, the southbound Turnpike connector lanes will be reconstructed to shift the alignment to the west in order to accommodate a future direct managed lane connection from Florida's Turnpike southbound to the 95 Express southbound managed lanes Interim Build Alternative 4 provides a three lane off-ramp for SR 826/Palmetto Expressway eastbound to I-95 NB/SB and also maintains the NW 12th Avenue on-ramp. In order to eliminate the

current weaving issue along the SR 826 mainline, the NW 12 Avenue on-ramp will be relocated and connected to the three lane off-ramp to I-95 NB/SB as a barrier separated auxiliary lane. An auxiliary lane will also be added to the Turnpike Connector southbound lanes to increase the weaving distance, and the off-ramp to SR 7/US 441 will be relocated approximately 1,150-ft south along SR 7/US 441. An additional northbound left turn lane is also provided at the NW 2nd Avenue and NW 167th Street intersection to improve operations.

The provision of the NW 12th Avenue on-ramp will require the removal of the eastbound frontage road east of NW 10th Avenue. The warehouse property on the southwest quadrant of the interchange within the Sunshine Industrial Park will be acquired due to the removal of the only access road for this property. No improvements along NW 17th Avenue; however, Texas U-Turns (matching the existing bridge vertical clearances) will be provided underneath the SR 826/Palmetto Expressway mainline bridges over NW 17th Avenue and NW 12th Avenue to enhance access and mobility for the adjacent residents and the Sunshine Industrial Park.. The provision of a direct connection flyover from SR 826/Palmetto Expressway eastbound to I-95 northbound and a new signalized intersection with double left turn lanes for SR 826/Palmetto Expressway eastbound to Turnpike northbound is similar to that of Interim Build Alternative 3A. **Figure 6-4** illustrates the conceptual layout for Interim Build Alternative 4.

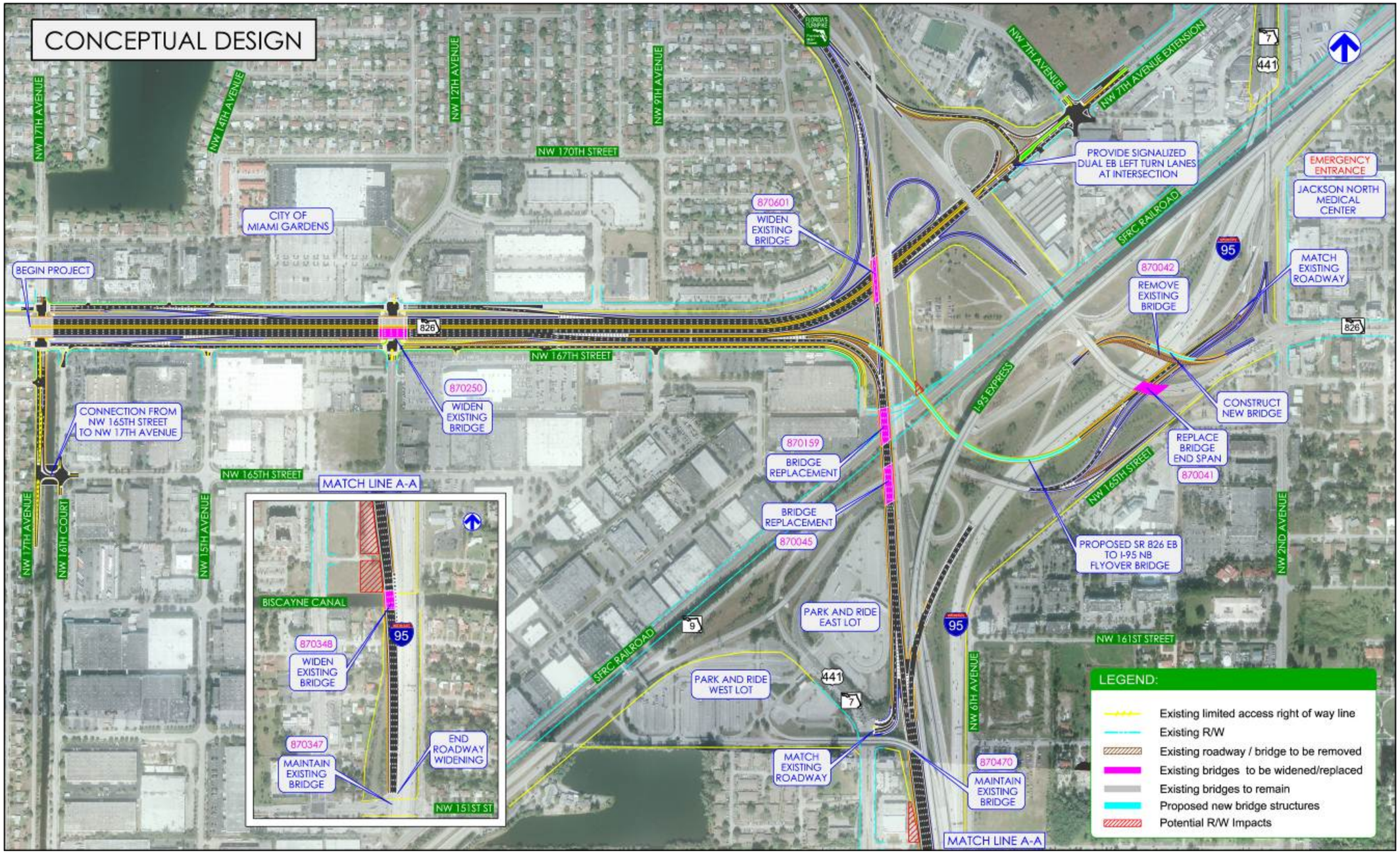


Figure 6-1 Conceptual Layout: Interim Build Alternative 3A

Figure 6-2 Conceptual Layout: Interim Build Alternative 3B

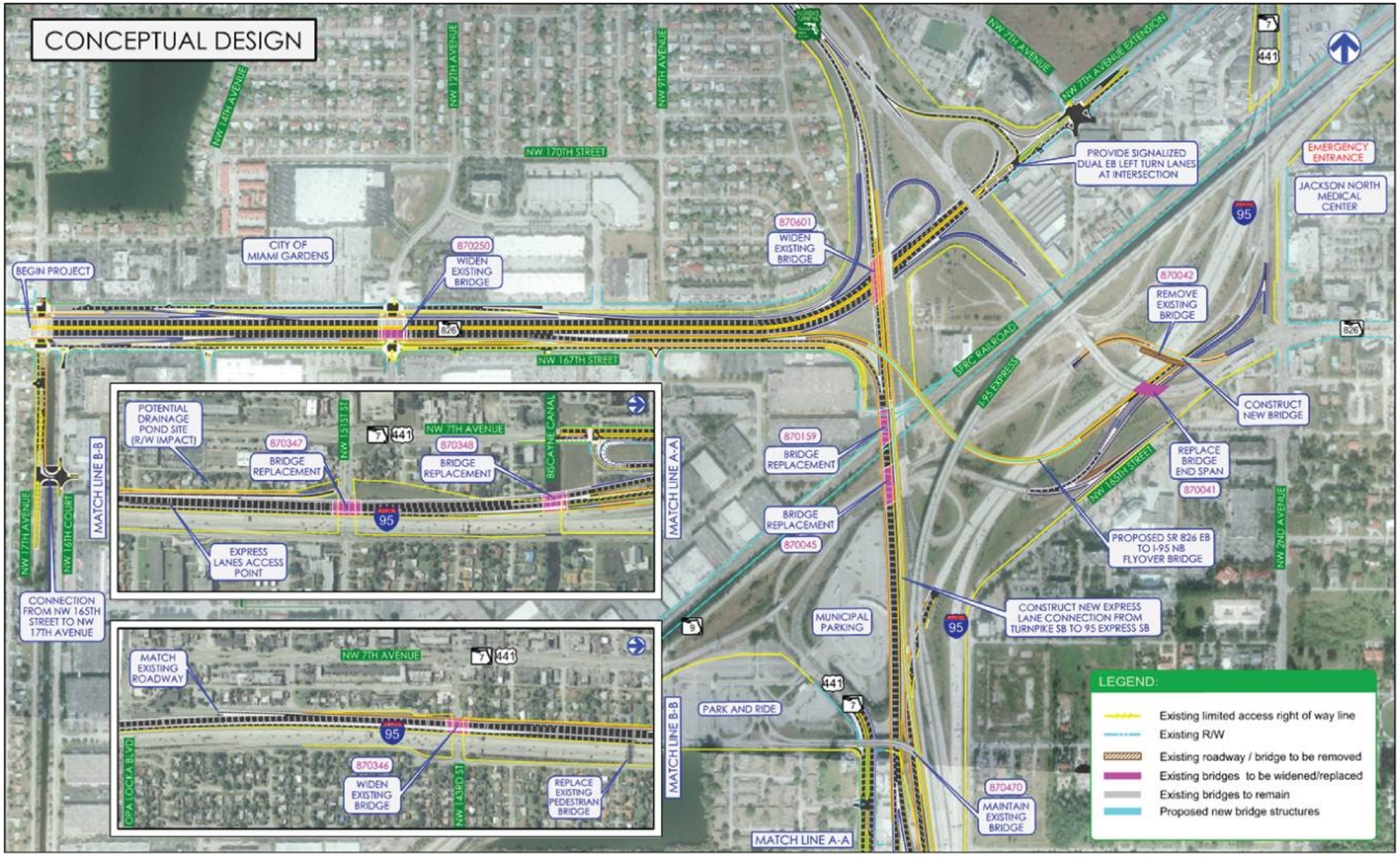


Figure 6-3 Conceptual Layout: Interim Build Alternative 3C

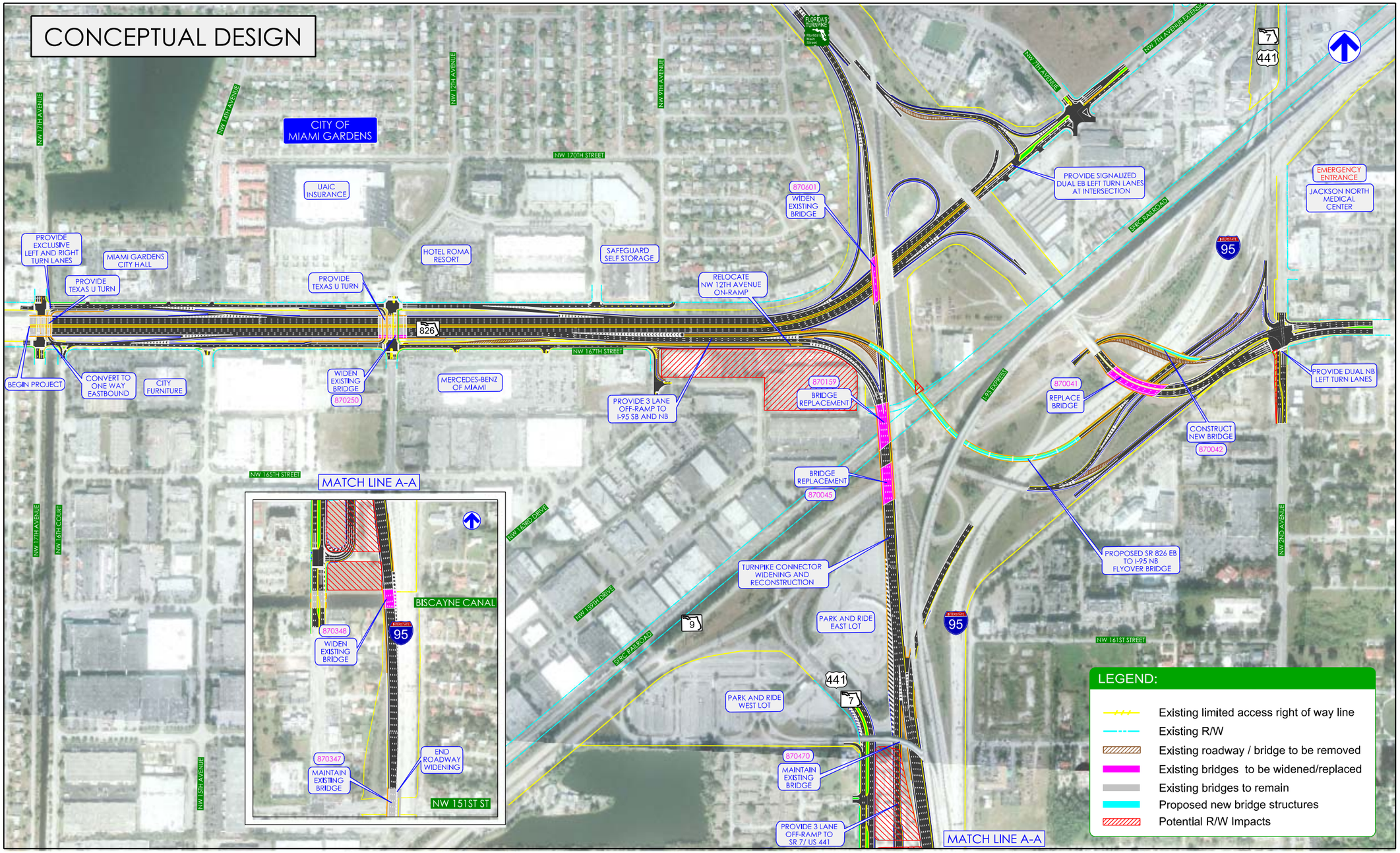


Figure 6-4 Conceptual Layout: Interim Build Alternative 4

6.3.2 Ultimate Build Alternative

The Ultimate Build Alternative represents the master plan to improve operations, safety and mobility within the Golden Glades Interchange and provide an improved connection between the new express lanes on SR 826/Palmetto Expressway and the I-95 express lanes system. The feasibility of express lanes along SR 826/Palmetto Expressway are currently being evaluated under a separate adjacent PD&E Study (FPID: 418423-1, ETDM #11241). The following improvements are included in the Ultimate Build Alternative and illustrated in **Figure 6-5**:

1. Provide express lane connections between SR 826/Palmetto Expressway and I-95 to and from the north only with modifications to SR 826/Palmetto Expressway mainline between GGI and NW 17 Avenue to accommodate four general use lanes in each direction
2. Provide direct express lane connections between Florida's Turnpike and I-95 express southbound lanes and reconstruct I-95 southbound to accommodate new ramp
3. Provide a new ramp for the SR 9/SR 7/US 441 northbound to I-95 northbound movement that merges with the SR 826/Palmetto Expressway eastbound to I-95 northbound flyover ramp before joining I-95 as a two lane on-ramp
4. Provide an auxiliary lane along I-95 northbound between Golden Glades Interchange and Miami Gardens Drive to increase capacity along mainline
5. Widen the existing I-95 express flyover ramps from one to two lanes in each direction north of the merge/diverge locations with the new SR 826 express lanes flyover ramps
6. Widening of SR 826 connector to NW 167 Street to accommodate two lanes from SR 826/ Palmetto Expressway eastbound to NW 167 Street eastbound
7. Combination and realignment of the I-95 northbound to SR 7/US 441 northbound and NW 167 Street eastbound exit ramps
8. Relocate Turnpike connector to SR 7/US 441 off ramp 1,150-ft south to increase distance between signals along SR 7/US 441.
9. NW 12 Avenue eastbound on-ramp will be relocated and connected to the three lane off-ramp to I-95 northbound and southbound as a barrier separated auxiliary lane
10. Provide a Texas U-turn at NW 17 Avenue and NW 167 Street Frontage Road intersection
11. Provide an additional northbound left turn lane at NW 2 Avenue and NW 167 Street intersection.

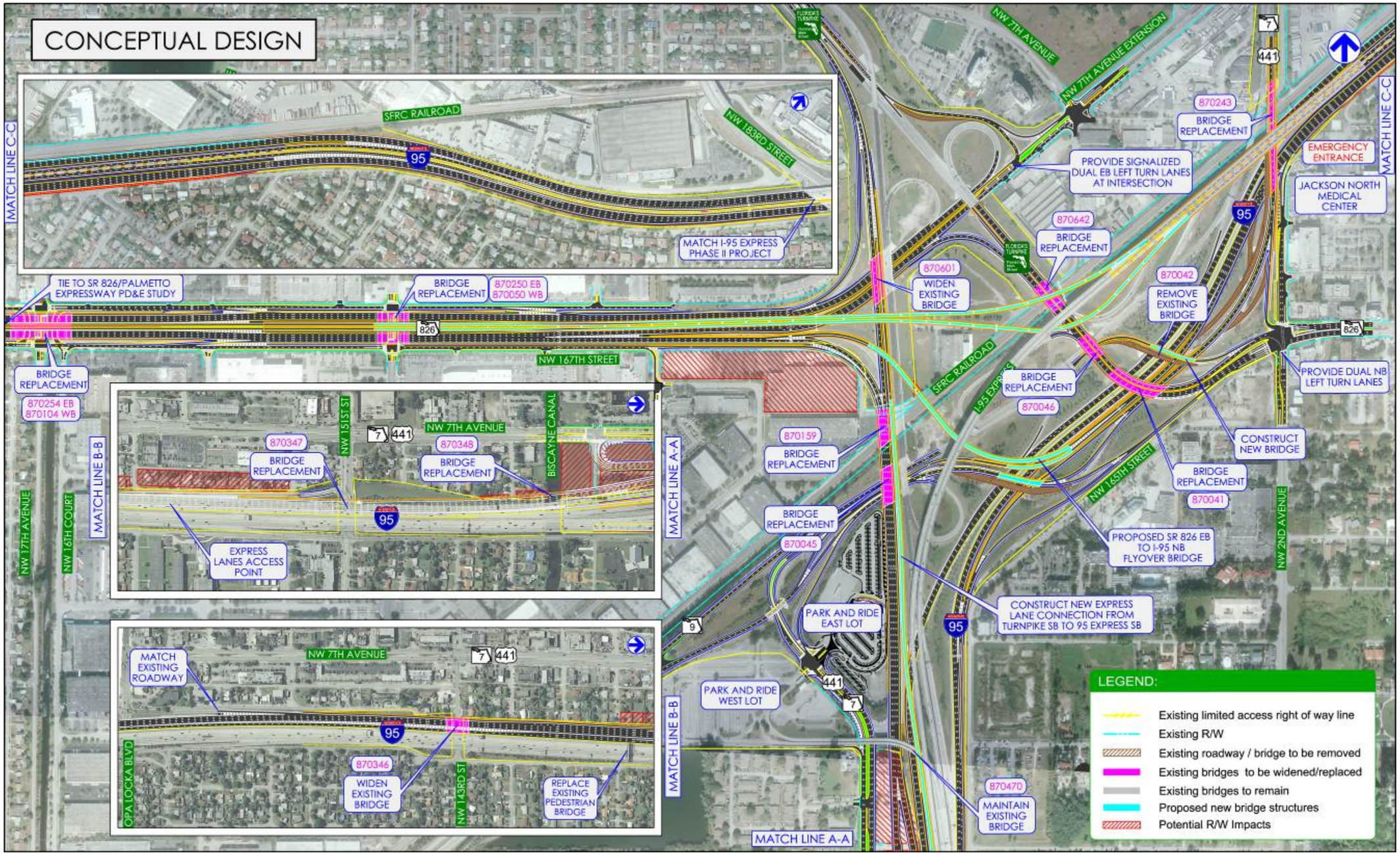


Figure 6-5 Conceptual Layout: Ultimate Build Alternative

7. FUTURE YEAR TRAFFIC

The analysis years for this project are: existing year 2010, opening year 2018, interim year 2030 and design year 2040. Future traffic forecasts for GGI were developed by the consultant for the SR 826 PD&E since GGI represents the eastern termini for their project. Forecasts were based on the SERPM data files for 2035 and the Long Range Transportation Plan projects from the Miami-Dade, Broward and Palm Beach Metropolitan Planning Organizations. SERPM-based forecasts for the design year 2040 were extrapolated with growth parameters developed from growth between 2005 and 2035. The model validation and calibration methods were refined in the project location and its surrounding areas. Updates to the coding of several roadway attributes were required before the model could be run for each set of alternatives. The GGI PD&E Study travel demand estimation was performed in correlation with the SR 826 North-South and SR 826 East-West PD&E Studies. Since all three of the PD&E studies have been performed in the same time line, FDOT decided to follow a consistent travel demand estimation methodology among all three PD&E studies.

7.1 Development of AADT Volumes

A subarea validation was performed in order to better validate the model results and prepare the tool for a more reliable forecasting. The forecasted volumes were adjusted by following the National Cooperative Highway Research Program Report 255 (NCHRP 255) methods to match the existing year projections with the existing year traffic counts. The FDOT's *Project Traffic Forecasting Handbook* recommends using the NCHRP 255 methods for forecasting purpose.

AADT volume estimates were developed for the entire study area by following the process below (post processing adjustments and balancing):

- AADT volumes were developed on all freeway mainline segments, using the NCHRP 255 procedure. It was made sure that, in general, the AADT volumes were directionally balanced. The AADT volumes were checked for reasonableness against other study forecasts and historical traffic counts.
- All ramp and arterial AADT volumes were developed using the same process. The reciprocal ramp movements were balanced in order to make them directionally balanced.
- All volumes were rounded off to the nearest 100s.
- During the balancing effort, mainline freeway volumes were held constant to the best possible extent and the ramp volumes were adjusted.
- A manual check quality control process was performed on the balancing effort to ensure proper system-wide AADT balancing.

7.2 Development of DDHV Volumes

Future Directional Design Hourly Volumes (DDHV) and turning movement volumes were developed for the entire study area by following the approved methodology outlined in the Methodology Letter of Understanding (MLOU) that was prepared consistent with the FDOT *Project Traffic Forecasting Handbook*. The methodology approved for this project is illustrated in the traffic analysis process flowchart shown in **Section 2** in **Figure 2-1**.

Methodology

The methodology's main steps to develop future directional peak hour volumes consisted of: (1) obtaining and reviewing the reasonableness the future AADTs developed by the SR 826 PD&E Study, (2) performing manual diversions to account for alternative characteristics, (3) applying K and D factors to develop directional peak hour volumes, (4) using TMTOOL to balance future intersection turning movements, and (5) smoothing traffic volumes throughout the system and at ramp terminals. The balances DDHV were then used in CORSIM, HCS and SYNCHRO to perform the operational analysis for the future No Build and Build alternatives for opening, interim and design years.

Step 1: Review AADTs developed by the SR 826 PD&E Study

The AADTs for the No Build and Build alternatives were provided by the Consultant performing the SR 826 PD&E Study and are included in **Appendix G**. The modeled scenarios included **No Build** and **Build 1B** alternatives for opening year (2018) and interim year (2030); as well as **No Build** and **Ultimate Build 2** for design year (2040). Therefore, only one build alternative was modeled for each of the opening, interim and design year. ATEC reviewed the future AADTs provided by the SR 826 PD&E Study for reasonableness, identified inconsistencies and missing values, and provided constructive comments that were incorporated into the final forecasts.

Step 2: Manual adjustments

Design hour volumes were developed for No Build, 3A, 3B and 3C Alternatives for opening year in 2018 and interim year in 2030; and for No Build and Ultimate Build for 2040. Alternatives 3A and 3B do not include the elevated flyover connecting southbound Turnpike to southbound I-95. Additionally, Alternatives 3A and 3B differ at the bifurcation of the southbound Turnpike/SR 826 connector with I-95 southbound. Also Build 3B moves southward the intersection formed by the connector's off-ramp and SR 7, east of the park and ride lots, to increase the stacking distance northeast of the intersection.

For the 2010 SERPM AADT values associated with intersection approach legs, manual adjustments and additions were made to supply every intersection approach with an existing AADT value. For missing segments of the arterial network sources from the 2010 FTI DVD and existing counts were used. Also, when reviewing the 2010 SERPM generated AADTS there were instances of values averaging more than 100% difference between

collected existing values. Using these values without adjustment would have provided unreasonable growth rates (+/-) between the base and future years. A table of the final intersection approach leg AADT values is provided in **Appendix G**.

Few to no adjustments were applied to future freeway segment AADTs, except for the segments that were shared with an arterial roadway segment. However, manual adjustments were applied to the generated peak hours volumes to account for geometric differences between modeled opening and interim Build alternatives in SERPM (Build 1B) and the final geometry of the selected alternatives (Build 3A, 3B, 3C, and 4). For instance, Build 1B alternative modeled in SERPM assumed the new flyover connecting southbound Turnpike to southbound I-95 merges into the existing southbound express lane, thereby significantly limiting the capacity of both the flyover and express lane. The final design of Build 3C alternative, however, does not merge the Turnpike overpass and I-95 express lanes into one lane, but into their own separate lanes resulting in minimum friction and significantly greater capacity. Therefore, manual adjustments were applied to increase the traffic assignment onto the Turnpike's flyover.

Step 3: K and D Factors

The Standard K factors were used to develop peak hour volumes consistent with the approved MLOU. The Standard K factors for GGI main facilities are 8.0 for I-95 and SR 826, 9.5 for the Turnpike, and 9.0 for arterials including SR 7 and SR 9. A weighted K factor of 8.6 was calculated for the system-to-system connections between I-95 or SR 826 and the Turnpike. The peak hour volumes for ramps were calculated as a percent split of the freeway segment volume based on existing counts. A summary of the K, D and T factors is provided in a previous section in **Table 2-2**.

Step 4: Intersection Volume Balancing

TMTOOL software was used to balance future intersection volumes consistent with methodology agreement. Future approach AADTs were obtained from three sources: SR 826 PD&E traffic projections, FDOT 2010 FTI DVD, and peak hour to daily conversion of existing turning movement counts using the necessary conversion factors. The volumes generated by TMTOOL were reviewed and adjustments were made when justified. Overall, minor adjustments were needed to eliminate unsupported traffic volume reductions or excessive growth rates. Therefore, due to these adjustments and further volume smoothing, the peak period volumes represented within the TMTOOL spreadsheets may differ from the final turning movement volumes. The final turning movement volumes are provided in **Figures 7-1 to 7-12**, provided below. The adjusted TMTOOL input and output printouts are provided in **Appendix H**.

Step 5: Volume Smoothing

The final step in developing future peak hour volumes for the various design alternatives was to perform a traffic smoothing throughout the GGI network and between the

intersections and terminal ramps. The smoothing process gave priority to freeway segments, then system-to-system ramps and finally on and off ramps. The final future freeway peak hour volumes are provided in **Figures 5-13 to 5-20** for the 2018 No Build Alternative, 2030 No Build Alternative, 2040 No Build Alternative, 2018 Build 3A, 3B, 3C Alternatives, 2030 Build 3A, 3B, 3C Alternatives, 2018 Build 4 Alternative, 2030 Build 4 Alternative, and 2040 Ultimate Build Alternative, respectively.

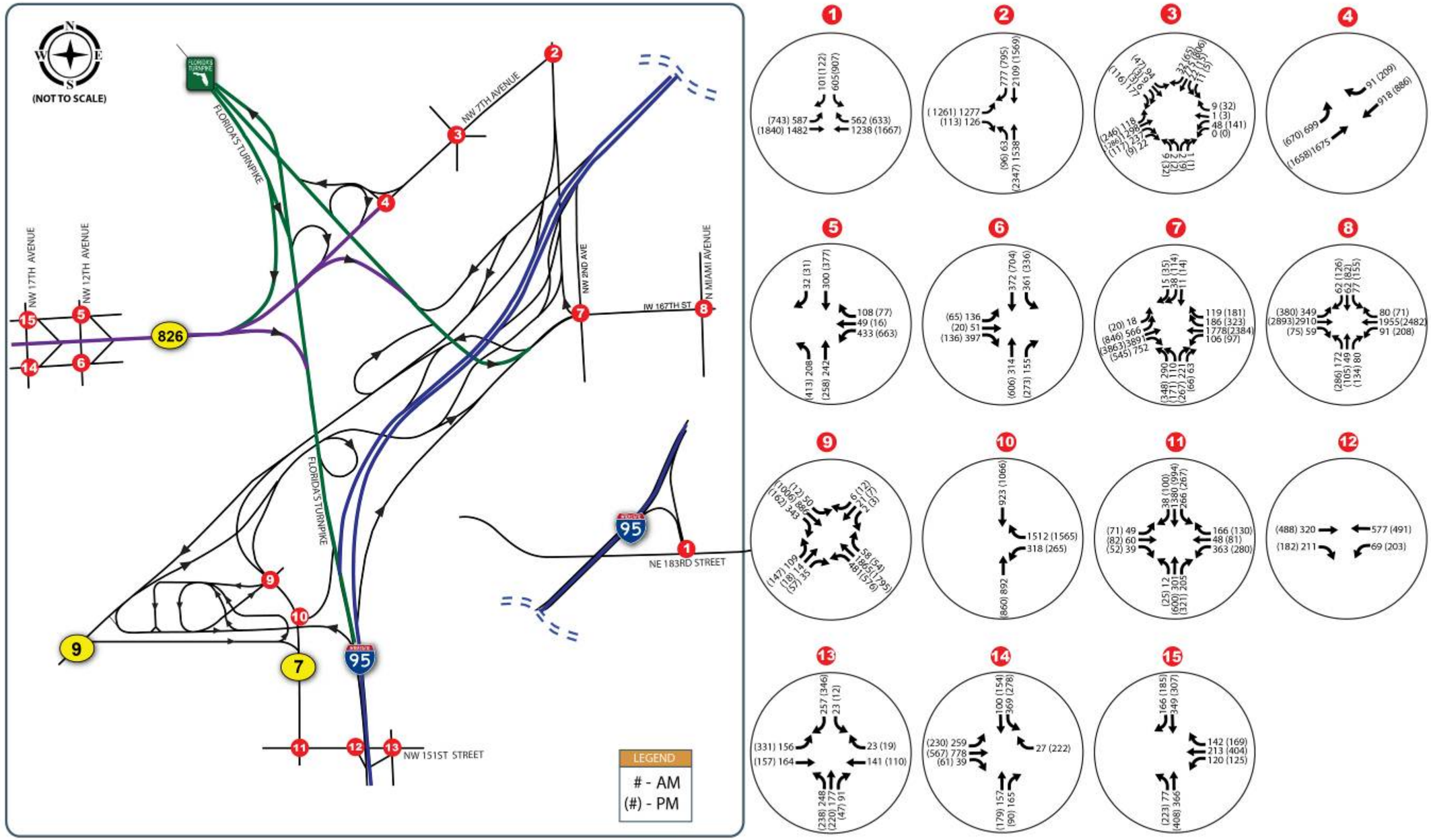


Figure 7-1 TMC Volumes – No Build 2018

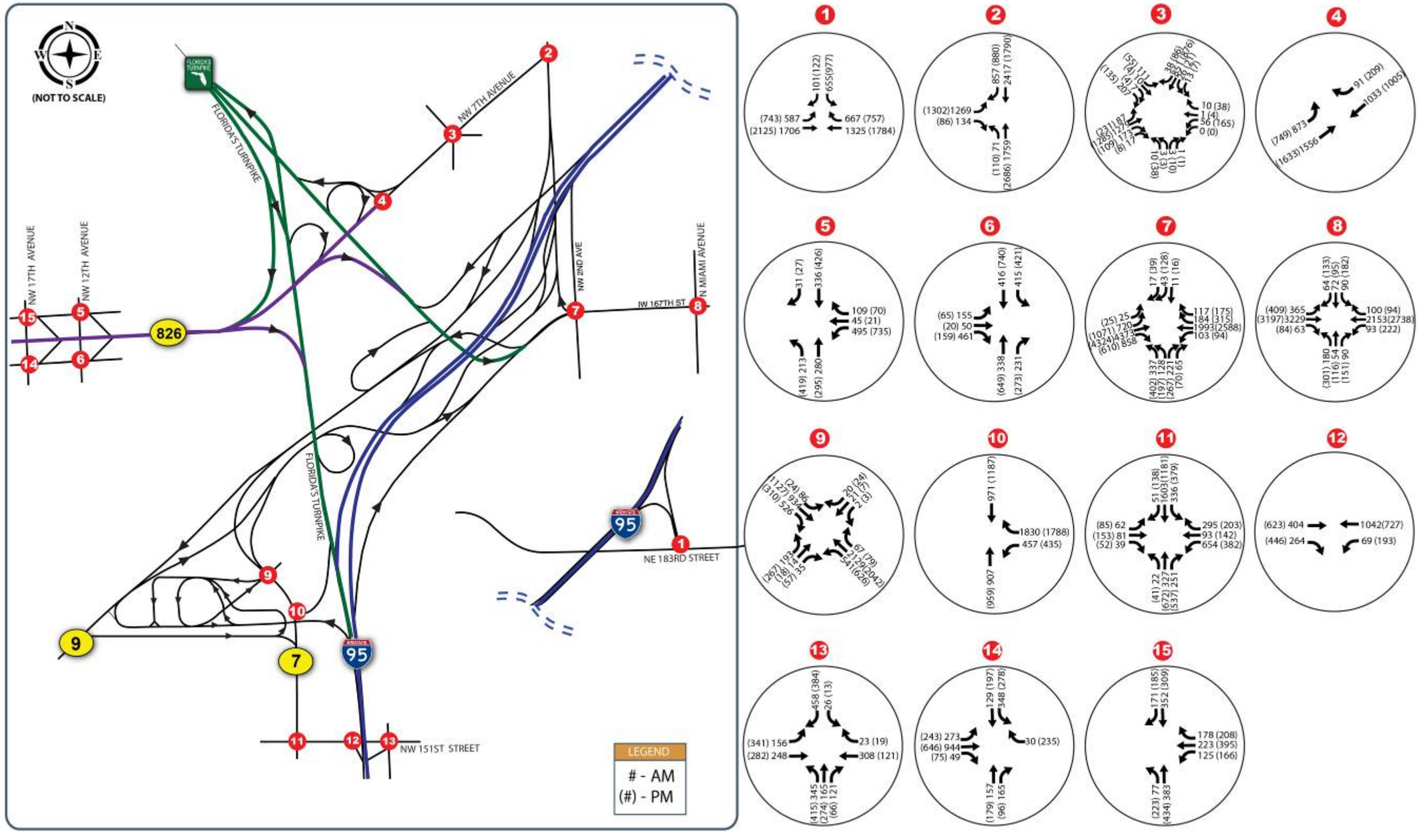


Figure 7-2 TMC Volumes – No Build 2030

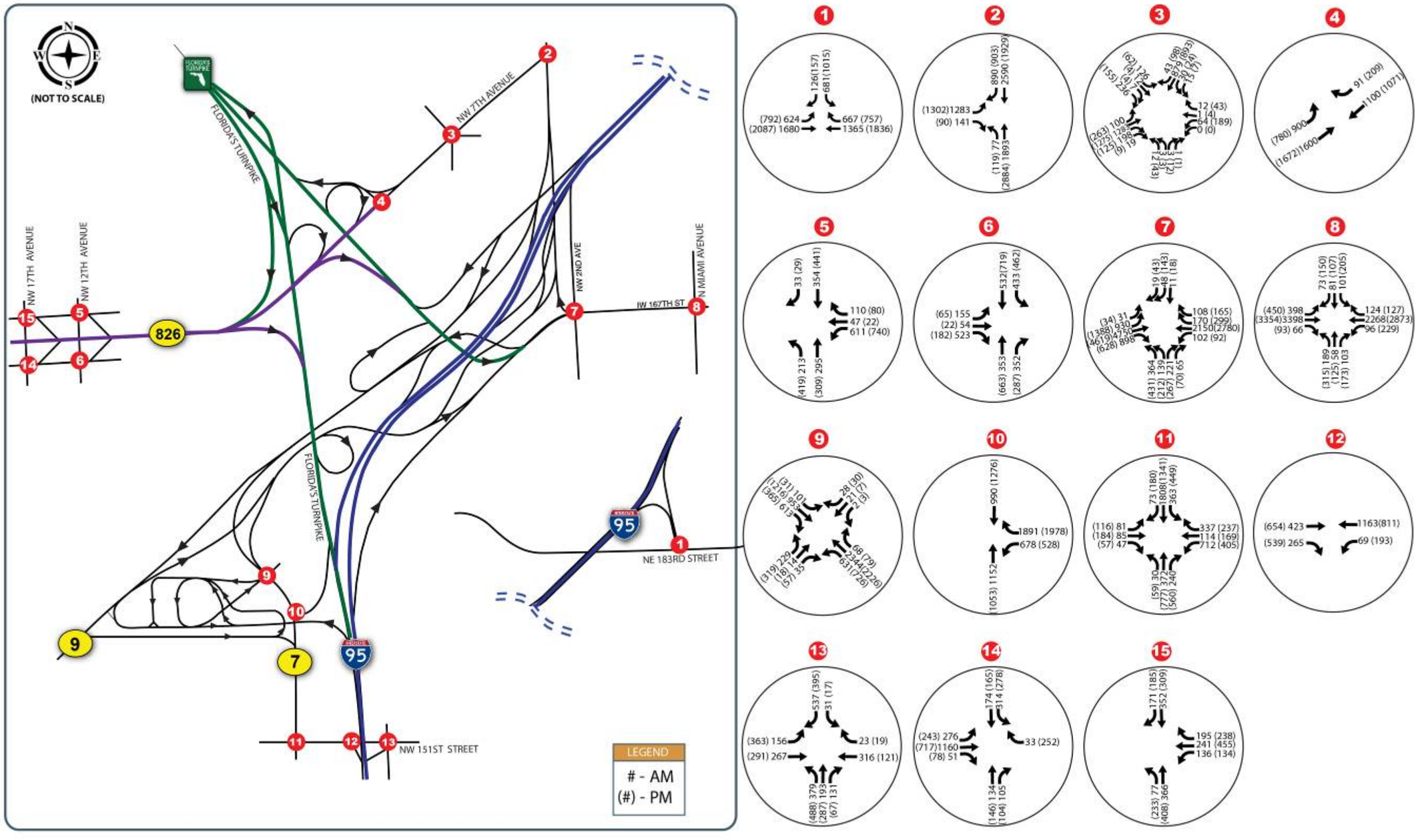
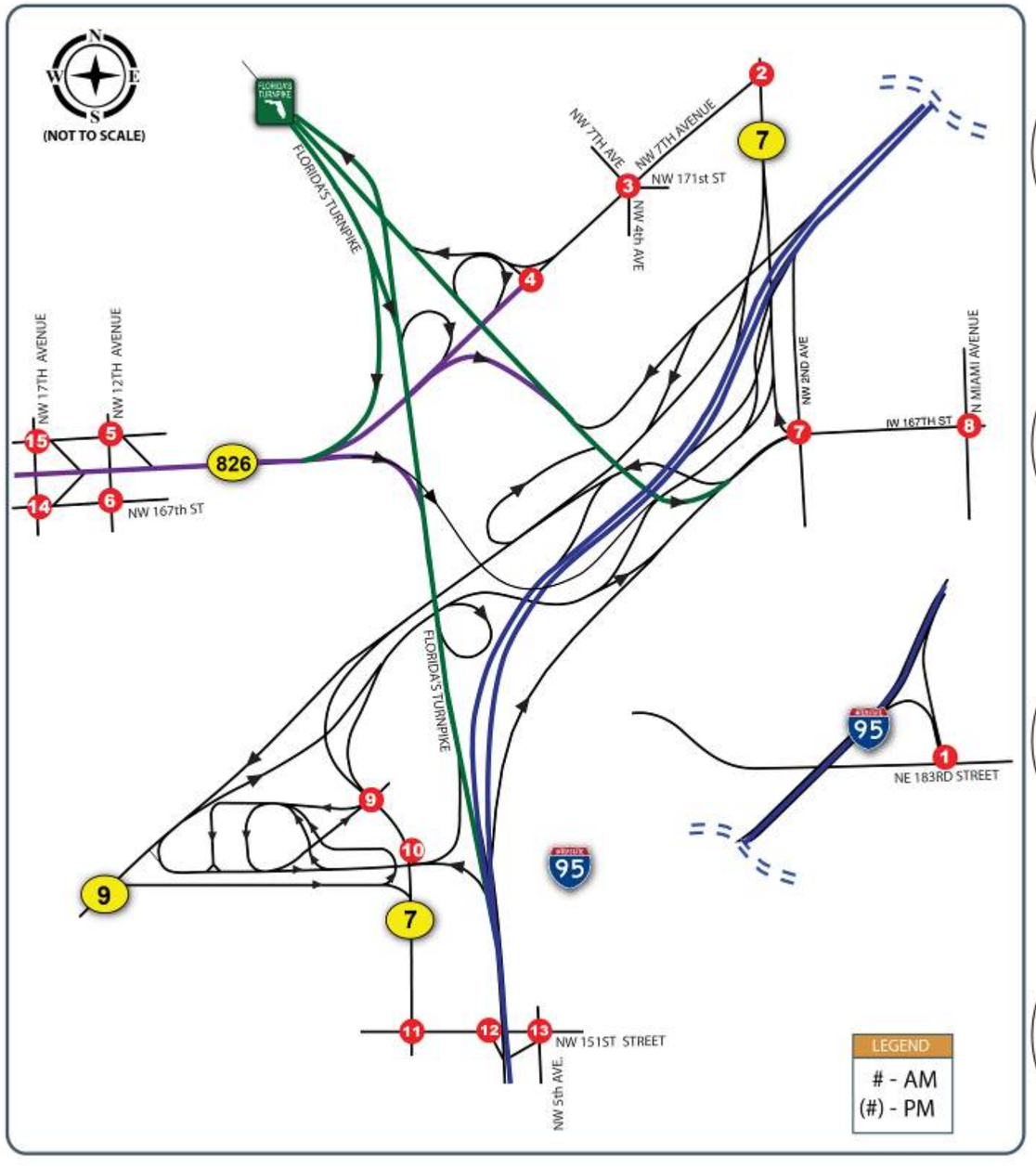


Figure 7-3 TMC Volumes – No Build 2040



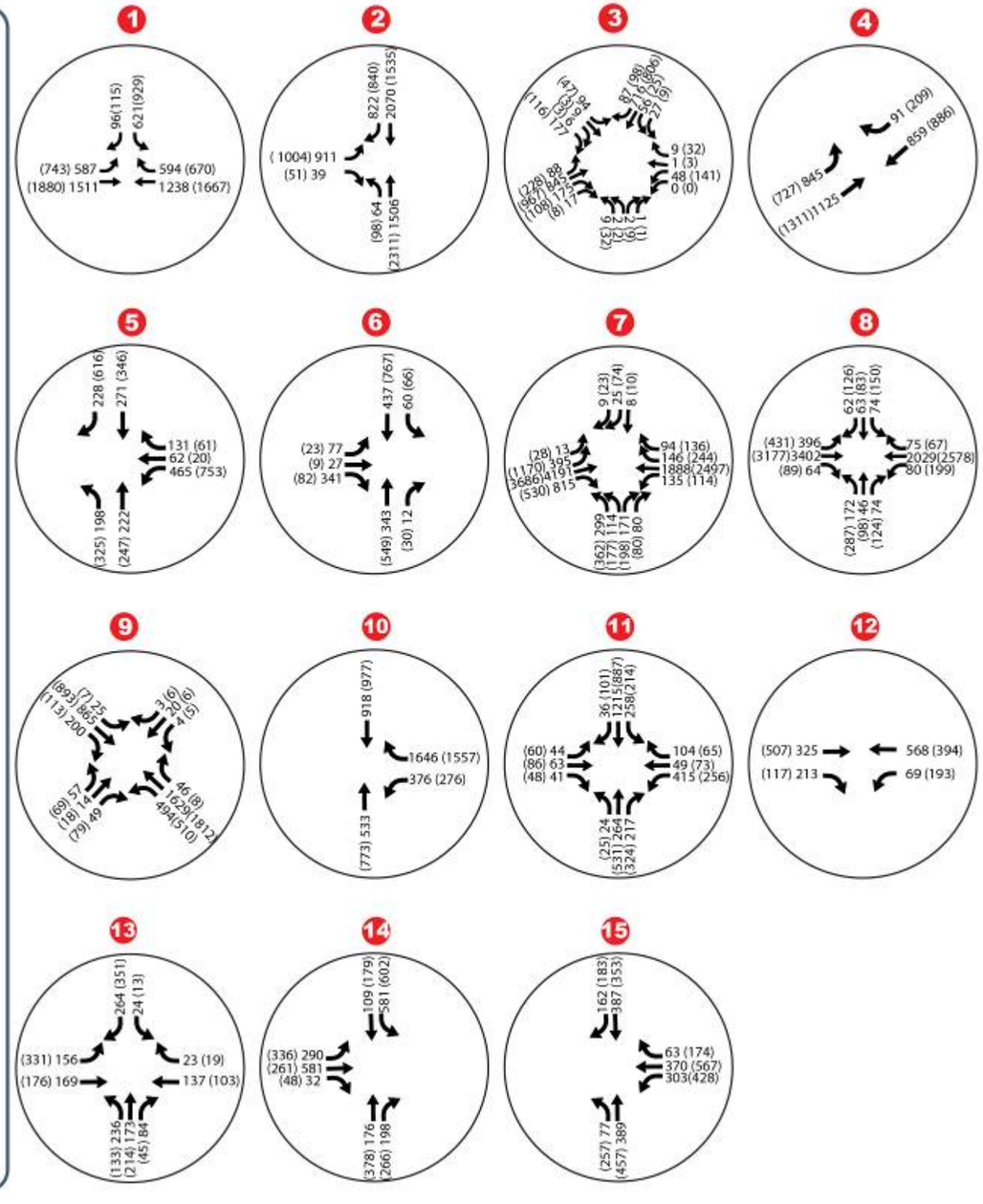


Figure 7-4 TMC Volumes – Build 3A 2018

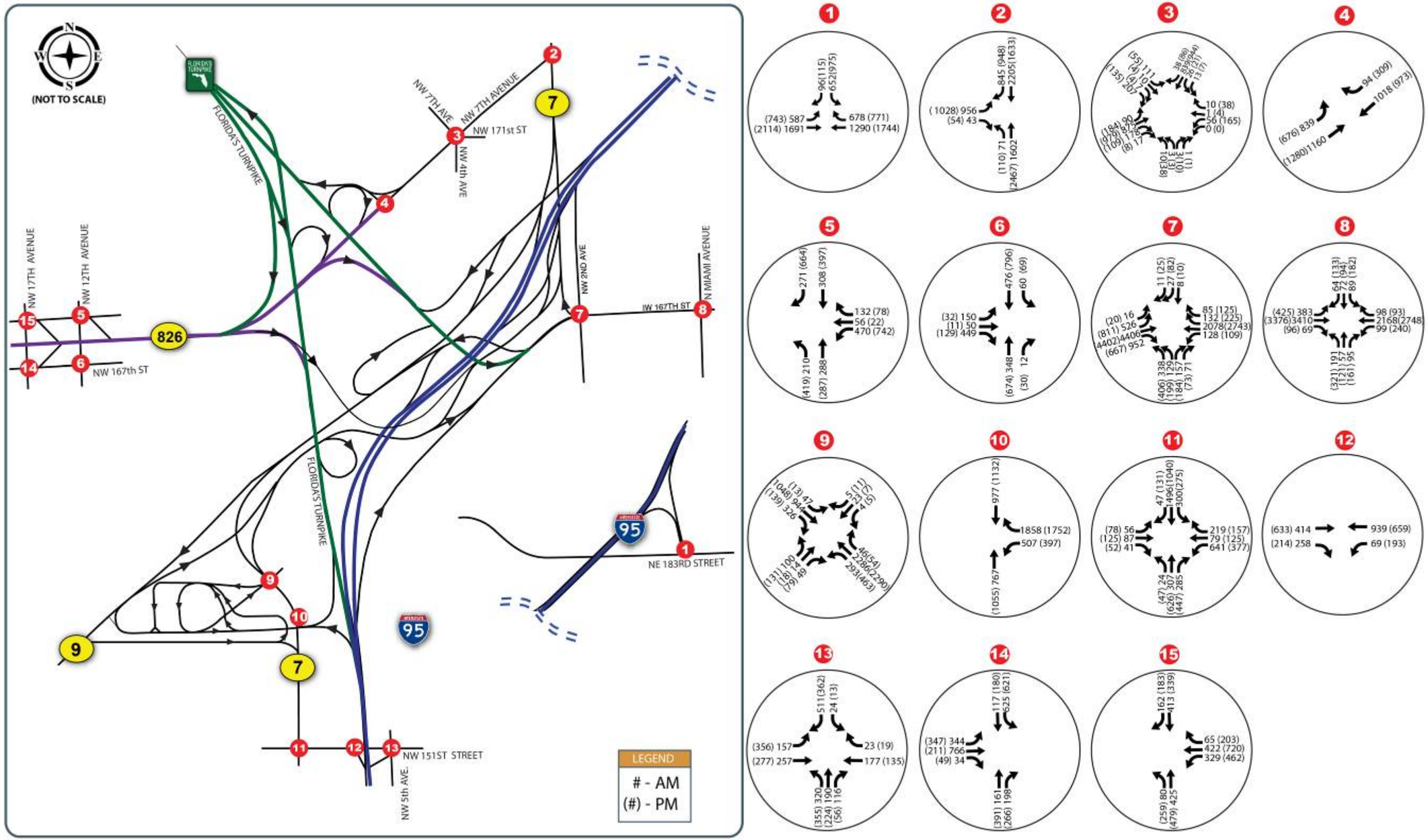


Figure 7-5 TMC Volumes – Build 3A 2030

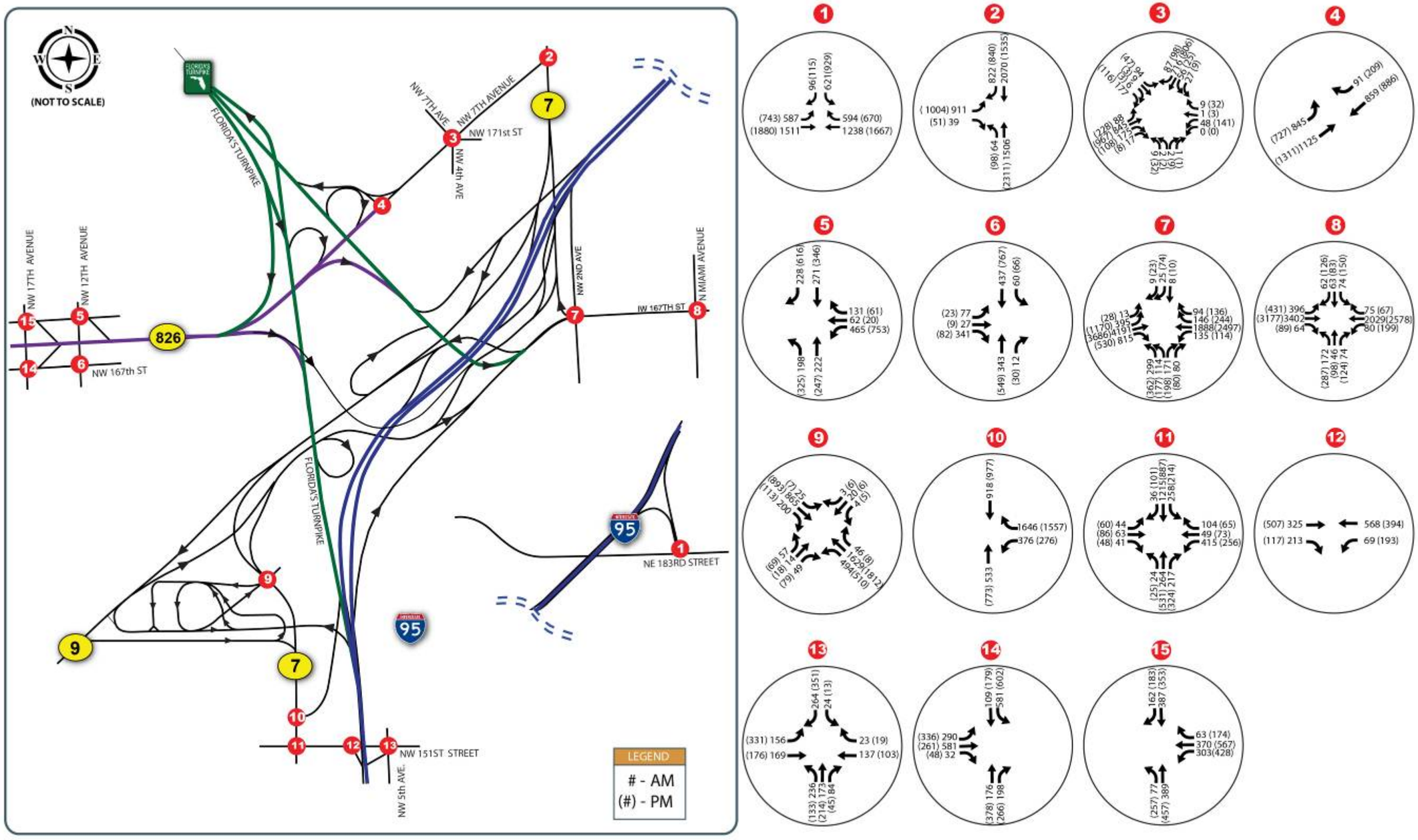


Figure 7-6 TMC Volumes – Build 3B 2018

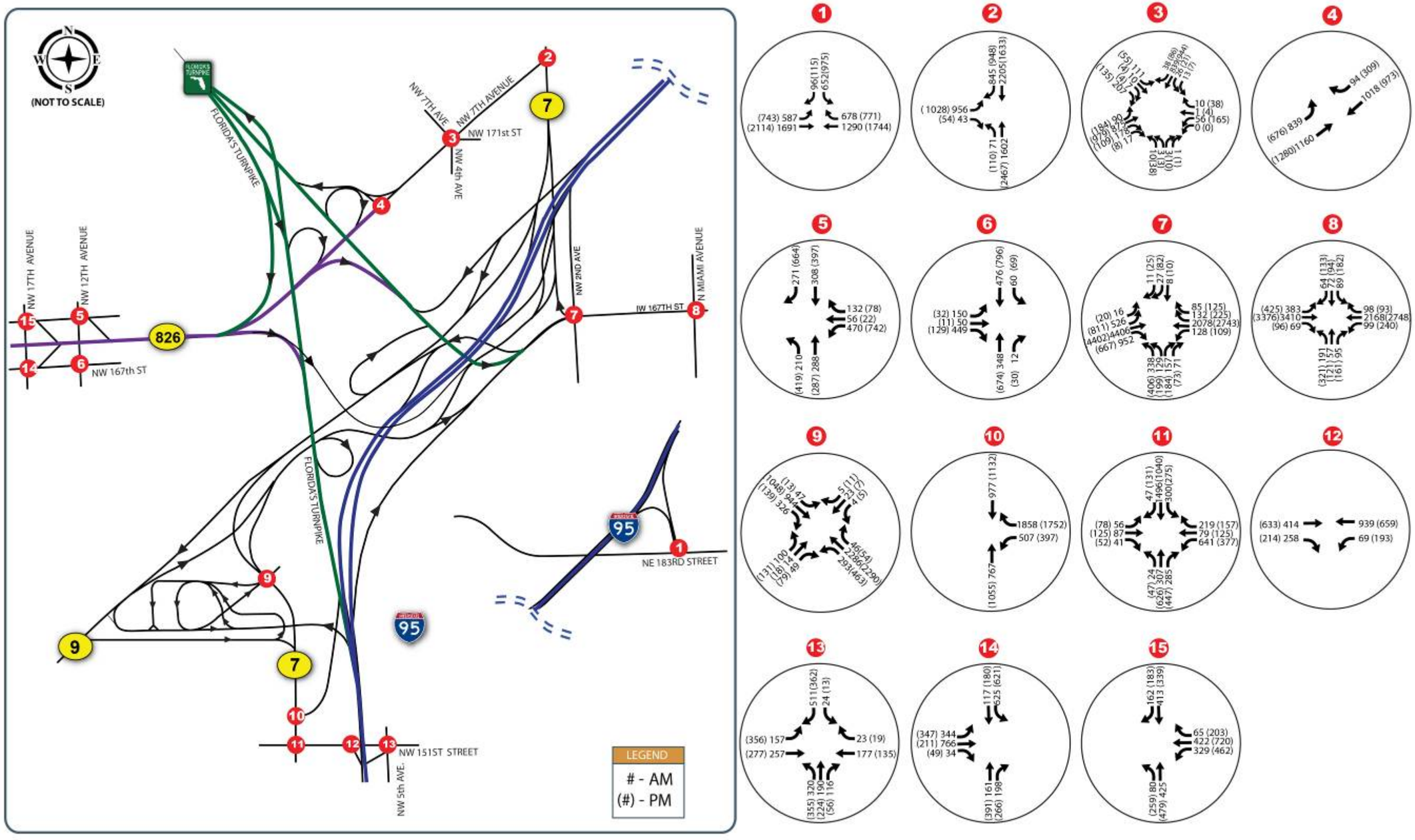
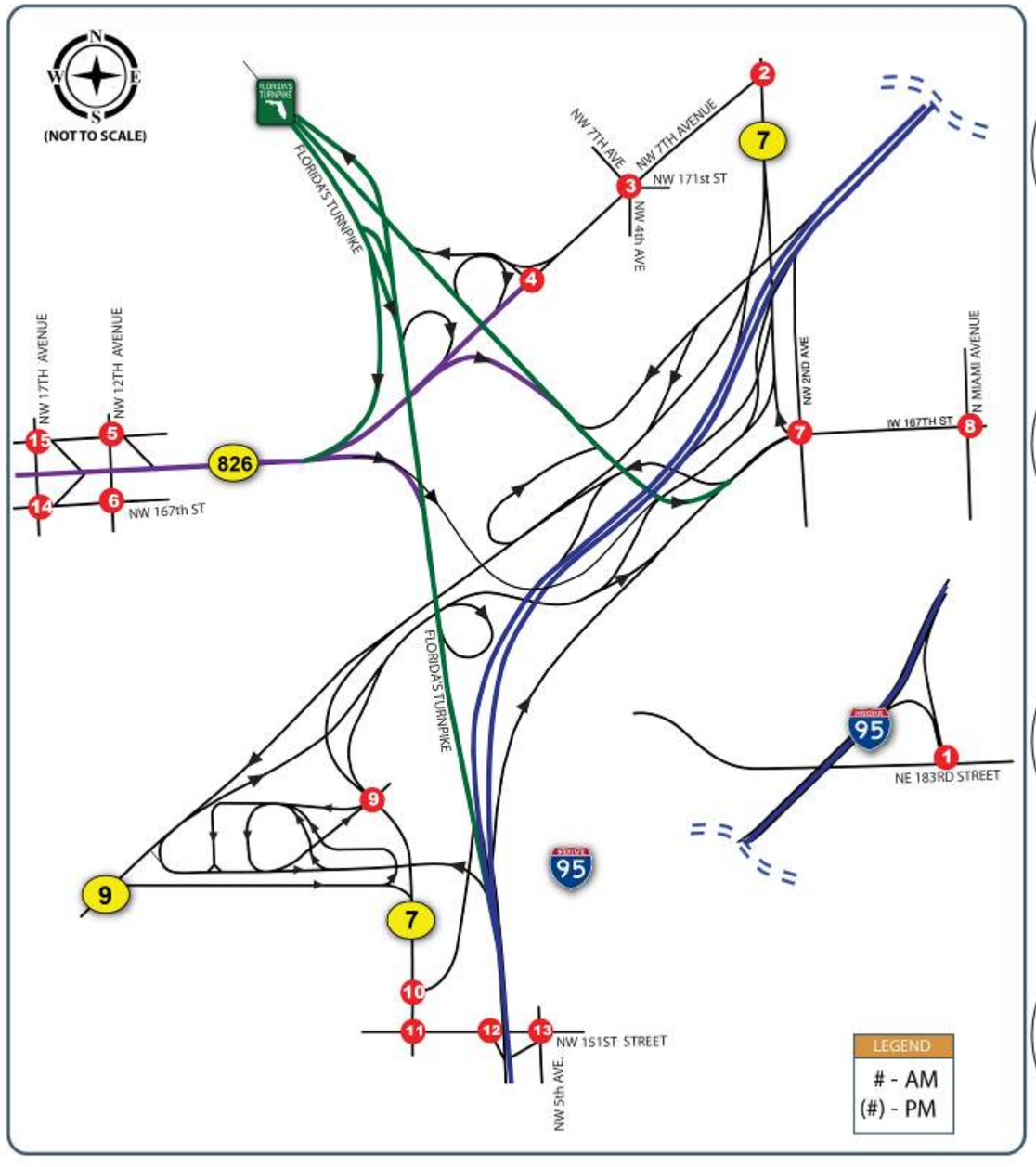


Figure 7-7 TMC Volumes – Build 3B 2030



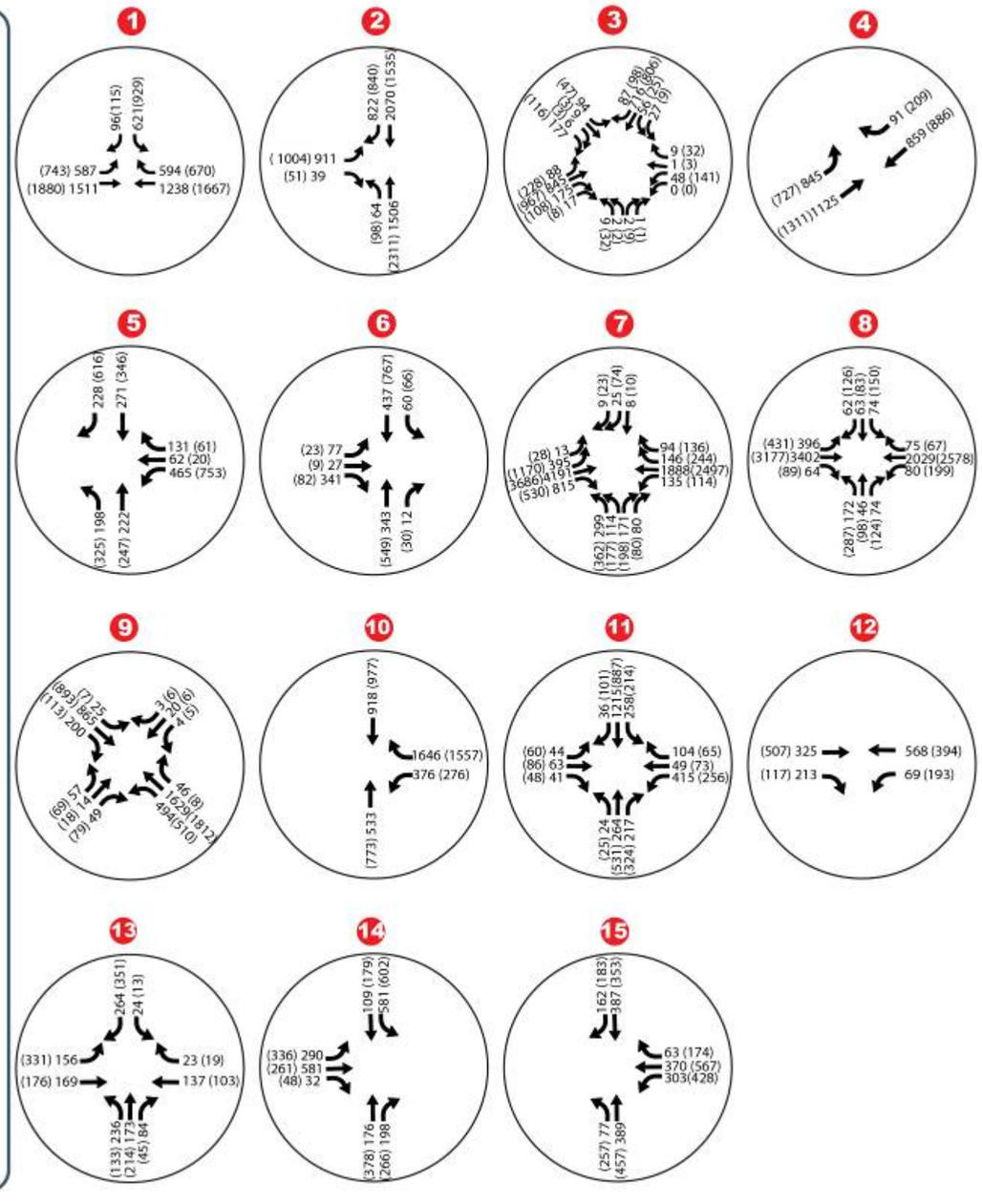


Figure 7-8 TMC Volumes – Build 3C 2018

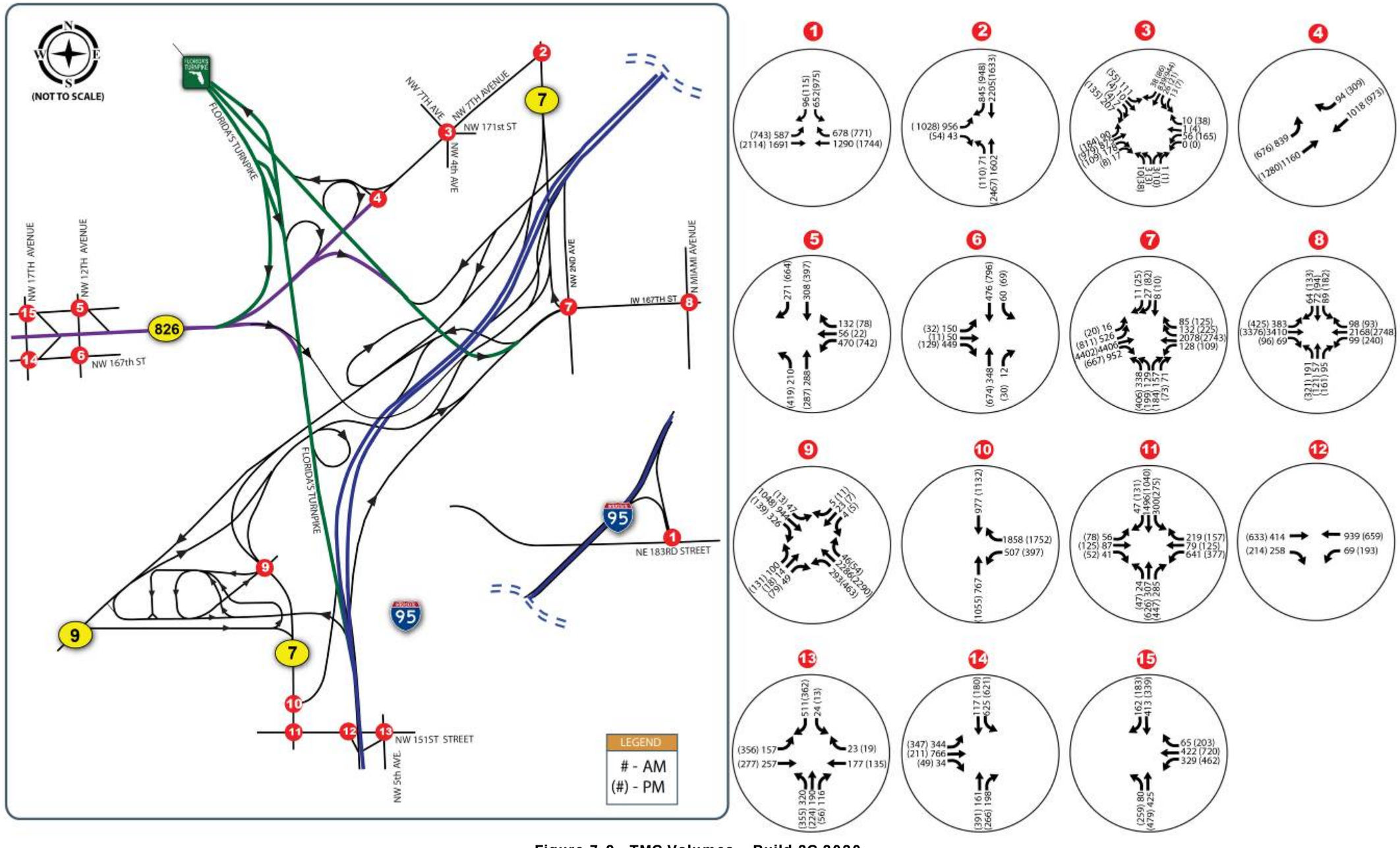
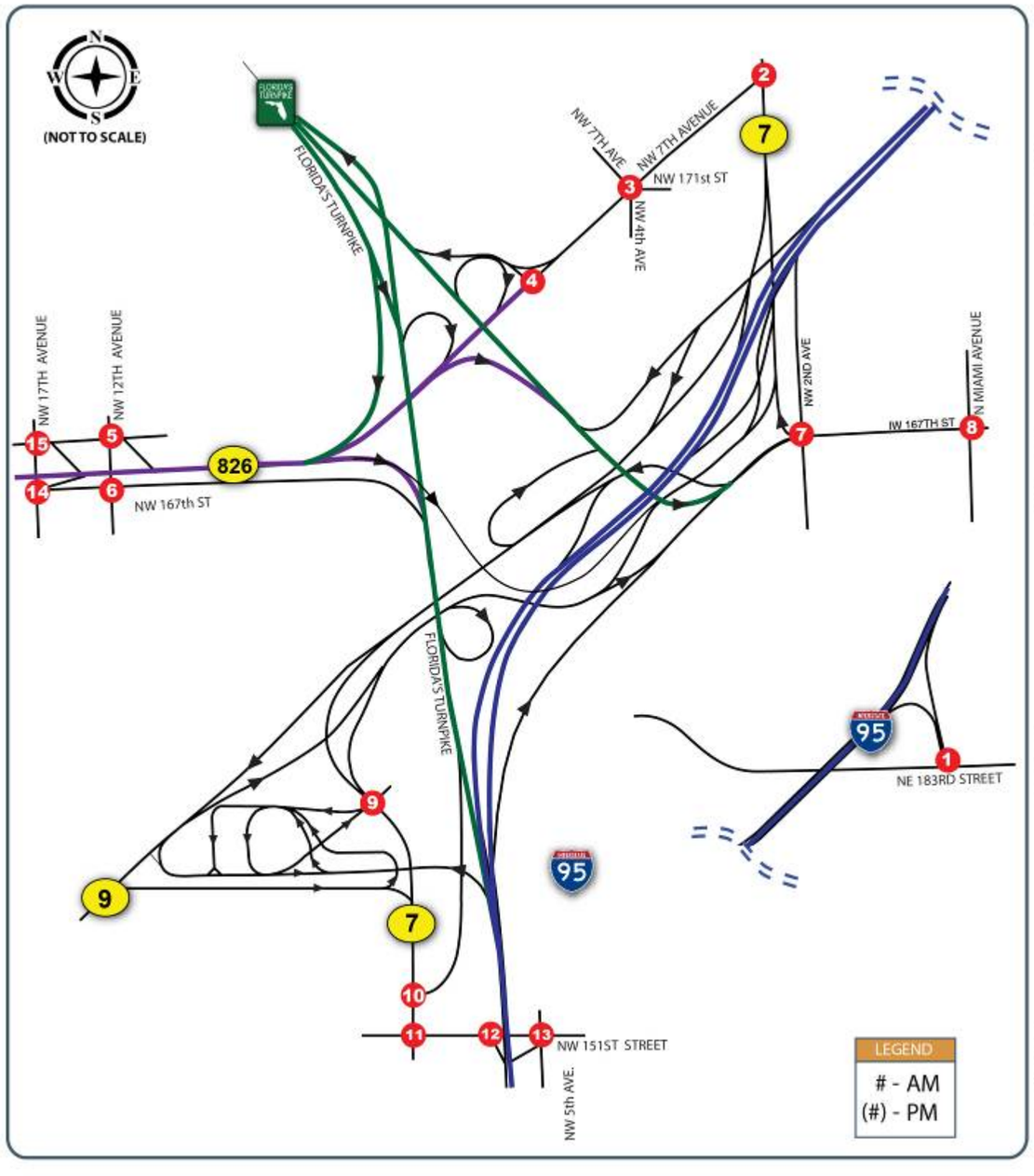


Figure 7-9 TMC Volumes – Build 3C 2030



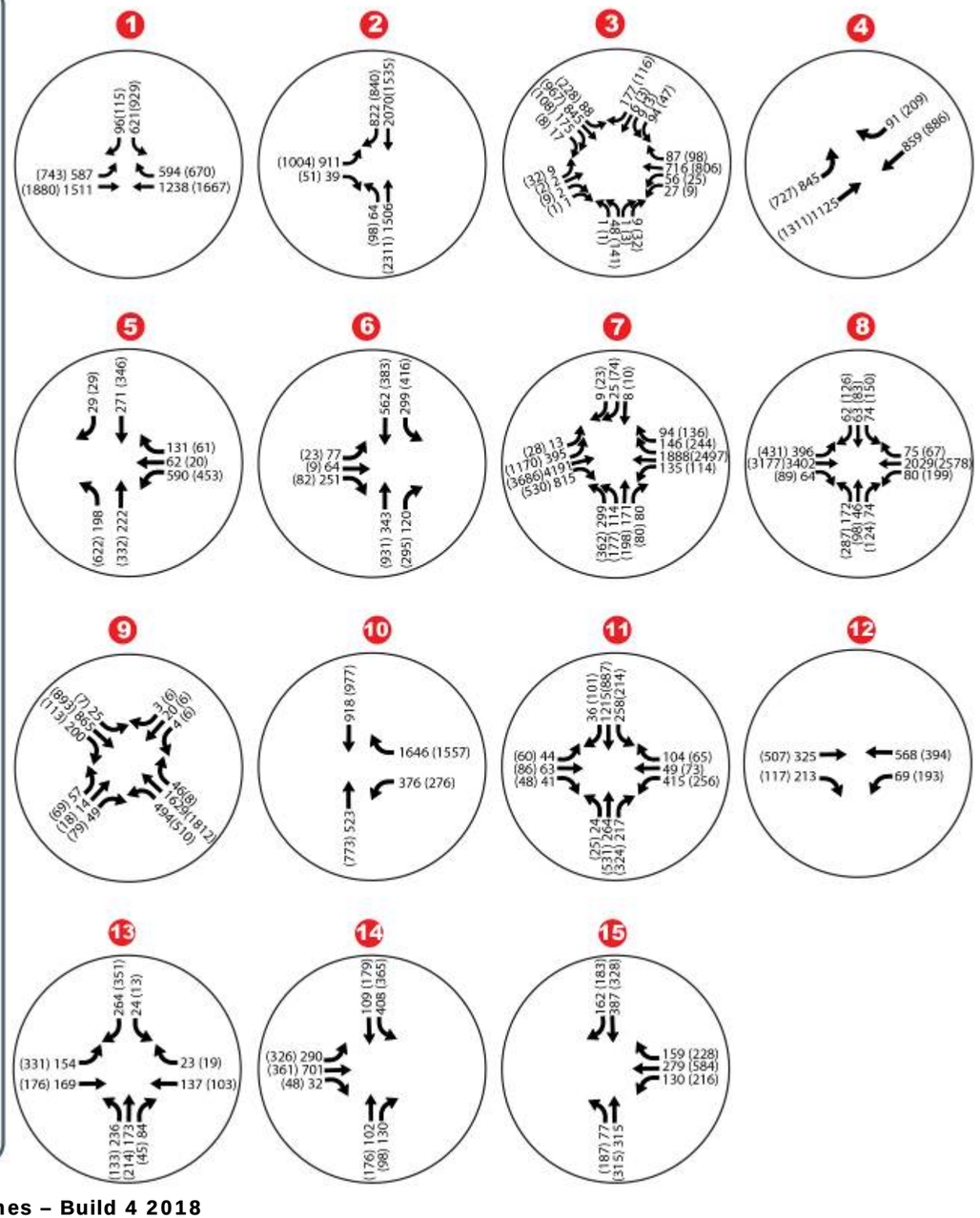
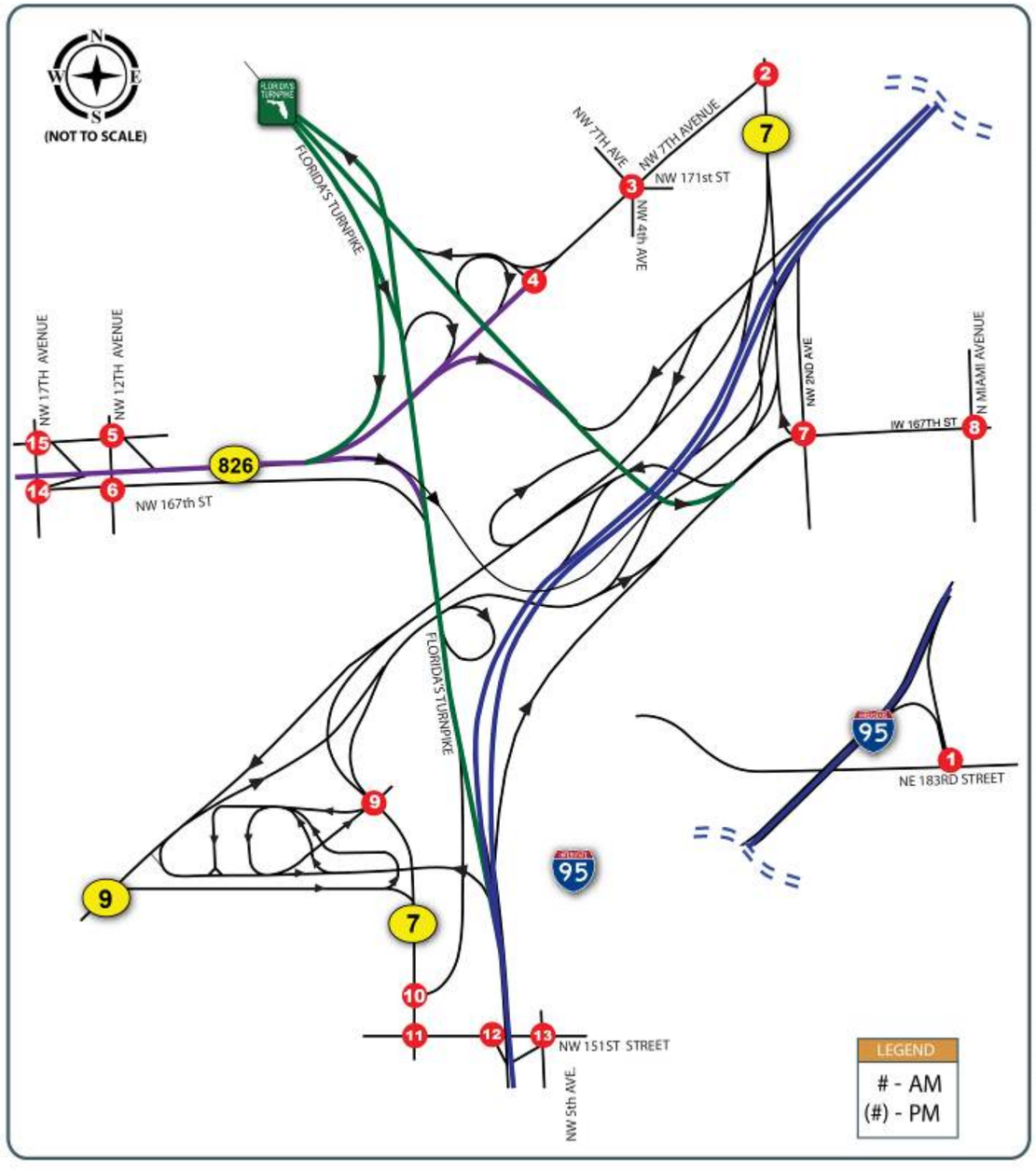


Figure 7-10 TMC Volumes – Build 4 2018



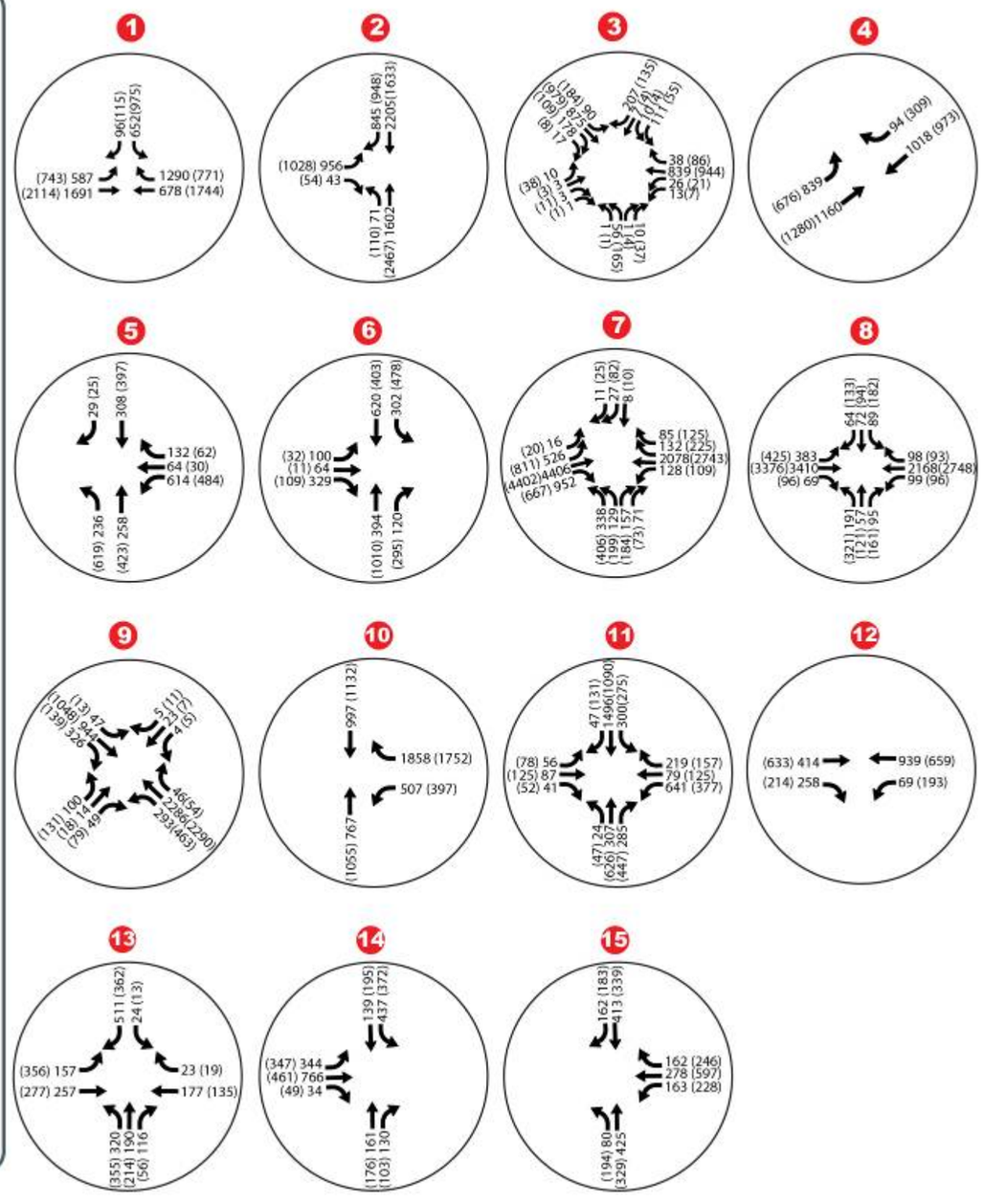


Figure 7-11 TMC Volumes – Build 4 2030

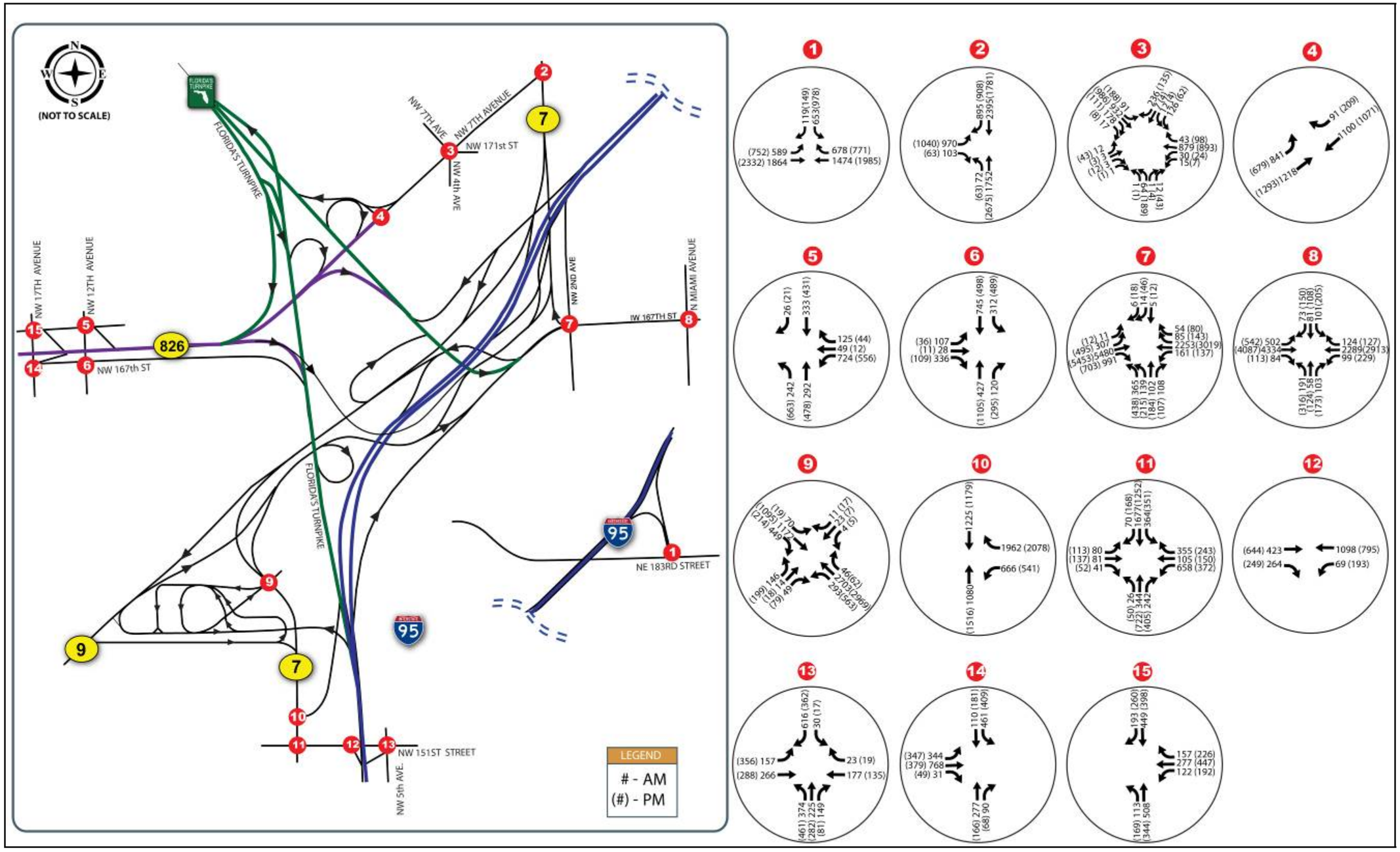


Figure 7-12 TMC Volumes – Ultimate Build 2040

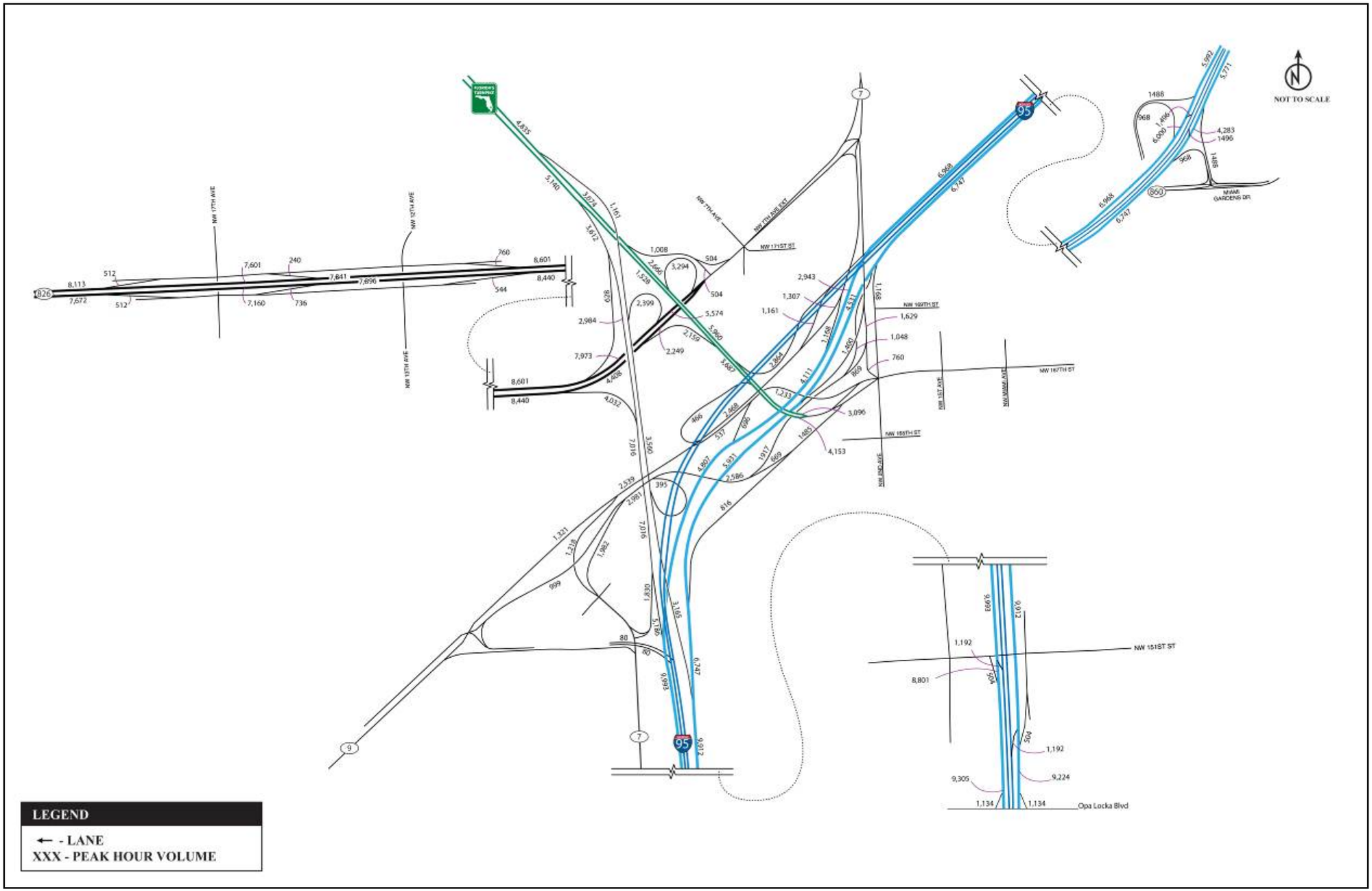


Figure 7-13 Peak Hour Volumes – No Build 2018

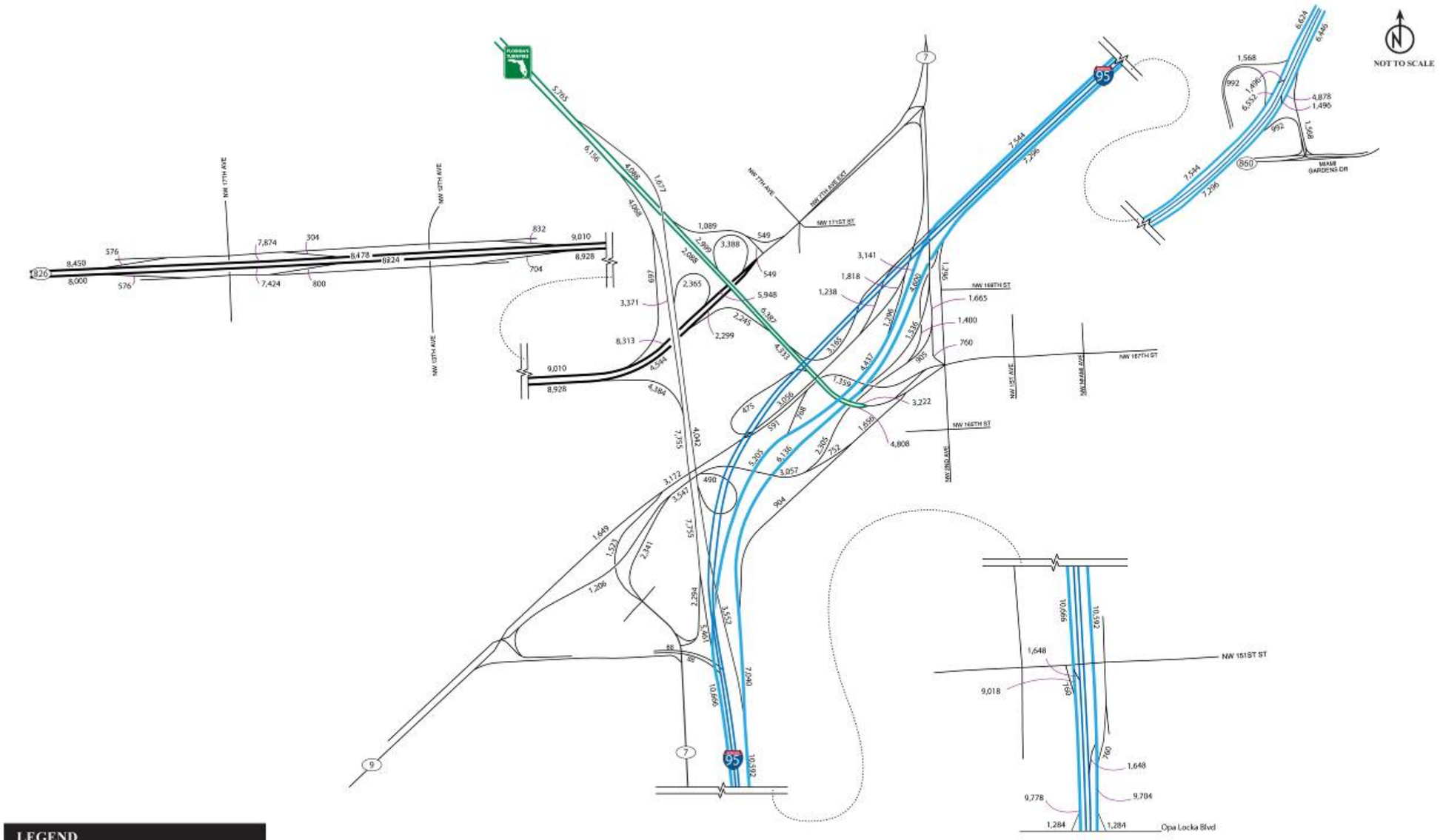


Figure 7-14 Peak Hour Volumes – No Build 2030

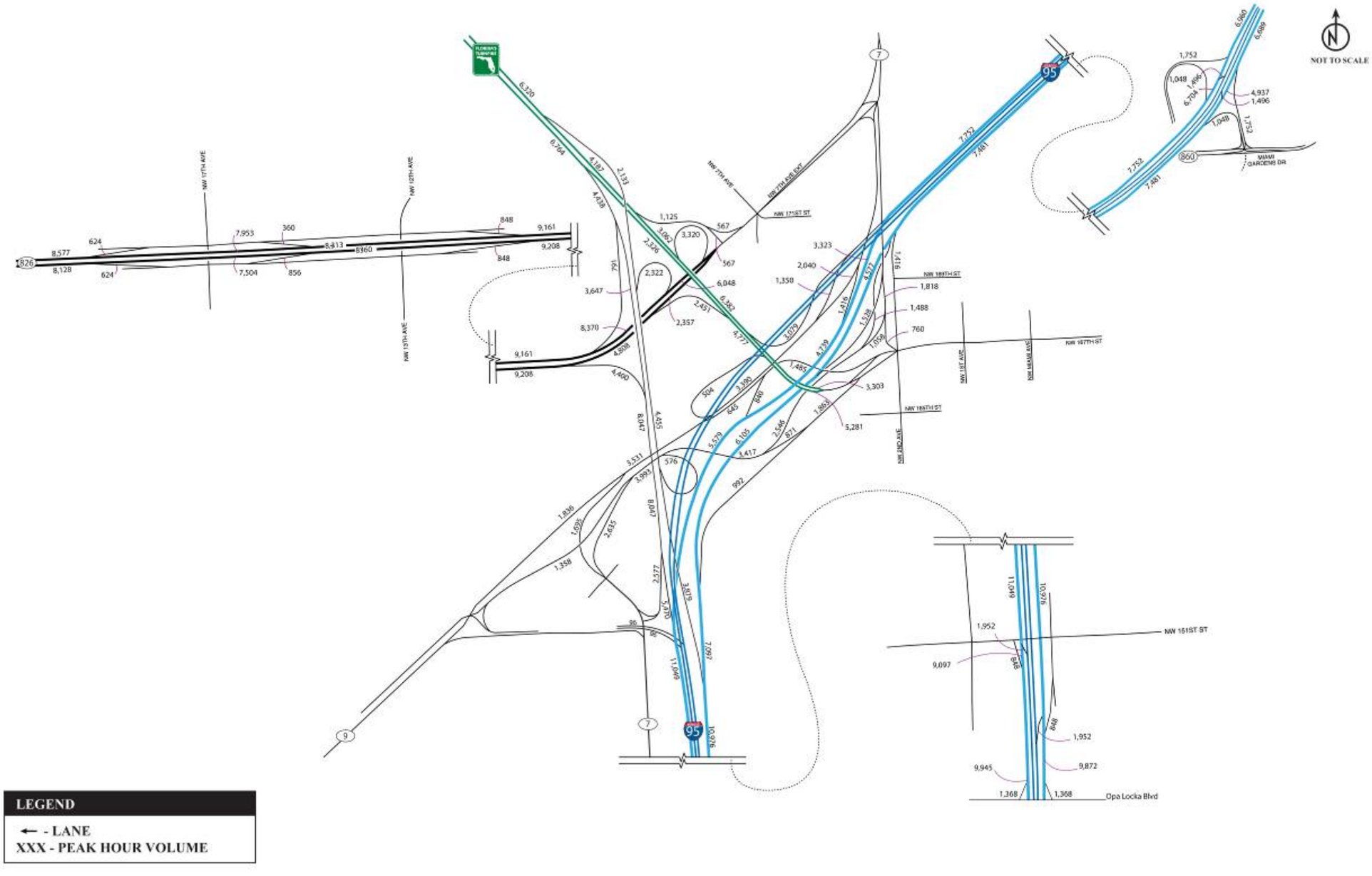


Figure 7-15 Peak Hour Volumes – No Build 2040

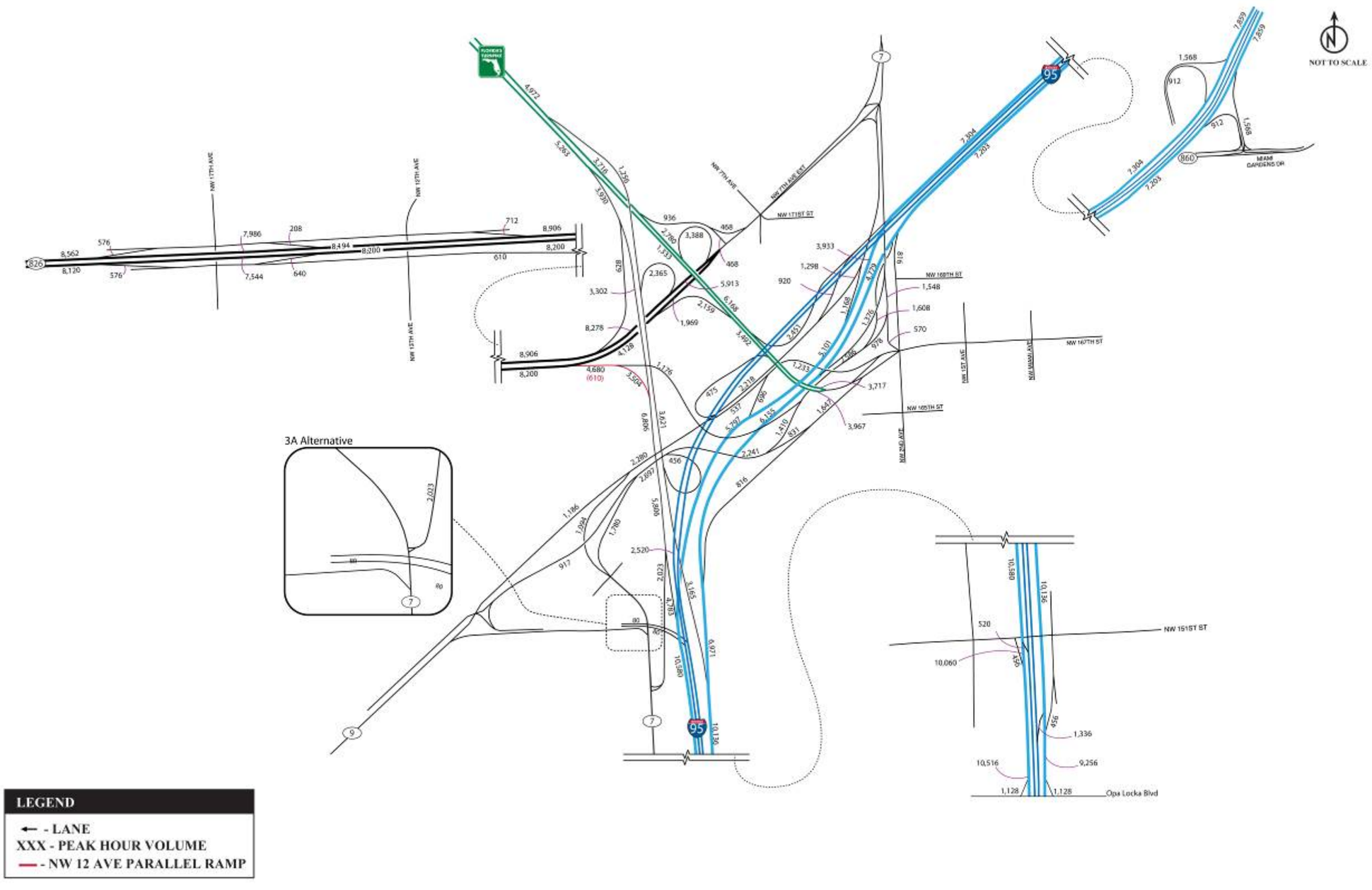


Figure 7-16 Peak Hour Volumes –Build 3A, 3B, & 4 2018

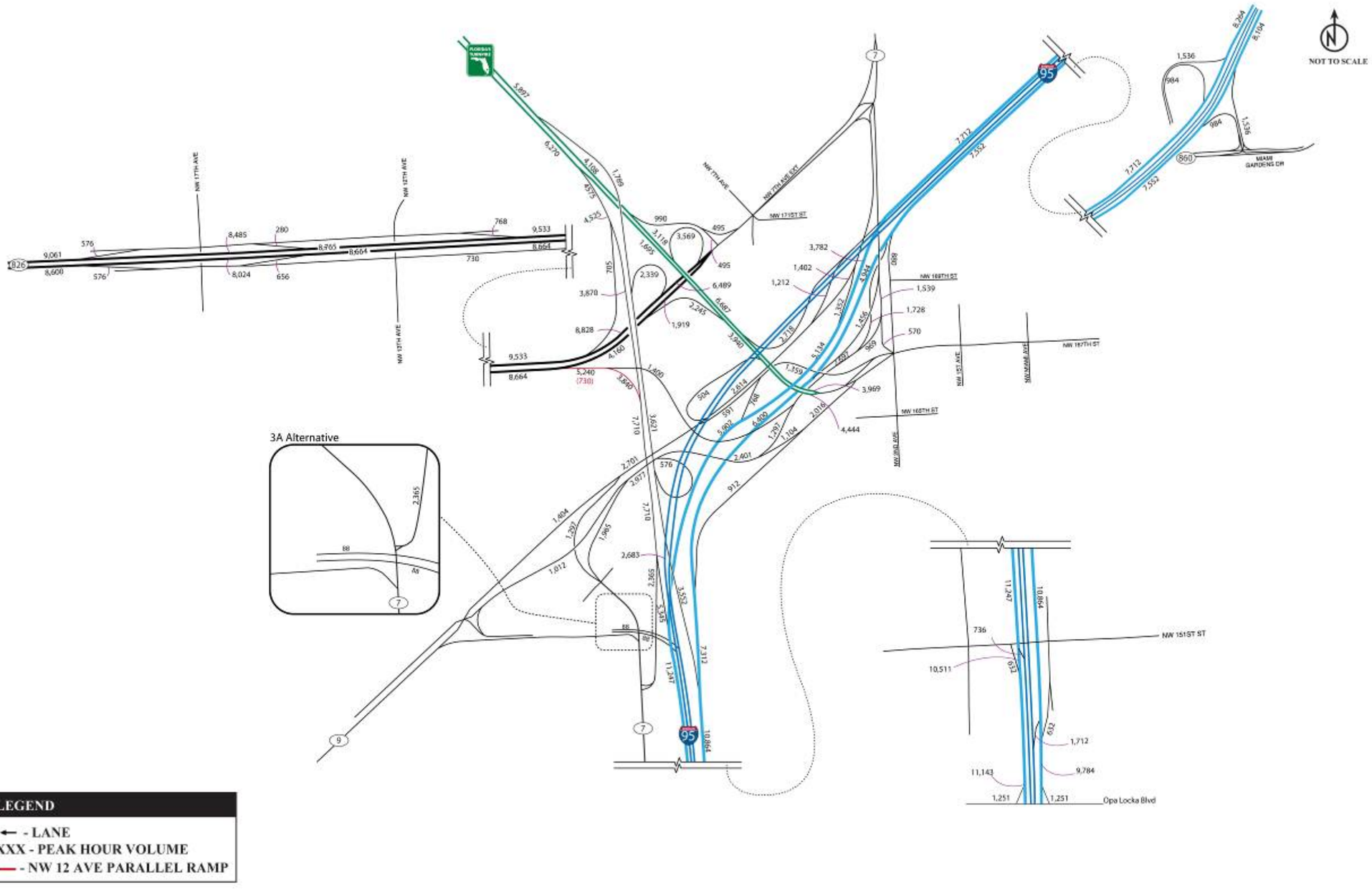


Figure 7-17 Peak Hour Volumes – Build 3A, 3B, & 4 2030

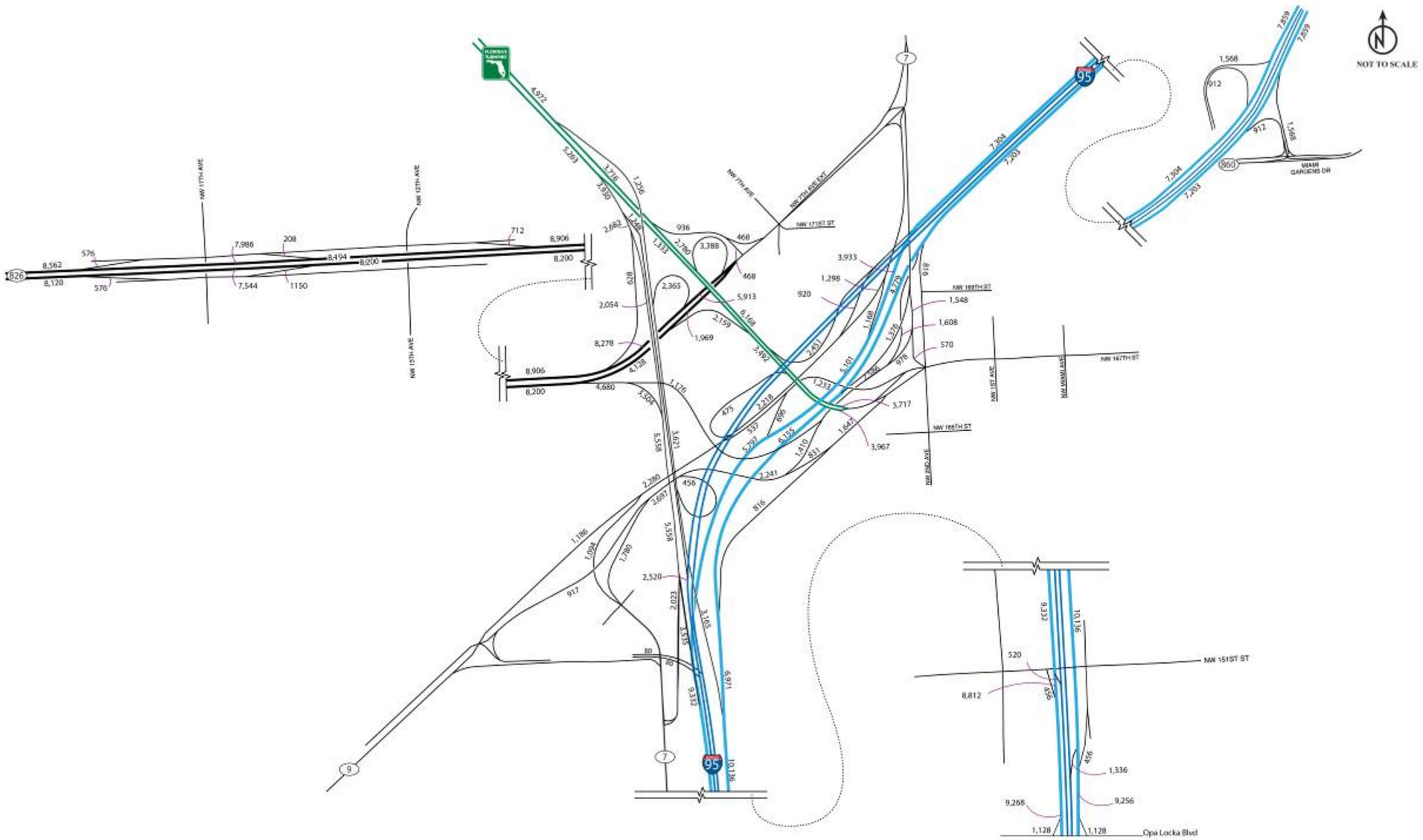


Figure 7-18 Peak Hour Volumes –Build 3C 2018

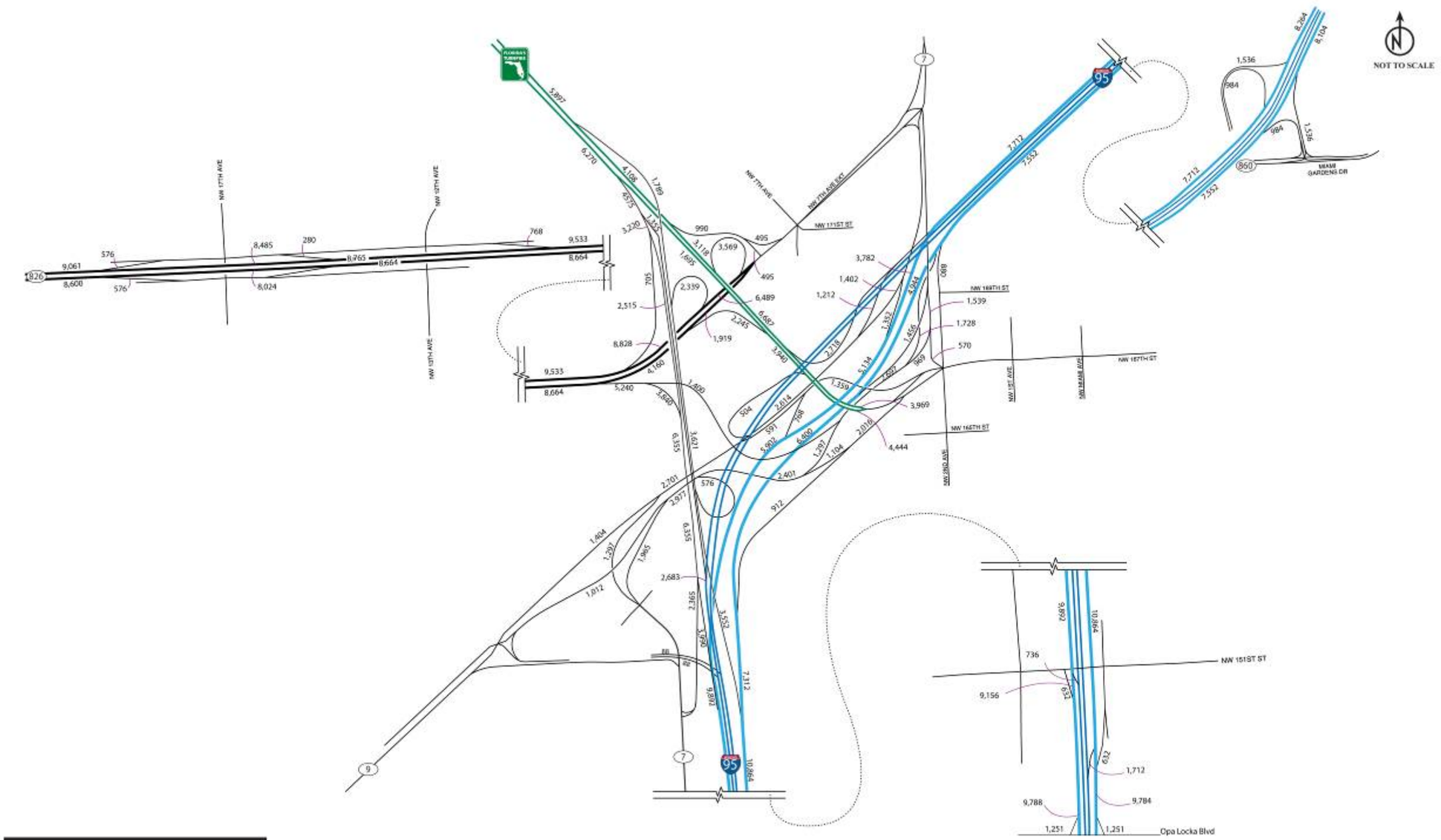


Figure 7-19 Peak Hour Volumes –Build 3C 2030

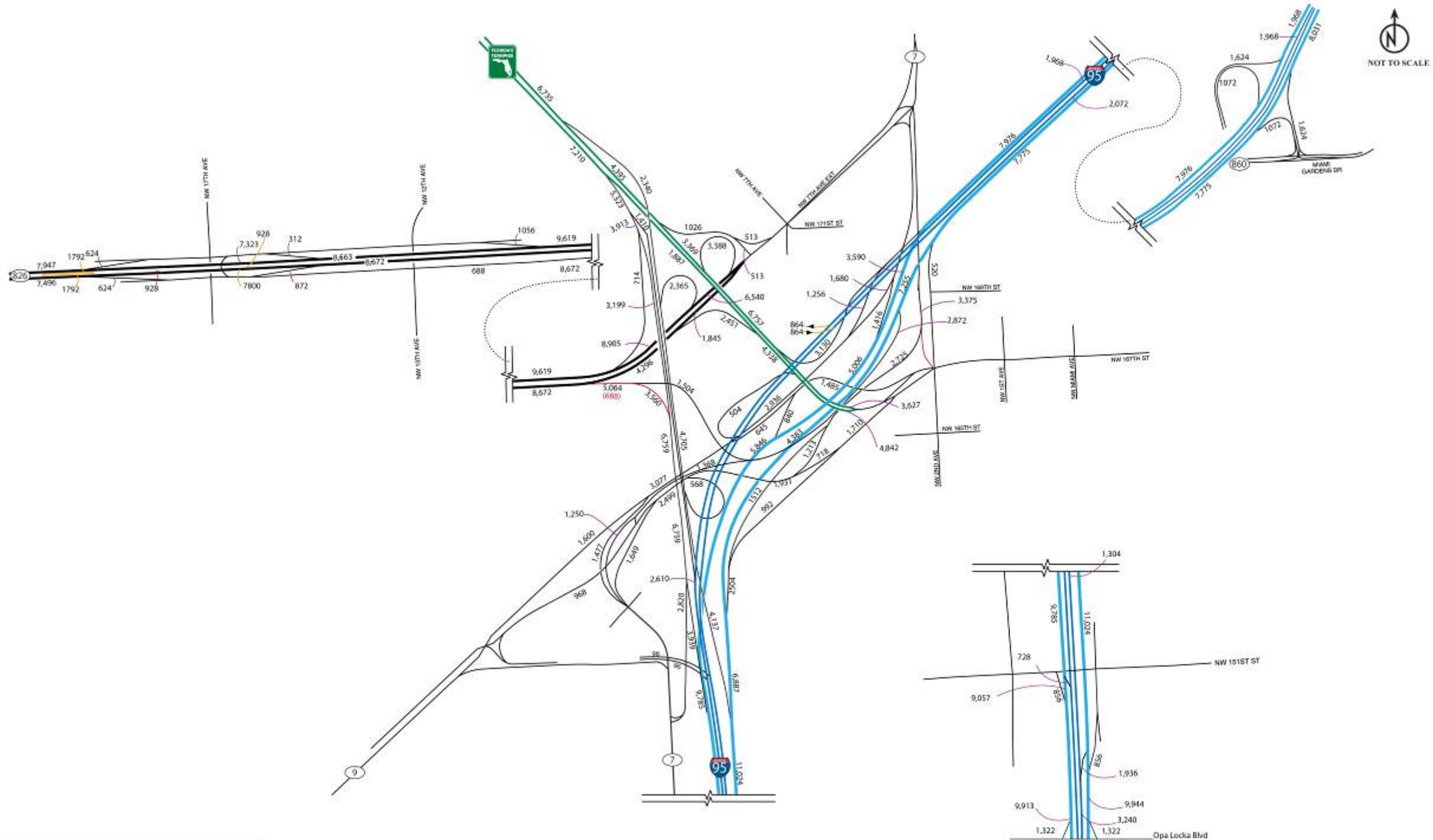


Figure 7-20 Peak Hour Volumes –Ultimate Build 2040

8. ALTERNATIVE ANALYSIS

8.1 Conformance with Transportation Plans

The SR 826/Palmetto Expressway eastbound to I-95 northbound ramp connection is identified in the Miami-Dade County Metropolitan Planning Organization (MPO) 2035 LRTP Cost Feasible Plan (CFP) with funding for the planning, design and construction phases. It is also identified in the Miami-Dade County approved 2014 Transportation Improvement Program (TIP) (FPID: 428358-1) with funding for the design phase in 2014 and the construction phase in 2017. The proposed improvement along the Turnpike Connector to I-95 southbound is also identified in the Miami-Dade County MPO 2035 LRTP CFP Amendment, the Miami-Dade County approved 2014 TIP (FPID: 423373-2) with funding for the design phase in 2015 and the construction phase in 2017. The right of way phase is partially funded for 2015 and 2016.

The project is consistent with the Miami-Dade County Comprehensive Development Master plan (CDMP) as amended and the 2009 update of the MPO-approved Congestion Management System, which is federally required as an integral part of the metropolitan planning process in Transportation Management Areas. Additionally, the project is included in the FDOT 2035 SIS CFP, as well as the approved 2014 State Transportation Improvement Program (STIP) with funding for the design and construction phases. FDOT will coordinate with Miami-Dade County during the next update of the LRTP to include the Turnpike Connector improvements.

8.2 Compliance with Policies and Engineering Standards

The proposed project alternatives were developed based on the current FDOT design standards and the American Association of State Highway Transportation Officials (AASHTO) A Policy on Geometric Design of Highways and Streets. As part of this project, several variations and exceptions are necessary to implement the proposed improvements under each alternative and would result in reducing right of way needs as well as potential cost savings without compromising safety. These include:

Design Variations

1. Cross Slope
2. Median Width
3. Vertical Alignment
4. Horizontal Alignment
5. Stopping Sight Distance
6. Vertical Clearance

Design Exceptions

1. Lane Width
2. Shoulder Width
3. Stopping Sight Distance
4. Superelevation
5. Vertical Alignment

Correction of these deficiencies to comply with the FDOT PPM and AASHTO criteria will entail significant reconstruction along I-95 and SR 826/Palmetto Expressway as well as most of the bridge structures along these roadway facilities. This will result in a significant budget increase with no documented safety benefits. The proposed designs will allow the

preservation of most of the existing pavement and the construction of the proposed features within the available project budget. Furthermore, the proposed Ultimate Master Plan for the GGI currently under development includes the reconstruction of the I-95 southbound and SR 826/Palmetto Expressway to accommodate express lanes connections. This will include upgrading several design elements to meet the current design standards. The documentation for these design variations and exceptions have been prepared and submitted to the Department for Approval.

8.3 Coordination

A Public Involvement Program (PIP) was developed for this project to obtain comments and input from the public, government officials, and affected parties and agencies. The major elements of this program to date consist of the Advanced Notification (AN); the Efficient Transportation Decision Making (ETDM) process; presentations to the MPO and subcommittees; coordination with local, county and other state agencies; meetings with area commissioners; a Public Kick-Off Meeting; and two Public Alternatives Workshops. The PIP includes a listing of the outreach activities that were performed during the PD&E Study. Some of the key elected officials, stakeholders, residential and business groups as well as MPO committees that have been involved in the public outreach include:

Elected Officials

- North Miami Beach Mayor George Vallejo
- Miami Gardens former Mayor Shirley Gibson
- Miami Gardens new Mayor Oliver G. Gilbert III
- Miami-Dade County Commissioner Jean Monestine
- Miami-Dade County Commissioner Barbara Jordan
- State Senator Oscar Braynon
- State Representative Cynthia Stafford
- State Representative Barbara Watson
- State Representative Daphne Campbell
- State Representative Sharon Pritchett
- Miami Gardens Vice Mayor Lisa Davis
- Miami Gardens Councilman Rodney Harris

Business and Residential Groups

- Sunshine State Industrial Park
- AutoNation (Mercedes Benz)
- Scott Lakes Crime Prevention Community Group
- Norwood Crime Prevention Community Group
- Andover Home Owners Association
- Jackson North Memorial Hospital
- Biscayne Gardens Civic Association

- Unrepresented People's Positive Action Council (UP-PAC)
- Pentab Crime Prevention Community Group

MPO Committees

- Transportation Planning Council (TPC)
- Transportation Planning Technical Advisory Committee (TPTAC)
- Citizens Transportation Advisory Committee (CTAC)
- Freight Transportation Advisory Committee (FTAC)
- Bicycle Pedestrian Advisory Committee (BPAC)
- Transportation Aesthetics Review Committee (TARC)

The prime concern during these public involvement activities has been the potential impact due to the NW 12th Avenue on-ramp. Four preliminary interim build alternatives (1A, 1B, 2A and 2B) were evaluated during the initial phase of the PD&E study and presented at the initial Alternatives Public Workshop held on May 3, 2012. These initial interim build alternatives were based on the concept developed for this interchange under the planning phase of this project, which provided a two-lane off-ramp from SR 826 eastbound to I-95 northbound and southbound and maintained the NW 12th Avenue on-ramp. However, with the incorporation of express lanes along SR 826/Palmetto Expressway, the ultimate build alternative eliminated the NW 12th Avenue on-ramp and provided a Texas U-Turn at the NW 17th Avenue interchange due to the right of way constraints. A Public Hearing is scheduled for late summer, 2013 to present the recommended interim build alternative.

8.4 Operational Analysis

The operational analysis was performed using CORSIM 6.2 and SYNCHRO 8 for the AM and PM peak periods and for opening, interim and design years. Similar to existing conditions analysis, **CORSIM traffic simulations** were extended to four (4) hours in the AM and four (4) hours in the PM periods in order to better understand the formation, spread and duration of traffic congestion. For each design phase, the peak hour volumes estimated using K and D factors were converted into eight (8) separate hourly volumes consisting of four (4) AM peak hours (from 6:00 AM to 10:00 AM) and four (4) PM peak hours (from 3:00 PM to 7:00 PM) at all main entry approaches of GGI. The hourly volumes were calculated as percentages of the daily peak hour volume derived from existing counts. CORSIM measures of effectiveness (MOEs) will be representative of the average two-hour peak period.

The SYNCHRO analysis was performed for the balanced peak hour volumes obtained from the adjusted TMTOOL intersection volume sheets. Therefore, SYNCHRO MOEs are representative of the one-hour peak period. This is another reason why CORSIM and SYNCHRO intersection volumes and signal timings are not comparative. The HCS analysis for freeway sections and weave sections were performed consistent with HCM procedures and used the demand daily peak hour volumes. For the weaving segment analysis HCM

2010 procedures were applied. For all HCS analysis the Peak Hour Factor (PHF) of 0.95 was used for all uninterrupted flow.

The following sections present the analysis results for each Build and No Build alternative considered for the Opening, Interim and Design phases. The analysis results for each alternative are summarized in tables and figures for system-wide MOEs, intersections, main freeway, merge, diverge and weaving sections.

8.4.1 Intersection Level Analysis

The intersection operational analysis results for the 15 analyzed intersections for the No Build and Build Alternatives for opening, interim, and ultimate design builds are provided in this sub-section. For all future SYNCHRO analysis the PHF of 0.92 was used for interrupted flow conditions. **Tables 8-1** to **8-10** provide the intersection queuing for all alternatives. Due to the similarities between Alternative 3B and 3C, both the queue and delay/LOS tables will be combined for these alternatives. The delay and LOS results by approach and for each intersection are provided in **Tables 8-11** to **8-20**. For comparative purposes, **Figures 8-1** to **8-3** provide summaries for all alternatives for each of the 2018 opening year, 2030 interim year, and 2040 design year. The printed outputs from SYNCHRO are provided in **Appendix I**.

Table 8-1
No Build 2018 Queuing Analysis at Study Intersection

No	Intersection	Time	95 % Queue Length (ft) / Link Length (ft)											
			EB			WB			NB			SB		
			L	T	R	L	T	R	L	T	R	L	T	R
1	Miami Gardens Dr/I-95 NB Exit	AM	#261/425				#474/322	#239/230				#265/325		39/325
		PM	#545/425				#1096/322	#738/230				#631/325		51/325
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	AM	#655/200		m60/250				69/120	566/845			#1498/912	543
		PM	#579/200		m52/250				105/120	#1512/845			#868/912	428
3	NW 171 St/NW 7 Ave Ext	AM	74/275	846/330		m7/200	171/1555	m0/160		39/681		174	87/731	
		PM	158/275	725/330		m6/200	343/1555	m0/160		84/681		96	70/731	
4*	NW 7 Ave Ext/NB Ramps to Turnpike	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	AM				123	69/726		85	93/167			41/907	
		PM				#258	106/726		#227	101/167			65/907	
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	AM		61/879						68/757		#115	38/167	
		PM		43/879						204/757		m175	139/167	
7	NW 167 St/NW 2 Ave	AM	#518/200	#2568/309	621/260	m#259/230	349/327	m23	#977/260	232/541			#216/586	
		PM	#964/200	#2579/309	433/260	m#145/230	m#1487/327	m57	#1182/260	238/541			#465/586	
8	NW 167 St/N Miami Ave	AM	m342/250	m197/815		#181/275	980/1241		#308/150	216/1221		151/100	#261/1197	
		PM	m293/250	m19/815		#461/275	#1494/1241		#604/150	#433/1221		#267/100	#478/1197	
9	NW 7 Ave/GGI Park-N-Ride	AM	#128/100	#131/259	0/50	11	47/257	0/100	m338/200	m379/491	m0/250	33/150	#632/215	
		PM	#150/100	#149/259	0/50	11	21/257	0/100	m330/200	m420/491	m0/250	8/150	#590/215	
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	AM				122/604		#409/550		#1086/240			82/491	
		PM				86/604		#419/550		#857/240			m14/491	
11	NW 151 St/NW 7 Ave	AM	54/120	35/837		#204/220	m27/265	15	21/100	77/981		127/100	233/1900	
		PM	91/120	55/837		173/220	m57/265	m13	38/100	226/981		105/100	47/1900	
12*	NW 151 St/I-95 SB On Ramp	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	AM	94	93/240			114/617		181	129/584	26		69/348	
		PM	196	58/240			92/617		238	217/584	10		90/348	
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	AM	153	#768/658						105/89		m#332	m10/159	
		PM	151	#566/658						94/89	110/300	123	m11/159	
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	AM					#220/728		5	17/159			149/361	54/220
		PM					#313/728		38	57/159			136/361	58/220

*Unsignalized Intersections
Queue shown is maximum after two cycles

m=Volume for 95th percentile queue is metered by upstream signal
#=95th Percentile volume exceeds capacity, queue may be longer

Table 8-2
No Build 2030 Queuing Analysis at Study Intersection

No	Intersection	Time	95 % Queue Length (ft) / Link Length (ft)											
			EB			WB			NB			SB		
			L	T	R	L	T	R	L	T	R	L	T	R
1	Miami Gardens Dr/I-95 NB Exit	AM	#272/425				#517/322	#323/230				#295/325		39/325
		PM	#617/425				#1287/322	#996/230				#707/325		59/325
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	AM	#877/200		150/250				114/120	880/845			#2321/912	961
		PM	#719/200		m47/250				146/120	#2061/845			#1225/912	703
3	NW 171 St/NW 7 Ave Ext	AM	66/275	900/330		m10/200	219/1555	m0/160		55/681		249	105/731	
		PM	165/275	790/330		m9/200	427/1555	m1/160		108/681		119	79/731	
4*	NW 7 Ave Ext/NB Ramps to Turnpike	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	AM				142	77/726		m78	m103/167			43/907	
		PM				#286	114/726		#189	m110/167			73/907	
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	AM		87/879						75/757		#177	40/167	
		PM		44/879						#258/757		m#234	m144/167	
7	NW 167 St/NW 2 Ave	AM	#680/200	#2797/309	825/260	m#201/230	m#1130/327	m5	#1014/260	211/541			#221/586	
		PM	#1308/200	#3176/309	579/260	m#138/230	m#1592/327	m46	#1460/260	248/541			#547/586	
8	NW 167 St/N Miami Ave	AM	m296/250	m321/815		#202/275	1037/1241		#346/150	218/1221		161/100	#258/1197	
		PM	m303/250	m18/815		#526/275	#1833/1241		#689/150	#573/1221		#417/100	#561/1197	
9	NW 7 Ave/GGI Park-N-Ride	AM	#248/100	#255/259	0/50	12	54/257	0/100	m368/200	m446/491	m0/250	#134/150	#920/215	
		PM	#298/100	#303/259	0/50	13	24/257	0/100	m#381/200	m421/491	m0/250	14/150	#870/215	
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	AM				174/604		#1081/550		#1406/240			m34/491	
		PM				157/604		#891/550		#1250/240			m18/491	
11	NW 151 St/NW 7 Ave	AM	110/120	73/837		#714/220	m64/265	m38	#69/100	194/981		#363/100	580/1900	
		PM	125/120	113/837		m#378/220	m93/265	m16	71/100	363/981		m#430/100	156/1900	
12*	NW 151 St/I-95 SB On Ramp	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	AM	m218	m157/240			364/617		#480	207/584	52		#449/348	
		PM	m283	m161/240			122/617		#489	279/584	32		113/348	
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	AM	158	#1083/658				0		137/89		m#384	m12/159	
		PM	185	#803/658				0		137/89		m166	m14/159	
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	AM					#314/728		m10	37/159			1190/361	63/220
		PM					#434/728		70	93/159			184/361	69/220

*Unsignalized Intersections
Queue shown is maximum after two cycles

m=Volume for 95th percentile queue is metered by upstream signal
#=95th Percentile volume exceeds capacity, queue may be longer

Table 8-3
No Build 2040 Queuing Analysis at Study Intersection

No	Intersection	Time	95 % Queue Length (ft) / Link Length (ft)											
			EB			WB			NB			SB		
			L	T	R	L	T	R	L	T	R	L	T	R
1	Miami Gardens Dr/I-95 NB Exit	AM	#315/425				#601/322	#415/230				#333/325		46/325
		PM	#657/425				#1344/322	#1019/230				#759/325		75/325
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	AM	#903/200		m139/250				126/120	1023/845			#2566/912	1081
		PM	#808/200		m58/250				#192/120	#2535/845			#1504/912	915
3	NW 171 St/NW 7 Ave Ext	AM	81/275	1017/330		m12/200	281/1555	m0/160		59/681		274	140/731	
		PM	228/275	899/330		m12/200	559/1555	m8/160		133/681		142	87/731	
4*	NW 7 Ave Ext/NB Ramps to Turnpike	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	AM				186	101/726		m67	m91/167			61/907	
		PM				#304	146/726		193	38/167			109/907	
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	AM		#173/879						111/757		#250	95/167	
		PM		58/879						#315/757		352	71/167	
7	NW 167 St/NW 2 Ave	AM	#1100/200	#3291/309	#1002/260	m#187/230	m673/327	m0	#1177/260	221/541			#259/586	
		PM	#1725/200	#3454/309	601/260	m#121/230	m1553/327	m36	#1617/260	250/541			#610/586	
8	NW 167 St/N Miami Ave	AM	m324/250	m427/815		#212/275	#1298/1241		#405/150	#259/1221		#184/100	#342/1197	
		PM	m303/250	m36/815		#576/275	#2075/1241		#734/150	#659/1221		#470/100	#618/1197	
9	NW 7 Ave/GGI Park-N-Ride	AM	#336/100	#335/259	0/50	12	60/257	0/100	m488/200	m460/491	m0/250	#199/150	#1157/215	
		PM	#387/100	#385/259	0/50	13	27/257	0/100	m481/200	m432/491	m0/250	21/150	#1160/215	
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	AM				351/604		#1333/550		#1973/240			m30/491	
		PM				216/604		#1379/550		m#1797/240			m21/491	
11	NW 151 St/NW 7 Ave	AM	110/120	65/837		m#553/220	m52/265	m18	#66/100	161/981		#400/100	#663/1900	
		PM	#244/120	159/837		m#498/220	m106/265	m9	#148/100	#528/981		m#585/100	261/1900	
12*	NW 151 St/I-95 SB On Ramp	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	AM	m#190	m115/240			324/617		#489	202/584	50		#567/348	
		PM	m342	m180/240			141/617		#653	316/584	35		131/348	
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	AM	171	#1750/658				0		137/89		m228	m13/159	
		PM	195	#988/658				0		111/89		m191	m10/159	
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	AM					#464/728	42	m13	47/159			#324/361	76/220
		PM					#519/728	47	70	86/159			198/361	72/220

*Unsignalized Intersections
Queue shown is maximum after two cycles

m=Volume for 95th percentile queue is metered by upstream signal
#=95th Percentile volume exceeds capacity, queue may be longer

Table 8-4
Build 3A 2018 Queuing Analysis at Study Intersection

No	Intersection	Time	95 % Queue Length (ft) / Link Length (ft)											
			EB			WB			NB			SB		
			L	T	R	L	T	R	L	T	R	L	T	R
1	Miami Gardens Dr/I-95 NB Exit	AM	#250/425				#462/322	#213/230				#258/325		37/325
		PM	#557/425				#1084/322	#791/230				#654/325		51/325
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	AM	#479/200		m48/250				71/120	438/845			#1359/912	453
		PM	#420/200		m47/250				87/120	#1245/845			691/912	273
3	NW 171 St/NW 7 Ave Ext	AM	61/275	494/330		m30/200	192/1555	m0/160		39/681		170	85/731	
		PM	143/275	462/330		m19/200	348/1555	m0/160		74/681		84	63/731	
4	NW 7 Ave Ext/NB Ramps to Turnpike	AM	515/275	0/775			429/330	0						
		PM	373/275	0/775			350/330	0						
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	AM				132	78/726		56	64/167			16/907	
		PM				#281	124/726		#180	115/167			38/907	
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	AM		55/879	49					65/757		20	53/167	
		PM		39/879	11					83/757		m1	5/167	
7	NW 167 St/NW 2 Ave	AM	357/200	#2887/309	792/260	m#318/230	m316/327	m9	#977/260	196/541			#137/586	
		PM	#1321/200	#2342/309	366/260	m#173/230	m#1477/327	m29	#1231/260	197/541			#339/586	
8	NW 167 St/N Miami Ave	AM	m383/250	m280/815		#189/275	1038/1241		#370/150	206/1221		150/100	#260/1197	
		PM	m379/250	m28/815		#466/275	#1586/1241		#619/150	#417/1221		#258/100	#494/1197	
9	NW 7 Ave/GGI Park-N-Ride	AM	49/100	50/259	0/50	11	33/257	0/100	m195/200	m399/491	m0/250	13/150	#454/215	
		PM	70/100	70/259	0/50	13	21/257	0/100	m269/200	m406/491	m0/250	5/150	#461/215	
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	AM				70/604		#504/550		#513/240			m#40/491	
		PM				81/604		#447/550		#845/240			70/491	
11	NW 151 St/NW 7 Ave	AM	53/120	38/837		#300/220	m30/265	m11	34/100	67/981		m33/100	m64/1900	
		PM	81/120	57/837		183/220	m59/265	m23	34/100	183/981		m46/100	20/1900	
12*	NW 151 St/I-95 SB On Ramp	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	AM	97	96/240			113/617		187	136/584	25		73/348	
		PM	133	48/240			82/617		145	#229/584	9		90/348	
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	AM	#209/300	#175/658						51/425	75/300	#299	m6/159	
		PM	#303/300	95/658						121/457	110/300	m#321	m8/159	
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	AM				#222/350	101/728	11	m2	m5/159			104/361	40/220
		PM				#330/350	160/728	39	m34	m8/159			114/361	47/220

*Unsignalized Intersections
Queue shown is maximum after two cycles

m=Volume for 95th percentile queue is metered by upstream signal
#=95th Percentile volume exceeds capacity, queue may be longer

Table 8-5
Build 3A 2030 Queuing Analysis at Study Intersection

No	Intersection	Time	95 % Queue Length (ft) / Link Length (ft)											
			EB			WB			NB			SB		
			L	T	R	L	T	R	L	T	R	L	T	R
1	Miami Gardens Dr/I-95 NB Exit	AM	#259/425				#483/322	#268/230				#275/325		37/325
		PM	#569/425				#1174/322	#932/230				#679/325		52/325
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	AM	#461/200		m47/250				66/120	445/845			#1364/912	460
		PM	#506/200		m61/250				121/120	#1560/845			#843/912	548
3	NW 171 St/NW 7 Ave Ext	AM	66/275	513/330		m27/200	363/1555	m0/160		41/681		169	82/731	
		PM	130/275	522/330		m14/200	469/1555	m0/160		97/681		108	75/731	
4	NW 7 Ave Ext/NB Ramps to Turnpike	AM	#520/275	0/775			#622/330	0						
		PM	404/275	0/775			397/330	0						
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	AM				134	76/726		59	84/167			19/907	
		PM				#326	136/726		#268	11/167			57/907	
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	AM		97/879	53					72/757		22	66/167	
		PM		46/879	40					112/757		m1	m5/167	
7	NW 167 St/NW 2 Ave	AM	#528/200	#3121/309	#1301/260	m#271/230	539/327	m3	#1119/260	176/541			#148/586	
		PM	#921/200	#2914/309	566/260	m#141/230	m#1291/327	m17	#1344/260	171/541			#350/586	
8	NW 167 St/N Miami Ave	AM	m346/250	m315/815		#244/275	1139/1241		#419/150	259/1221		173/100	#309/1197	
		PM	m272/250	m17/815		#544/275	#1683/1241		#683/150	#577/1221		#381/100	#517/1197	
9	NW 7 Ave/GGI Park-N-Ride	AM	#106/100	#105/259	0/50	14	48/257	0/100	m94/200	m363/491	m0/250	28/150	503/215	
		PM	77/100	77/259	0/50	10	16/257	0/100	m#180/200	m#600/491	m0/250	9/150	#424/215	
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	AM				146/604		#952/550		#961/240			237/491	
		PM				103/604		#572/550		#865/240			m13/491	
11	NW 151 St/NW 7 Ave	AM	83/120	62/837		#568/220	m43/265	m26	#59/100	152/981		m#238/100	433/1900	
		PM	93/120	70/837		m#217/220	m66/265	m9	#68/100	245/981		#260/100	223/1900	
12 *	NW 151 St/I-95 SB On Ramp	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	AM	m103	m130/240			194/617		#361	194/584	46		329/348	
		PM	m#350	m119/240			112/617		#370	198/584	15		93/348	
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	AM	#279/300	#301/658						56/425	96/300	#346	m5/159	
		PM	#331/300	86/658						147/457	101/300	#417	m7/159	
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	AM				#249/350	126/728	16	m2	m4/159			132/361	44/220
		PM				#377/350	224/728	43	m52	m22/159			128/361	57/220

*Unsignalized Intersections
Queue shown is maximum after two cycles

m=Volume for 95th percentile queue is metered by upstream signal
#=95th Percentile volume exceeds capacity, queue may be longer

Table 8-6
Builds 3B & 3C 2018 Queuing Analysis at Study Intersection

No	Intersection	Time	95 % Queue Length (ft) / Link Length (ft)											
			EB			WB			NB			SB		
			L	T	R	L	T	R	L	T	R	L	T	R
1	Miami Gardens Dr/I-95 NB Exit	AM	#250/425				#462/322	#213/230				#258/325		37/325
		PM	#557/425				#1084/322	#791/230				#654/325		51/325
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	AM	#479/200		m48/250				71/120	438/845			#1359/912	453
		PM	#420/200		m47/250				87/120	#1245/845			691/912	273
3	NW 171 St/NW 7 Ave Ext	AM	61/275	494/330		m30/200	192/1555	m0/160		39/681		170	85/731	
		PM	143/275	462/330		m19/200	348/1555	m0/160		74/681		84	63/731	
4	NW 7 Ave Ext/NB Ramps to Turnpike	AM	515/275	0/775			429/330	0						
		PM	373/275	0/775			350/330	0						
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	AM				132	78/726		56	64/167			16/907	
		PM				#310	127/726		#160	112/167			37/907	
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	AM		55/879	49					65/757		20	53/167	
		PM		39/879	11					83/757		m1	5/167	
7	NW 167 St/NW 2 Ave	AM	357/200	#2887/309	792/260	m#318/230	m316/327	m9	#977/260	196/541			#137/586	
		PM	#1321/200	#2342/309	366/260	m#173/230	m#1477/327	m29	#1231/260	197/541			#339/586	
8	NW 167 St/N Miami Ave	AM	m383/250	m280/815		#189/275	1038/1241		#370/150	206/1221		150/100	#260/1197	
		PM	m379/250	m28/815		#466/275	#1586/1241		#619/150	#417/1221		#258/100	#494/1197	
9	NW 7 Ave/GGI Park-N-Ride	AM	54/100	55/259	0/50	13	37/257	0/100	m257/200	m446/491	m0/250	13/150	#469/215	
		PM	70/100	70/259	0/50	13	21/257	0/100	m264/200	m505/491	m0/250	5/150	#461/215	
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	AM				55		#352/550		136/237			74/1042	
		PM				40		#311/550		#197/237			184/1042	
11	NW 151 St/NW 7 Ave	AM	59/120	43/837		#286/220	m33/265	m14	38/100	79/981		112/100	163/803	
		PM	66/120	46/837		#154/220	m51/265	m5	32/100	156/981		95/100	136/803	
12 *	NW 151 St/I-95 SB On Ramp	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	AM	58	60/240			123/617		206	150/584	32		78/348	
		PM	#192	69/240			75/617		119	#188/584	0		78/348	
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	AM	#209/300	#175/658						51/425	75/300	#299	m6/159	
		PM	#303/300	95/658						121/457	110/300	m#321	m8/159	
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	AM				#222/350	101/728	11	m2	m5/159			104/361	40/220
		PM				#330/350	160/728	39	m34	m8/159			114/361	47/220

*Unsignalized Intersections
Queue shown is maximum after two cycles

m=Volume for 95th percentile queue is metered by upstream signal
#=95th Percentile volume exceeds capacity, queue may be longer

Table 8-7
Build 3B & 3C 2030 Queuing Analysis at Study Intersection

No	Intersection	Time	95 % Queue Length (ft) / Link Length (ft)											
			EB			WB			NB			SB		
			L	T	R	L	T	R	L	T	R	L	T	R
1	Miami Gardens Dr/I-95 NB Exit	AM	#259/425				#483/322	#268/230				#275/325		37/325
		PM	#569/425				#1174/322	#932/230				#679/325		52/325
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	AM	#461/200		m47/250				66/120	445/845			#1364/912	460
		PM	#506/200		m61/250				121/120	#1560/845			#843/912	548
3	NW 171 St/NW 7 Ave Ext	AM	66/275	513/330		m27/200	363/1555	m0/160		41/681		169	82/731	
		PM	130/275	522/330		m14/200	469/1555	m0/160		97/681		108	75/731	
4	NW 7 Ave Ext/NB Ramps to Turnpike	AM	#520/275	0/775			#622/330	0						
		PM	404/275	0/775			397/330	0						
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	AM				134	76/726		59	84/167			19/907	
		PM				#326	136/726		#284	11/167			60/907	
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	AM		97/879	53					72/757		22	66/167	
		PM		46/879	40					112/757		m3	m13/167	
7	NW 167 St/NW 2 Ave	AM	#528/200	#3121/309	#1301/260	m#271/230	m539/327	m3	#1119/260	176/541			#148/586	
		PM	#921/200	#2914/309	566/260	m#141/230	m#1291/327	m17	#1344/260	171/541			#350/586	
8	NW 167 St/N Miami Ave	AM	m346/250	m315/815		#244/275	1139/1241		#419/150	259/1221		173/100	#309/1197	
		PM	m272/250	m17/815		#544/275	#1683/1241		#683/150	#577/1221		#381/100	#517/1197	
9	NW 7 Ave/GGI Park-N-Ride	AM	#106/100	#105/259	0/50	14	48/257	0/100	m84/200	m551/491	m0/250	28/150	503/215	
		PM	#97/100	#96/259	0/50	11	18/257	0/100	m#219/200	m733/491	m0/250	9/150	#447/215	
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	AM				71		#569/550		#227/237			158/1042	
		PM				76		#627/550		#454/237			m72/1042	
11	NW 151 St/NW 7 Ave	AM	76/120	57/837		#562/220	m40/265	m23	#50/100	130/981		m#252/100	420/803	
		PM	98/120	74/837		m#201/220	m64/265	m8	#68/100	257/981		m#249/100	184/803	
12 *	NW 151 St/I-95 SB On Ramp	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	AM	m97	m125/240			180/617		#341	180/584	44		#327/348	
		PM	m#353	m122/240			113/617		#387	208/584	17		97/348	
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	AM	#279/300	#301/658						56/425	96/300	#346	m5/159	
		PM	#331/300	86/658						147/457	101/300	#417	m7/159	
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	AM				#249/350	126/728	16	m2	m4/159			132/361	44/220
		PM				#377/350	224/728	43	m52	m22/159			128/361	57/220

*Unsignalized Intersections
Queue shown is maximum after two cycles

m=Volume for 95th percentile queue is metered by upstream signal
#=95th Percentile volume exceeds capacity, queue may be longer

Table 8-8
Build 4 2018 Queuing Analysis at Study Intersection

No	Intersection	Time	95 % Queue Length (ft) / Link Length (ft)											
			EB			WB			NB			SB		
			L	T	R	L	T	R	L	T	R	L	T	R
1	Miami Gardens Dr/I-95 NB Exit	AM	#250/425				#462/322	#213/230				#258/325		37/325
		PM	#557/425				#1084/322	#791/230				#654/325		51/325
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	AM	#479/200		m48/250				71/120	438/845			#1359/912	453
		PM	#420/200		m47/250				87/120	#1245/845			691/912	273
3	NW 171 St/NW 7 Ave Ext	AM	61/275	494/330		m30/200	192/1555	m0/160		39/681		170	85/731	
		PM	143/275	462/330		m19/200	348/1555	m0/160		74/681		84	63/731	
4	NW 7 Ave Ext/NB Ramps to Turnpike	AM	515/275	0/775			429/330	0						
		PM	373/275	0/775			350/330	0						
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	AM				#191	94/726		11	12/167			37/907	
		PM				#217	100/726		#339	m90/167			74/907	
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	AM		52/879						77/757		m55	48/167	
		PM		30/879						#442/757		m280	m73/167	
7	NW 167 St/NW 2 Ave	AM	357/200	#2798/309	666/260	m#304/230	m316/327	m9	#624/260	222/541			#137/586	
		PM	#1261/200	#2241/309	302/260	m#148/230	m#1413/327	m31	#773/260	235/541			#327/586	
8	NW 167 St/N Miami Ave	AM	m384/250	m281/815		#189/275	1038/1241		#370/150	206/1221		150/100	#260/1197	
		PM	m379/250	m28/815		#466/275	#1586/1241		#619/150	#417/1221		#258/100	#494/1197	
9	NW 7 Ave/GGI Park-N-Ride	AM	54/100	55/259	0/50	13	37/257	0/100	m403/200	m560/491	m0/250	13/150	#469/215	
		PM	63/100	65/259	0/50	13	18/257	0/100	m#393/200	m#718/491	m0/250	6/150	#473/215	
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	AM				57	#917/653	0/550		232/237			#204/1042	
		PM				50	#874/663	0/550		#350/237			93/1042	
11	NW 151 St/NW 7 Ave	AM	59/120	43/837		#286/220	m33/265	m14	38/100	79/981		112/100	163/803	
		PM	66/120	46/837		#154/220	m51/265	m5	32/100	156/981		95/100	136/803	
12 *	NW 151 St/I-95 SB On Ramp	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	AM	58	60/240			123/617		206	150/584	32		78/348	
		PM	#192	69/240			75/617		119	#188/584	0		78/348	
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	AM	193/300	224/658						48/425		153	2/159	
		PM	#246/300	107/658						56/457		61	13/159	
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	AM				94/350	88/728	42	m3	11/159			124/361	44/220
		PM				135/350	162/728	47	m6	m10/159			88/361	42/220

*Unsignalized Intersections
Queue shown is maximum after two cycles

m=Volume for 95th percentile queue is metered by upstream signal
#=95th Percentile volume exceeds capacity, queue may be longer

Table 8-9
Build 4 2030 Queuing Analysis at Study Intersection

No	Intersection	Time	95 % Queue Length (ft) / Link Length (ft)											
			EB			WB			NB			SB		
			L	T	R	L	T	R	L	T	R	L	T	R
1	Miami Gardens Dr/I-95 NB Exit	AM	#259/425				#483/322	#268/230				#275/325		37/325
		PM	#569/425				#1174/322	#932/230				#679/325		52/325
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	AM	#461/200		m47/250				66/120	445/845			#1364/912	460
		PM	#506/200		m61/250				121/120	#1560/845			#843/912	548
3	NW 171 St/NW 7 Ave Ext	AM	66/275	513/330		m27/200	363/1555	m0/160		41/681		169	82/731	
		PM	130/275	522/330		m14/200	469/1555	m0/160		97/681		108	75/731	
4	NW 7 Ave Ext/NB Ramps to Turnpike	AM	#520/275	0/775			#622/330	0						
		PM	404/275	0/775			397/330	0						
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	AM				187	109/726		12	14/167			54/907	
		PM				239	131/726		m50	m5/167			116/907	
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	AM		86/879						112/757		69	64/167	
		PM		43/879						#545/757		#419	82/167	
7	NW 167 St/NW 2 Ave	AM	#488/200	#3019/309	1044/260	m#257/230	m291/327	m4	#710/260	202/541			#148/586	
		PM	#896/200	#2825/309	481/260	m#129/230	m#1215/327	m20	#815/260	204/541			#339/586	
8	NW 167 St/N Miami Ave	AM	m367/250	m316/815		#244/275	1139/1241		#419/150	259/1221		173/100	#309/1197	
		PM	m292/250	m154/815		#544/275	#1683/1241		#683/150	#577/1221		#381/100	#517/1197	
9	NW 7 Ave/GGI Park-N-Ride	AM	#183/100	#182/259	0/50	20	67/257	0/100	m155/200	m853/491	m0/250	#74/150	586/215	
		PM	97/100	#96/259	0/50	11	18/257	0/100	m#297/200	m#842/491	m0/250	9/150	#447/215	
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	AM				79	#1074/653	0/550		#363/237			#370/1042	
		PM				72	#988/663	0/550		#466/237			m93/1042	
11	NW 151 St/NW 7 Ave	AM	76/120	57/837		#562/220	m40/265	m23	#50/100	130/981		m#252/100	420/803	
		PM	98/120	74/837		m#201/220	m64/265	m8	68/100	257/981		m#249/100	184/803	
12*	NW 151 St/I-95 SB On Ramp	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	AM	m97	m125/240			180/617		#341	180/584	44		#327/348	
		PM	m#353	m122/240			113/617		#387	208/584	17		97/348	
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	AM	229/300	243/658						71/425		#185	1/159	
		PM	#267/300	137/658						56/457		61	16/159	
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	AM				119/350	90/728	44	m3	14/159			132/361	44/220
		PM				142/350	#167/728	49	m6	m10/159			92/361	42/220

*Unsignalized Intersections
Queue shown is maximum after two cycles

m=Volume for 95th percentile queue is metered by upstream signal
#=95th Percentile volume exceeds capacity, queue may be longer

Table 8-10
Ultimate Build 2040 Queuing Analysis at Study Intersection

No	Intersection	Time	95 % Queue Length (ft) / Link Length (ft)											
			EB			WB			NB			SB		
			L	T	R	L	T	R	L	T	R	L	T	R
1	Miami Gardens Dr/I-95 NB Exit	AM	#311/425				#668/322	#443/230				#387/325		
		PM	#672/425				#1580/322	#1147/230				#924/325		
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	AM	#471/200		m92/250				67/120	539/845			#1551/912	602
		PM	#515/200		m66/250				128/120	#1777/845			#1076/912	567
3	NW 171 St/NW 7 Ave Ext	AM	69/275	555/330		m31/200	392/1555	m0/160		43/681		186	85/731	
		PM	133/275	528/330		m16/200	426/1555	m0/160		107/681		117	78/731	
4	NW 7 Ave Ext/NB Ramps to Turnpike	AM	#522/275	0/775			#761/330	0						
		PM	406/275	0/775			#1317/330	m0						
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	AM				223	118/726		12	16/167			57/907	
		PM				#320	147/726		m35	m5/167			140/907	
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	AM		94/879						126/757		m66	72/167	
		PM		47/879						#640/757		#441	106/167	
7	NW 167 St/NW 2 Ave	AM	#289/200	#4117/309	#1344/260	m#293/230	m128/327	m0	#791/260	131/541			67/586	
		PM	#655/200	#4129/309	606/260	m#162/230	m177/327	m0	#997/260	204/541			#266/586	
8	NW 167 St/N Miami Ave	AM	m398/250	m480/815		#269/275	#1421/1241		#462/150	#280/1221		#210/100	#367/1197	
		PM	m426/250	m471/815		#600/275	#2103/1241		#761/150	#654/1221		#517/100	#646/1197	
9	NW 7 Ave/GGI Park-N-Ride	AM	#269/100	#273/259	0/50	22	75/257	0/100	m298/200	m1380/491	m1/250	#177/150	#976/215	
		PM	#344/100	#347/259	38/50	21	35/257	0/100	m594/200	m1648/491	m3/250	19/150	#933/215	
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	AM				238	#2386/653	0/550		#1095/237			635/1042	
		PM				213	#2619/663	0/550		#1535/237			356/1042	
11	NW 151 St/NW 7 Ave	AM	100/120	53/837		m#398/220	m45/265	m23	46/100	140/981		m#343/100	#547/803	
		PM	#149/120	82/837		m154/220	m60/265	m4	#93/100	284/981		m#388/100	256/803	
12 *	NW 151 St/I-95 SB On Ramp	AM	-	-	-	-	-	-	-	-	-	-	-	-
		PM	-	-	-	-	-	-	-	-	-	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	AM	m77	m97/240			180/617		#430	213/584	49		#552/348	
		PM	m239	m108/240			113/617		#558	365/584	37		101/348	
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	AM	#245/300	#274/658						105/425		#291	m1/159	
		PM	#267/300	113/658						52/457		m100	m7/159	
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	AM					125/32	42	m5	9/159			#144/361	48/220
		PM					#203/62	47	m5	m4/159			107/361	49/220

*Unsignalized Intersections
Queue shown is maximum after two cycles

m=Volume for 95th percentile queue is metered by upstream signal
#=95th Percentile volume exceeds capacity, queue may be longer

Table 8-11
No Build 2018 Intersections LOS

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS				Control Delay (s/veh)/LOS
				EB	WB	NB	SB	
1	Miami Gardens Dr/I-95 NB Exit	D	AM	49.5/D	35.9/D	0.9/A	46.4/D	27.9/C
			PM	144.6/F	134.7/F	1.6/A	116.0/F	91.3/F
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	E	AM	112.6/F	-	17.2/B	63.1/E	62.4/E
			PM	76.0/E	-	76.4/E	30.3/C	58.7/E
4	NW 7 Ave Ext/NB Ramps to Turnpike* (EBL)	E	AM	(38.4/F)	-	-	-	-
			PM	(31.6/F)	-	-	-	-
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	E	AM	-	17.4/B	5.7/A	11.0/B	12.0/B
			PM	-	23.4/C	14.5/B	15.7/B	18.4/B
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	E	AM	17.9/B	-	11.8/B	5.6/A	11.3/B
			PM	23.9/C	-	12.8/B	9.5/A	12.3/B
7	NW 167 St/NW 2 Ave	v/c<120%	AM	179.6/F	34.4/C	194.0/F	241.7/F	116.8/F (v/c 1.33)
			PM	222.7/F	201.6/F	223.6/F	317.0/F	217.7/F (V/C 1.51)
8	NW 167 St/N Miami Ave	v/c<120%	AM	20.8/C	43.1/D	94.6/F	103.1/F	35.3/D (v/c 0.95)
			PM	54.5/D	104.7/F	130.4/F	164.3/F	85.7/F (V/C 1.17)
9	NW 7 Ave/GGI Park and Ride**	D	AM	66.9/E	58.5/E	19.0/B	36.1/D	26.9/C
			PM	62.7/E	47.8/D	17.6/B	100.2/F	45.7/D
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	D	AM	-	57.6/E	81.8/F	7.0/A	50.7/D
			PM	-	67.9/E	71.7/E	2.7/A	50.3/D
11	NW 151 St/NW 7 Ave	D	AM	32.3/C	29.9/C	18.8/B	12.2/B	17.9/B
			PM	42.5/D	24.5/C	22.6/C	5.8/A	16.7/B
12	NW 151 St/I-95 SB On Ramp* (WBL)	D	AM	-	(1.0/A)	-	-	-
			PM	-	(3.1/B)	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	D	AM	20.5/C	23.4/C	28.6/C	21.4/C	24.3/C
			PM	14.2/B	19.1/B	44.7/D	32.9/C	29.5/C
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	E	AM	41.7/D	30.7/C	32.5/C	26.3/C	36.1/D
			PM	32.8/C	25.8/C	32.2/C	6.1/A	25.4/C
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	E	AM	-	46.6/D	1.1/A	33.0/C	27.6/C
			PM	-	41.9/D	3.7/A	32.6/C	26.1/C

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS					Control Delay (s/veh)/LOS
				NW 171 ST	NW 4 Ave	NW 7 Ave	NW 7 Ave Ext		
							NB	SB	
3	NW 7 Ave Ext/NW 171 ST	E	AM	69.8/E	78.0/E	67.3/E	22.4/C	8.3/A	24.0/C
			PM	63.3/E	67.4/E	63.5/E	22.1/C	15.9/B	25.7/C

***Unsignalized Intersections; ICU LOS**
**** EB, WB, NB and SB for SEB, NWB, NEB, and SWB**

Table 8-12
No Build 2030 Intersections LOS

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS				Control Delay (s/veh)/LOS
				EB	WB	NB	SB	
1	Miami Gardens Dr/I-95 NB Exit	D	AM	63.9/E	44.9/D	1.3/A	56.0/E	34.0/C
			PM	210.0/F	181.1/F	3.0/A	109.8/F	114.2/F
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	E	AM	151.7/F	-	22.8/C	99.9/F	89.4/F
			PM	127.9/F	-	123.6/F	38.6/D	91.4/F
4	NW 7 Ave Ext/NB Ramps to Turnpike* (EBL)	E	AM	(129.6/F)	-	-	-	-
			PM	(79.9/F)	-	-	-	-
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	E	AM	-	18.3/B	6.1/A	10.9/B	12.5/B
			PM	-	23.3/C	18.6/B	16.4/B	20.1/C
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	E	AM	18.5/B	-	13.9/B	13.3/B	15.2/B
			PM	23.9/C	-	16.8/B	13.6/B	15.9/B
7	NW 167 St/NW 2 Ave	v/c<120%	AM	202.4/F	48.5/D	248.1/F	226.9/F	166.2/F (v/c 1.57)
			PM	296.2/F	286.1/F	278.5/F	385.3/F	293.1/F (v/c 1.69)
8	NW 167 St/N Miami Ave	v/c<120%	AM	34.3/C	45.4/D	125.5/F	95.4/F	45.0/D (v/c 1.04)
			PM	107.2/F	146.1/F	168.4/F	204.6/F	132.3/F (v/c 1.30)
9	NW 7 Ave/GGI Park and Ride**	D	AM	147.7/F	66.0/E	27.9/C	74.0/E	50.2/D
			PM	182.1/F	56.2/E	31.6/C	122.0/F	71.8/E
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	D	AM	-	132.7/F	161.5/F	4.4/A	109.1/F
			PM	-	125.5/F	129.9/F	2.6/A	93.1/F
11	NW 151 St/NW 7 Ave	D	AM	64.0/E	40.6/D	46.1/D	25.5/C	34.7/C
			PM	55.5/E	46.3/D	37.7/D	17.0/B	31.7/C
12	NW 151 St/I-95 SB On Ramp* (WBL)	D	AM	-	(0.6/A)	-	-	-
			PM	-	(3.1/A)	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	D	AM	16.3/B	39.7/D	58.8/E	54.0/D	44.8/D
			PM	22.7/C	24.5/C	47.8/D	45.0/D	37.3/D
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	E	AM	51.8/D	39.2/D	44.7/D	44.8/D	48.9/D
			PM	37.4/D	32.4/C	47.0/D	6.6/A	30.6/C
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	E	AM	-	87.4/F	1.4/A	47.1/D	47.2/D
			PM	-	52.5/D	5.4/A	48.4/D	35.3/D

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS					Control Delay (s/veh)/LOS
				NW 171 ST	NW 4 Ave	NW 7 Ave	NW 7 Ave Ext		
							NB	SB	
3	NW 7 Ave Ext/NW 171 ST	E	AM	93.5/F	100.7/F	90.9/F	21.3/C	6.1/A	26.6/C
			PM	80.4/F	84.3/F	73.3/E	23.9/C	15.4/B	29.2/C

***Unsignalized Intersections**
**** EB, WB, NB and SB for SEB, NWB, NEB, and SWB**

Table 8-13
No Build 2040 Intersections LOS

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS				Control Delay (s/veh)/LOS
				EB	WB	NB	SB	
1	Miami Gardens Dr/I-95 NB Exit	D	AM	68.8/E	59.9/E	1.2/A	56.7/E	41.3/D
			PM	222.6/F	198.4/F	2.7/A	134.3/F	128.5/F
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	E	AM	165.5/F	-	25.0/C	126.7/F	105.6/F
			PM	141.8/F	-	154.7/F	49.3/D	110.9/F
4	NW 7 Ave Ext/NB Ramps to Turnpike* (EBL)	E	AM	(165.5/F)	-	-	-	-
			PM	(111.4/F)	-	-	-	-
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	E	AM	-	19.8/B	7.6/A	14.2/B	14.8/B
			PM	-	27.8/C	10.7/B	21.5/C	20.2/C
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	E	AM	29.0/C	-	16.8/B	16.7/B	20.5/C
			PM	33.8/C	-	17.1/B	10.7/B	15.8/B
7	NW 167 St/NW 2 Ave	v/c<120%	AM	271.6/F	29.9/C	290.6/F	306.2/F	212.2/F (v/c 1.67)
			PM	345.1/F	373.8/F	346.5/F	420.0/F	355.2/F (v/c 1.86)
8	NW 167 St/N Miami Ave	v/c<120%	AM	63.7/E	66.4/E	125.7/F	113.6/F	69.6/E (v/c 1.09)
			PM	141.1/F	209.4/F	189.3/F	201.2/F	175.0/F (v/c 1.36)
9	NW 7 Ave/GGI Park and Ride**	D	AM	224.9/F	76.2/E	43.8/D	106.7/F	74.9/F
			PM	204.2/F	66.3/E	50.1/D	179.1/F	103.2/F
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	D	AM	-	139.1/F	202.9/F	2.4/A	126.0/F
			PM	-	169.6/F	192.3/F	4.1/A	130.9/F
11	NW 151 St/NW 7 Ave	D	AM	49.1/D	74.3/E	39.8/D	35.1/D	47.2/D
			PM	79.3/E	43.1/D	59.2/E	24.4/C	42.8/D
12	NW 151 St/I-95 SB On Ramp* (WBL)	D	AM	-	(0.5/A)	-	-	-
			PM	-	(3.3/C)	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	D	AM	21.6/C	37.6/D	59.0/E	73.6/E	51.7/D
			PM	35.9/D	29.2/C	53.9/D	54.1/D	46.5/D
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	E	AM	78.1/E	53.1/D	65.1/E	19.0/B	63.5/E
			PM	47.5/D	36.1/D	52.1/D	7.6/A	37.7/D
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	E	AM	-	132.4/F	1.6/A	106.1/F	85.8/F
			PM	-	67.5/E	5.6/A	56.2/E	44.5/D

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS					Control Delay (s/veh)/LOS
				NW 171 ST	NW 4 Ave	NW 7 Ave	NW 7 Ave Ext		
							NB	SB	
3	NW 7 Ave Ext/NW 171 ST	E	AM	93.2/F	101.3/F	90.4/F	23.7/C	6.8/A	29.0/C
			PM	101.1/F	94.7/F	82.9/F	28.4/C	20.5/C	36.3/D

***Unsignalized Intersections**
**** EB, WB, NB and SB for SEB, NWB, NEB, and SWB**

Table 8-14
Build 3A 2018 Intersections LOS

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS				Control Delay (s/veh)/LOS
				EB	WB	NB	SB	
1	Miami Gardens Dr/I-95 NB Exit	D	AM	49.7/D	37.4/D	0.9/A	44.6/D	28.2/C
			PM	165.0/F	136.9/F	1.7/A	126.6/F	96.3/F
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	E	AM	95.3/F	-	12.4/B	33.7/C	38.3/D
			PM	74.9/E	-	49.6/D	23.4/C	43.5/D
4	NW 7 Ave Ext/NB Ramps to Turnpike	E	AM	26.2/C	12.8/B	-	0.0/A	21.8/C
			PM	18.1/B	11.0/B	-	0.0/A	15.6/B
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	E	AM	-	17.6/B	5.9/A	9.2/A	12.2/B
			PM	-	24.1/C	9.6/A	18.2/B	18.2/B
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	E	AM	15.8/B	-	7.8/A	4.3/A	9.2/A
			PM	29.9/C	-	4.9/A	0.8/A	4.5/A
7	NW 167 St/NW 2 Ave	v/c<120%	AM	179.9/F	32.6/C	226.2/F	126.2/F	143.5/F (v/c 1.43)
			PM	197.3/F	251.0/F	258.2/F		221.5/F (v/c 1.55)
8	NW 167 St/N Miami Ave	v/c<120%	AM	40.3/D	45.3/D	142.1/F	104.6/F	48.5/D (v/c 1.05)
			PM	81.7/F	122.4/F	145.2/F	176.0/F	106.2/F (v/c 1.25)
9	NW 7 Ave/GGI Park and Ride**	D	AM	35.8/D	39.7/D	17.9/B	57.4/E	31.3/C
			PM	47.0/D	48.0/D	16.3/B	29.3/C	21.7/C
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	D	AM	-	98.3/F	74.0/E	16.0/B	72.8/E
			PM	-	72.6/E	76.8/E	9.2/A	56.2/E
11	NW 151 St/NW 7 Ave	D	AM	34.9/C	63.0/E	17.7/B	4.1/A	20.5/C
			PM	42.7/D	27.9/C	19.1/B	3.5/A	15.1/B
12	NW 151 St/I-95 SB On Ramp* (WBL)	D	AM	-	(1.0/A)	-	-	-
			PM	-	(3.4/B)	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	D	AM	18.8/B	22.6/C	31.4/C	22.9/C	25.1/C
			PM	10.5/B	17.0/B	45.8/D	33.1/C	27.0/C
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	E	AM	24.7/C	-	17.4/B	12.3/B	19.0/B
			PM	35.1/D	-	23.2/C	11.5/B	22.5/C
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	E	AM	-	22.9/C	1.0/A	18.0/B	15.5/B
			PM	-	22.9/C	3.6/A	22.4/C	17.1/B

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS					Control Delay (s/veh)/LOS
				NW 171 ST	NW 4 Ave	NW 7 Ave	NW 7 Ave Ext		
							NB	SB	
3	NW 7 Ave Ext/NW 171 ST	E	AM	69.8/E	78.0/E	66.9/E	17.7/B	9.9/A	22.4/C
			PM	53.2/D	56.8/E	53.5/D	19.9/B	21.4/C	25.4/C

***Unsignalized Intersections**
**** EB, WB, NB and SB for SEB, NWB, NEB, and SWB**

Table 8-15
Build 3A 2030 Intersections LOS

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS				Control Delay (s/veh)/LOS
				EB	WB	NB	SB	
1	Miami Gardens Dr/I-95 NB Exit	D	AM	62.7/E	41.3/D	1.2/A	50.6/D	31.6/C
			PM	186.7/F	178.0/F	2.9/A	120.7/F	112.1/F
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	E	AM	122.6/F	-	12.3/B	53.6/D	53.6/D
			PM	100.1/F	-	65.8/E	27.3/C	55.8/E
4	NW 7 Ave Ext/NB Ramps to Turnpike	E	AM	26.4/C	23.9/C	-	0.0/A	25.5/C
			PM	21.8/C	11.7/B	-	0.0/A	17.8/B
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	E	AM	0.0/A	17.5/B	6.3/A	9.3/A	11.9/B
			PM	0.0/A	27.6/C	14.2/B	21.3/C	21.4/C
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	E	AM	15.7/B	0.0/A	9.1/A	5.5/A	10.6/B
			PM	29.7/C	0.0/A	5.4/A	1.1/A	5.7/A
7	NW 167 St/NW 2 Ave	v/c<120%	AM	207.8/F	33.9/C	265.3/F	141.6/F	165.4/F (v/c 1.52)
			PM	277.5/F	209.3/F	313.0/F	355.3/F	259.8/F (v/c 1.69)
8	NW 167 St/N Miami Ave	v/c<120%	AM	57.5/E	53.3/D	130.1/F	110.7/F	61.5/E (v/c 1.08)
			PM	131.1/F	151.8/F	191.1/F	202.9/F	147.3/F (v/c 1.34)
9	NW 7 Ave/GGI Park and Ride**	D	AM	68.2/E	53.3/D	33.4/C	20.3/C	30.7/C
			PM	34.6/C	32.6/C	116.0/F	97.8/F	106.1/F
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	D	AM	-	142.1/F	122.1/F	22.9/C	109.6/F
			PM	-	133.5/F	151.8/F	2.9/A	103.9/F
11	NW 151 St/NW 7 Ave	D	AM	47.8/D	39.1/D	38.6/D	19.1/B	29.2/C
			PM	40.3/D	33.4/C	26.7/C	17.3/B	24.9/C
12	NW 151 St/I-95 SB On Ramp* (WBL)	D	AM	-	(0.7/A)	-	-	-
			PM	-	(2.8/B)	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	D	AM	15.8/B	35.1/D	45.6/D	36.8/D	34.8/C
			PM	22.2/C	21.0/C	42.5/D	34.0/C	31.7/C
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	E	AM	32.1/C	-	21.9/C	14.5/B	24.6/C
			PM	36.4/D	-	28.2/C	11.5/B	24.1/C
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	E	AM	-	23.3/C	0.9/A	22.9/C	17.2/B
			PM	-	23.1/C	5.1/A	27.1/C	18.9/B

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS					Control Delay (s/veh)/LOS
				NW 171 ST	NW 4 Ave	NW 7 Ave	NW 7 Ave Ext		
							NB	SB	
3	NW 7 Ave Ext/NW 171 ST	E	AM	59.8/E	67.5/E	56.1/E	19.6/B	20.0/B	26.1/C
			PM	64.2/E	70.2/E	63.0/E	20.2/C	20.9/C	27.7/C

***Unsignalized Intersections**
**** EB, WB, NB and SB for SEB, NWB, NEB, and SWB**

Table 8-16
Build 3B & 3C 2018 Intersections LOS

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS				Control Delay (s/veh)/LOS
				EB	WB	NB	SB	
1	Miami Gardens Dr/I-95 NB Exit	D	AM	49.7/D	37.4/D	0.9/A	44.6/D	28.2/C
			PM	165.0/F	136.9/F	1.7/A	126.6/F	96.3/F
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	E	AM	95.3/F	-	12.4/B	33.7/C	38.3/D
			PM	74.9/E	-	49.6/D	23.4/C	43.5/D
4	NW 7 Ave Ext/NB Ramps to Turnpike	E	AM	26.2/C	12.8/B	-	0.0/A	21.8/C
			PM	18.1/B	11.0/B	-	0.0/A	15.6/B
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	E	AM	0.0/A	17.6/B	5.9/A	9.2/A	12.2/B
			PM	0.0/A	25.1/C	9.0/A	17.9/B	18.3/B
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	E	AM	15.8/B	0.0/A	7.8/A	4.3/A	9.2/A
			PM	29.9/C	0.0/A	4.9/A	0.8/A	4.5/A
7	NW 167 St/NW 2 Ave	v/c<120%	AM	179.9/F	32.6/C	226.2/F	126.2/F	143.5/F (v/c 1.43)
			PM	197.3/F	251.0/F	258.2/F	341.3/F	221.5/F (v/c 1.55)
8	NW 167 St/N Miami Ave	v/c<120%	AM	40.3/D	45.3/D	142.1/F	104.6/F	48.5/D (v/c 1.05)
			PM	81.7/F	122.4/F	145.2/F	176.0/F	106.2/F (v/c 1.25)
9	NW 7 Ave/GGI Park and Ride**	D	AM	41.1/D	45.3/D	17.2/B	35.4/D	24.1/C
			PM	47.0/D	48.0/D	15.3/B	29.3/C	21.0/B
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	D	AM	0.0/A	126.0/F	15.9/B	12.6/B	79.3/E
			PM	0.0/A	97.9/F	21.6/C	17.7/B	59.6/E
11	NW 151 St/NW 7 Ave	D	AM	39.9/D	32.3/C	20.7/C	9.3/A	17.9/B
			PM	33.0/C	25.1/C	18.0/B	9.8/A	16.4/B
12	NW 151 St/I-95 SB On Ramp* (WBL)	D	AM	-	(1.0/A)	-	-	-
			PM	-	(3.4/B)	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	D	AM	13.5/B	24.5/C	35.5/D	24.6/C	26.0/C
			PM	15.4/B	16.8/B	35.4/D	26.2/C	24.0/C
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	E	AM	24.7/C	-	17.4/B	12.3/B	19.0/B
			PM	35.1/D	-	23.2/C	11.5/B	22.5/C
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	E	AM	-	22.9/C	1.0/A	18.0/B	15.5/B
			PM	-	22.9/C	3.6/A	22.4/C	17.1/B

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS					Control Delay (s/veh)/LOS
				NW 171 ST	NW 4 Ave	NW 7 Ave	NW 7 Ave Ext		
							NB	SB	
3	NW 7 Ave Ext/NW 171 ST	E	AM	69.8/E	78.0/E	66.9/E	17.7/B	9.9/A	22.4/C
			PM	53.2/D	56.8/E	53.5/D	19.9/B	21.4/C	25.4/C

***Unsignalized Intersections**
**** EB, WB, NB and SB for SEB, NWB, NEB, and SWB**

Table 8-17
Build 3B & 3C 2030 Intersections LOS

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS				Control Delay (s/veh)/LOS
				EB	WB	NB	SB	
1	Miami Gardens Dr/I-95 NB Exit	D	AM	62.7/E	41.3/D	1.2/A	50.6/D	31.6/C
			PM	186.7/F	178.0/F	2.9/A	120.7/F	112.1/F
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	E	AM	122.6/F	-	12.3/B	53.6/D	53.6/D
			PM	100.1/F	-	65.8/E	27.3/C	55.8/E
4	NW 7 Ave Ext/NB Ramps to Turnpike	E	AM	26.4/C	23.9/C	-	0.0/A	25.5/C
			PM	21.8/C	11.7/B	-	0.0/A	17.8/B
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	E	AM	0.0/A	17.5/B	6.3/A	9.3/A	11.9/B
			PM	0.0/A	27.6/C	16.4/B	20.1/C	21.7/C
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	E	AM	15.7/B	0.0/A	9.1/A	5.5/A	10.6/B
			PM	29.7/C	0.0/A	5.4/A	1.4/A	5.8/A
7	NW 167 St/NW 2 Ave	v/c<120%	AM	207.8/F	33.9/C	265.3/F	141.6/F	165.4/F (v/c 1.52)
			PM	277.5/F	209.3/F	313.0/F	355.3/F	259.8/F (v/c 1.69)
8	NW 167 St/N Miami Ave	v/c<120%	AM	57.5/E	53.3/D	130.1/F	110.7/F	61.5/E (v/c 1.08)
			PM	131.1/F	151.8/F	191.1/F	202.9/F	147.3/F (v/c 1.34)
9	NW 7 Ave/GGI Park and Ride**	D	AM	68.2/E	53.3/D	34.3/C	20.3/C	31.4/C
			PM	45.2/D	37.7/D	71.2/E	60.9/E	66.7/E
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	D	AM	0.0/A	167.6/F	28.5/C	22.0/C	106.6/F
			PM	0.0/A	126.9/F	65.6/E	7.1/A	80.7/F
11	NW 151 St/NW 7 Ave	D	AM	42.9/D	55.7/E	33.6/C	21.8/C	33.8/C
			PM	43.1/D	28.4/C	27.8/C	16.8/B	24.4/C
12	NW 151 St/I-95 SB On Ramp* (WBL)	D	AM	-	(0.7/A)	-	-	-
			PM	-	(2.8/B)	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	D	AM	17.3/B	32.4/C	42.4/D	35.7/D	33.4/C
			PM	20.2/C	20.7/C	45.1/D	36.5/D	32.5/C
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	E	AM	32.1/C	-	21.9/C	14.5/B	24.6/C
			PM	36.4/D	-	28.2/C	11.5/B	24.1/C
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	E	AM	-	23.3/C	0.9/A	22.9/C	17.2/B
			PM	-	23.1/C	5.1/A	27.1/C	18.9/B

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS					Control Delay (s/veh)/LOS
				NW 171 ST	NW 4 Ave	NW 7 Ave	NW 7 Ave Ext		
							NB	SB	
3	NW 7 Ave Ext/NW 171 ST	E	AM	59.8/E	67.5/E	56.1/E	19.6/B	20.0/B	26.1/C
			PM	64.2/E	70.2/E	63.0/E	20.2/C	20.9/C	27.7/C

***Unsignalized Intersections**
**** EB, WB, NB and SB for SEB, NWB, NEB, and SWB**

Table 8-18
Build 4 2018 Intersections LOS

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS				Control Delay (s/veh)/LOS
				EB	WB	NB	SB	
1	Miami Gardens Dr/I-95 NB Exit	D	AM	49.7/D	37.4/D	0.9/A	44.6/D	28.2/C
			PM	165.0/F	136.9/F	1.7/A	126.6/F	96.3/F
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	E	AM	95.3/F	-	12.4/B	33.7/C	38.3/D
			PM	74.9/E	-	49.6/D	23.4/C	43.5/D
4	NW 7 Ave Ext/NB Ramps to Turnpike	E	AM	26.2/C	12.8/B	-	0.0/A	21.8/C
			PM	18.1/B	11.0/B	-	0.0/A	15.6/B
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	E	AM	0.0/A	18.4/B	3.6/A	10.6/B	12.7/B
			PM	0.0/A	30.8/C	18.9/B	17.4/B	22.0/C
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	E	AM	18.5/B	0.0/A	10.7/B	4.1/A	9.1/A
			PM	30.1/C	0.0/A	18.4/B	19.4/B	19.4/B
7	NW 167 St/NW 2 Ave	v/c<120%	AM	151.1/F	27.7/C	189.0/F	126.2/F	120.7/F (v/c 1.29)
			PM	152.4/F	207.6/F	231.3/F	284.7/F	178.5/F (v/c 1.39)
8	NW 167 St/N Miami Ave	v/c<120%	AM	34.4/C	45.3/D	142.1/F	104.6/F	45.0/D (v/c 1.05)
			PM	84.4/F	122.4/F	145.2/F	176.0/F	107.6/F (v/c 1.25)
9	NW 7 Ave/GGI Park and Ride**	D	AM	41.1/D	45.3/D	17.8/B	35.4/D	24.5/C
			PM	41.5/D	42.8/D	17.9/B	34.6/C	23.9/C
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	D	AM	0.0/A	23.9/C	40.1/D	18.8/B	25.0/C
			PM	0.0/A	26.4/C	44.2/D	12.2/B	26.3/C
11	NW 151 St/NW 7 Ave	D	AM	39.9/D	32.3/C	20.7/C	9.3/A	17.9/B
			PM	33.0/C	25.1/C	18.0/B	9.8/A	16.4/B
12	NW 151 St/I-95 SB On Ramp* (WBL)	D	AM	-	(1.0/A)	-	-	-
			PM	-	(3.4/B)	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	D	AM	13.5/B	24.5/C	35.5/D	24.6/C	26.0/C
			PM	15.4/B	16.8/B	35.4/D	26.2/C	24.0/C
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	E	AM	21.4/C	-	19.0/B	7.4/A	17.0/B
			PM	25.2/C	-	17.3/B	4.1/A	16.4/B
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	E	AM	-	21.3/C	1.0/A	20.2/C	15.6/B
			PM	-	21.3/C	1.7/A	17.6/B	15.6/B

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS					Control Delay (s/veh)/LOS
				NW 171 ST	NW 4 Ave	NW 7 Ave	NW 7 Ave Ext		
							NB	SB	
3	NW 7 Ave Ext/NW 171 ST	E	AM	69.8/E	78.0/E	66.9/E	17.7/B	9.9/A	22.4/C
			PM	53.2/D	56.8/E	53.5/D	19.9/B	21.4/C	25.4/C

***Unsignalized Intersections**
**** EB, WB, NB and SB for SEB, NWB, NEB, and SWB**

Table 8-19
Build 4 2030 Intersections LOS

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS				Control Delay (s/veh)/LOS
				EB	WB	NB	SB	
1	Miami Gardens Dr/I-95 NB Exit	D	AM	62.7/E	41.3/D	1.2/A	50.6/D	31.6/C
			PM	186.7/F	178.0/F	2.9/A	120.7/F	112.1/F
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	E	AM	122.6/F	-	12.3/B	53.6/D	53.6/D
			PM	100.1/F	-	65.8/E	27.3/C	55.8/E
4	NW 7 Ave Ext/NB Ramps to Turnpike	E	AM	26.4/C	23.9/C	-	0.0/A	25.5/C
			PM	21.8/C	11.7/B	-	0.0/A	17.8/B
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	E	AM	0.0/A	20.0/C	5.1/A	14.0/B	14.0/B
			PM	0.0/A	36.2/D	5.3/A	21.3/C	17.3/B
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	E	AM	23.6/C	0.0/A	11.3/B	4.5/A	11.2/B
			PM	38.7/D	0.0/A	26.0/C	13.6/B	22.2/C
7	NW 167 St/NW 2 Ave	v/c<120%	AM	172.5/F	27.4/C	220.6/F	141.6/F	137.2/F (v/c 1.36)
			PM	235.2/F	166.0/F	241.1/F	292.2/F	214.4/F (v/c 1.50)
8	NW 167 St/N Miami Ave	v/c<120%	AM	51.1/D	53.3/D	130.1/F	110.7/F	57.9/E (v/c 1.08)
			PM	133.5/F	151.8/F	191.1/F	202.9/F	148.5/F (v/c 1.34)
9	NW 7 Ave/GGI Park and Ride**	D	AM	129.9/F	93.2/F	16.4/B	15.8/C	21.3/C
			PM	45.2/D	37.7/D	69.7/E	60.9/E	65.7/E
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	D	AM	0.0/A	51.4/D	63.8/E	42.4/D	51.4/D
			PM	0.0/A	64.7/E	81.2/F	8.4/A	54.0/D
11	NW 151 St/NW 7 Ave	D	AM	42.9/D	55.7/E	33.6/C	21.8/C	33.8/C
			PM	43.1/D	28.4/C	27.8/C	16.8/B	24.4/C
12	NW 151 St/I-95 SB On Ramp* (WBL)	D	AM	-	(0.7/A)	-	-	-
			PM	-	(2.8/B)	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	D	AM	17.3/B	32.4/C	42.4/D	35.7/D	33.4/C
			PM	20.2/C	20.7/C	45.1/D	36.5/D	32.5/C
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	E	AM	22.9/C	-	20.6/C	9.5/A	18.7/B
			PM	27.1/C	-	17.7/B	4.2/A	17.9/B
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	E	AM	-	22.0/C	1.0/A	21.5/C	15.5/B
			PM	-	21.7/C	1.8/A	18.1/B	15.9/B

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS					Control Delay (s/veh)/LOS
				NW 171 ST	NW 4 Ave	NW 7 Ave	NW 7 Ave Ext		
							NB	SB	
3	NW 7 Ave Ext/NW 171 ST	E	AM	59.8/E	67.5/E	56.1/E	19.6/B	20.0/B	26.1/C
			PM	64.2/E	70.2/E	63.0/E	20.2/C	20.9/C	27.7/C

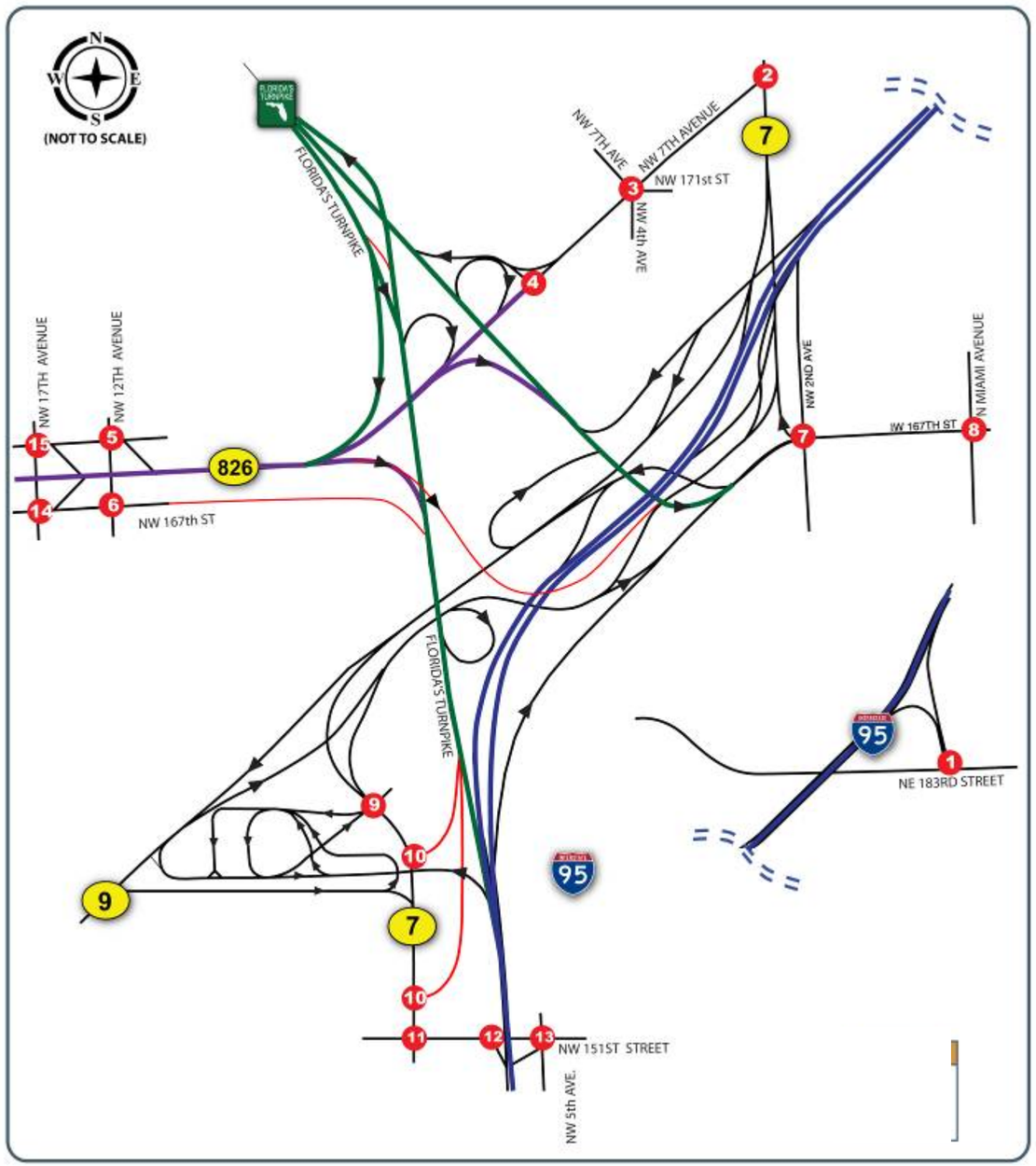
***Unsignalized Intersections**
**** EB, WB, NB and SB for SEB, NWB, NEB, and SWB**

Table 8-20
Ultimate Build 2040 Intersections LOS

No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS				Control Delay (s/veh)/LOS
				EB	WB	NB	SB	
1	Miami Gardens Dr/I-95 NB Exit	D	AM	84.8/F	74.3/E	1.7/A	82.4/F	51.4/D
			PM	238.3/F	227.2/F	5.7/A	196.6/F	149.3/F
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	E	AM	131.7/F	-	13.8/B	82.6/F	70.8/E
			PM	103.1/F	-	102.6/F	31.6/C	73.7/E
4	NW 7 Ave Ext/NB Ramps to Turnpike	E	AM	27.2/C	37.3/D	-	0.0/A	30.9/C
			PM	21.7/C	17.9/B	-	0.0/A	20.2/C
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	E	AM	0.0/A	19.5/B	6.0/A	15.0/B	14.6/B
			PM	0.0/A	40.8/D	5.5/A	27.8/C	19.8/B
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	E	AM	24.1/C	0.0/A	12.0/B	4.4/A	10.9/B
			PM	43.7/D	0.0/A	30.2/C	12.8/B	24.3/C
7	NW 167 St/NW 2 Ave	v/c<120%	AM	311.7/F	18.5/B	281.7/F	100.5/F	234.8/F (v/c 1.64)
			PM	340.3/F	73.6/E	297.2/F	326.4/F	255.1/F (v/c 1.75)
8	NW 167 St/N Miami Ave	v/c<120%	AM	162.7/F	87.7/F	161.4/F	126.7/F	138.0/F (v/c 1.31)
			PM	250.6/F	214.7/F	211.5/F	275.0/F	236.3/F (v/c 1.51)
9	NW 7 Ave/GGI Park and Ride**	D	AM	177.0/F	99.4/F	61.9/E	32.0/C	56.9/E
			PM	204.2/F	91.9/F	99.1/F	54.9/D	93.8/F
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	D	AM	0.0/A	64.6/E	149.0/F	55.9/E	80.8/F
			PM	0.0/A	109.4/F	219.3/F	14.6/B	119.7/F
11	NW 151 St/NW 7 Ave	D	AM	43.1/D	49.6/D	38.2/D	29.0/C	36.7/D
			PM	46.6/D	19.5/B	35.5/D	24.9/C	28.6/C
12	NW 151 St/I-95 SB On Ramp* (WBL)	D	AM	-	(0.6/A)	-	-	-
			PM	-	(2.6/B)	-	-	-
13	NW 151 St/I-95 NB Exit/NW 6 Ave	D	AM	15.6/B	32.4/C	48.2/D	67.2/E	45.9/D
			PM	19.4/B	20.7/C	72.1/E	38.2/D	44.8/D
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	E	AM	25.0/C	-	22.1/C	13.6/B	21.3/C
			PM	27.0/C	-	17.5/B	5.7/A	18.1/B
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	E	AM	-	22.0/C	1.2/A	22.5/C	15.1/B
			PM	-	23.9/C	1.6/A	18.3/B	16.5/B

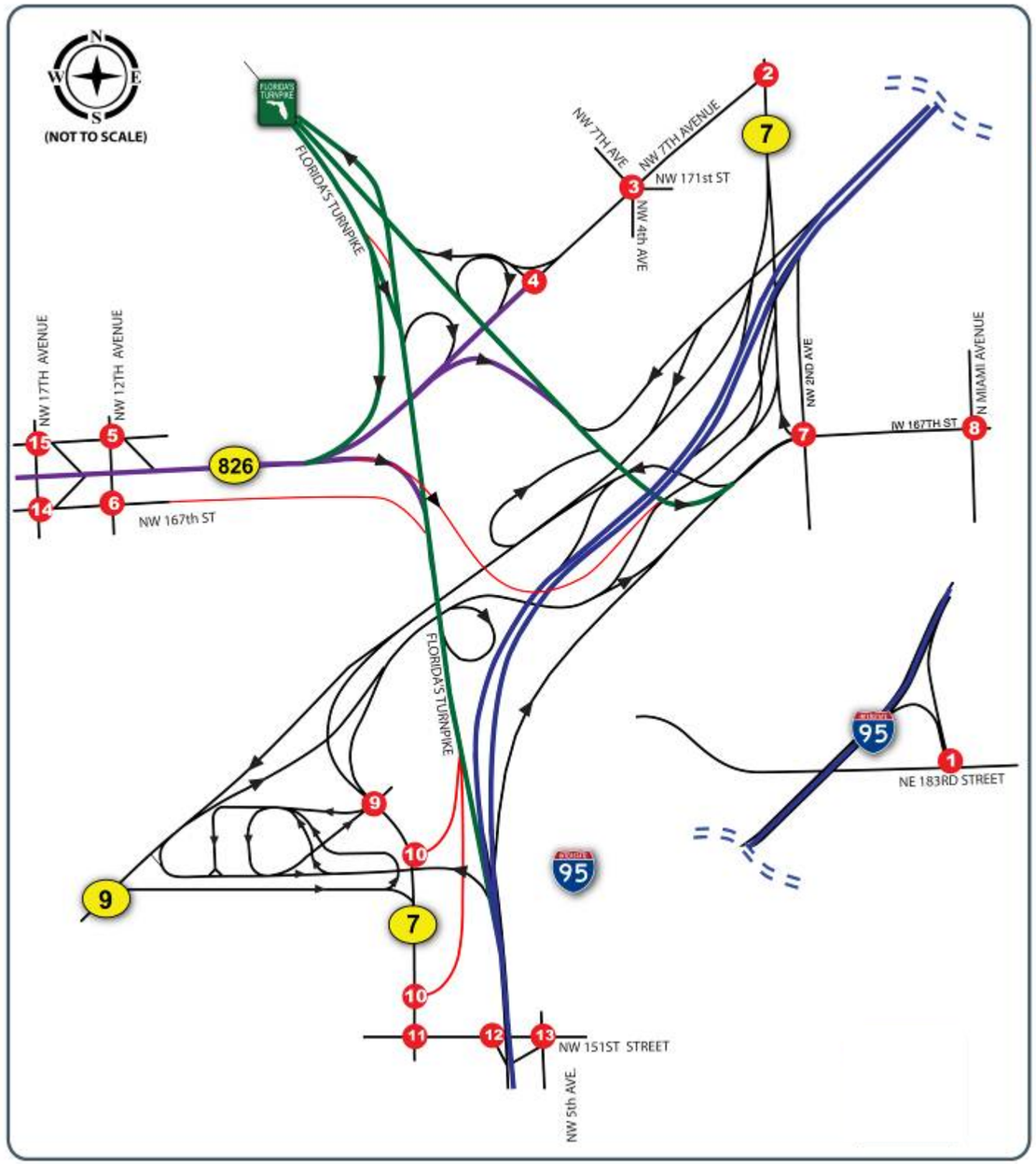
No	Intersection	Adopted LOS	Time	Approach Delay (s/veh)/LOS					Control Delay (s/veh)/LOS
				NW 171 ST	NW 4 Ave	NW 7 Ave	NW 7 Ave Ext		
							NB	SB	
3	NW 7 Ave Ext/NW 171 ST	E	AM	58.5/E	63.5/E	55.9/E	23.4/C	23.4/C	29.4/C
			PM	70.1/E	73.1/E	63.8/E	21.4/C	21.4/C	29.9/C

***Unsignalized Intersections**
**** EB, WB, NB and SB for SEB, NWB, NEB, and SWB**



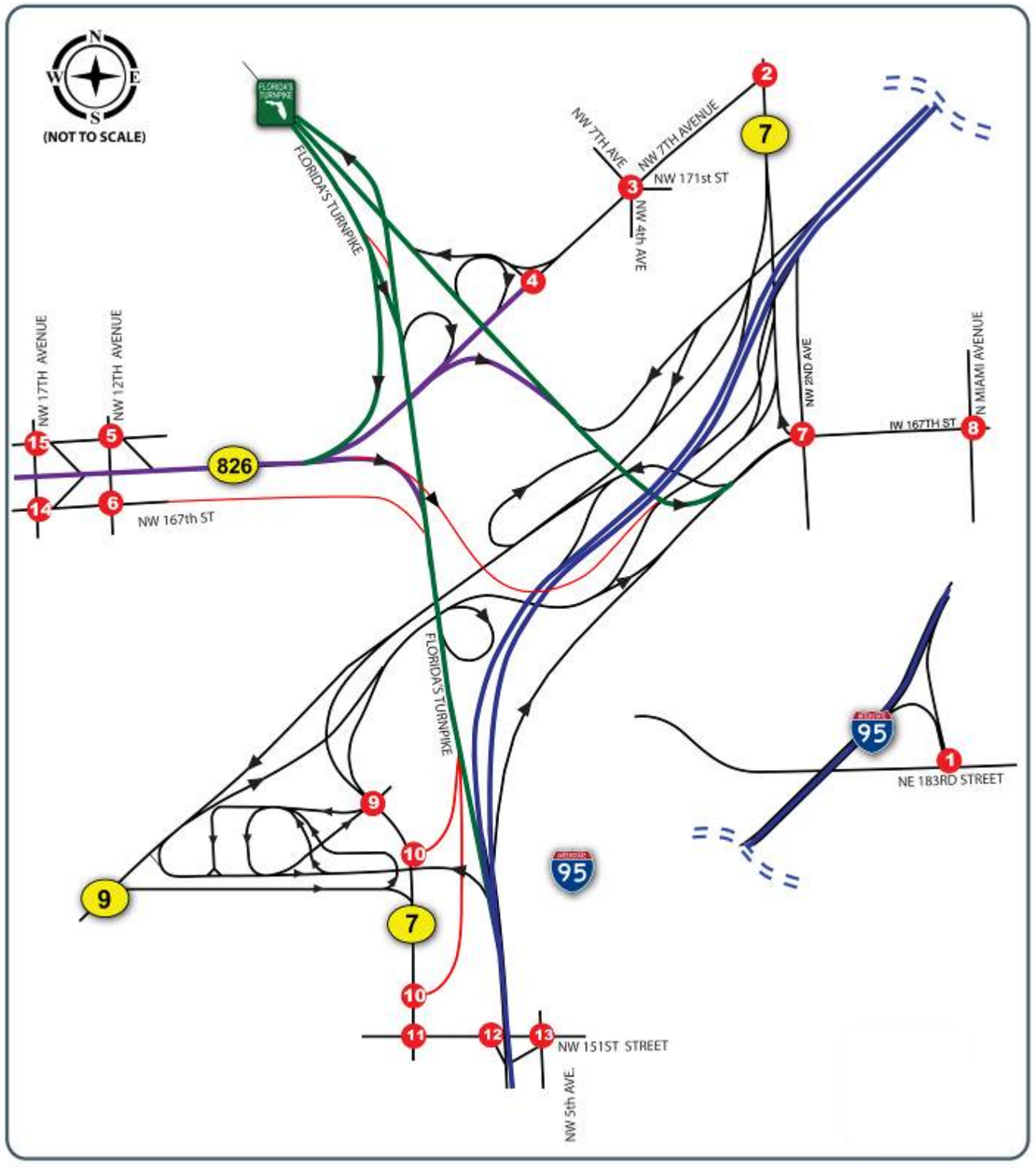
No	Intersection		No Build Control Delay (s/veh)/LOS	Build 3A Control Delay (s/veh)/LOS	Build 3B &3C Control Delay (s/veh)/LOS	Build 4 Control Delay (s/veh)/LOS
1	Miami Gardens Dr/I-95 NB Exit	AM	27.9/C	28.2/C	28.2/C	28.2/C
		PM	91.3/F	96.3/F	96.3/F	96.3/F
2	NW 2 Ave (SR 7)/NW 7 Ave Ext	AM	62.4/E	38.3/D	38.3/D	38.3/D
		PM	58.7/E	43.5/D	43.5/D	43.5/D
3	NW 7 Ave Ext/NW 171ST	AM	24.0/C	22.4/C	22.4/C	22.4/C
		PM	25.7/C	25.4/C	25.4/C	25.4/C
4	NW 7 Ave Ext/NB Ramps to Turnpike	AM	-	21.8/C	21.8/C	21.8/C
		PM	-	15.6/B	15.6/B	15.6/B
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	AM	12.0/B	12.2/B	12.2/B	12.7/B
		PM	18.4/B	18.2/B	18.3/B	22.0/C
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	AM	11.3/B	9.2/A	9.2/A	9.1/A
		PM	12.3/B	4.5/A	4.5/A	19.4/B
7	NW 167 St/NW 2 Ave	AM	116.8/F (v/c 1.33)	143.5/F (v/c 1.43)	143.5/F (v/c 1.43)	120.7/F (v/c 1.29)
		PM	217.7/F (V/C 1.51)	221.5/F (v/c 1.55)	221.5/F (v/c 1.55)	178.5/F (v/c 1.39)
8	NW 167 St/N Miami Ave	AM	35.3/D (v/c 0.95)	48.5/D (v/c 1.05)	48.5/D (v/c 1.05)	45.0/D (v/c 1.05)
		PM	85.7/F (V/C 1.17)	106.2/F (v/c 1.25)	106.2/F (v/c 1.25)	107.6/F (v/c 1.25)
9	NW 7 Ave/GGI Park and Ride	AM	26.9/C	31.3/C	24.1/C	24.5/C
		PM	45.7/D	21.7/C	21.0/B	23.9/C
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	AM	50.7/D	72.8/E	79.3/E	25.0/C
		PM	50.3/D	56.2/E	59.6/E	26.3/C
11	NW 151St/NW 7 Ave	AM	17.9/B	20.5/C	17.9/B	17.9/B
		PM	16.7/B	15.1/B	16.4/B	16.4/B
12	NW 151St/I-95 SB On Ramp	AM	-	-	-	-
		PM	-	-	-	-
13	NW 151St/I-95 NB Exit/NW 6 Ave	AM	24.3/C	25.1/C	26.0/C	26.0/C
		PM	29.5/C	27.0/C	24.0/C	24.0/C
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	AM	36.1/D	19.0/B	19.0/B	17.0/B
		PM	25.4/C	22.5/C	22.5/C	16.4/B
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	AM	27.6/C	15.5/B	15.5/B	15.6/B
		PM	26.1/C	17.1/B	17.1/B	15.6/B

Figure 8-1 Summary Delay and LOS Intersection Analysis – Year 2018



No	Intersection		No Build Control Delay (s/veh)/LOS	Build 3A Control Delay (s/veh)/LOS	Build 3B &3C Control Delay (s/veh)/LOS	Build 4 Control Delay (s/veh)/LOS
1	Miami Gardens Dr/I-95 NB Exit	AM	34.0/C	316/C	316/C	316/C
		PM	114.2/F	112.1/F	112.1/F	112.1/F
2	NW2 Ave (SR 7)/NW7 Ave Ext	AM	89.4/F	53.6/D	53.6/D	53.6/D
		PM	91.4/F	55.8/E	55.8/E	55.8/E
3	NW7 Ave Ext/NW 171ST	AM	26.6/C	26.1/C	26.1/C	26.1/C
		PM	29.2/C	27.7/C	27.7/C	27.7/C
4	NW7 Ave Ext/NB Ramps to Turnpike	AM	-	25.5/C	25.5/C	25.5/C
		PM	-	17.8/B	17.8/B	17.8/B
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	AM	12.5/B	11.9/B	11.9/B	14.0/B
		PM	20.1/C	21.4/C	21.7/C	17.3/B
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	AM	15.2/B	10.6/B	10.6/B	11.2/B
		PM	15.9/B	5.7/A	5.8/A	22.2/C
7	NW 167 St/NW2 Ave	AM	166.2/F (v/c 157)	165.4/F (v/c 152)	165.4/F (v/c 152)	137.2/F (v/c 136)
		PM	293.1/F (v/c 169)	259.8/F (v/c 169)	259.8/F (v/c 169)	214.4/F (v/c 150)
8	NW 167 St/N Miami Ave	AM	45.0/D (v/c 104)	61.5/E (v/c 108)	61.5/E (v/c 108)	57.9/E (v/c 108)
		PM	132.3/F (v/c 130)	147.3/F (v/c 134)	147.3/F (v/c 134)	148.5/F (v/c 134)
9	NW7 Ave/GGI Park and Ride	AM	50.2/D	30.7/C	31.4/C	21.3/C
		PM	71.8/E	106.1/F	66.7/E	65.7/E
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	AM	109.1/F	109.6/F	106.6/F	51.4/D
		PM	93.1/F	103.9/F	80.7/F	54.0/D
11	NW 151St/NW7 Ave	AM	34.7/C	29.2/C	33.8/C	33.8/C
		PM	31.7/C	24.9/C	24.4/C	24.4/C
12	NW 151St/I-95 SB On Ramp	AM	-	-	-	-
		PM	-	-	-	-
13	NW 151St/I-95 NB Exit/NW6 Ave	AM	44.8/D	34.8/C	33.4/C	33.4/C
		PM	37.3/D	31.7/C	32.5/C	32.5/C
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	AM	48.9/D	24.6/C	24.6/C	18.7/B
		PM	30.6/C	24.1/C	24.1/C	17.9/B
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	AM	47.2/D	17.2/B	17.2/B	15.5/B
		PM	35.3/D	18.9/B	18.9/B	15.9/B

Figure 8-2 Summary Delay and LOS Intersection Analysis – Year 2030



No	Intersection		No Build Control Delay (s/veh)/LOS	Ultimate Build Control Delay (s/veh)/LOS
1	Miami Gardens Dr/I-95 NB Exit	AM	413/D	514/D
		PM	128.5/F	149.3/F
2	NW2 Ave (SR 7)/NW7 Ave Ext	AM	105.6/F	70.8/E
		PM	110.9/F	73.7/E
3	NW7 Ave Ext/NW 171ST	AM	29.0/C	29.4/C
		PM	36.3/D	29.9/C
4	NW7 Ave Ext/NB Ramps to Turnpike	AM	-	30.9/C
		PM	-	20.2/C
5	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 12 Ave	AM	14.8/B	14.6/B
		PM	20.2/C	19.8/B
6	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 12 Ave	AM	20.5/C	10.9/B
		PM	15.8/B	24.3/C
7	NW 167 St/NW2 Ave	AM	212.2/F (v/c 167)	234.8/F (v/c 164)
		PM	355.2/F (v/c 186)	255.1/F (v/c 175)
8	NW 167 St/N Miami Ave	AM	69.6/E (v/c 109)	138.0/F (v/c 131)
		PM	175.0/F (v/c 136)	236.3/F (v/c 151)
9	NW7 Ave/GGI Park and Ride	AM	74.9/F	56.9/E
		PM	103.2/F	93.8/F
10	Turnpike Eastbound to I-95 SB Ramp/SR 7	AM	126.0/F	80.8/F
		PM	130.9/F	119.7/F
11	NW 151St/NW7 Ave	AM	47.2/D	36/7/D
		PM	42.8/D	28.6/C
12	NW 151St/I-95 SB On Ramp	AM	-	-
		PM	-	-
13	NW 151St/I-95 NB Exit/NW6 Ave	AM	517/D	45.9/D
		PM	46.5/D	44.8/D
14	Frontage Rd (NW 167 St)/SR 826 EB Exit/NW 17 Ave	AM	63.5/E	213/C
		PM	37.7/D	18.1/B
15	Frontage Rd (NW 167 St)/SR 826 WB Exit/NW 17 Ave	AM	85.8/F	15.1/B
		PM	44.5/D	16.5/B

Figure 8-3 Summary Delay and LOS Intersection Analysis – Year 2040

8.4.2 Freeway Basic Segment Analysis

Basic freeway sections were analyzed using both HCS 2010 and ten (10) CORSIM runs density averages. There are a total of ten (10) basic freeway segments (including both directions) analyzed for the multiple freeways that connect within GGI. The HCS analysis results identifying failing freeway segments and their corresponding LOS are shown in **Tables 8-21** to **8-28**. Due to the similarities between geometry and volumes, Alternatives 3A, 3B, and 4 HCS 2010 results are provided together. The CORSIM analysis results identifying high density freeway segments are shown in **Tables 8-29** to **8-40**. CORSIM processed volumes, speed, and densities are provided for the average of the middle two-hour peak period. All HCS 2010 program files for Basic Freeway Segment and CORSIM Models will be supplied on a CD.

Table 8-21
No Build 2018 Basic Freeway Segment HCS 2010 Analysis

SEGMENT	Period	Direction	Volume (vph)	Speed (mph)	Density (pc/mi/ln)	LOS
I-95 B/W GGI and NW 151 St	AM	NB	7682	56.5	36.2	E
I-95 B/W GGI and NW 151 St	AM	SB	9358	45.7	54.4	F
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	EB	8094	57.6	34.1	D
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	WB	6111	60.0	25.3	C
Turnpike at Toll Plaza	AM	SB	4896	59.6	29.4	D
Turnpike at Toll Plaza	AM	NB	4605	60.0	27.5	D
I-95 B/W GGI and Miami Gardens Dr	AM	SB	6526	50.6	45.8	F
I-95 B/W GGI and Miami Gardens Dr	AM	NB	5229	50.6	31.5	D
I-95 South of NW 151 St	AM	NB	7149	60.0	25.3	C
I-95 South of NW 151 St	AM	SB	8714	50.7	45.7	F
I-95 B/W GGI and NW 151 St	PM	NB	9828	41.4	63.1	F
I-95 B/W GGI and NW 151 St	PM	SB	8649	51.1	45.0	E
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	EB	8073	54.4	39.6	E
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	WB	8364	52.7	42.4	E
Turnpike at Toll Plaza	PM	SB	3092	60.0	18.5	C
Turnpike at Toll Plaza	PM	NB	2908	60.0	17.4	B
I-95 B/W GGI and Miami Gardens Dr	PM	SB	6031	54.8	39.0	E
I-95 B/W GGI and Miami Gardens Dr	PM	NB	6690	49.2	48.2	F
I-95 South of NW 151 St	PM	NB	9146	58.6	33.2	D
I-95 South of NW 151 St	PM	SB	8053	54.7	39.1	E

Table 8-22
No Build 2030 Basic Freeway Segment HCS 2010 Analysis

SEGMENT	Period	Direction	Volume (vph)	Speed (mph)	Density (pc/mi/ln)	LOS
I-95 B/W GGI and NW 151 St	AM	NB	8209	53.8	40.5	E
I-95 B/W GGI and NW 151 St	AM	SB	9989	39.8	66.7	F
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	EB	8562	51.4	44.5	E
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	WB	6402	59.8	28.6	D
Turnpike at Toll Plaza	AM	SB	5864	55.5	37.8	E
Turnpike at Toll Plaza	AM	NB	5491	57.6	34.1	D
I-95 B/W GGI and Miami Gardens Dr	AM	SB	7065	45.2	55.4	F
I-95 B/W GGI and Miami Gardens Dr	AM	NB	5654	43.1	59.5	F
I-95 South of NW 151 St	AM	NB	7521	60.0	26.6	D
I-95 South of NW 151 St	AM	SB	9157	47.4	51.4	F
I-95 B/W GGI and NW 151 St	PM	NB	10502	34.2	81.5	F
I-95 B/W GGI and NW 151 St	PM	SB	9231	46.8	52.5	F
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	EB	8540	51.6	44.2	E
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	WB	8762	50.1	46.7	F
Turnpike at Toll Plaza	PM	SB	3703	60.0	22.1	C
Turnpike at Toll Plaza	PM	NB	3468	60.0	20.7	C
I-95 B/W GGI and Miami Gardens Dr	PM	SB	6529	50.7	45.6	F
I-95 B/W GGI and Miami Gardens Dr	PM	NB	7234	43.1	59.5	F
I-95 South of NW 151 St	PM	NB	9622	57.2	35.7	E
I-95 South of NW 151 St	PM	SB	8463	52.4	43.0	E

Table 8-23
No Build 2040 Basic Freeway Segment HCS 2010 Analysis

SEGMENT	Period	Direction	Volume (vph)	Speed (mph)	Density (pc/mi/ln)	LOS
I-95 B/W GGI and NW 151 St	AM	NB	8506	52.1	43.4	E
I-95 B/W GGI and NW 151 St	AM	SB	10347	36.0	76.4	F
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	EB	8830	49.5	47.6	F
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	WB	6509	59.8	28.7	D
Turnpike at Toll Plaza	AM	SB	6443	50.9	45.3	F
Turnpike at Toll Plaza	AM	NB	6020	54.4	39.6	E
I-95 B/W GGI and Miami Gardens Dr	AM	SB	7260	42.8	60.1	F
I-95 B/W GGI and Miami Gardens Dr	AM	NB	5798	56.2	36.5	E
I-95 South of NW 151 St	AM	NB	7651	60.0	27.1	E
I-95 South of NW 151 St	AM	SB	9313	46.1	53.7	F
I-95 B/W GGI and NW 151 St	PM	NB	10883	29.6	97.6	F
I-95 B/W GGI and NW 151 St	PM	SB	9563	43.9	57.9	F
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	EB	8807	49.7	47.3	F
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	WB	8909	49.0	48.6	F
Turnpike at Toll Plaza	PM	SB	4069	60.0	24.3	C
Turnpike at Toll Plaza	PM	NB	3801	60.0	22.7	C
I-95 B/W GGI and Miami Gardens Dr	PM	SB	6709	49.0	48.5	F
I-95 B/W GGI and Miami Gardens Dr	PM	NB	7417	40.8	64.4	F
I-95 South of NW 151 St	PM	NB	9788	56.6	36.7	E
I-95 South of NW 151 St	PM	SB	8607	51.4	44.5	E

Table 8-24
Builds 3A, 3B, and 4 2018 Basic Freeway Segment HCS 2010 Analysis

SEGMENT	Period	Direction	Volume (vph)	Speed (mph)	Density (pc/mi/ln)	LOS
I-95 B/W GGI and NW 151 St	AM	NB	7855	59.9	27.9	D
I-95 B/W GGI and NW 151 St	AM	SB	9908	55.3	38.1	E
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	EB	7864	59.9	28.1	D
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	WB	6328	60.0	22.5	C
Turnpike at Toll Plaza	AM	SB	5013	60.0	22.4	C
Turnpike at Toll Plaza	AM	NB	4736	60.0	21.2	C
I-95 B/W GGI and Miami Gardens Dr	AM	SB	6840	59.1	30.7	D
I-95 B/W GGI and Miami Gardens Dr	AM	NB	5582	60.0	24.7	C
I-95 South of NW 151 St	AM	NB	7173	60.0	25.4	C
I-95 South of NW 151 St	AM	SB	9848	41.2	63.5	F
I-95 B/W GGI and NW 151 St	PM	NB	10050	54.8	39.0	E
I-95 B/W GGI and NW 151 St	PM	SB	9157	57.8	33.7	D
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	EB	7843	59.9	28.0	D
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	WB	8661	59.9	31.4	D
Turnpike at Toll Plaza	PM	SB	3166	60.0	14.2	B
Turnpike at Toll Plaza	PM	NB	2991	60.0	13.4	B
I-95 B/W GGI and Miami Gardens Dr	PM	SB	6322	59.9	28.1	D
I-95 B/W GGI and Miami Gardens Dr	PM	NB	7142	58.4	32.5	D
I-95 South of NW 151 St	PM	NB	9177	58.5	33.3	D
I-95 South of NW 151 St	PM	SB	9102	47.8	50.6	F

Table 8-25
Builds 3C 2018 Basic Freeway Segment HCS 2010 Analysis

SEGMENT	Period	Direction	Volume (vph)	Speed (mph)	Density (pc/mi/ln)	LOS
I-95 B/W GGI and NW 151 St	AM	NB	7855	59.9	27.9	D
I-95 B/W GGI and NW 151 St	AM	SB	8739	58.8	31.6	D
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	EB	7864	59.9	28.1	D
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	WB	6328	60.0	22.5	C
Turnpike at Toll Plaza	AM	SB	5013	60.0	22.4	C
Turnpike at Toll Plaza	AM	NB	4736	60.0	21.2	C
I-95 B/W GGI and Miami Gardens Dr	AM	SB	6840	59.1	30.7	D
I-95 B/W GGI and Miami Gardens Dr	AM	NB	5582	60.0	24.7	C
I-95 South of NW 151 St	AM	NB	7173	60.0	25.4	C
I-95 South of NW 151 St	AM	SB	8679	50.9	45.3	F
I-95 B/W GGI and NW 151 St	PM	NB	10050	54.8	39.0	E
I-95 B/W GGI and NW 151 St	PM	SB	8077	59.8	28.7	D
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	EB	7843	59.9	28.0	D
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	WB	8661	59.9	31.4	D
Turnpike at Toll Plaza	PM	SB	3166	60.0	14.2	B
Turnpike at Toll Plaza	PM	NB	2991	60.0	13.4	B
I-95 B/W GGI and Miami Gardens Dr	PM	SB	6322	59.9	28.1	D
I-95 B/W GGI and Miami Gardens Dr	PM	NB	7142	58.4	32.5	D
I-95 South of NW 151 St	PM	NB	9177	58.5	33.3	D
I-95 South of NW 151 St	PM	SB	8021	54.9	38.9	E

Table 8-26
Builds 3A, 3B, and 4 2030 Basic Freeway Segment HCS 2010 Analysis

SEGMENT	Period	Direction	Volume (vph)	Speed (mph)	Density (pc/mi/ln)	LOS
I-95 B/W GGI and NW 151 St	AM	NB	8420	59.3	30.2	D
I-95 B/W GGI and NW 151 St	AM	SB	10533	52.6	42.6	E
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	EB	8309	59.4	29.9	D
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	WB	6773	60.0	22.9	C
Turnpike at Toll Plaza	AM	SB	5972	60.0	26.7	D
Turnpike at Toll Plaza	AM	NB	5617	60.0	25.1	C
I-95 B/W GGI and Miami Gardens Dr	AM	SB	7222	58.1	33.0	D
I-95 B/W GGI and Miami Gardens Dr	AM	NB	5853	60.0	25.9	C
I-95 South of NW 151 St	AM	NB	7583	60.0	26.9	D
I-95 South of NW 151 St	AM	SB	10435	35.0	79.3	F
I-95 B/W GGI and NW 151 St	PM	NB	10772	51.4	44.6	E
I-95 B/W GGI and NW 151 St	PM	SB	9734	56.0	37.0	E
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	EB	8287	59.5	29.5	D
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	WB	9271	58.5	32.2	D
Turnpike at Toll Plaza	PM	SB	3771	60.0	16.9	B
Turnpike at Toll Plaza	PM	NB	3547	60.0	15.9	B
I-95 B/W GGI and Miami Gardens Dr	PM	SB	6675	59.5	29.8	D
I-95 B/W GGI and Miami Gardens Dr	PM	NB	7488	57.2	34.8	D
I-95 South of NW 151 St	PM	NB	9701	57.0	36.2	E
I-95 South of NW 151 St	PM	SB	9644	53.2	59.4	F

Table 8-27
Builds 3C 2030 Basic Freeway Segment HCS 2010 Analysis

SEGMENT	Period	Direction	Volume (vph)	Speed (mph)	Density (pc/mi/ln)	LOS
I-95 B/W GGI and NW 151 St	AM	NB	8420	59.3	30.2	D
I-95 B/W GGI and NW 151 St	AM	SB	9264	57.5	34.3	D
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	EB	8309	59.4	29.9	D
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	WB	6773	60.0	22.9	C
Turnpike at Toll Plaza	AM	SB	5972	60.0	26.7	D
Turnpike at Toll Plaza	AM	NB	5617	60.0	25.1	C
I-95 B/W GGI and Miami Gardens Dr	AM	SB	7222	58.1	33.0	D
I-95 B/W GGI and Miami Gardens Dr	AM	NB	5853	60.0	25.9	C
I-95 South of NW 151 St	AM	NB	7583	60.0	26.9	D
I-95 South of NW 151 St	AM	SB	9166	47.3	51.5	F
I-95 B/W GGI and NW 151 St	PM	NB	10772	51.4	44.6	E
I-95 B/W GGI and NW 151 St	PM	SB	8562	59.1	30.8	D
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	EB	8287	59.5	29.5	D
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	WB	9271	58.5	32.2	D
Turnpike at Toll Plaza	PM	SB	3771	60.0	16.9	B
Turnpike at Toll Plaza	PM	NB	3547	60.0	15.9	B
I-95 B/W GGI and Miami Gardens Dr	PM	SB	6675	59.5	29.8	D
I-95 B/W GGI and Miami Gardens Dr	PM	NB	7488	57.2	34.8	D
I-95 South of NW 151 St	PM	NB	9701	57.0	36.2	E
I-95 South of NW 151 St	PM	SB	8472	52.3	43.1	E

Table 8-28
Ultimate Build 2040 Basic Freeway Segment HCS 2010 Analysis

SEGMENT	Period	Direction	Volume (vph)	Speed (mph)	Density (pc/mi/ln)	LOS
I-95 B/W GGI and NW 151 St	AM	NB	8544	59.1	30.7	D
I-95 B/W GGI and NW 151 St	AM	SB	9164	57.8	33.7	D
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	EB	8316	59.4	29.9	D
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	WB	6834	60.0	24.3	C
Turnpike at Toll Plaza	AM	SB	6868	58.9	31.3	D
Turnpike at Toll Plaza	AM	NB	6415	59.7	28.8	D
I-95 B/W GGI and Miami Gardens Dr	AM	SB	7470	57.3	34.6	D
I-95 B/W GGI and Miami Gardens Dr	AM	NB	6026	60.0	26.7	D
I-95 South of NW 151 St	AM	NB	7707	60.0	27.3	D
I-95 South of NW 151 St	AM	SB	9284	46.3	53.3	F
I-95 B/W GGI and NW 151 St	PM	NB	10930	50.5	46.0	F
I-95 B/W GGI and NW 151 St	PM	SB	8469	59.3	30.4	D
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	EB	8297	59.5	29.8	D
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	WB	9354	57.9	34.5	D
Turnpike at Toll Plaza	PM	SB	4337	60.0	19.4	C
Turnpike at Toll Plaza	PM	NB	4051	60.0	18.1	C
I-95 B/W GGI and Miami Gardens Dr	PM	SB	6903	59.0	31.1	D
I-95 B/W GGI and Miami Gardens Dr	PM	NB	7709	56.3	36.4	E
I-95 South of NW 151 St	PM	NB	9859	56.4	37.2	E
I-95 South of NW 151 St	PM	SB	8580	51.6	44.2	E

Table 8-29
No Build 2018 Basic Freeway Segment CORSIM Analysis

SEGMENT		Direction	CORSIM Node	Demand Volume (vph)	Processed Volume (vph)	Speed (mph)	Density (veh/mi/ln)
AM	I-95 B/W GGI and NW 151 St	NB	70	7682	7443	54	28
	I-95 B/W GGI and NW 151 St	SB	52	9358	6430	52	31
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8094	4382	12	93
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	5087	4464	58	19
	Turnpike at Toll Plaza	SB	63	4896	4288	7	154
	Turnpike at Toll Plaza	NB	127	4605	2516	25	25
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6526	3287	57	19
	I-95 B/W GGI and Miami Gardens Dr	NB	48	5229	6264	55	29
	I-95 South of NW 151 St	NB	42	7149	6358	52	25
	I-95 South of NW 151 St	SB	101	8714	7390	56	26
PM	I-95 B/W GGI and NW 151 St	NB	70	9828	8053	16	102
	I-95 B/W GGI and NW 151 St	SB	52	8649	5532	52	27
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8073	3430	10	98
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	6963	4698	57	21
	Turnpike at Toll Plaza	SB	63	3092	3660	33	33
	Turnpike at Toll Plaza	NB	127	2908	2904	25	29
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6031	3096	57	18
	I-95 B/W GGI and Miami Gardens Dr	NB	48	6690	5982	19	83
	I-95 South of NW 151 St	NB	42	9146	5848	51	23
	I-95 South of NW 151 St	SB	101	8053	7313	11	140

Table 8-30
No Build 2030 Basic Freeway Segment CORSIM Analysis

	SEGMENT	Direction	CORSIM Node	Demand Volume (vph)	Processed Volume (vph)	Speed (mph)	Density (veh/mi/ln)
AM	I-95 B/W GGI and NW 151 St	NB	70	8209	7425	54	28
	I-95 B/W GGI and NW 151 St	SB	52	9989	5798	52	28
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8562	3840	10	100
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	5275	4700	55	24
	Turnpike at Toll Plaza	SB	63	5864	3130	10	79
	Turnpike at Toll Plaza	NB	127	5491	3050	25	30
	I-95 B/W GGI and Miami Gardens Dr	SB	28	7065	3609	57	21
	I-95 B/W GGI and Miami Gardens Dr	NB	48	5654	5924	27	69
	I-95 South of NW 151 St	NB	42	7521	5653	52	22
	I-95 South of NW 151 St	SB	101	9157	7510	56	27
PM	I-95 B/W GGI and NW 151 St	NB	70	10502	6458	13	99
	I-95 B/W GGI and NW 151 St	SB	52	9231	5454	52	26
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8540	3280	8	104
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	7220	4850	58	21
	Turnpike at Toll Plaza	SB	63	3703	2858	9	82
	Turnpike at Toll Plaza	NB	127	3468	3210	25	32
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6529	3396	57	20
	I-95 B/W GGI and Miami Gardens Dr	NB	48	7234	5386	56	24
	I-95 South of NW 151 St	NB	42	9622	5583	52	22
	I-95 South of NW 151 St	SB	101	8463	5743	7	170

Table 8-31
No Build 2040 Basic Freeway Segment CORSIM Analysis

	SEGMENT	Direction	CORSIM Node	Demand Volume (vph)	Processed Volume (vph)	Speed (mph)	Density (veh/mi/ln)
AM	I-95 B/W GGI and NW 151 St	NB	70	8506	7725	54	29
	I-95 B/W GGI and NW 151 St	SB	52	10347	5722	52	27
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8830	3384	8	104
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	5332	4846	58	21
	Turnpike at Toll Plaza	SB	63	6443	3004	10	79
	Turnpike at Toll Plaza	NB	127	6020	3144	25	32
	I-95 B/W GGI and Miami Gardens Dr	SB	28	7260	3738	55	23
	I-95 B/W GGI and Miami Gardens Dr	NB	48	5798	6378	55	29
	I-95 South of NW 151 St	NB	42	7651	5478	52	21
	I-95 South of NW 151 St	SB	101	9313	7940	56	28
PM	I-95 B/W GGI and NW 151 St	NB	70	10883	6865	13	104
	I-95 B/W GGI and NW 151 St	SB	52	9563	5150	53	25
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8807	2888	7	109
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	7298	4662	58	20
	Turnpike at Toll Plaza	SB	63	4069	2758	8	89
	Turnpike at Toll Plaza	NB	127	3801	3168	25	32
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6709	3495	57	21
	I-95 B/W GGI and Miami Gardens Dr	NB	48	7417	5642	56	25
	I-95 South of NW 151 St	NB	42	9788	5290	52	20
	I-95 South of NW 151 St	SB	101	8607	6253	8	162

Table 8-32
Build 3A 2018 Basic Freeway Segment CORSIM Analysis

	SEGMENT	Direction	CORSIM Node	Demand Volume (vph)	Processed Volume (vph)	Speed (mph)	Density (veh/mi/ln)
AM	I-95 B/W GGI and NW 151 St	NB	70	7855	7650	54	28
	I-95 B/W GGI and NW 151 St	SB	52	9908	9863	29	69
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	7864	8388	49	34
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	5360	4688	57	20
	Turnpike at Toll Plaza	SB	63	5013	5004	41	31
	Turnpike at Toll Plaza	NB	127	4736	3996	25	40
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6840	5868	57	26
	I-95 B/W GGI and Miami Gardens Dr	NB	48	5582	5648	56	25
	I-95 South of NW 151 St	NB	42	7173	8557	45	43
	I-95 South of NW 151 St	SB	101	9848	7418	56	26
PM	I-95 B/W GGI and NW 151 St	NB	70	10050	8465	31	70
	I-95 B/W GGI and NW 151 St	SB	52	9157	8593	40	43
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	7843	7820	34	53
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	7337	4772	58	21
	Turnpike at Toll Plaza	SB	63	3166	3162	42	19
	Turnpike at Toll Plaza	NB	127	2991	3674	25	37
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6322	5520	57	24
	I-95 B/W GGI and Miami Gardens Dr	NB	48	7142	6288	54	30
	I-95 South of NW 151 St	NB	42	9177	8508	49	35
	I-95 South of NW 151 St	SB	101	9102	8438	34	72

Table 8-33
Build 3A 2030 Basic Freeway Segment CORSIM Analysis

	SEGMENT	Direction	CORSIM Node	Demand Volume (vph)	Processed Volume (vph)	Speed (mph)	Density (veh/mi/ln)
AM	I-95 B/W GGI and NW 151 St	NB	70	8420	7978	54	30
	I-95 B/W GGI and NW 151 St	SB	52	10533	9820	30	66
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8309	8618	48	36
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	5701	4926	57	22
	Turnpike at Toll Plaza	SB	63	5972	5572	24	63
	Turnpike at Toll Plaza	NB	127	5617	4586	25	47
	I-95 B/W GGI and Miami Gardens Dr	SB	28	7222	6194	56	28
	I-95 B/W GGI and Miami Gardens Dr	NB	48	5853	6224	50	35
	I-95 South of NW 151 St	NB	42	7583	8429	44	44
	I-95 South of NW 151 St	SB	101	10435	7848	56	28
PM	I-95 B/W GGI and NW 151 St	NB	70	10772	7170	21	91
	I-95 B/W GGI and NW 151 St	SB	52	9734	8715	38	48
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8287	7325	30	67
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	7803	4788	58	21
	Turnpike at Toll Plaza	SB	63	3771	3756	37	27
	Turnpike at Toll Plaza	NB	127	3547	4368	24	45
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6675	5632	10	143
	I-95 B/W GGI and Miami Gardens Dr	NB	48	7488	5584	32	68
	I-95 South of NW 151 St	NB	42	9701	8700	42	37
	I-95 South of NW 151 St	SB	101	9644	7080	21	121

Table 8-34
Build 3B 2018 Basic Freeway Segment CORSIM Analysis

	SEGMENT	Direction	CORSIM Node	Demand Volume (vph)	Processed Volume (vph)	Speed (mph)	Density (veh/mi/ln)
AM	I-95 B/W GGI and NW 151 St	NB	70	7855	7640	54	28
	I-95 B/W GGI and NW 151 St	SB	52	9908	9833	40	51
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	7864	8390	49	34
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	5360	4690	57	20
	Turnpike at Toll Plaza	SB	63	5013	5004	41	31
	Turnpike at Toll Plaza	NB	127	4736	3978	25	40
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6840	5872	57	26
	I-95 B/W GGI and Miami Gardens Dr	NB	48	5582	5600	56	25
	I-95 South of NW 151 St	NB	42	7173	9295	41	51
	I-95 South of NW 151 St	SB	101	9848	7418	56	26
PM	I-95 B/W GGI and NW 151 St	NB	70	10050	8983	39	53
	I-95 B/W GGI and NW 151 St	SB	52	9157	8630	51	34
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	7843	8103	48	35
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	7337	4886	58	21
	Turnpike at Toll Plaza	SB	63	3166	3160	42	19
	Turnpike at Toll Plaza	NB	127	2991	3848	25	39
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6322	5566	57	25
	I-95 B/W GGI and Miami Gardens Dr	NB	48	7142	6242	33	30
	I-95 South of NW 151 St	NB	42	9177	9273	49	38
	I-95 South of NW 151 St	SB	101	9102	8933	44	49

Table 8-35
Build 3B 2030 Basic Freeway Segment CORSIM Analysis

	SEGMENT	Direction	CORSIM Node	Demand Volume (vph)	Processed Volume (vph)	Speed (mph)	Density (veh/mi/ln)
AM	I-95 B/W GGI and NW 151 St	NB	70	8420	7968	54	30
	I-95 B/W GGI and NW 151 St	SB	52	10533	9793	34	60
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8309	8628	47	37
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	5701	4962	57	22
	Turnpike at Toll Plaza	SB	63	5972	5582	25	60
	Turnpike at Toll Plaza	NB	127	5617	4594	24	47
	I-95 B/W GGI and Miami Gardens Dr	SB	28	7222	6200	56	28
	I-95 B/W GGI and Miami Gardens Dr	NB	48	5853	6200	49	37
	I-95 South of NW 151 St	NB	42	7583	9179	39	53
	I-95 South of NW 151 St	SB	101	10435	7845	56	28
PM	I-95 B/W GGI and NW 151 St	NB	70	10772	6833	12	111
	I-95 B/W GGI and NW 151 St	SB	52	9734	8928	51	35
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8287	8485	48	36
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	7803	5024	57	22
	Turnpike at Toll Plaza	SB	63	3771	3766	42	23
	Turnpike at Toll Plaza	NB	127	3547	4120	24	42
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6675	5752	14	118
	I-95 B/W GGI and Miami Gardens Dr	NB	48	7488	6054	51	34
	I-95 South of NW 151 St	NB	42	9701	9625	46	41
	I-95 South of NW 151 St	SB	101	9644	6958	10	147

Table 8-36
Build 3C 2018 Basic Freeway Segment CORSIM Analysis

	SEGMENT	Direction	CORSIM Node	Demand Volume (vph)	Processed Volume (vph)	Speed (mph)	Density (veh/mi/ln)
AM	I-95 B/W GGI and NW 151 St	NB	70	7855	7640	54	28
	I-95 B/W GGI and NW 151 St	SB	52	8739	8950	50	36
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	7864	8390	49	34
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	5360	4662	57	20
	Turnpike at Toll Plaza	SB	63	5013	5004	41	31
	Turnpike at Toll Plaza	NB	127	4736	3988	25	40
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6840	5868	56	26
	I-95 B/W GGI and Miami Gardens Dr	NB	48	5582	5590	56	25
	I-95 South of NW 151 St	NB	42	7173	8427	48	40
	I-95 South of NW 151 St	SB	101	8679	7418	56	26
PM	I-95 B/W GGI and NW 151 St	NB	70	10050	9118	44	48
	I-95 B/W GGI and NW 151 St	SB	52	8077	8170	51	32
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	7843	8113	50	33
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	7337	4890	58	21
	Turnpike at Toll Plaza	SB	63	3166	3160	42	19
	Turnpike at Toll Plaza	NB	127	2991	3916	25	40
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6322	5562	57	25
	I-95 B/W GGI and Miami Gardens Dr	NB	48	7142	6618	40	50
	I-95 South of NW 151 St	NB	42	9177	8810	50	35
	I-95 South of NW 151 St	SB	101	8021	8998	49	44

Table 8-37
Build 3C 2030 Basic Freeway Segment CORSIM Analysis

	SEGMENT	Direction	CORSIM Node	Demand Volume (vph)	Processed Volume (vph)	Speed (mph)	Density (veh/mi/ln)
AM	I-95 B/W GGI and NW 151 St	NB	70	8420	7970	54	30
	I-95 B/W GGI and NW 151 St	SB	52	9264	9133	50	37
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8309	8623	48	36
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	5701	4910	57	21
	Turnpike at Toll Plaza	SB	63	5972	5934	35	46
	Turnpike at Toll Plaza	NB	127	5617	4580	24	47
	I-95 B/W GGI and Miami Gardens Dr	SB	28	7222	6210	56	28
	I-95 B/W GGI and Miami Gardens Dr	NB	48	5853	6158	53	30
	I-95 South of NW 151 St	NB	42	7583	8612	46	43
	I-95 South of NW 151 St	SB	101	9166	7845	56	28
PM	I-95 B/W GGI and NW 151 St	NB	70	10772	7970	16	100
	I-95 B/W GGI and NW 151 St	SB	52	8562	8133	51	32
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8287	8413	49	35
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	7803	4870	58	21
	Turnpike at Toll Plaza	SB	63	3771	3766	41	23
	Turnpike at Toll Plaza	NB	127	3547	4108	24	42
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6675	5810	11	134
	I-95 B/W GGI and Miami Gardens Dr	NB	48	7488	6124	56	27
	I-95 South of NW 151 St	NB	42	9701	8815	49	36
	I-95 South of NW 151 St	SB	101	8472	7738	12	134

Table 8-38
Build 4 2018 Basic Freeway Segment CORSIM Analysis

	SEGMENT	Direction	CORSIM Node	Demand Volume (vph)	Processed Volume (vph)	Speed (mph)	Density (veh/mi/ln)
AM	I-95 B/W GGI and NW 151 St	NB	70	7855	7640	54	28
	I-95 B/W GGI and NW 151 St	SB	52	9908	9898	34	62
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	7864	8258	49	33
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	5360	4708	57	21
	Turnpike at Toll Plaza	SB	63	5013	5002	41	31
	Turnpike at Toll Plaza	NB	127	4736	3988	25	40
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6840	5878	57	26
	I-95 B/W GGI and Miami Gardens Dr	NB	48	5582	5602	56	25
	I-95 South of NW 151 St	NB	42	7173	9422	40	53
	I-95 South of NW 151 St	SB	101	9848	7415	56	26
PM	I-95 B/W GGI and NW 151 St	NB	70	10050	9103	40	51
	I-95 B/W GGI and NW 151 St	SB	52	9157	9078	51	36
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	7843	8000	50	32
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	7337	4896	58	21
	Turnpike at Toll Plaza	SB	63	3166	3160	42	19
	Turnpike at Toll Plaza	NB	127	2991	3898	25	39
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6322	5578	57	25
	I-95 B/W GGI and Miami Gardens Dr	NB	48	7142	6726	51	36
	I-95 South of NW 151 St	NB	42	9177	9780	47	42
	I-95 South of NW 151 St	SB	101	9102	8995	46	46

Table 8-39
Build 4 2030 Basic Freeway Segment CORSIM Analysis

	SEGMENT	Direction	CORSIM Node	Demand Volume (vph)	Processed Volume (vph)	Speed (mph)	Density (veh/mi/ln)
AM	I-95 B/W GGI and NW 151 St	NB	70	8420	7975	54	30
	I-95 B/W GGI and NW 151 St	SB	52	10533	9845	29	71
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8309	8425	47	36
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	5701	5016	57	22
	Turnpike at Toll Plaza	SB	63	5972	5916	36	42
	Turnpike at Toll Plaza	NB	127	5617	4636	24	47
	I-95 B/W GGI and Miami Gardens Dr	SB	28	7222	6204	56	28
	I-95 B/W GGI and Miami Gardens Dr	NB	48	5853	6156	56	28
	I-95 South of NW 151 St	NB	42	7583	9284	39	54
	I-95 South of NW 151 St	SB	101	10435	7845	56	28
PM	I-95 B/W GGI and NW 151 St	NB	70	10772	4785	9	106
	I-95 B/W GGI and NW 151 St	SB	52	9734	9335	49	38
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8287	8350	48	35
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	7803	4660	58	20
	Turnpike at Toll Plaza	SB	63	3771	3768	42	23
	Turnpike at Toll Plaza	NB	127	3547	3876	24	40
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6675	5720	19	120
	I-95 B/W GGI and Miami Gardens Dr	NB	48	7488	4960	57	22
	I-95 South of NW 151 St	NB	42	9701	10105	43	47
	I-95 South of NW 151 St	SB	101	9644	4650	5	176

Table 8-40
Ultimate Build 2040 Basic Freeway Segment CORSIM Analysis

	SEGMENT	Direction	CORSIM Node	Demand Volume (vph)	Processed Volume (vph)	Speed (mph)	Density (veh/mi/ln)
AM	I-95 B/W GGI and NW 151 St	NB	70	8544	6885	31	63
	I-95 B/W GGI and NW 151 St	SB	52	9164	9695	48	41
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8316	7520	51	29
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	4883	4732	57	21
	Turnpike at Toll Plaza	SB	63	6868	5584	20	69
	Turnpike at Toll Plaza	NB	127	6415	4364	24	45
	I-95 B/W GGI and Miami Gardens Dr	SB	28	7470	6444	54	30
	I-95 B/W GGI and Miami Gardens Dr	NB	48	6026	5052	57	22
	I-95 South of NW 151 St	NB	42	7707	8758	44	46
	I-95 South of NW 151 St	SB	101	9284	7110	34	72
PM	I-95 B/W GGI and NW 151 St	NB	70	10930	6140	12	100
	I-95 B/W GGI and NW 151 St	SB	52	8469	9225	50	37
	SR 826 B/W NW 17 Ave and NW 12 Ave	EB	502	8297	7425	52	29
	SR 826 B/W NW 17 Ave and NW 12 Ave	WB	704	6683	4388	57	19
	Turnpike at Toll Plaza	SB	63	4337	4332	41	26
	Turnpike at Toll Plaza	NB	127	4051	4132	24	43
	I-95 B/W GGI and Miami Gardens Dr	SB	28	6903	6056	56	27
	I-95 B/W GGI and Miami Gardens Dr	NB	48	7709	5272	57	23
	I-95 South of NW 151 St	NB	42	9859	9710	47	41
	I-95 South of NW 151 St	SB	101	8580	6100	8	160

8.4.3 Ramp Merge and Diverge Analysis

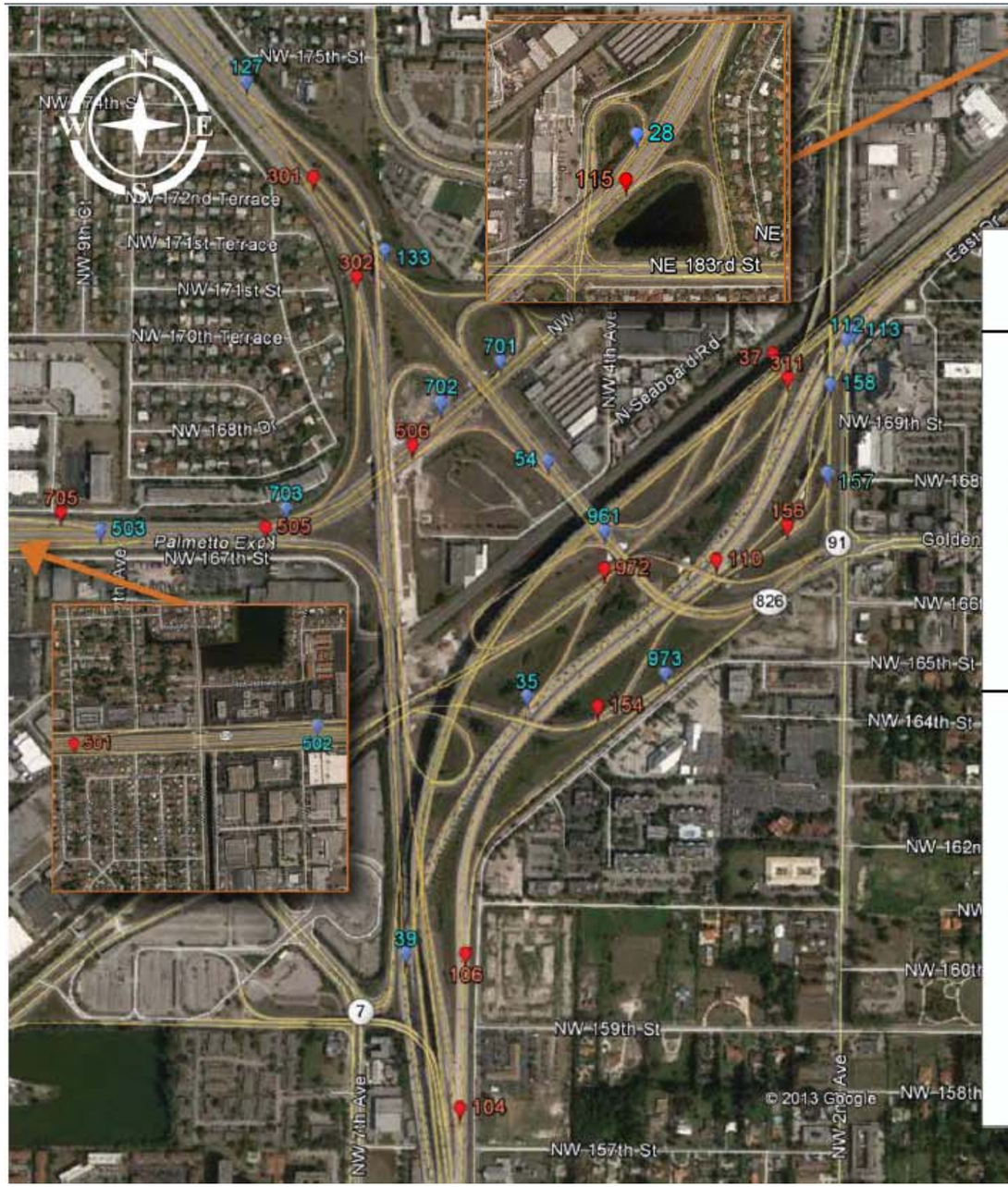
The merge and diverge analysis was performed by extracting volumes, speeds, and densities calculated by CORSIM for the incoming and outgoing ramp segments from the merge/diverge node. It should be noted that CORSIM density is based on number of vehicles instead of equivalent passenger car. However, since peak hour truck percentages are relatively low within GGI, no adjustments were necessary.

HCM states that currently there are no reliable empirical models for analyzing Major Merge and Major Diverge ramp junctions. As such, only CORSIM results will be used for all types of merge and diverge ramp analysis. The merge and diverge analysis results are summarized in **Figure 8-4** to **8-15** for No Build Alternatives for years 2018, 2030, and 2040, Build Alternative 3A (2018 and 2030), Build Alternative 3B (2018 and 2030), Build Alternative 3C (2018 and 2030), Build Alternative 4 (2018 and 2030), and Ultimate Build 2040, respectively.

	CORSIM NODES	AM			PM		
		Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)	Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)
DIVERGE	154	947	25	37	1076	58	22
	156	1431	40	36	1627	57	31
	311	1062	26	41	689	16	42
	37	1008	30	34	961	27	36
	302	1216	181	7	1060	25	43
	301	1072	154	7	915	33	33
	506	826	66	13	663	71	10
	501	1063	187	6	853	195	5
	505	1218	67	18	967	68	16
	106	1584	31	50	1652	35	49
	104	1489	28	54	1610	102	16
	110	1449	29	50	1490	31	49
	115	1565	33	48	1496	76	20
	972	937	N/A	29	1137	N/A	28
MERGE	157	697	19	37	759	22	37
	158	1006	24	42	1121	28	42
	39	1526	31	50	1312	27	51
	127	629	25	25	726	29	25
	54	1110	160	7	886	170	6
	133	786	19	42	889	22	42
	702	1167	25	46	1248	27	46
	701	782	22	36	776	22	36
	503	1142	72	16	906	76	13
	35	983	18	55	885	16	56
	112	1002	20	50	1019	37	36
	113	1125	20	56	1146	82	26
	28	1096	19	57	1032	18	57
	703	1116	20	57	1174	21	57
	502	1095	93	12	857	98	10
	961	2627	N/A	8	2091	N/A	7
	973	1086	N/A	20	1244	N/A	10

Note: The critical segment length does not conform to the standard 1,500-ft mentioned in HCM

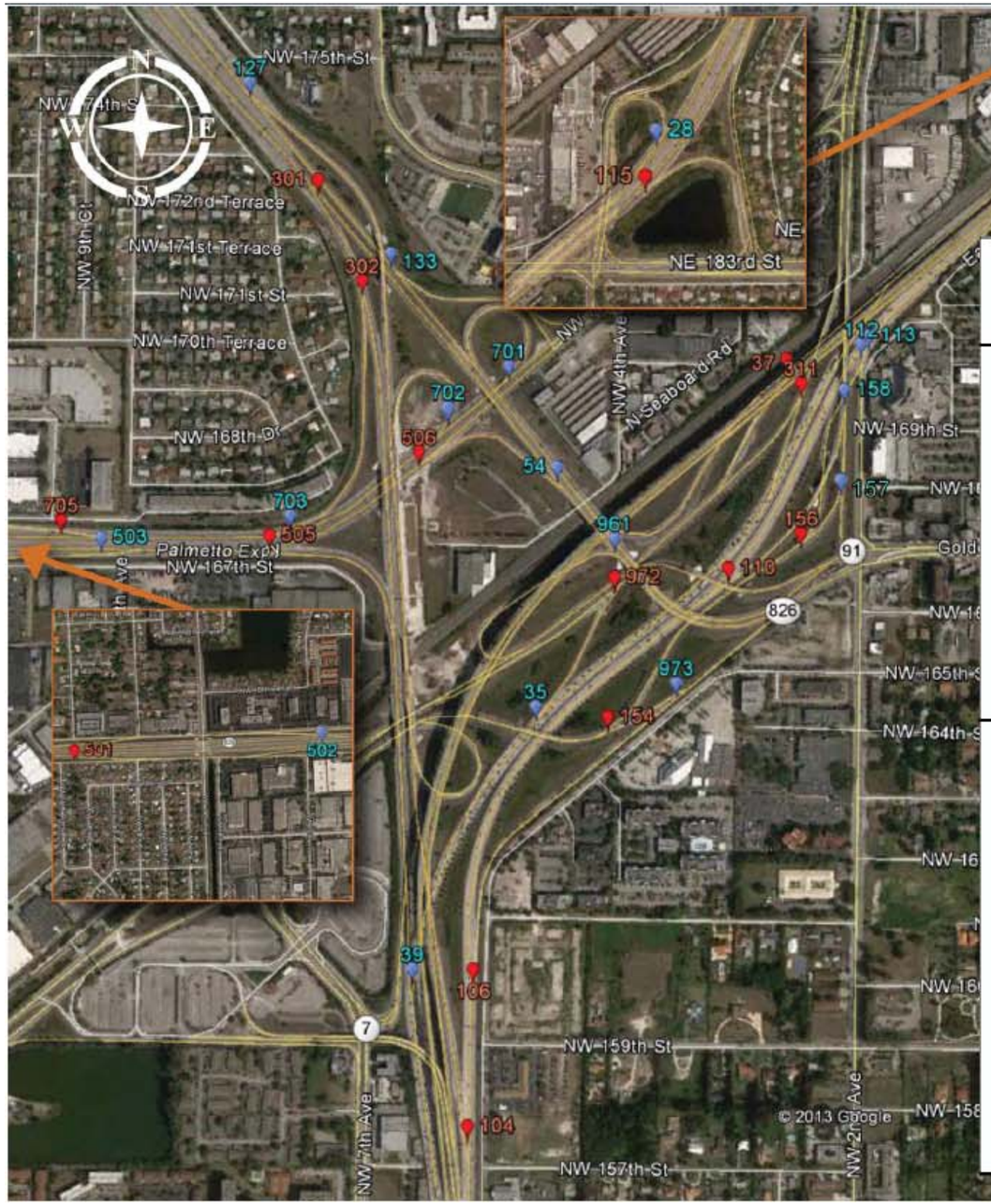
Figure 8-4 Ramp Merge and Diverge Analysis – No Build 2018

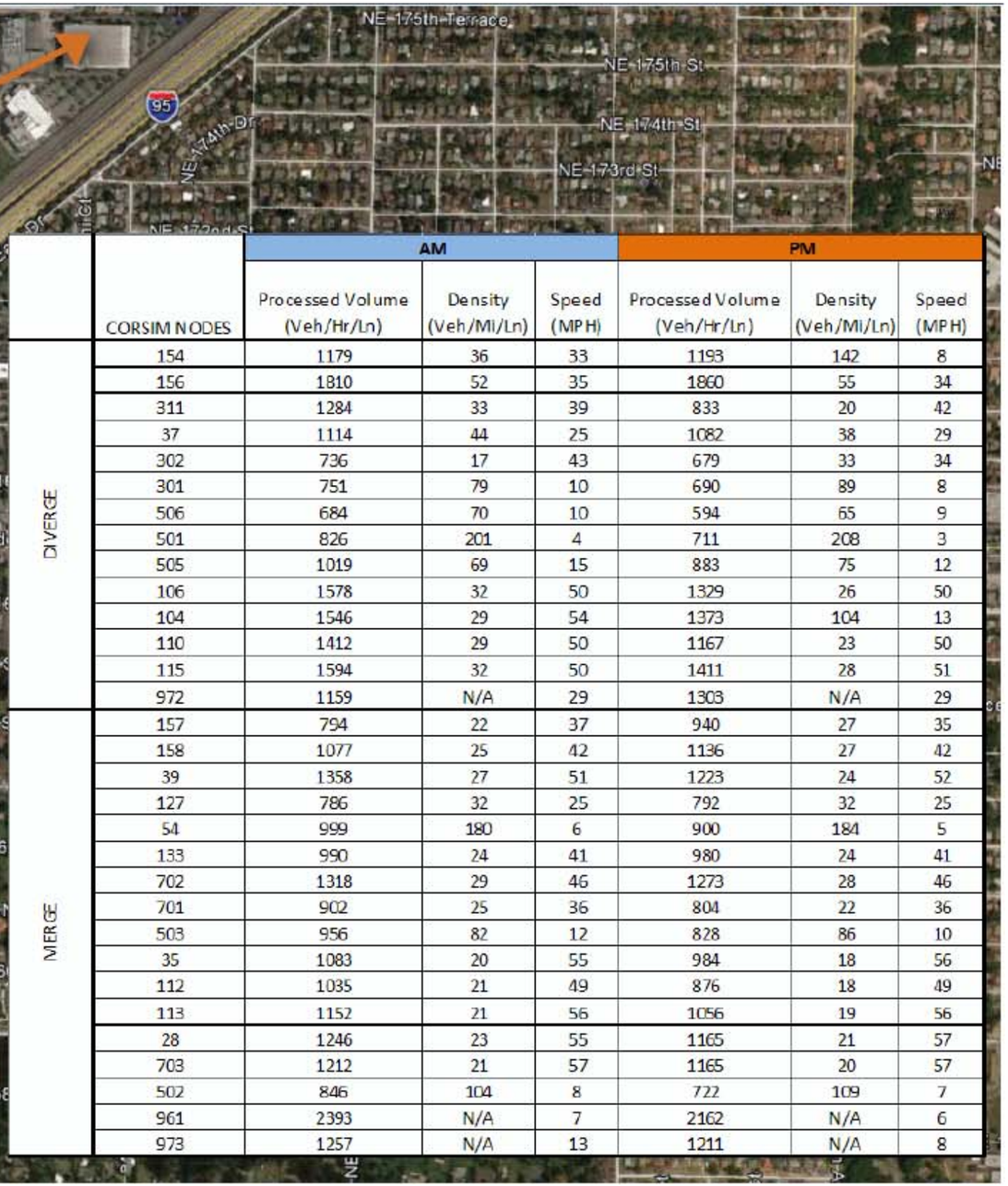


	CORSIM NODES	AM			PM		
		Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)	Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)
DIVERGE	154	1105	49	27	1301	40	33
	156	1645	79	26	1984	58	34
	311	1196	30	40	948	23	41
	37	1099	41	27	1065	35	31
	302	761	18	43	693	16	43
	301	783	79	10	714	82	9
	506	733	66	12	669	70	10
	501	901	194	5	806	203	4
	505	1101	65	18	1027	67	15
	106	1528	30	50	1139	22	51
	104	1485	28	54	1292	99	13
	110	1382	28	49	1011	20	51
	115	1475	66	24	1346	26	52
	972	1097	N/A	29	1245	N/A	29
MERGE	157	713	19	37	948	27	36
	158	1015	24	42	1069	25	43
	39	1376	27	51	1294	25	51
	127	763	30	25	802	32	25
	54	1049	175	6	981	180	5
	133	988	24	42	1007	24	41
	702	1283	30	45	1329	29	46
	701	881	25	35	870	24	36
	503	1032	75	14	963	80	12
	35	1043	19	55	976	18	55
	112	995	52	32	824	17	48
	113	1093	72	32	996	18	56
	28	1203	21	57	1132	20	57
	703	1176	24	55	1213	21	57
	502	960	100	10	820	104	8
	961	2500	N/A	8	2356	N/A	7
	973	1195	N/A	15	1165	N/A	13

Note: The critical segment length does not conform to the standard 1,500-ft mentioned in HCM

Figure 8-5 Ramp Merge and Diverge Analysis – No Build 2030

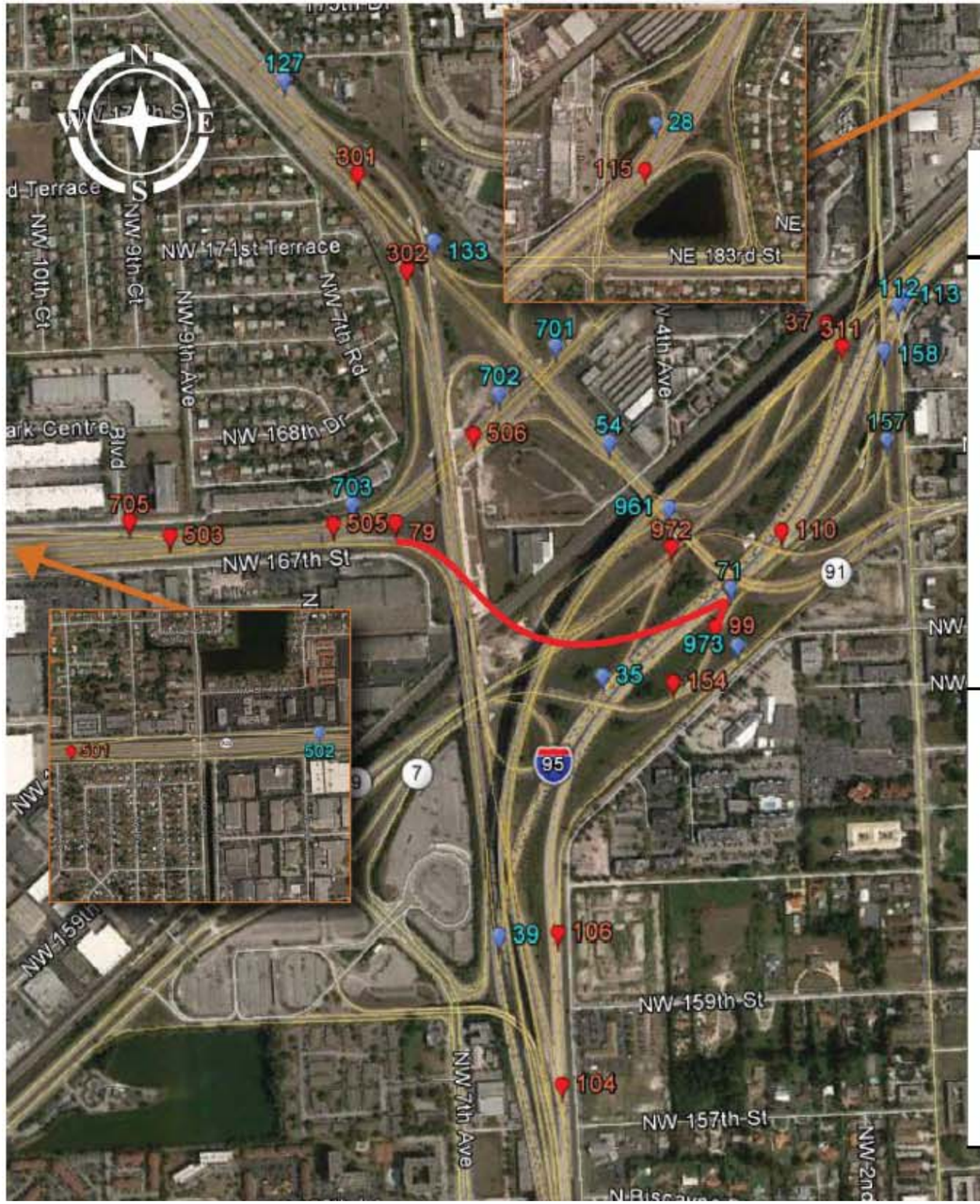




		AM			PM		
	CORSIM NODES	Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)	Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)
DIVERGE	154	1179	36	33	1193	142	8
	156	1810	52	35	1860	55	34
	311	1284	33	39	833	20	42
	37	1114	44	25	1082	38	29
	302	736	17	43	679	33	34
	301	751	79	10	690	89	8
	506	684	70	10	594	65	9
	501	826	201	4	711	208	3
	505	1019	69	15	883	75	12
	106	1578	32	50	1329	26	50
	104	1546	29	54	1373	104	13
	110	1412	29	50	1167	23	50
	115	1594	32	50	1411	28	51
	972	1159	N/A	29	1303	N/A	29
MERGE	157	794	22	37	940	27	35
	158	1077	25	42	1136	27	42
	39	1358	27	51	1223	24	52
	127	786	32	25	792	32	25
	54	999	180	6	900	184	5
	133	990	24	41	980	24	41
	702	1318	29	46	1273	28	46
	701	902	25	36	804	22	36
	503	956	82	12	828	86	10
	35	1083	20	55	984	18	56
	112	1035	21	49	876	18	49
	113	1152	21	56	1056	19	56
	28	1246	23	55	1165	21	57
	703	1212	21	57	1165	20	57
	502	846	104	8	722	109	7
	961	2393	N/A	7	2162	N/A	6
	973	1257	N/A	13	1211	N/A	8

Note: The critical segment length does not conform to the standard 1,500-ft mentioned in HCM

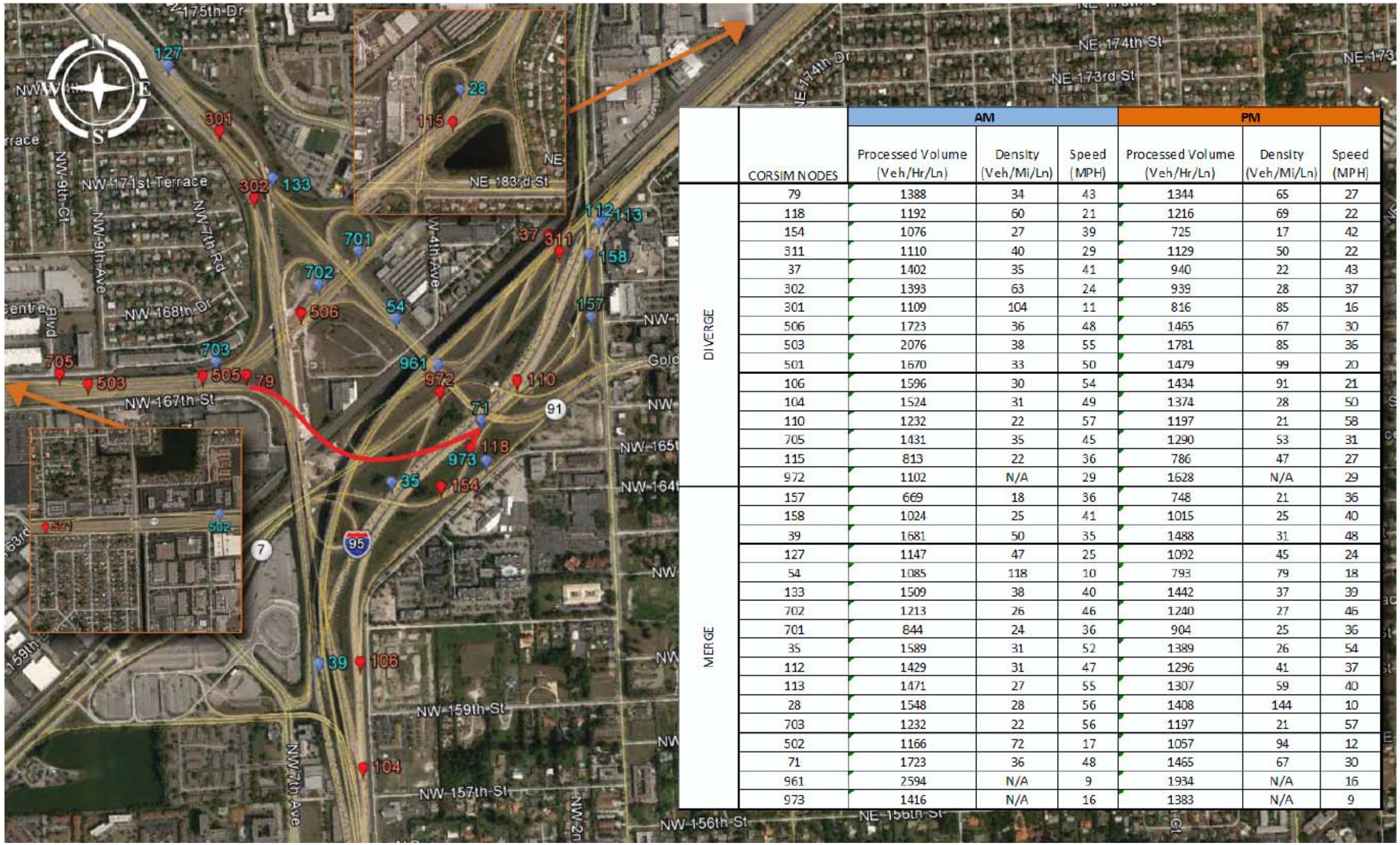
Figure 8-6 Ramp Merge and Diverge Analysis – No Build 2040



	CORSIM NODES	AM			PM		
		Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)	Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)
DIVERGE	79	1414	30	48	1392	29	48
	99	630	16	38	1135	32	36
	154	976	27	36	675	16	42
	311	1028	26	40	1004	30	34
	37	1065	37	29	732	19	38
	302	1246	30	42	788	18	44
	301	1251	31	41	791	19	42
	506	1035	60	18	896	175	5
	503	1678	34	49	1564	53	34
	501	1961	35	56	1937	45	50
	106	1639	33	50	1808	80	28
	104	1530	28	54	1693	70	31
	110	1517	31	49	1688	35	48
	705	1172	20	57	1193	21	58
	115	1301	25	53	1449	32	48
	972	1010	N/A	29	1437	N/A	29
MERGE	157	573	16	36	715	20	36
	158	964	23	42	1125	30	38
	39	1690	57	30	1466	29	50
	127	999	40	25	918	37	25
	54	912	31	29	972	116	10
	133	1481	37	40	1256	31	41
	702	1179	25	46	1266	28	46
	701	801	22	36	835	23	36
	35	1494	28	53	1410	27	53
	112	1294	27	47	1468	31	47
	113	1332	24	56	1477	27	55
	28	1467	26	57	1380	24	57
	703	1173	21	56	1193	21	57
	502	1678	34	49	1564	53	34
	71	907	28	33	1062	40	27
	961	2279	N/A	26	2287	N/A	9
	973	1282	N/A	21	1390	N/A	9

Note: The critical segment length does not conform to the standard 1,500-ft mentioned in HCM

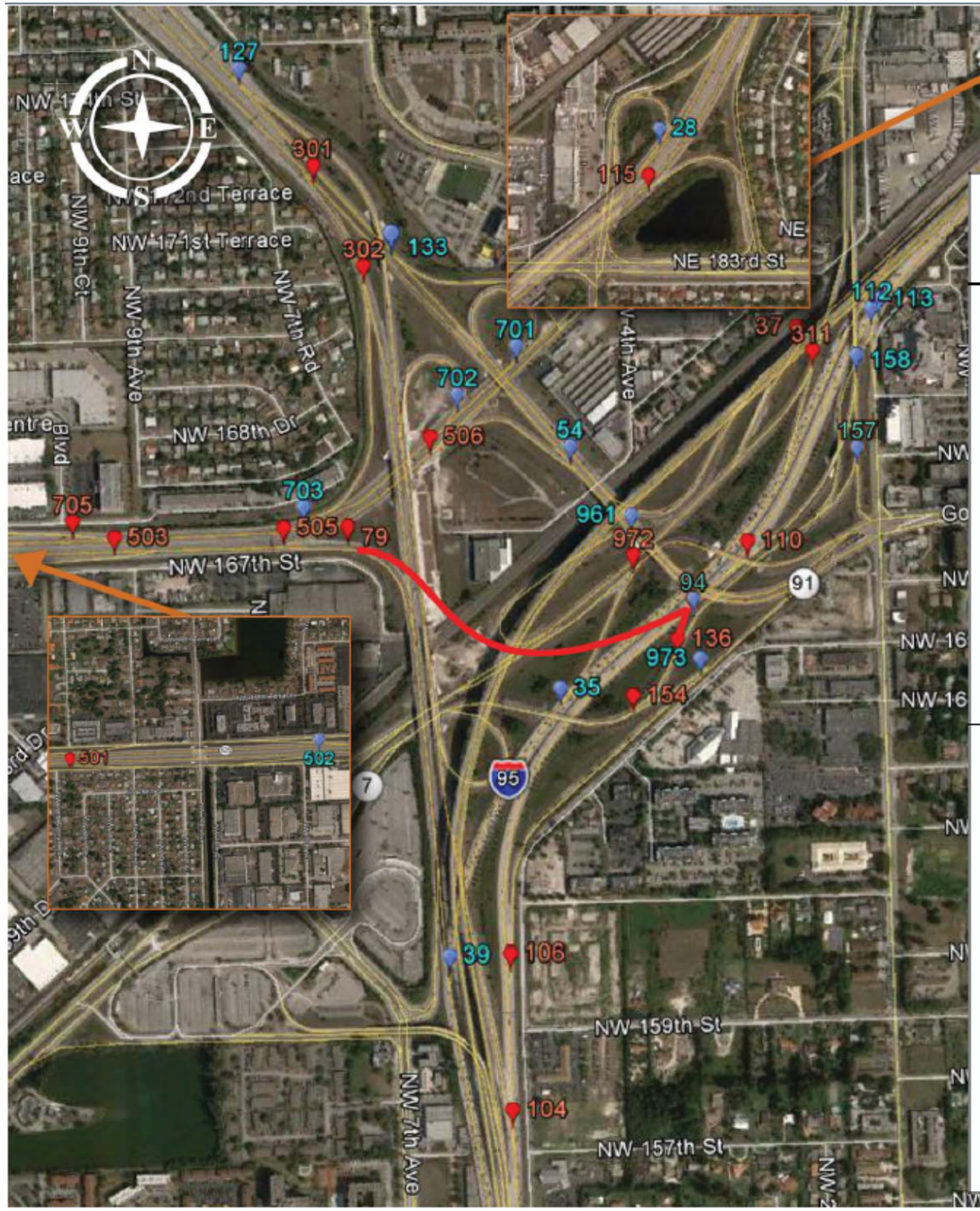
Figure 8-7 Ramp Merge and Diverge Analysis –Build 3A 2018



	CORSIM NODES	AM Processed Volume (Veh/Hr/Ln)	AM Density (Veh/Mi/Ln)	AM Speed (MPH)	PM Processed Volume (Veh/Hr/Ln)	PM Density (Veh/Mi/Ln)	PM Speed (MPH)
DIVERGE	79	1388	34	43	1344	65	27
	118	1192	60	21	1216	69	22
	154	1076	27	39	725	17	42
	311	1110	40	29	1129	50	22
	37	1402	35	41	940	22	43
	302	1393	63	24	939	28	37
	301	1109	104	11	816	85	16
	506	1723	36	48	1465	67	30
	503	2076	38	55	1781	85	36
	501	1670	33	50	1479	99	20
	106	1596	30	54	1434	91	21
	104	1524	31	49	1374	28	50
	110	1232	22	57	1197	21	58
	705	1431	35	45	1290	53	31
	115	813	22	36	786	47	27
	972	1102	N/A	29	1628	N/A	29
MERGE	157	669	18	36	748	21	36
	158	1024	25	41	1015	25	40
	39	1681	50	35	1488	31	48
	127	1147	47	25	1092	45	24
	54	1085	118	10	793	79	18
	133	1509	38	40	1442	37	39
	702	1213	26	46	1240	27	46
	701	844	24	36	904	25	36
	35	1589	31	52	1389	26	54
	112	1429	31	47	1296	41	37
	113	1471	27	55	1307	59	40
	28	1548	28	56	1408	144	10
	703	1232	22	56	1197	21	57
	502	1166	72	17	1057	94	12
	71	1723	36	48	1465	67	30
	961	2594	N/A	9	1934	N/A	16
	973	1416	N/A	16	1383	N/A	9

Note: The critical segment length does not conform to the standard 1,500-ft mentioned in HCM

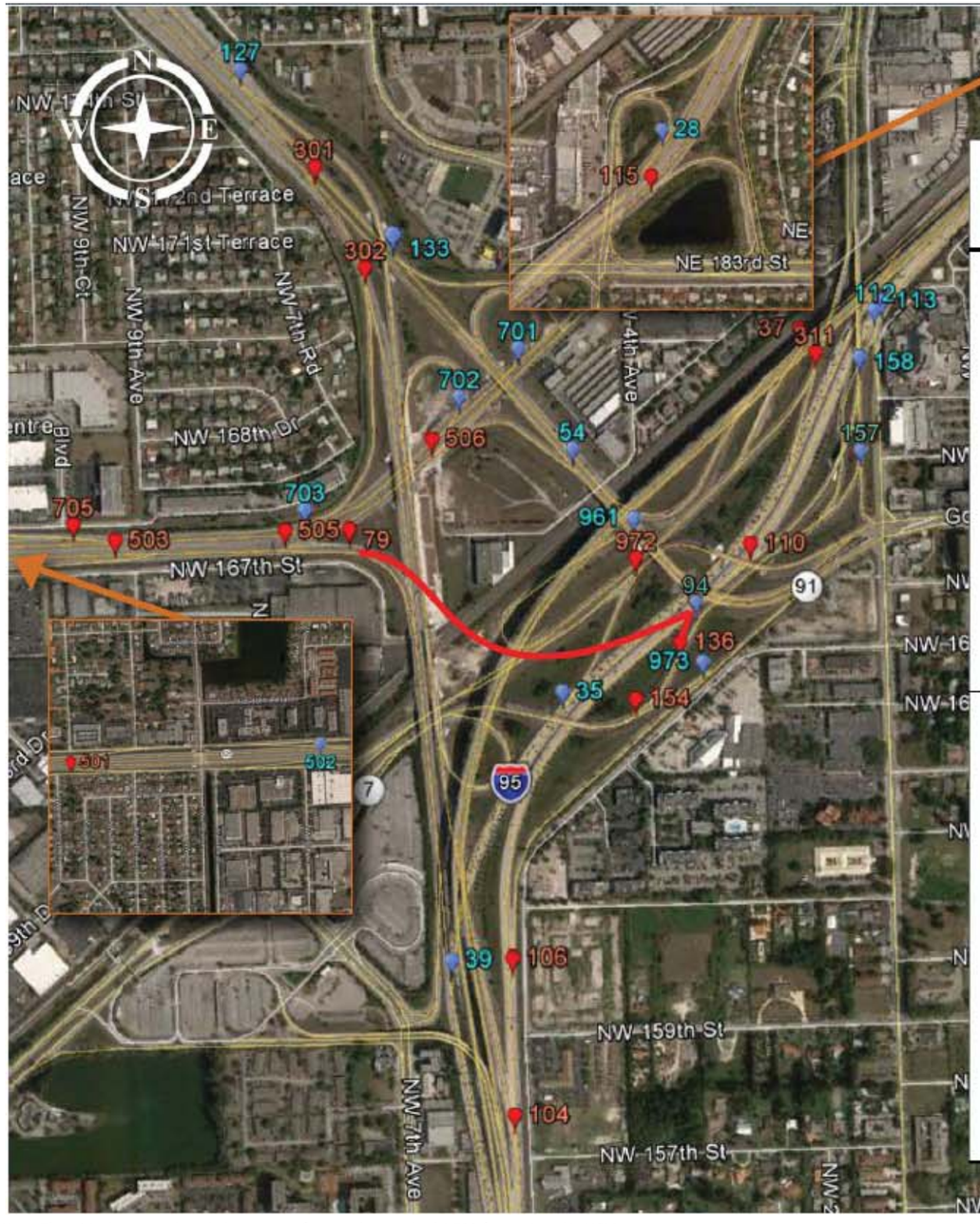
Figure 8-8 Ramp Merge and Diverge Analysis –Build 3A 2030



	CORSIM NODES	AM			PM		
		Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)	Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)
DIVERGE	79	1416	29	48	1445	30	48
	154	982	27	37	1142	33	35
	311	1031	26	40	677	16	42
	37	1055	35	31	1015	31	33
	136	631	16	38	737	19	38
	302	1245	29	42	786	18	44
	301	1251	31	41	790	19	42
	506	1034	61	18	940	152	6
	503	1678	34	49	1622	35	48
	501	1961	35	55	1957	35	56
	106	1637	32	50	1931	58	38
	104	1528	28	54	1800	53	39
	110	1514	31	49	1800	38	48
	705	1172	20	57	1219	21	58
	115	1295	24	54	1531	31	50
	972	1008	N/A	29	1459	N/A	29
MERGE	157	581	16	36	728	20	36
	158	972	23	42	1172	34	36
	39	1758	49	37	1542	33	47
	127	994	40	25	968	39	25
	54	913	32	29	902	61	20
	133	1468	36	41	1322	33	41
	702	1178	25	46	1295	28	46
	701	803	22	36	842	24	36
	35	1502	28	53	1420	27	53
	112	1287	27	47	1549	33	47
	113	1326	24	56	1561	28	55
	28	1468	26	57	1394	25	57
	703	1173	21	56	1219	22	57
	94	902	27	33	1095	46	25
	502	1678	34	49	1438	35	10
	961	2273	N/A	26	2166	N/A	17
	973	1294	N/A	21	1438	N/A	10

Note: The critical segment length does not conform to the standard 1,500-ft mentioned in HCM

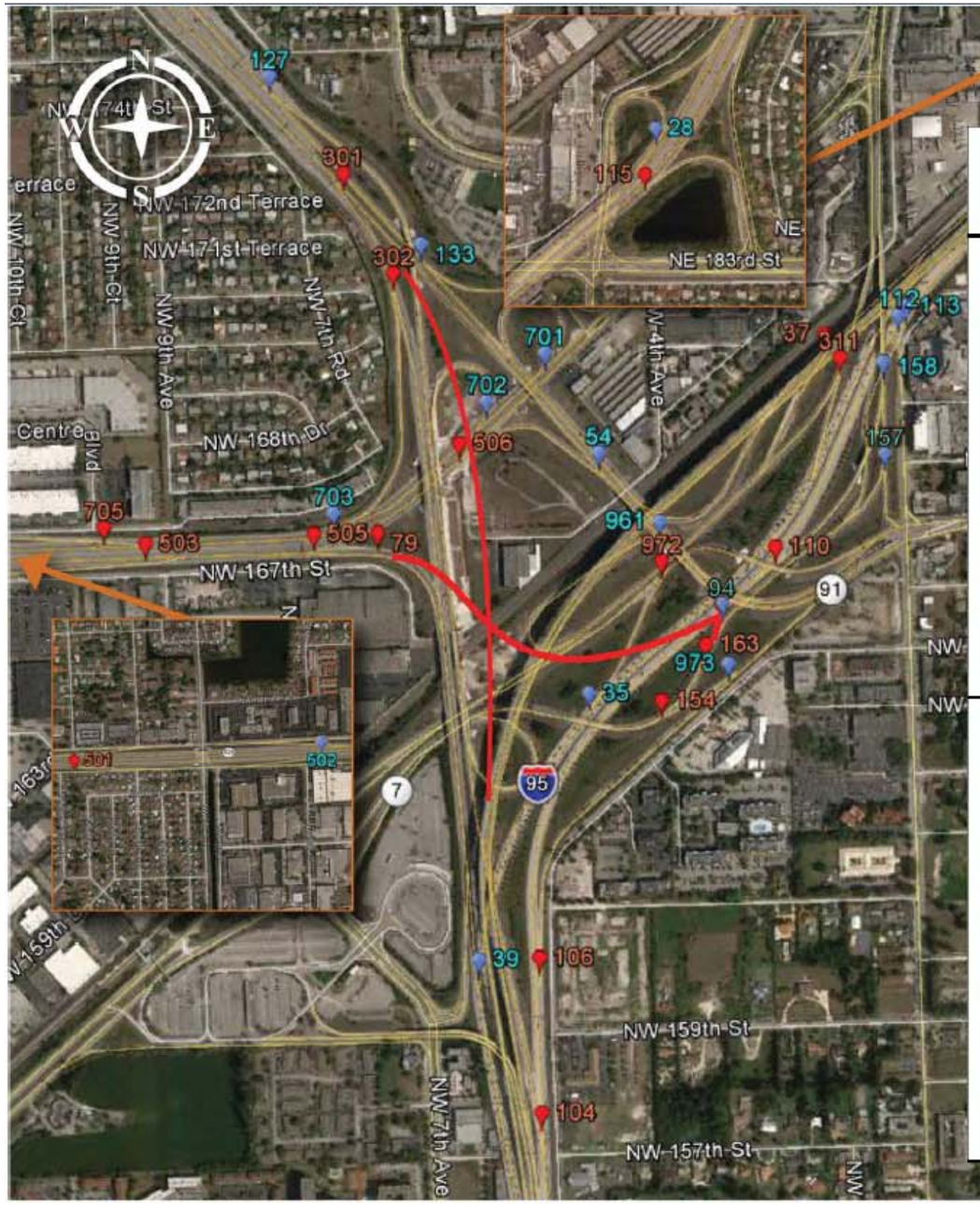
Figure 8-9 Ramp Merge and Diverge Analysis –Build 3B 2018



	CORSIM NODES	AM			PM		
		Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)	Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)
DIVERGE	79	1396	30	47	1715	39	45
	154	1196	60	22	1357	45	31
	311	1075	27	39	725	18	41
	37	1115	41	28	1160	48	24
	136	817	22	36	759	20	38
	302	1410	34	41	915	21	43
	301	1396	60	25	942	23	42
	506	1104	105	11	835	93	10
	503	1726	37	47	1697	36	48
	501	2077	38	55	2072	38	55
	106	1660	33	50	1405	78	24
	104	1594	30	54	1367	111	12
	110	1514	31	49	1297	26	50
	705	1241	22	57	1256	22	57
	115	1425	36	45	1396	32	48
	972	1102	N/A	29	1460	N/A	29
MERGE	157	670	19	36	760	21	36
	158	1016	25	41	998	24	41
	39	1752	51	35	1593	35	45
	127	1149	47	24	1030	42	24
	54	1084	115	10	799	30	28
	133	1512	38	40	1473	37	40
	702	1221	26	46	1327	29	46
	701	848	24	36	884	25	36
	35	1594	31	51	1351	25	54
	112	1427	31	47	1305	28	46
	113	1469	27	55	1422	26	55
	28	1550	28	56	1438	118	14
	703	1241	22	56	1256	22	57
	94	1167	77	15	1162	65	18
	502	1726	37	47	1697	36	48
	961	2585	N/A	10	1989	N/A	26
	973	1417	N/A	16	1707	N/A	13

Note: The critical segment length does not conform to the standard 1,500-ft mentioned in HCM

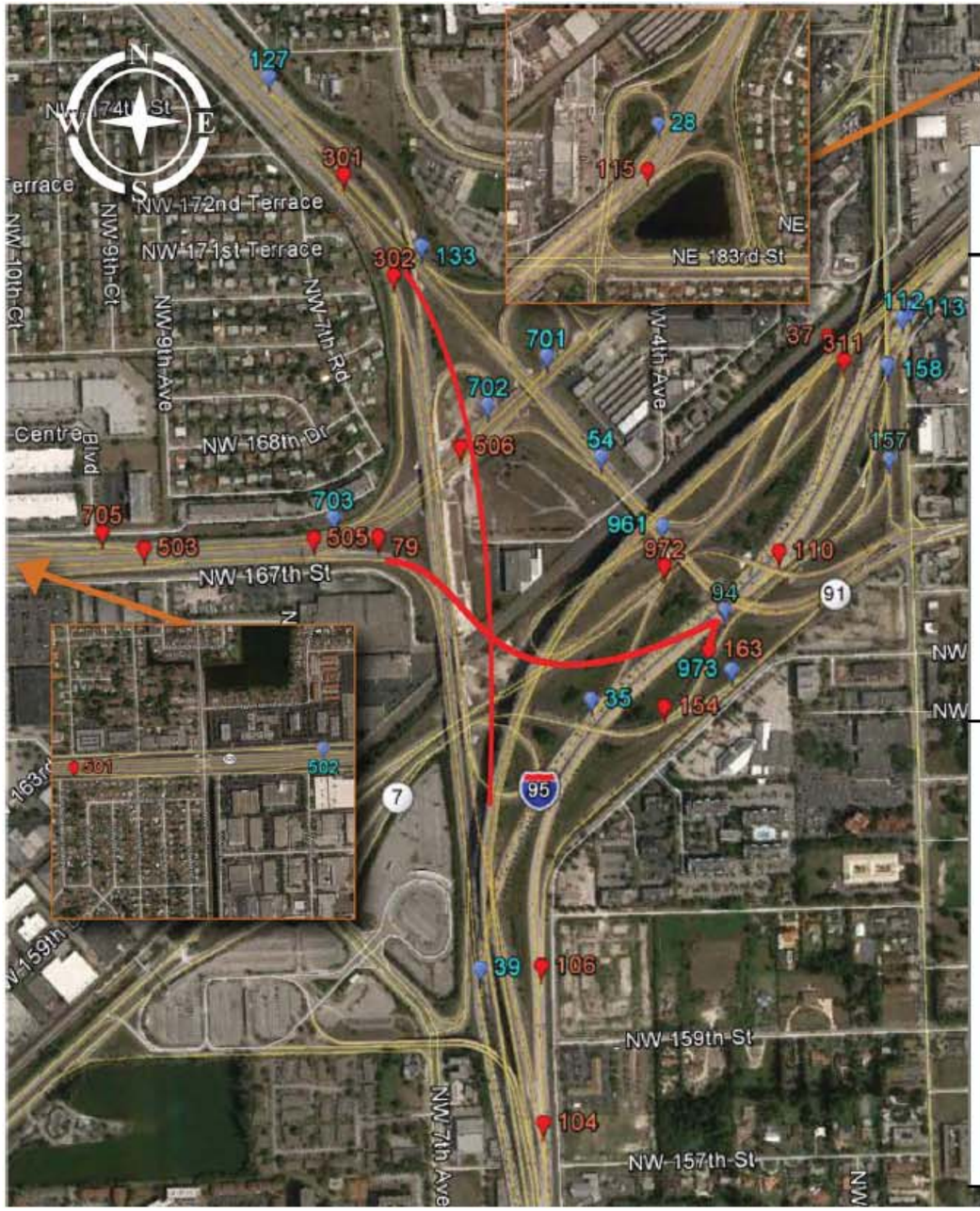
Figure 8-10 Ramp Merge and Diverge Analysis –Build 3B 2030



	CORSIM NODES	AM			PM		
		Processed Volume (Veh/Hr/Ln)	Density (Veh/MI/Ln)	Speed (MPH)	Processed Volume (Veh/Hr/Ln)	Density (Veh/MI/Ln)	Speed (MPH)
DIVERGE	79	1415	30	48	1448	30	48
	154	903	24	38	1098	31	36
	311	1031	26	40	679	16	42
	37	1060	37	29	1008	31	33
	163	582	15	38	708	19	38
	302	1109	26	43	708	16	44
	301	1251	31	41	790	19	42
	137	1243	29	43	788	18	44
	506	1035	58	19	943	150	6
	503	1678	34	49	1623	33	50
	501	1961	35	56	1957	35	56
	106	1641	33	50	1964	56	40
	104	1528	28	54	1824	48	44
	110	1517	31	49	1827	38	48
	705	1166	20	57	1223	21	58
	115	1287	24	54	1523	51	35
	972	1010	N/A	29	1564	N/A	29
MERGE	157	546	15	37	715	20	36
	158	944	23	42	1165	32	37
	39	1598	35	45	1458	31	48
	127	997	40	25	979	40	25
	54	912	31	29	902	53	21
	133	1479	36	41	1340	33	40
	702	1172	25	46	1298	28	46
	701	806	23	36	846	24	36
	35	1493	28	53	1441	27	53
	112	1281	27	47	1555	33	47
	113	1320	24	56	1560	28	55
	28	1467	26	56	1390	25	57
	703	1166	21	56	1222	22	57
	94	1678	26	33	1623	39	50
	502	880	34	49	1068	33	27
	961	2274	N/A	26	2170	N/A	16
	973	1241	N/A	22	1428	N/A	10

Note: The critical segment length does not conform to the standard 1,500-ft mentioned in HCM

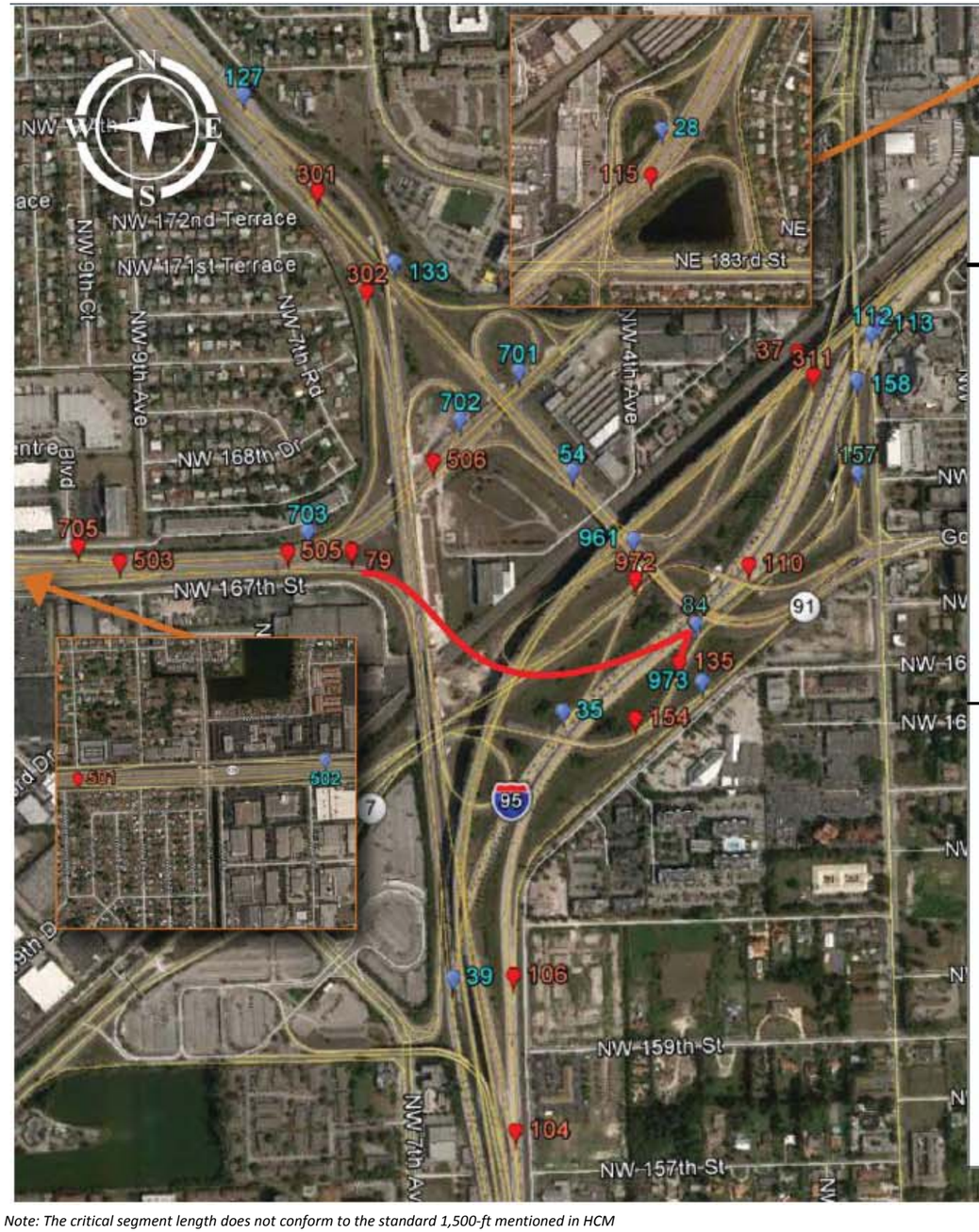
Figure 8-11 Ramp Merge and Diverge Analysis –Build 3C 2018



	CORSIM NODES	AM			PM		
		Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)	Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)
DIVERGE	79	1398	28	49	1493	32	47
	154	1125	38	32	1246	33	38
	311	1082	27	39	727	18	41
	37	1114	40	29	1169	48	24
	163	772	21	38	813	21	38
	302	1396	33	42	839	19	44
	301	1484	46	35	941	23	41
	137	1526	37	42	917	21	43
	506	1103	100	11	980	147	7
	503	1724	36	48	1682	35	49
	501	2077	38	55	2088	39	54
	106	1659	33	50	1661	34	49
	104	1594	30	54	1594	100	16
	110	1514	31	49	1542	31	49
	705	1227	21	57	1218	21	58
	115	1417	31	48	1411	27	53
	972	1105	N/A	29	1279	N/A	29
MERGE	157	642	18	36	680	19	36
	158	1010	25	41	1015	25	41
	39	1632	37	44	1451	31	47
	127	1145	47	24	1027	42	24
	54	1071	88	14	1018	54	22
	133	1525	38	40	1437	36	40
	702	1212	26	46	1321	29	46
	701	854	24	36	865	24	36
	35	1597	31	51	1330	24	55
	112	1411	30	47	1454	31	47
	113	1454	26	55	1442	26	56
	28	1553	28	56	1452	134	11
	703	1228	22	56	1218	21	57
	94	1148	62	19	1168	70	17
	502	1724	36	48	1682	35	49
	961	2569	N/A	12	2426	N/A	20
	973	1361	N/A	18	1458	N/A	16

Note: The critical segment length does not conform to the standard 1,500-ft mentioned in HCM

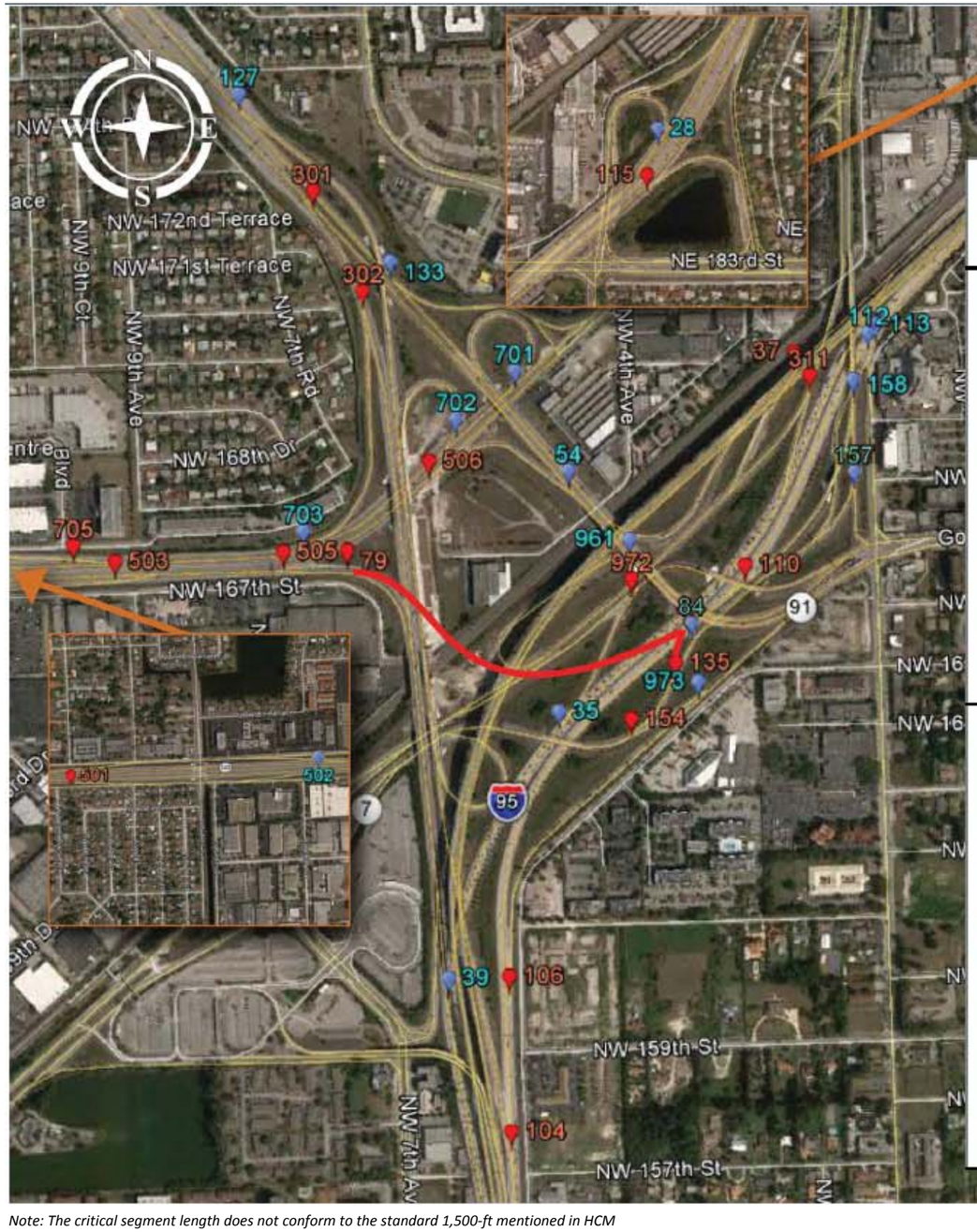
Figure 8-12 Ramp Merge and Diverge Analysis –Build 3C 2030



	CORSIM NODES	AM			PM		
		Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)	Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)
DIVERGE	79	1125	27	42	1230	29	42
	154	994	29	35	1183	35	34
	311	1029	26	40	678	16	42
	37	1065	37	29	1016	32	33
	135	639	17	38	765	20	38
	302	1244	29	42	788	18	44
	301	1250	31	41	790	19	42
	506	1020	55	20	927	143	7
	503	1651	33	49	1600	32	50
	501	1961	35	56	1956	35	56
	106	1638	33	50	1960	53	41
	104	1528	28	54	1821	51	40
	110	1515	31	49	1818	38	47
	705	1177	21	57	1224	21	58
	115	1290	24	53	1550	36	46
	972	1004	N/A	29	1416	N/A	29
MERGE	157	576	16	36	763	22	35
	158	970	23	41	1192	33	36
	39	1883	58	35	1720	36	48
	127	997	40	25	974	39	25
	54	897	31	29	867	31	28
	133	1475	36	40	1328	33	41
	702	1185	26	46	1300	28	46
	701	809	23	36	846	24	36
	35	1490	30	50	1414	27	52
	112	1283	27	47	1562	33	47
	113	1322	24	56	1583	29	55
	28	1470	26	57	1394	25	57
	703	1178	21	56	1224	22	57
	84	1651	27	33	1600	43	50
	502	893	33	49	1091	32	25
	961	2250	N/A	30	2108	N/A	30
	973	1304	N/A	17	1514	N/A	12

Note: The critical segment length does not conform to the standard 1,500-ft mentioned in HCM

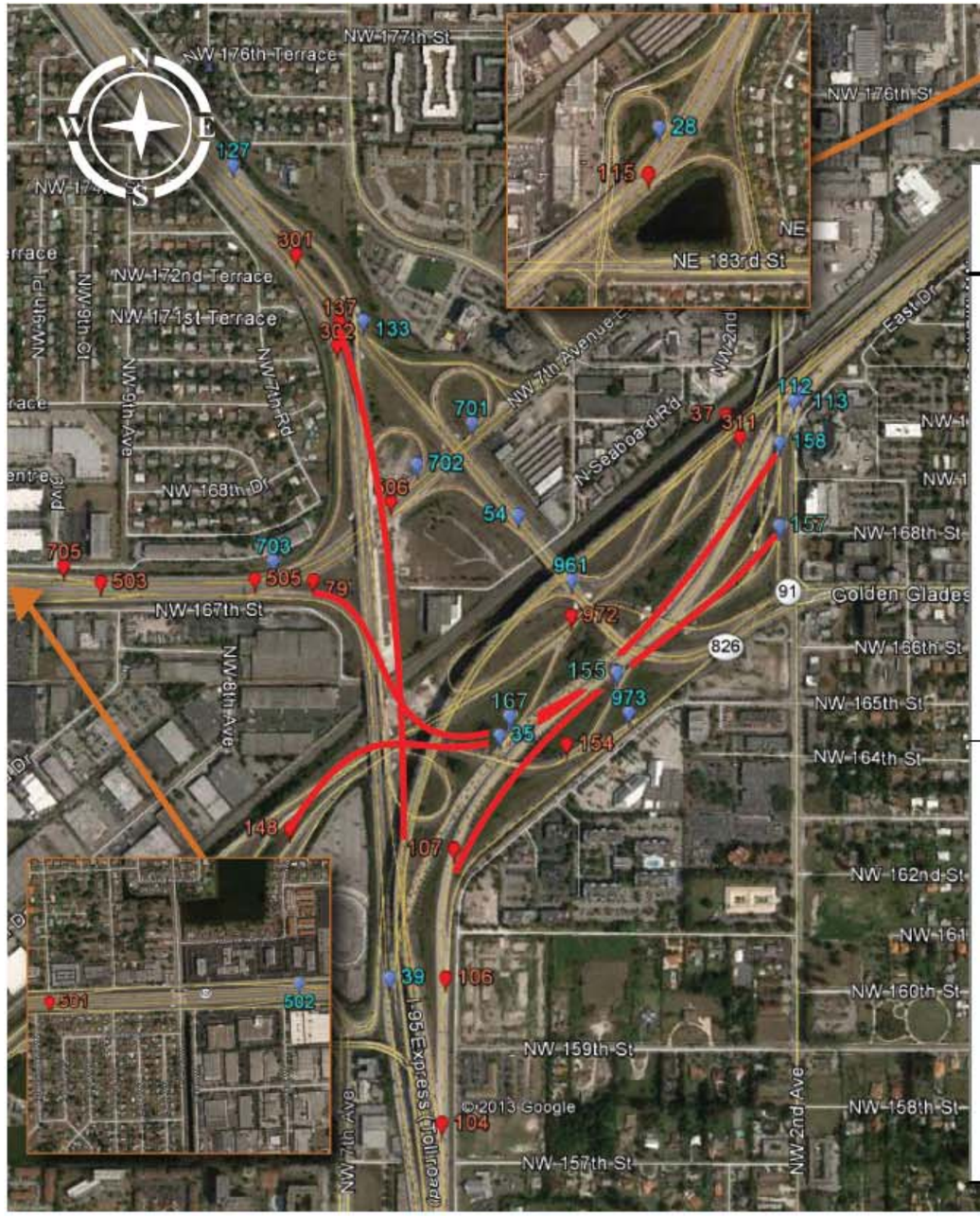
Figure 8-13 Ramp Merge and Diverge Analysis –Build 4 2018



	CORSIM NODES	AM			PM		
		Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)	Processed Volume (Veh/Hr/Ln)	Density (Veh/Mi/Ln)	Speed (MPH)
DIVERGE	79	1108	27	42	1422	43	33
	154	1145	77	16	1308	64	21
	311	1075	31	36	726	18	41
	37	1111	41	28	1156	48	24
	135	779	22	36	731	20	37
	302	1472	43	37	916	21	43
	301	1479	42	36	941	23	42
	506	1085	97	11	827	87	11
	503	1685	36	47	1670	35	48
	501	2068	39	54	2073	38	55
	106	1668	33	50	973	107	9
	104	1595	30	54	957	106	9
	110	1523	31	49	888	17	51
	705	1254	22	57	1165	20	58
	115	1418	27	53	1143	21	54
	972	1096	N/A	29	1439	N/A	29
MERGE	157	644	18	36	749	21	35
	158	1005	25	40	839	20	42
	39	1873	72	28	1768	39	46
	127	1158	47	24	968	40	24
	54	1128	41	27	779	27	29
	133	1511	38	40	1470	37	39
	702	1226	27	46	1221	26	46
	701	850	24	36	884	25	36
	35	1561	70	33	1339	25	55
	112	1407	30	47	1039	23	45
	113	1453	26	55	1166	21	55
	28	1551	28	56	1430	120	15
	703	1254	22	56	1164	21	57
	84	1120	60	20	1670	47	24
	502	1685	36	47	1095	35	48
	961	2696	N/A	29	1954	N/A	30
	973	1387	N/A	13	1552	N/A	10

Note: The critical segment length does not conform to the standard 1,500-ft mentioned in HCM

Figure 8-14 Ramp Merge and Diverge Analysis –Build 4 2030



	CORSIM NODES	AM			PM		
		Processed Volume (Veh/Hr/Ln)	Density (Veh/MI/Ln)	Speed (MPH)	Processed Volume (Veh/Hr/Ln)	Density (Veh/MI/Ln)	Speed (MPH)
DIVERGE	79	1094	26	42	1170	28	42
	107	1169	23	52	1131	26	45
	154	710	19	37	831	25	35
	311	1205	30	40	787	19	42
	37	1119	44	26	1085	39	29
	148	582	12	47	731	16	47
	302	1334	31	42	1017	24	43
	301	1396	69	20	1083	26	41
	137	1386	34	41	1064	25	43
	506	870	24	37	861	23	37
	503	1503	29	51	1485	29	52
	501	1810	32	56	1806	32	56
	106	1030	59	26	999	91	11
	104	1377	63	31	1227	100	12
	705	1183	21	57	1097	19	57
	115	1164	22	54	1215	23	54
	972	1297	N/A	29	1575	N/A	29
MERGE	157	871	23	37	980	27	36
	39	1731	41	42	1645	36	45
	127	1091	45	24	1033	43	24
	54	950	100	10	857	31	28
	133	1283	32	40	1301	33	40
	702	1202	26	46	1141	24	47
	701	868	24	36	860	24	36
	35	1699	34	50	1576	31	51
	112	936	17	56	946	17	56
	113	986	18	56	1028	19	55
	28	1610	30	54	1514	27	56
	703	1183	21	56	1097	19	57
	155	884	21	43	958	23	42
	167	1050	19	56	1125	20	56
	502	1503	29	51	1485	29	52
	961	3236	N/A	7	2912	N/A	29

Note: The critical segment length does not conform to the standard 1,500-ft mentioned in HCM

Figure 8-15 Ramp Merge and Diverge Analysis –Ultimate Build 2040

8.4.4 Weaving Segment Analysis

Weaving Segment analysis was performed using HCS 2010 software for freeway sections where an on-ramp was followed closely by an off-ramp within the maximum weaving length estimated using HCM 2010 procedure. Six segments in total were identified as weaving. A summary of the weaving results is show in **Tables 8-41** to **8-46** and in **Figures 8-16** to **8-27;** for No Build Alternatives for years 2018, 2030, and 2040, Build Alternative 3A (2018 and 2030), Build Alternative 3B (2018 and 2030), Build Alternative 3C (2018 and 2030), Build Alternative 4 (2018 and 2030), and Ultimate Build 2040, respectively.

The weaving segment on Turnpike connector SB (Segment 4) for Interim Build Alternative 4 and Ultimate Build Alternative 1 incorporates the NW 12th Avenue Ramp. In order to eliminate potential weaving from the NW 12th Avenue on-ramp to the new SR 826 EB to I-95 NB flyover ramp, the NW 12th Avenue on-ramp is barrier separated before merging with the SR 826/Palmetto Expressway EB to I-95 SB ramp prior to joining the Turnpike connector SB lanes at the weaving junction.

This proposed design would have led to a multi-weaving segment in conjunction with a merge segment, which is one of the listed limitations of the Highway Capacity methodologies, as outlined in the Highway Capacity Manual (2010) page 12-9. However, after simulation of various configurations for the ramp merge from NW 12th Avenue on-ramp using the CORSIM Model; it was assumed that, the NW 12th Avenue on-ramp merge will take place upstream of the expected point of convergence. This assumption provided the most realistic traffic observation from the CORSIM model and was subsequently used for the Highway Capacity Analysis.

While the results in the Highway Capacity Analysis do not reflect the practical application of the design, it is shown for informative purposes only. Ultimately, the results from the CORSIM analysis at this section should supersede the HCS analysis results. Please refer to **Section 8.4.6** (**Table 8-55**) for the CORSIM Results for weaving segment 4.

Table 8-41
No Build 2018 Weaving Operational Analysis Results

#	Mainline	Weave Length (ft)	AM				PM			
			v/c Ratio	Speed (mph)	Density pc/mi/ln	LOS	v/c Ratio	Speed (mph)	Density pc/mi/ln	LOS
1	SR 7 NB	350	0.59	32.6	25.2	C	0.70	31.7	33.8	D
2	SR 7 SB	1387	0.71	40.6	32.7	D	0.63	40.9	27.8	C
3	SR 7 SB	800	0.77	41.8	32.3	D	0.65	38.2	31.5	C
4	Turnpike Connector SB	1530	1.57	-	-	F	1.01	-	-	F
5	NW 167th Street to Turnpike	1130	1.21	-	-	F	0.76	55	22.8	B
6	Turnpike Connector NB	1800	0.64	59.1	16.4	B	0.70	58.5	21.3	B

Table 8-42
No Build 2030 Weaving Operational Analysis Results

#	Mainline	Weave Length (ft)	AM				PM			
			v/c Ratio	Speed (mph)	Density pc/mi/ln	LOS	v/c Ratio	Speed (mph)	Density pc/mi/ln	LOS
1	SR 7 NB	350	0.71	31.7	31.7	C	0.83	30.7	43.4	E
2	SR 7 SB	1387	0.87	40.2	41.9	E	0.78	40.6	35.3	D
3	SR 7 SB	800	0.96	41.4	41.3	E	0.81	37.3	41.6	E
4	Turnpike Connector SB	1530	1.74	-	-	F	1.12	-	-	F
5	NW 167th Street to Turnpike	1130	1.30	-	-	F	0.82	54.7	24.7	C
6	Turnpike Connector NB	1800	0.73	59	18.7	B	0.79	58.3	24.4	C

Table 8-43
No Build 2040 Weaving Operational Analysis Results

#	Mainline	Weave Length (ft)	AM				PM			
			v/c Ratio	Speed (mph)	Density pc/mi/ln	LOS	v/c Ratio	Speed (mph)	Density pc/mi/ln	LOS
1	SR 7 NB	350	0.80	29.1	38.8	E	0.94	30	52.2	E
2	SR 7 SB	1387	0.97	40	47.4	E	0.86	40.4	39.8	E
3	SR 7 SB	800	1.07	-	-	F	0.90	36.9	48	E
4	Turnpike Connector SB	1530	1.80	-	-	F	1.16	-	-	F
5	NW 167th Street to Turnpike	1130	1.30	-	-	F	0.82	54.7	24.7	C
6	Turnpike Connector NB	1800	0.80	58.8	20.7	B	0.88	58.1	27.1	C

Table 8-44
Builds 3A, 3B, 3C, and 4 2018 Weaving Operational Analysis Results

#	Mainline		Weave Length (ft)	AM				PM			
				v/c Ratio	Speed (mph)	Density pc/mi/ln	LOS	v/c Ratio	Speed (mph)	Density pc/mi/ln	LOS
1	SR 7 NB		350	0.632	30.1	30.4	C	0.632	30.1	30.4	C
2	SR 7 SB		1387	0.635	39.2	29.0	C	0.566	40.0	24.7	C
3	SR 7 SB		800	0.700	41.0	28.5	C	0.588	41.2	24.7	C
4	Turnpike Connector SB	3A	1530	1.046	-	-	F	0.673	56.3	19.5	B
		3B	2530	1.046	-	-	F	0.673	56.6	19.4	B
		3C	2530	0.854	54.3	26.2	C	0.550	57.6	15.6	B
		4	1675	1.046	-	-	F	0.730	56.4	19.5	B
5	NW 167th Street to Turnpike		1130	1.255	-	-	F	0.790	54.3	23.7	B
6	Turnpike Connector NB		1800	0.655	60.2	12.4	B	0.715	59.6	16.0	B

Table 8-45
Builds 3A, 3B, 3C, and 4 2030 Weaving Operational Analysis Results

#	Mainline		Weave Length (ft)	AM				PM			
				v/c Ratio	Speed (mph)	Density pc/mi/ln	LOS	v/c Ratio	Speed (mph)	Density pc/mi/ln	LOS
1	SR 7 NB		350	0.632	30.1	30.4	C	0.698	29.1	34.8	D
2	SR 7 SB		1387	0.749	38.4	34.9	D	0.668	39.3	29.7	C
3	SR 7 SB		800	0.830	40.2	34.4	D	0.696	40.5	29.7	C
4	Turnpike Connector SB	3A	1530	1.185	-	-	F	0.763	55.5	22.4	B
		3B	2530	1.185	-	-	F	0.763	55.9	22.3	B
		3C	2530	0.977	53.2	30.5	C	0.629	57.0	18.0	B
		4	1675	1.185	-	-	F	0.763	55.6	22.4	B
5	NW 167th Street to Turnpike		1130	1.360	-	-	F	0.857	53.5	26.1	C
6	Turnpike Connector NB		1800	0.747	59.9	14.2	B	0.811	59.1	18.4	B

Table 8-46
Ultimate Build 2040 Weaving Operational Analysis Results

#	Mainline	Weave Length (ft)	AM				PM			
			v/c Ratio	Speed (mph)	Density pc/mi/ln	LOS	v/c Ratio	Speed (mph)	Density pc/mi/ln	LOS
1	SR 7 NB	350	0.521	32.0	22.1	B	0.613	30.4	29.2	C
2	SR 7 SB	1387	0.841	37.7	40.0	E	0.749	38.8	33.8	D
3	SR 7 SB	800	0.945	39.6	39.8	E	0.794	39.9	34.4	D
4	Turnpike Connector SB	2530	1.039	-	-	F	0.669	56.7	19.3	B
5	NW 167th Street to Turnpike	1130	1.374	-	-	F	0.866	53.4	26.4	C
6	Turnpike Connector NB	1800	0.854	59.5	16.3	B	0.925	58.6	21.2	B

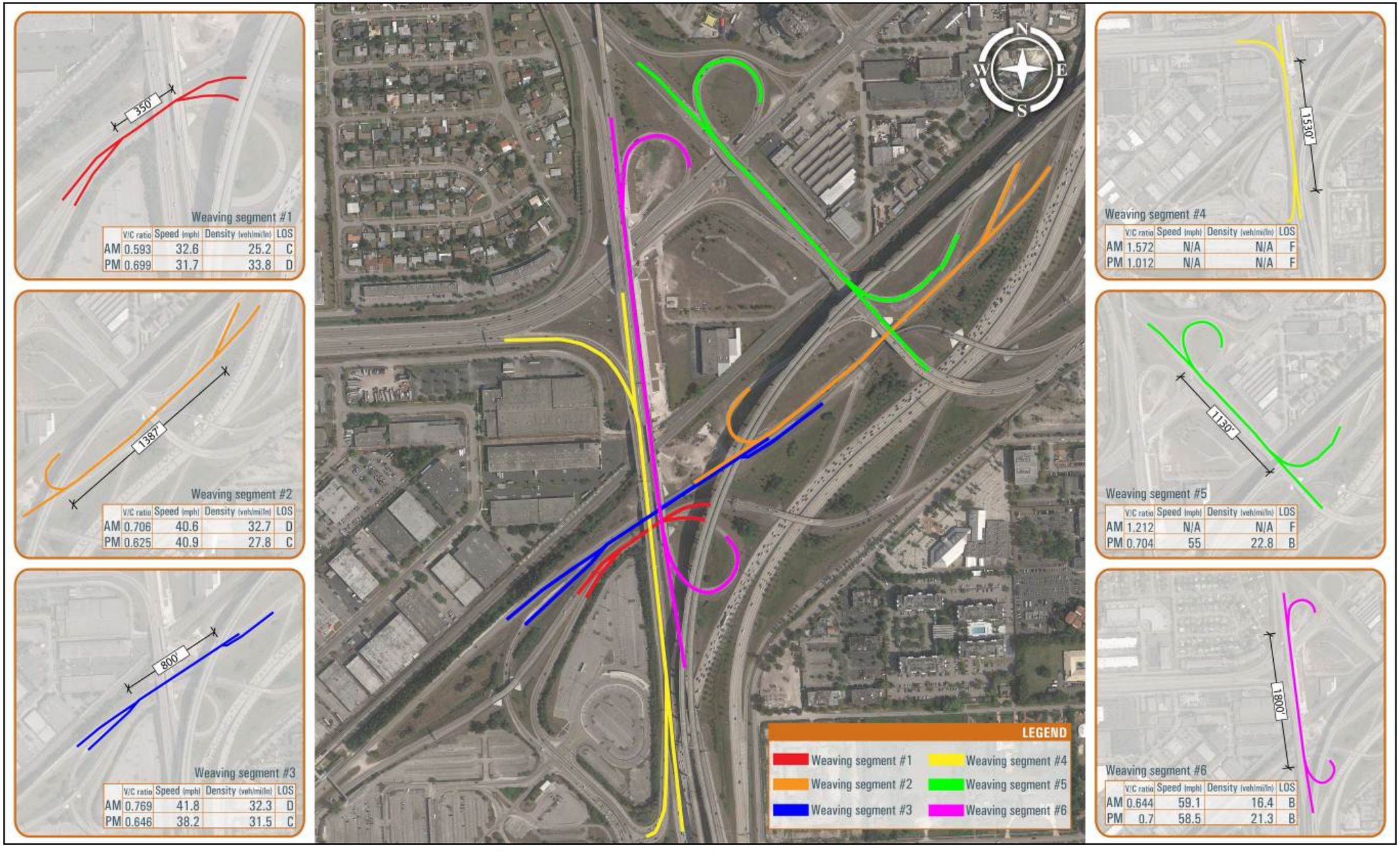


Figure 8-16 Weaving Segment Analysis – No Build 2018

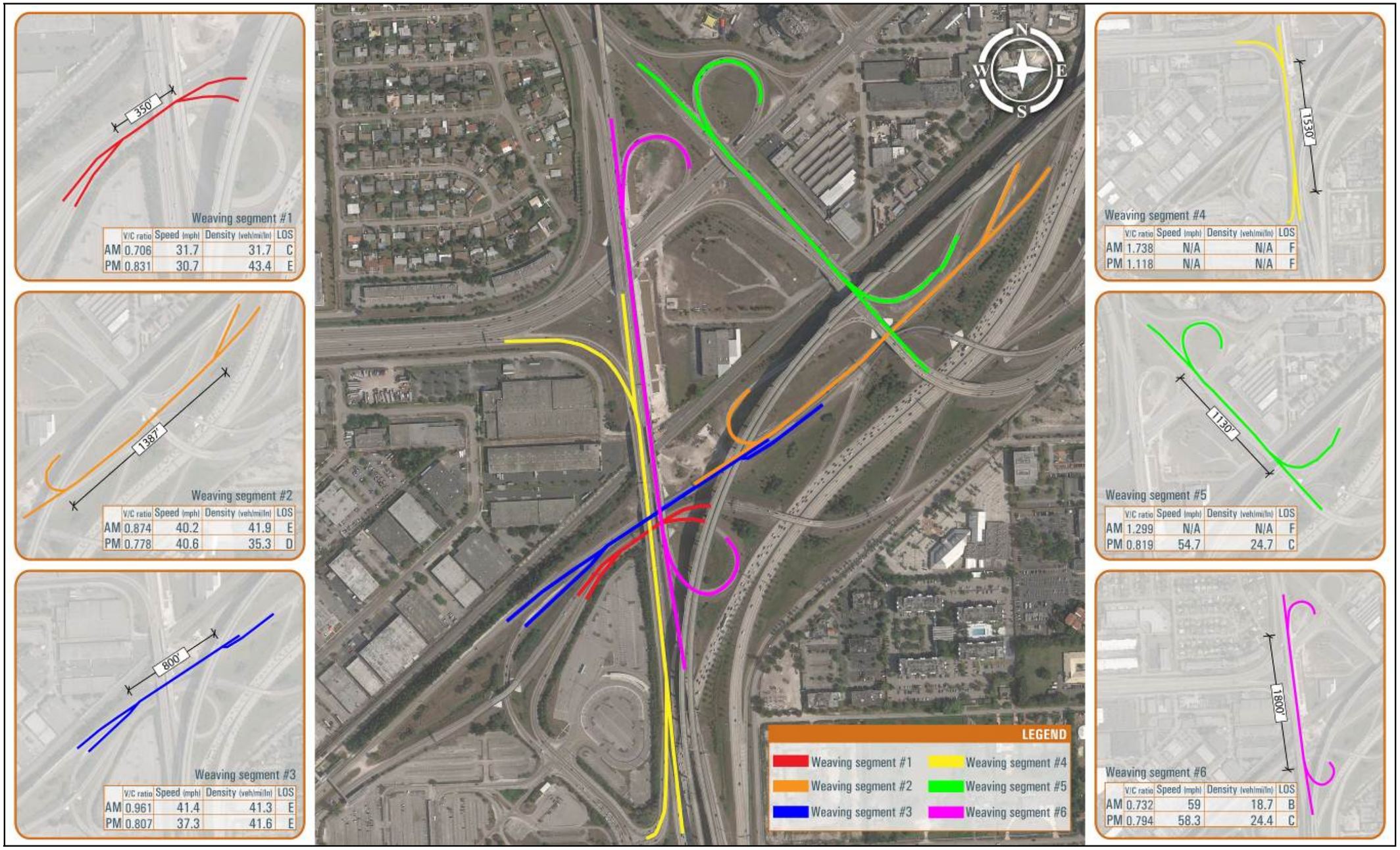


Figure 8-17 Weaving Segment Analysis – No Build 2030

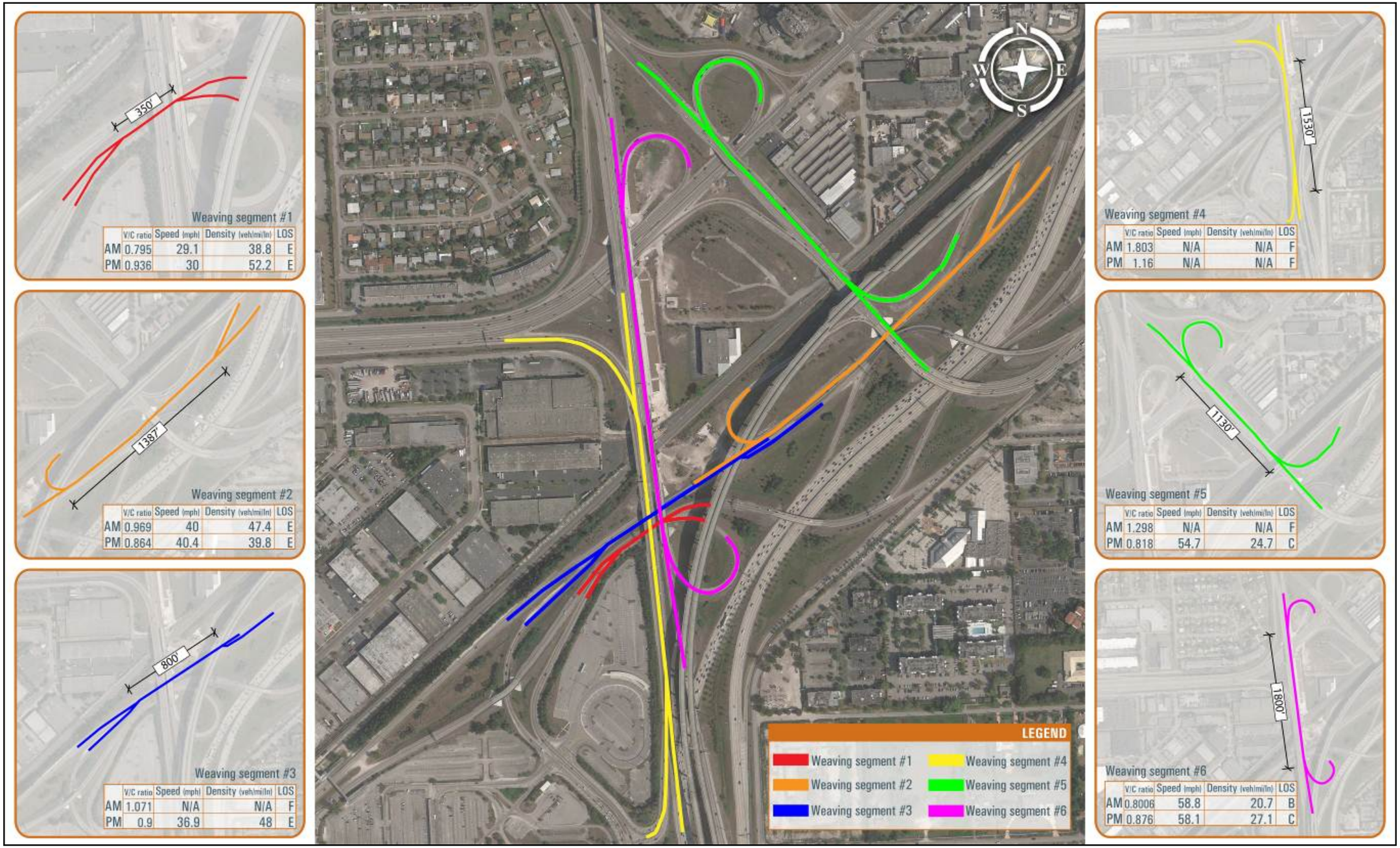


Figure 8-18 Weaving Segment Analysis – No Build 2040

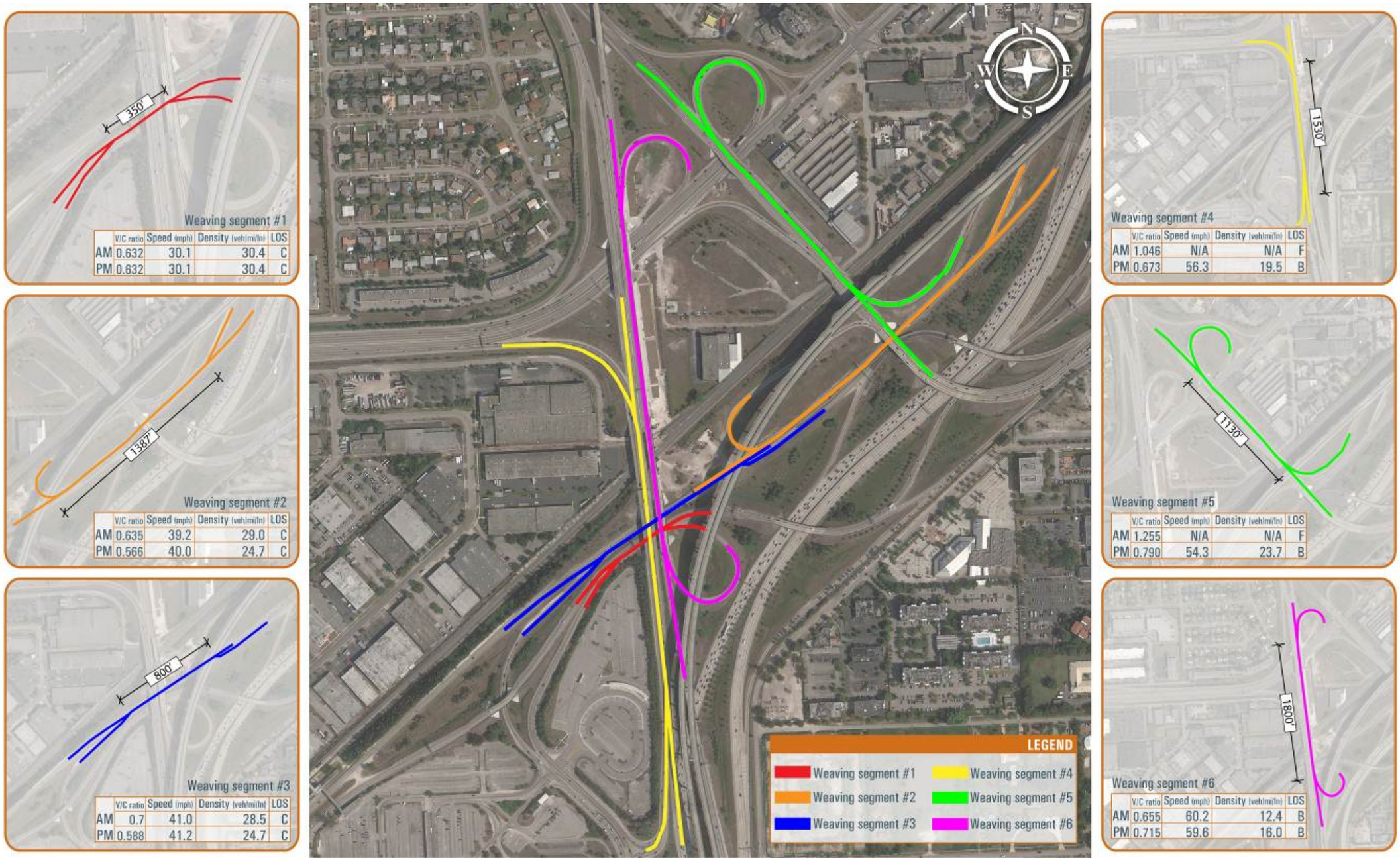


Figure 8-19 Weaving Segment Analysis –Build 3A 2018

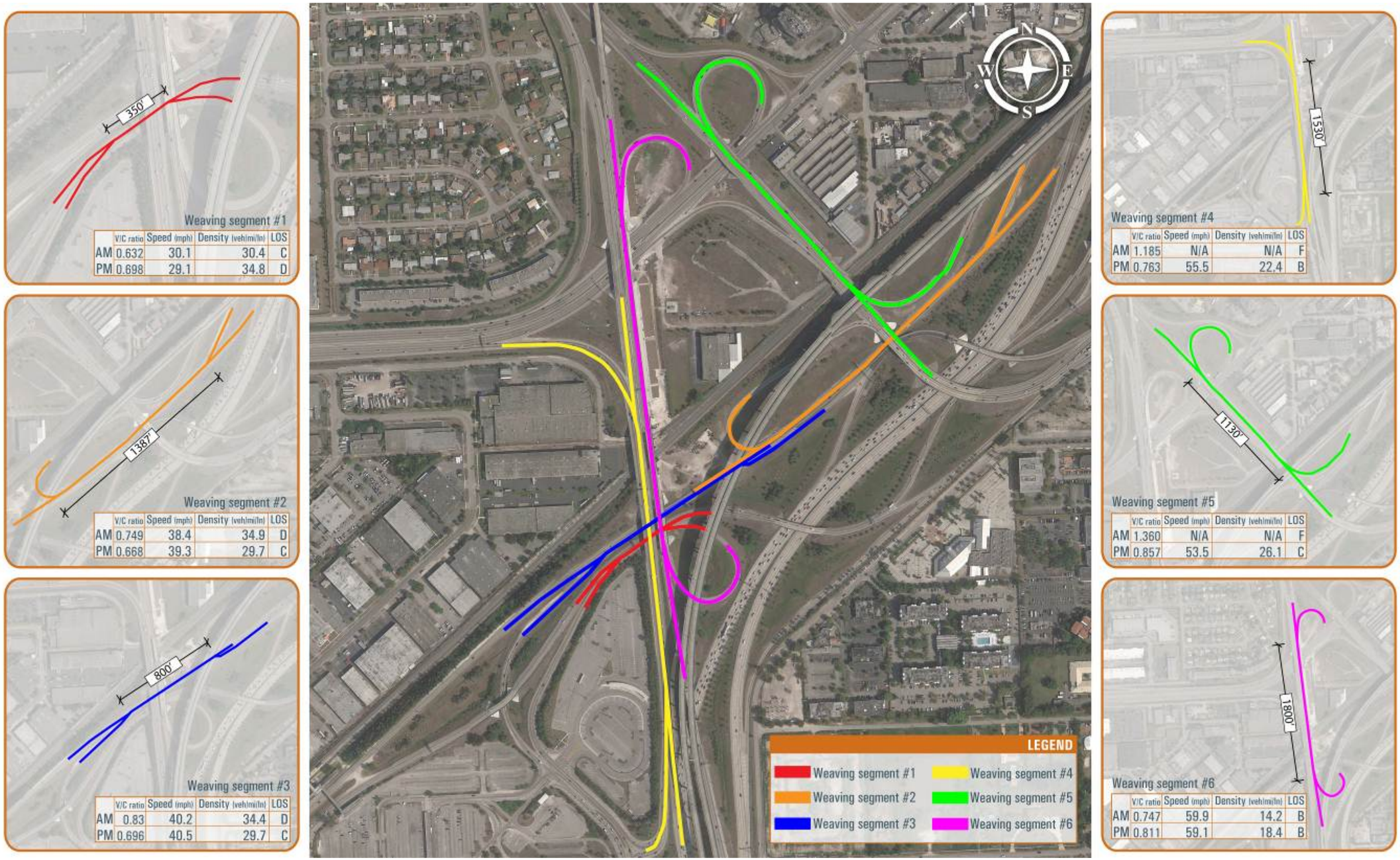


Figure 8-20 Weaving Segment Analysis –Build 3A 2030

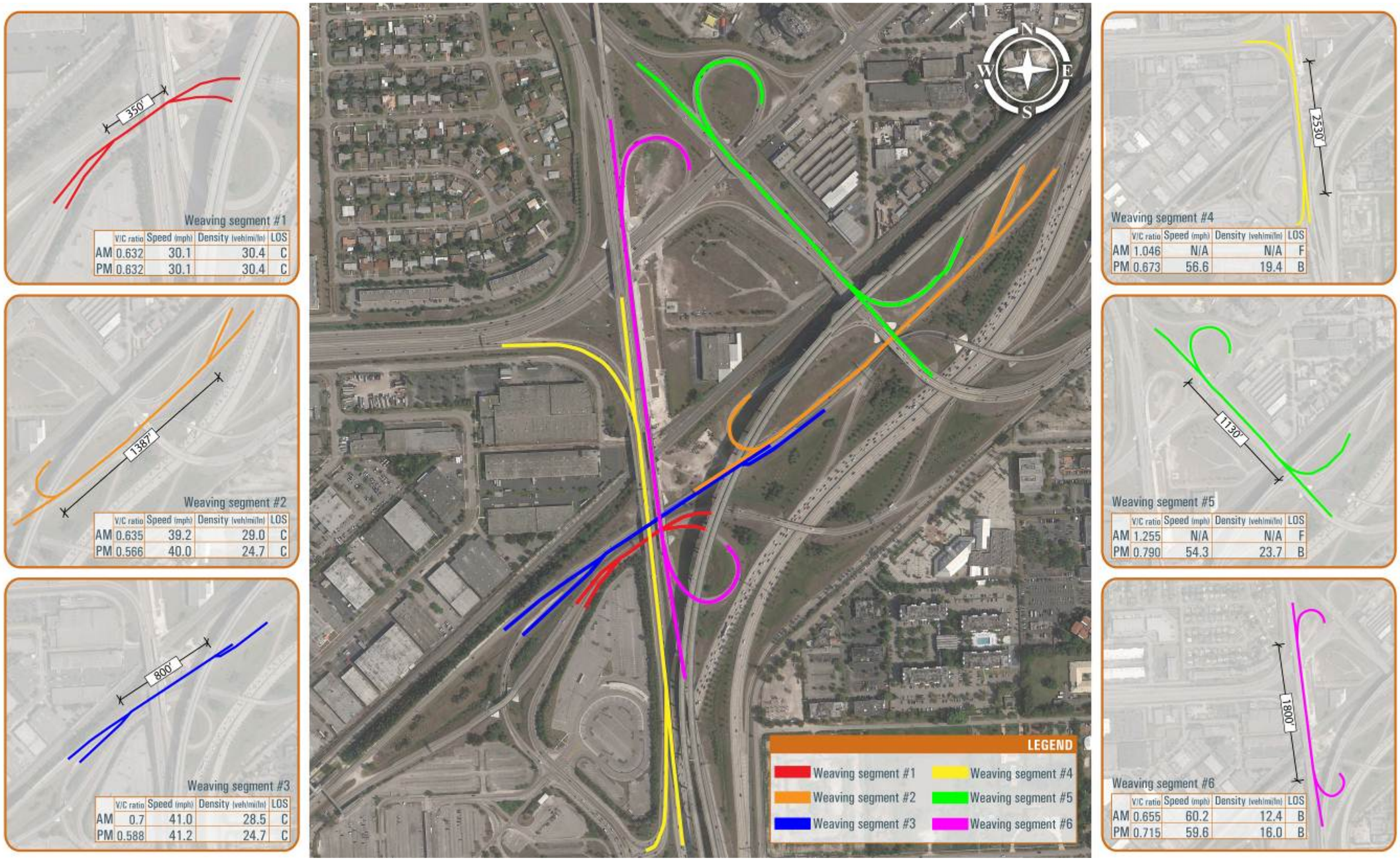


Figure 8-21 Weaving Segment Analysis –Build 3B 2018

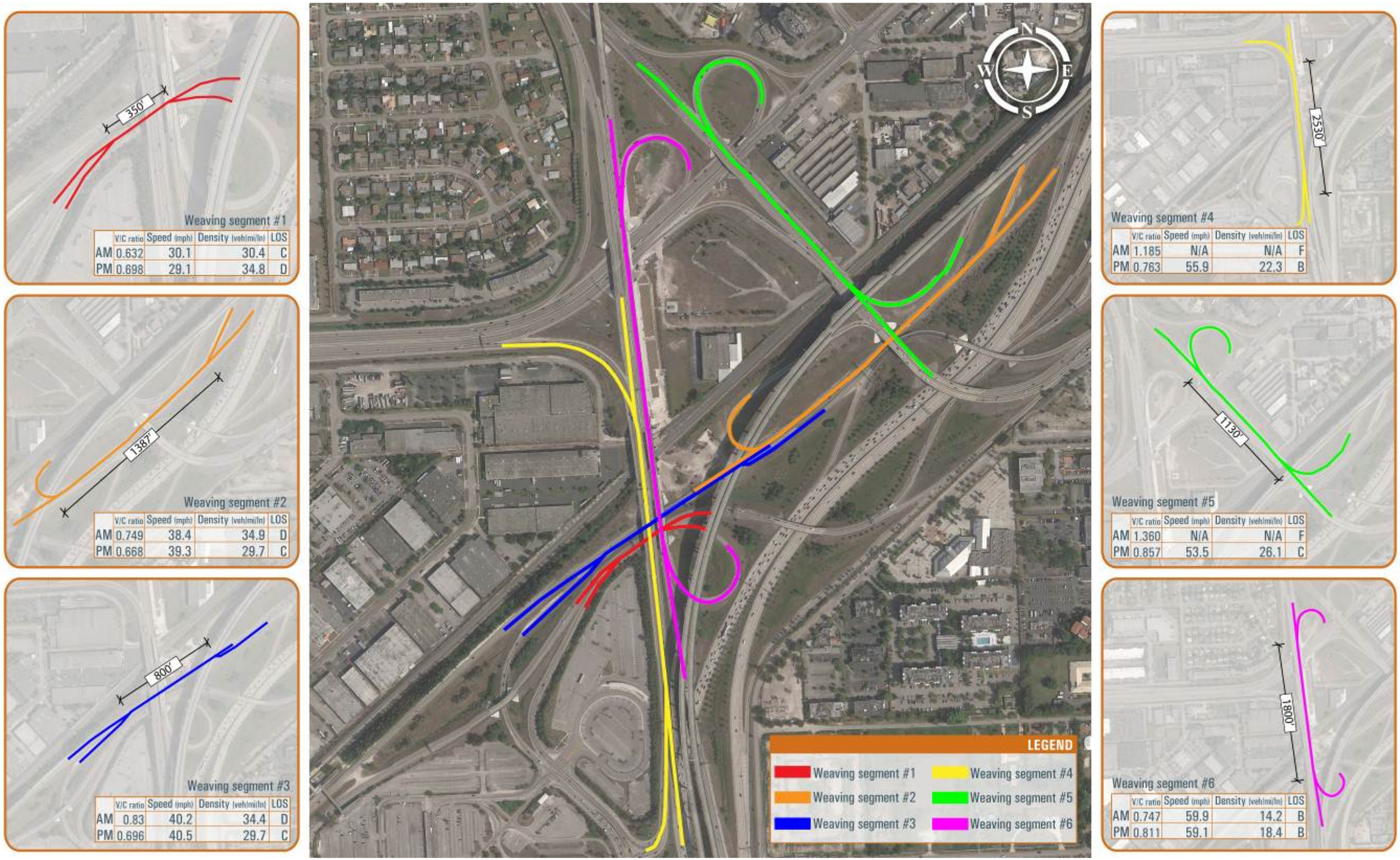


Figure 8-22 Weaving Segment Analysis –Build 3B 2030

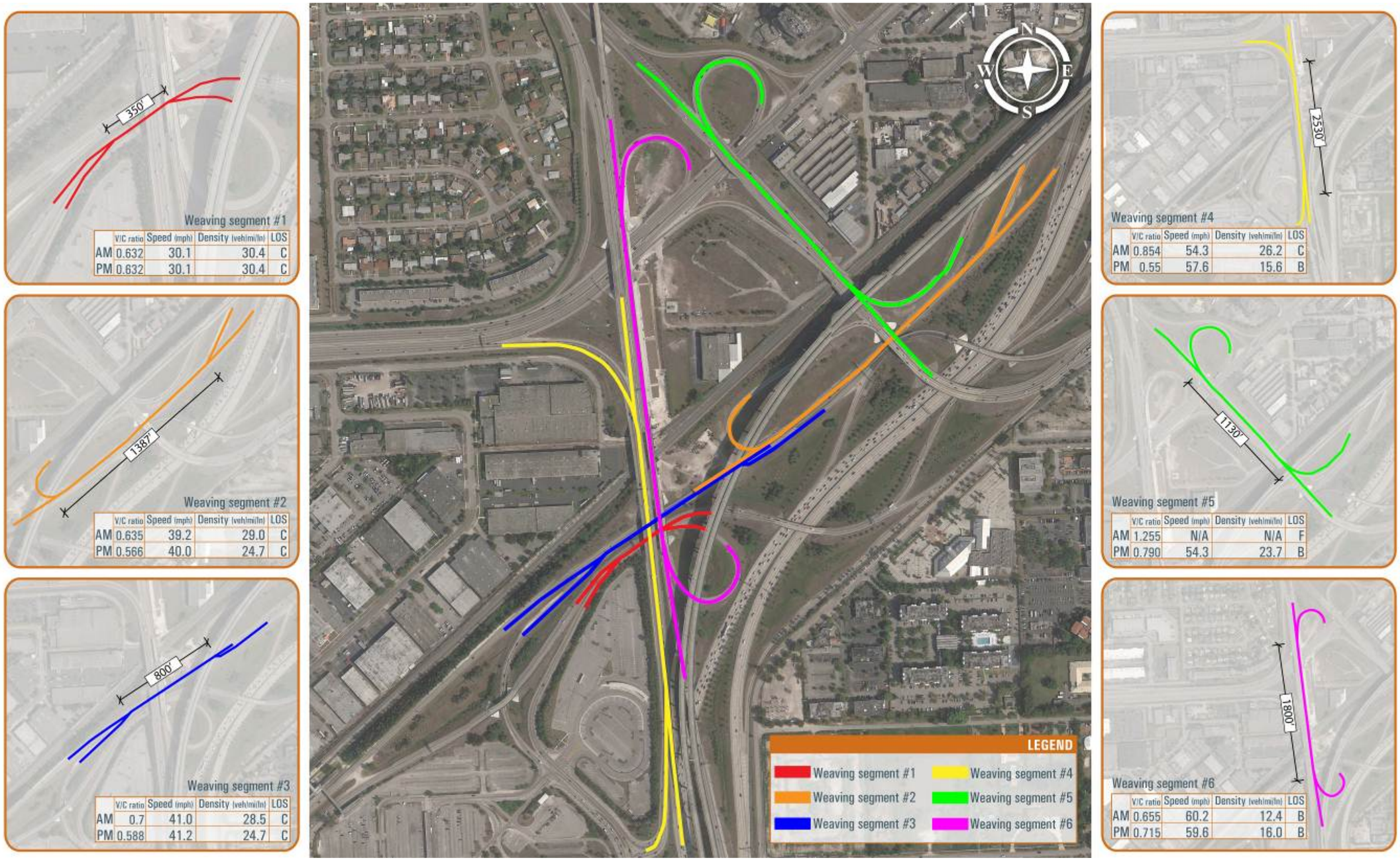


Figure 8-23 Weaving Segment Analysis –Build 3C 2018

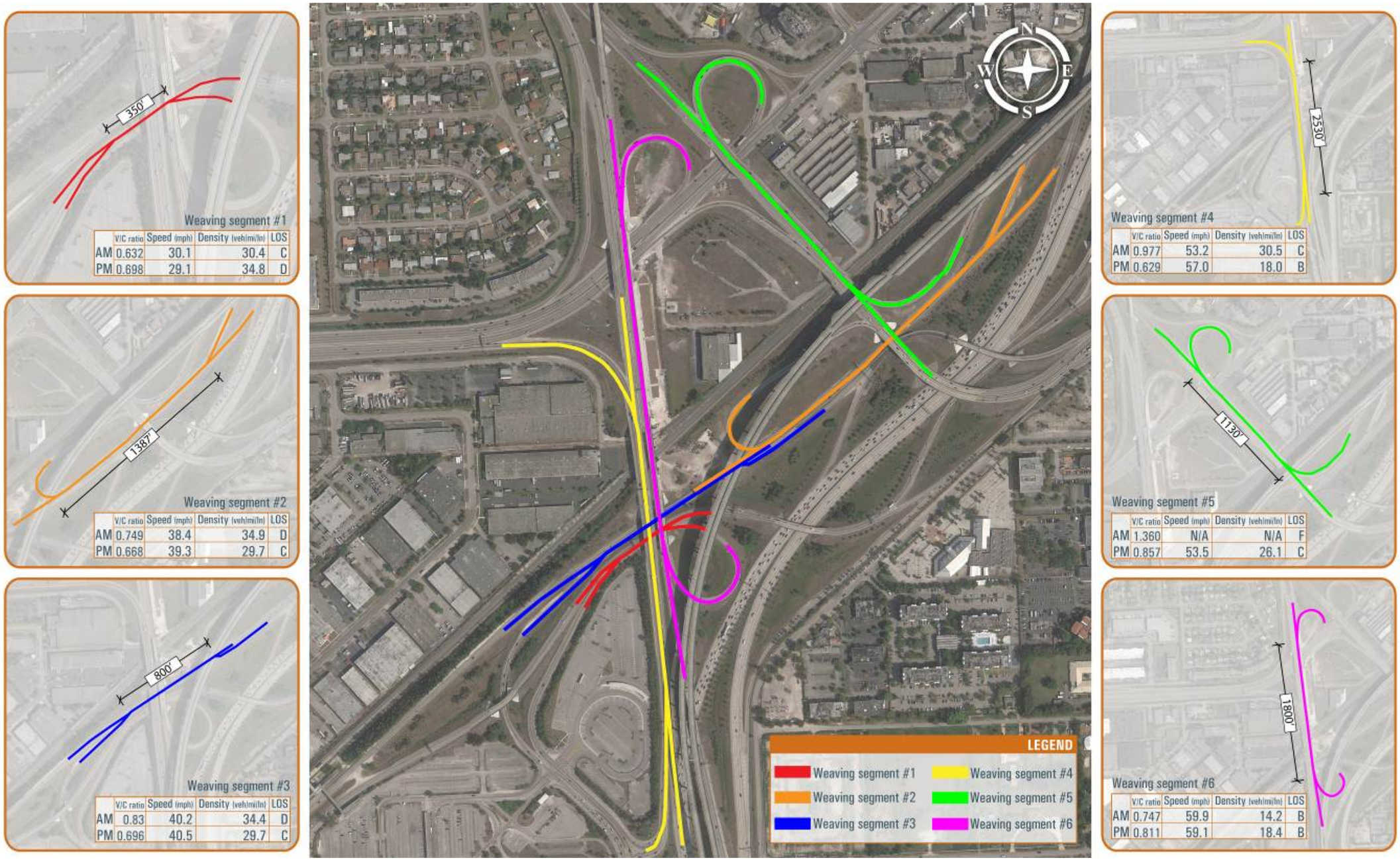


Figure 8-24 Weaving Segment Analysis –Build 3C 2030

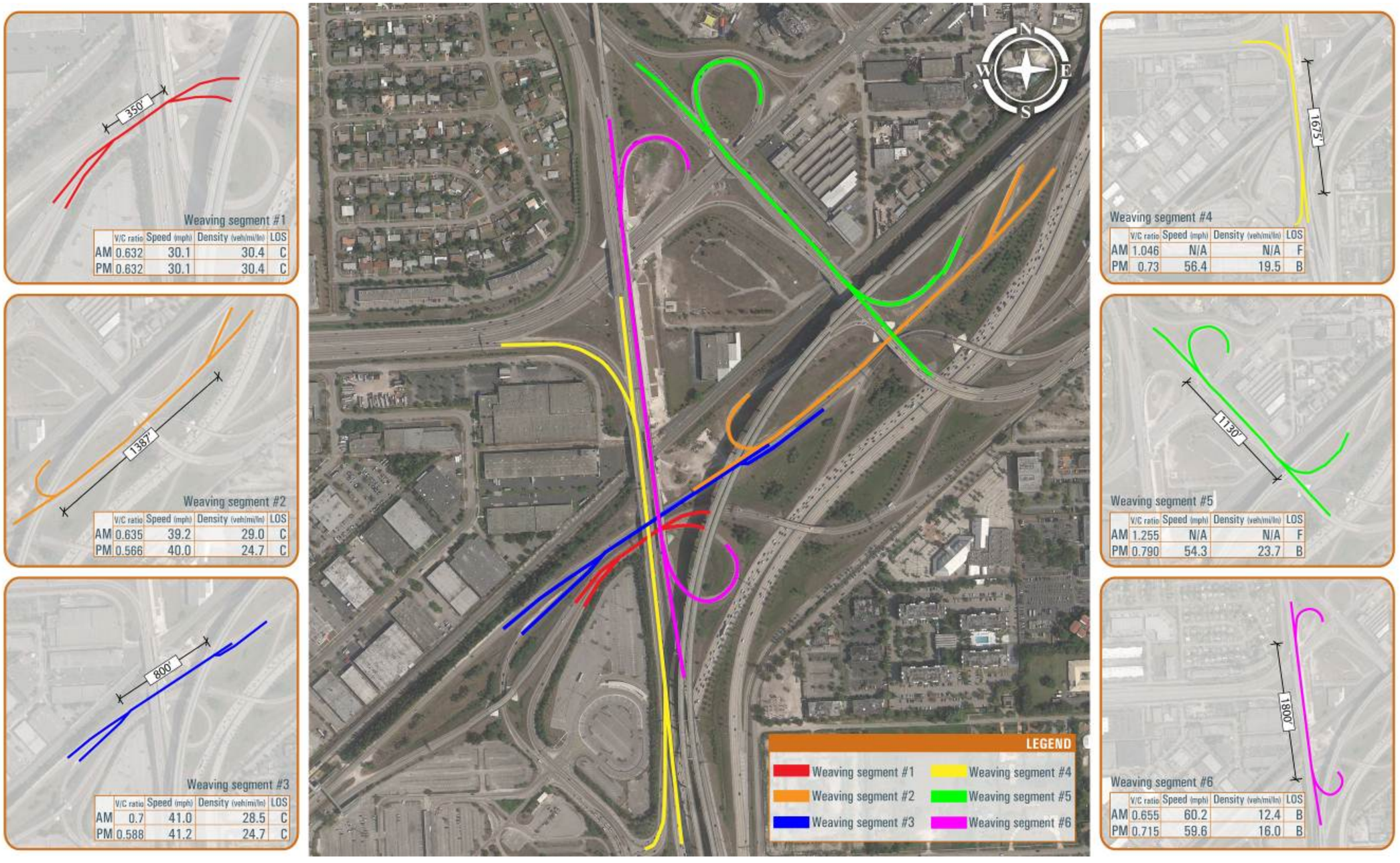


Figure 8-25 Weaving Segment Analysis –Build 4 2018

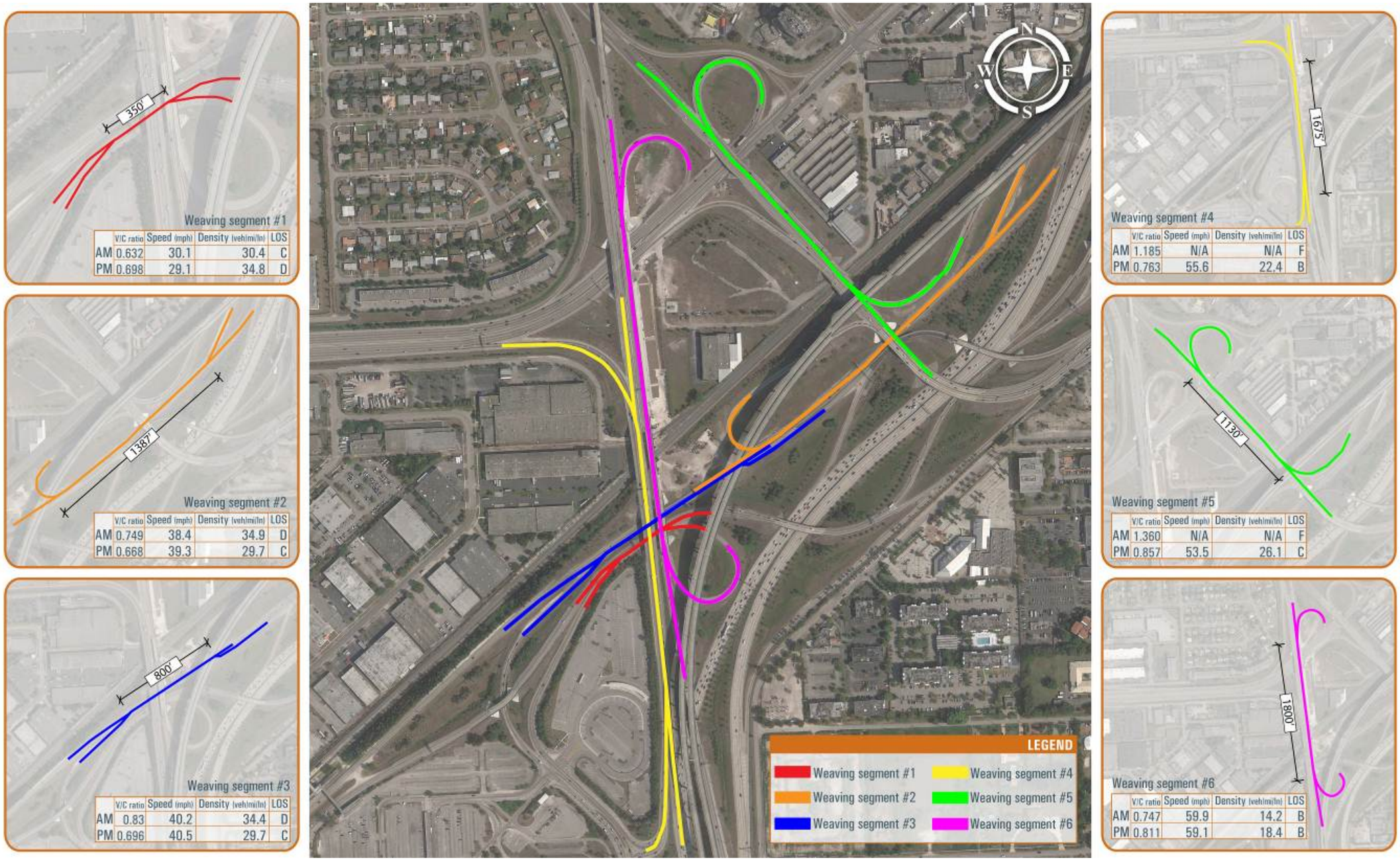


Figure 8-26 Weaving Segment Analysis –Build 4 2030

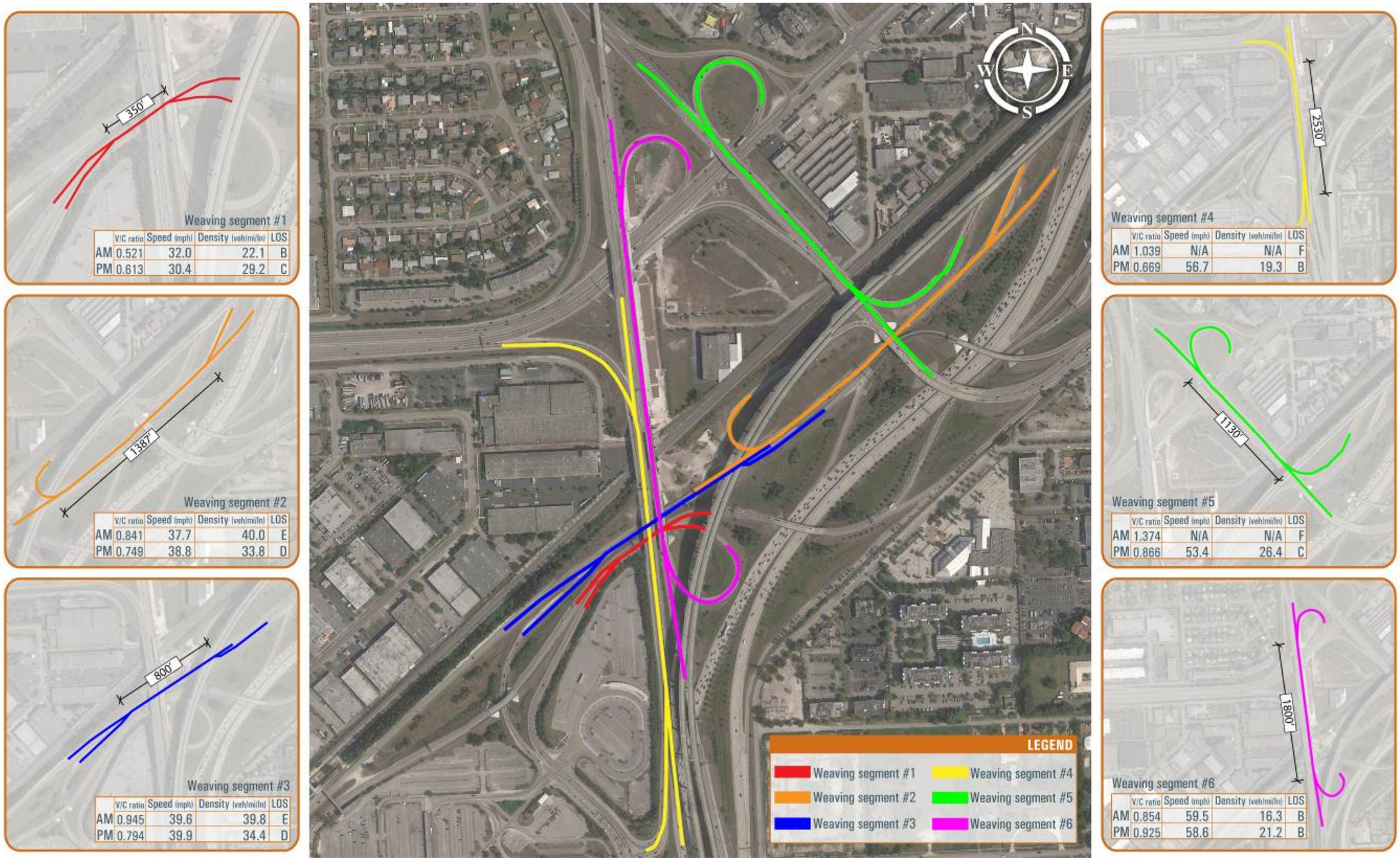


Figure 8-27 Weaving Segment Analysis –Ultimate Build 2040

8.4.5 Travel Time and Average Speed Alternative Comparison

Travel time and speed analysis were also performed for the four interim build alternatives and compared to the No-Build Alternative. Six critical roadway links were selected for the comparison analysis and the results are summarized in **Tables 8-47** through **8-50**. It should be noted that the No Build Alternatives in 2030 and 2040 resulted in constrained conditions with tens of thousands of vehicles held at the entry nodes and not entering GGI, causing the travel times and speeds for the No-Build conditions to be more favorable than the Build Conditions. **Figure 8-28** provides a graphical representation of the travel routes.

Table 8-47
Travel Time Summary (2030 AM Peak)

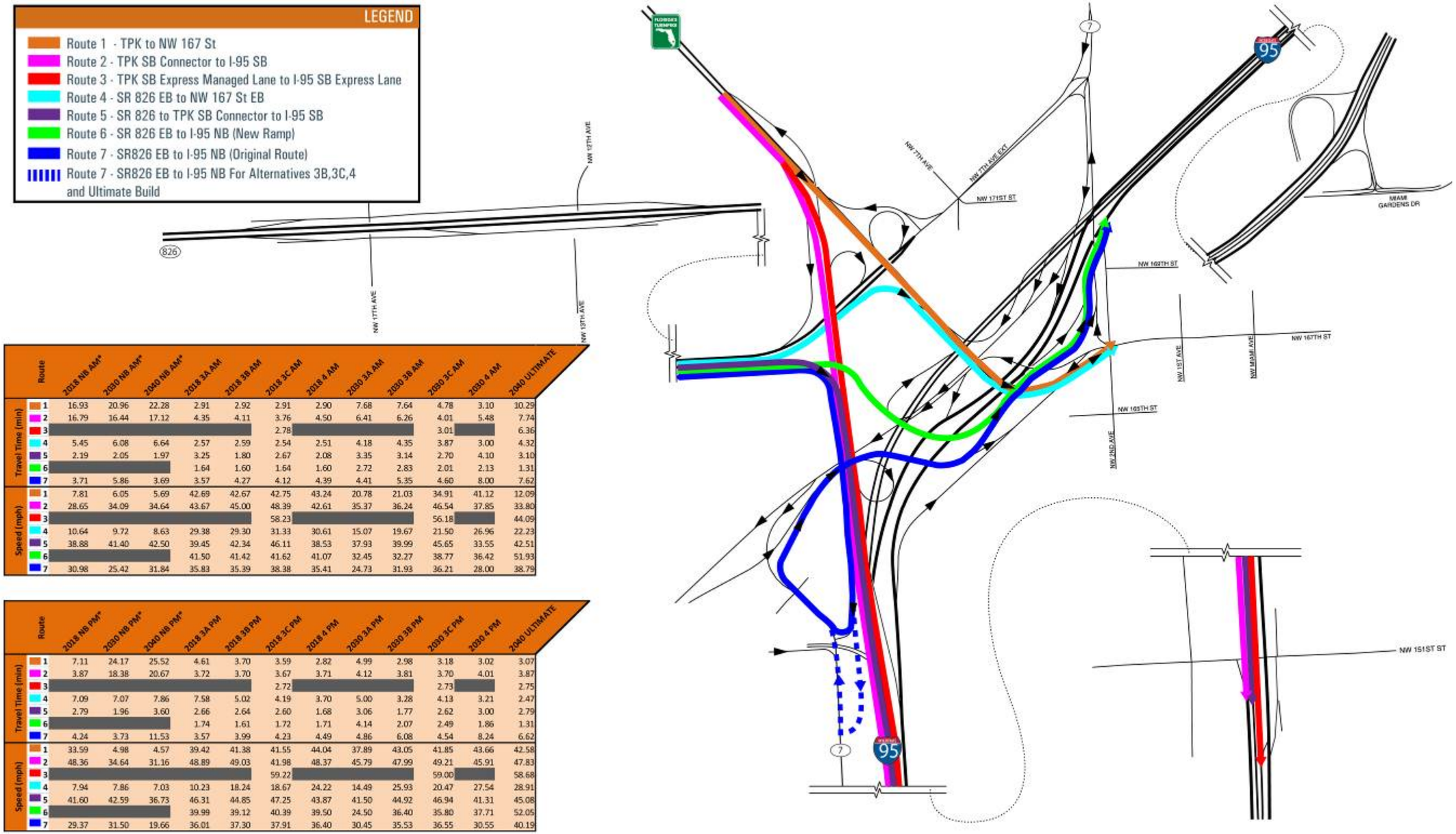
Route	Description	Travel Time (minutes)				
		No-Build	3A	3B	3C	4
Route 1	Turnpike SB to NW 2 Avenue	20.96	7.68	7.64	4.78	3.10
Route 2	Turnpike SB Connector to I-95 SB	16.44	6.41	6.26	4.01	5.48
Route 3	TPK SB to I-95 SB (Express Ramp)				3.01	
Route 4	SR 826 EB to NW 2 Avenue	6.08	4.18	4.35	3.87	3.00
Route 5	SR 826 EB to I-95 SB	2.05	3.35	3.14	2.70	4.10
Route 6	SR 826 EB to I-95 NB (New Ramp)		2.72	2.83	2.01	2.13
Route 7	SR 826 EB to I-95 NB (Existing Route)	5.86	4.41	5.35	4.60	8.00

Table 8-48
Travel Time Summary (2030 PM Peak)

Route	Description	Travel Time (minutes)				
		No-Build	3A	3B	3C	4
Route 1	Turnpike SB to NW 2 Avenue	24.17	4.99	2.98	3.18	3.02
Route 2	Turnpike SB Connector to I-95 SB	18.38	4.12	3.81	3.70	4.01
Route 3	TPK SB to I-95 SB (Express Ramp)				2.73	
Route 4	SR 826 EB to NW 2 Avenue	7.07	5.00	3.28	4.13	3.21
Route 5	SR 826 EB to I-95 SB	1.96	3.06	1.77	2.62	3.00
Route 6	SR 826 EB to I-95 NB (New Ramp)		4.14	2.07	2.49	1.86
Route 7	SR 826 EB to I-95 NB (Existing Route)	3.73	4.86	6.08	4.54	8.24

Table 8-49 Travel Speed Summary (2030 AM Peak)						
Route	**Description**	**Travel Speed (mph)**				
		No-Build	**3A**	**3B**	**3C**	**4**
Route 1	Turnpike SB to NW 2 Avenue	6.05	20.78	21.03	34.91	41.12
Route 2	Turnpike SB Connector to I-95 SB	34.09	35.37	36.24	46.54	37.85
Route 3	TPK SB to I-95 SB (Express Ramp)				56.18	
Route 4	SR 826 EB to NW 2 Avenue	9.72	15.07	19.67	21.50	26.96
Route 5	SR 826 EB to I-95 SB	41.40	37.93	39.99	45.65	33.55
Route 6	SR 826 EB to I-95 NB (New Ramp)		32.45	32.27	38.77	36.42
Route 7	SR 826 EB to I-95 NB (Existing Route)	25.42	24.73	31.93	36.21	28.00

Table 8-50 Travel Speed Summary (2030 PM Peak)						
Route	**Description**	**Travel Speed (mph)**				
		No-Build	**3A**	**3B**	**3C**	**4**
Route 1	Turnpike SB to NW 2 Avenue	4.98	37.89	43.05	41.85	43.66
Route 2	Turnpike SB Connector to I-95 SB	34.64	45.79	47.99	49.21	45.91
Route 3	TPK SB to I-95 SB (Express Ramp)				59.00	
Route 4	SR 826 EB to NW 2 Avenue	7.86	14.49	25.93	20.47	27.54
Route 5	SR 826 EB to I-95 SB	42.59	41.50	44.92	46.94	41.31
Route 6	SR 826 EB to I-95 NB (New Ramp)		24.50	36.40	35.80	37.71
Route 7	SR 826 EB to I-95 NB (Existing Route)	31.50	30.45	35.53	36.55	30.55



Travel Time (min)	Route	2018 NB AM*	2030 NB AM*	2040 NB AM*	2018 3A AM	2018 3B AM	2018 3C AM	2018 4 AM	2030 3A AM	2030 3B AM	2030 3C AM	2030 4 AM	2040 ULTIMATE
	1	16.93	20.96	22.28	2.91	2.92	2.91	2.90	7.68	7.64	4.78	3.10	10.29
	2	16.79	16.44	17.12	4.35	4.11	3.76	4.50	6.41	6.26	4.01	5.48	7.74
	3						2.78				3.01		6.36
	4	5.45	6.08	6.64	2.57	2.59	2.54	2.51	4.18	4.35	3.87	3.00	4.32
	5	2.19	2.05	1.97	3.25	1.80	2.67	2.08	3.35	3.14	2.70	4.10	3.10
	6				1.64	1.60	1.64	1.60	2.72	2.83	2.01	2.13	1.31
	7	3.71	5.86	3.69	3.57	4.27	4.12	4.39	4.41	5.35	4.60	8.00	7.62
Speed (mph)	1	7.81	6.05	5.69	42.69	42.67	42.75	43.24	20.78	21.03	34.91	41.12	12.09
	2	28.65	34.09	34.64	43.67	45.00	48.39	42.61	35.37	36.24	46.54	37.85	33.80
	3						58.23				56.18		44.09
	4	10.64	9.72	8.63	29.38	29.30	31.33	30.61	15.07	19.67	21.50	26.96	22.23
	5	38.88	41.40	42.50	39.45	42.34	46.11	38.53	37.93	39.99	45.65	33.55	42.51
	6				41.50	41.42	41.62	41.07	32.45	32.27	38.77	36.42	51.93
	7	30.98	25.42	31.84	35.83	35.39	38.38	35.41	24.73	31.93	36.21	28.00	38.79

Travel Time (min)	Route	2018 NB PM*	2030 NB PM*	2040 NB PM*	2018 3A PM	2018 3B PM	2018 3C PM	2018 4 PM	2030 3A PM	2030 3B PM	2030 3C PM	2030 4 PM	2040 ULTIMATE
	1	7.11	24.17	25.52	4.61	3.70	3.59	2.82	4.99	2.98	3.18	3.02	3.07
	2	3.87	18.38	20.67	3.72	3.70	3.67	3.71	4.12	3.81	3.70	4.01	3.87
	3						2.72				2.73		2.75
	4	7.09	7.07	7.86	7.58	5.02	4.19	3.70	5.00	3.28	4.13	3.21	2.47
	5	2.79	1.96	3.60	2.66	2.64	2.60	1.68	3.06	1.77	2.62	3.00	2.79
	6				1.74	1.61	1.72	1.71	4.14	2.07	2.49	1.86	1.31
	7	4.24	3.73	11.53	3.57	3.99	4.23	4.49	4.86	6.08	4.54	8.24	6.62
Speed (mph)	1	33.59	4.98	4.57	39.42	41.38	41.55	44.04	37.89	43.05	41.85	43.66	42.58
	2	48.36	34.64	31.16	48.89	49.03	41.98	48.37	45.79	47.99	49.21	45.91	47.83
	3						59.22				59.00		58.68
	4	7.94	7.86	7.03	10.23	18.24	18.67	24.22	14.49	25.93	20.47	27.54	28.91
	5	41.60	42.59	36.73	46.31	44.85	47.25	43.87	41.50	44.92	46.94	41.31	45.08
	6				39.99	39.12	40.39	39.50	24.50	36.40	35.80	37.71	52.05
	7	29.37	31.50	19.66	36.01	37.30	37.91	36.40	30.45	35.53	36.55	30.55	40.19

* No Build alternatives are constrained with traffic backing up at entry nodes, causing travel time and speed to appear more favorable.

Figure 8-28 Travel Time and Speed Summary

8.4.6 Operational Performance

The operational analysis was performed consistent with the MLOU and FDOT and FHWA guidelines using CORSIM 6.2, SYNCHRO 8, and HCS2010. CORSIM micro-simulations identified locations of traffic congestion and traffic backups, and estimated densities throughout the system. SYNCHRO 8 was used to analyze intersections and optimize signal timing. HCS 2010 was used to evaluate basic freeway segments and weaving segments using HCM 2010 procedures. CORSIM analysis was used to analyze basic freeway segments and merge/diverge ramp junctions. When CORSIM analysis differed from HCS, CORSIM results prevailed considering HCS limitations in analyzing complex and congested roadway systems.

The **intersection level** analysis indicates that the unsignalized intersection of NW 7 Avenue Extension and the Turnpike northbound ramp will benefit from adding signalization and a second left turn lane. Likewise, the intersection of NW 7 Avenue and the Park & Ride (Int. # 9) will improve from LOS D to LOS C or better by 2030 in the AM peak period by constructing the flyover connection between SR 826 eastbound and I-95 northbound that would divert traffic from this intersection; PM peak period shows a decrease of 8% in overall control delay. However, the intersections of NW 167 Street and NW 2 Avenue, and the nearby intersection of NW 167 Street and North Miami Avenue although show minor improvements in operation, will still not operate at acceptable levels of service with the improvement alternatives considered in this PD&E. Additional through lanes or some type of grade separation or parallel routes would be needed at these locations. It should be noted that the growth in traffic at the intersection of NW 167 Street and NW 2 Avenue causes traffic to back up and impact I-95 causing a stop-and-go condition. The stop-and-go situation is also identified by the very high density at the freeway exit connected to this intersection. Therefore improvements should be considered in the future to minimize its impacts on the freeways, especially for the PM peak period; which has a higher NB traffic on I-95 and hence on all diverging ramps heading Northbound.

As part of the PD&E Study, several meetings and discussions were held with the City of Miami Gardens, adjacent residents and business owners within the Sunshine Industrial Park. The City of Miami Gardens and the business owners requested for the inclusion of the Texas U-Turns at both NW 12th Avenue and NW 17th Avenue as part of the interim project as a mitigation strategy to address the business community's circulation and access concerns until the ultimate project is constructed that implements the permanent Texas U-Turn at NW 17 Avenue. The interim Texas U-Turns are required in order to receive the MPO approval and support for the project. For this reason additional intersection level analysis was conducted for the signalized ramp terminal intersections at NW 12th Avenue and NW 17th Avenue interchanges using SYNCHRO.

In the ultimate build , where the NW 17 Avenue Texas U-turn is permanent, the traffic projections model attributed 20% of traffic that wanted to do the turnaround would use the Texas U-turn and 80% will remain using the circulation through the two interaction. To

maintain consistency, the same traffic split is assumed for the interim Texas U-Turns. **Table 8-51** below presents the intersection analysis results for Build Alternative 4 with and without the Texas U-Turns.

Table 8-51
Intersection Analysis of Interim Texas U-Turns (2030)

#	Intersection	Time Period	Without Texas U-Turns		With Texas U-Turns	
			Control Delay (sec/Veh)	LOS	Control Delay (sec/Veh)	LOS
14	Frontage Rd (NW 167 St)/ SR 826 EB Exit/ NW 17th Avenue	AM	18.7	B	17.8	B
		PM	17.9	B	18.0	B
15	Frontage Rd (NW 167 St)/ SR 826 WB Exit/ NW 17th Avenue	AM	15.5	B	15.5	B
		PM	15.9	B	15.6	B
6	Frontage Rd (NW 167 St)/ SR 826 EB Exit/ NW 12th Avenue	AM	11.2	B	10.9	B
		PM	22.2	C	22.0	C
5	Frontage Rd (NW 167 St)/ SR 826 WB Exit/ NW 12th Avenue	AM	14.0	B	14.4	B
		PM	17.3	B	17.2	B

The comparison of the values shows that the proposed Texas U-Turns will only result in ver minor improvements to the intersection LOS. This is due to the low peak hour left turn volumes and the linked signal timing plans of these two intersections, which allows for more efficient signal timing coordination to move traffic through the signals.

Freeway segments were evaluated using both HCS 2010 software and densities obtained from CORSIM. The No Build Alternatives in 2030 and 2040 resulted in constrained conditions with tens of thousands of vehicles held at the entry nodes and not entering GGI, and therefore densities and LOS for No Build are not valid for the CORSIM analysis. HCS 2010 for the No Build Alternatives indicated that all I-95 segments north and south of the GGI will operate at LOS E or worse in 2040. HCS 2010 indicated that all freeway segments of the Build Alternatives will operate at LOS E or better, except for the following:

- I-95 SB south of NW 151 Street, which operates at LOS F during the AM Peak period for all Build Alternatives
- I-95 SB south of NW 151 Street, which operates at LOS F during the PM Peak period for Build Alternatives 3A, 3B and 4
- I-95 NB between GGI and NW 151 Street, which operates at LOS F during the PM Peak period for the Ultimate Build Alternative

However, CORSIM simulations showed different results with high densities exceeding 45 veh/mi/ln at ramps, connectors and several I-95 sections (northbound and southbound between GGI and NW 135 Street and between GGI and Miami Gardens Drive). In the 2030 build alternatives analysis the Turnpike freeway segments surpassed the 45 veh/mi/ln

threshold for the AM peak in SB direction, however in Build Alternatives 3C and 4 an approximate 30% decrease is observed most likely due to the improvements of an additional express lane connection from Turnpike SB to I-95 Express and the improvements to the intersection of the Turnpike Connector off ramp to SR 7, respectively.

CORSIM segment densities estimated from multiple micro-simulation runs are summarized in **Table 8-52**. Densities for the No Build runs mostly represent constrained conditions and therefore these densities are not representative of the true demand. For the main freeway segments, high densities were identified at a few segments typically representing a merge or weave segment, or traffic backup caused by the intersection of NW 167 Street and NW 2 Avenue such as I-95 northbound segment between NW 151 Street off ramp and GGI. Regarding ramp segments and ignoring the loop ramps, high density was identified at I-95 northbound off ramps serving the congested intersections. The summary of the **HCS 2010 analysis** of freeway segments using HCS 2010 procedures is provided in **Table 8-53**. It should be noted that since the HCS results conflict with CORSIM densities from the traffic simulation, CORSIM results are more accurate in considering operations on GGI segments under saturated conditions and outside the applicability of HCM procedures.

Table 8-52
Basic Freeway Segment CORSIM Analysis Comparison

SEGMENT	Period	Direction	CORSIM Node	2030 No Build Density (veh/mi/ln)	2040 No Build Density (veh/mi/ln)	2030 Build 3A Density (veh/mi/ln)	2030 Build 3B Density (veh/mi/ln)	2030 Build 3C Density (veh/mi/ln)	2030 Build 4 Density (veh/mi/ln)	2040 Ult. Build Density (veh/mi/ln)
I-95 B/W GGI and NW 151 St	AM	NB	70	28	29	30	30	30	30	63
I-95 B/W GGI and NW 151 St	AM	SB	52	28	27	66	60	37	71	41
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	EB	502	100	104	36	37	36	36	29
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	WB	704	24	21	22	22	21	22	21
Turnpike at Toll Plaza	AM	SB	63	79	79	63	60	46	42	69
Turnpike at Toll Plaza	AM	NB	127	30	32	47	47	47	47	45
I-95 B/W GGI and Miami Gardens Dr	AM	SB	28	21	23	28	28	28	28	30
I-95 B/W GGI and Miami Gardens Dr	AM	NB	48	69	29	35	37	30	28	22
I-95 South of NW 151 St	AM	NB	42	22	21	44	53	43	54	46
I-95 South of NW 151 St	AM	SB	101	27	28	28	28	28	28	72

Table 8-52
Basic Freeway Segment CORSIM Analysis Comparison

SEGMENT	Period	Direction	CORSIM Node	2030 No Build Density (veh/mi/ln)	2040 No Build Density (veh/mi/ln)	2030 Build 3A Density (veh/mi/ln)	2030 Build 3B Density (veh/mi/ln)	2030 Build 3C Density (veh/mi/ln)	2030 Build 4 Density (veh/mi/ln)	2040 Ult. Build Density (veh/mi/ln)
I-95 B/W GGI and NW 151 St	PM	NB	70	99	104	91	111	100	106	100
I-95 B/W GGI and NW 151 St	PM	SB	52	26	25	48	35	32	38	37
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	EB	502	104	109	67	36	35	35	29
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	WB	704	21	20	21	22	21	20	19
Turnpike at Toll Plaza	PM	SB	63	82	89	27	23	23	23	26
Turnpike at Toll Plaza	PM	NB	127	32	32	45	42	42	40	43
I-95 B/W GGI and Miami Gardens Dr	PM	SB	28	20	21	143	118	134	120	27
I-95 B/W GGI and Miami Gardens Dr	PM	NB	48	24	25	68	34	27	22	23
I-95 South of NW 151 St	PM	NB	42	22	20	37	41	36	47	41
I-95 South of NW 151 St	PM	SB	101	170	162	121	147	134	176	160

Table 8-53
Basic Freeway Segment HCS 2010 Analysis Comparison

SEGMENT	Period	Direction	CORSIM Node	2030 No Build	2040 No Build	2030 Builds 3A, 3B, & 4	2030 Build 3C	2040 Ult. Build
I-95 B/W GGI and NW 151 St	AM	NB	70	E	E	D	D	D
I-95 B/W GGI and NW 151 St	AM	SB	52	F	F	E	D	D
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	EB	502	E	F	D	D	D
SR 826 B/W NW 17 Ave and NW 12 Ave	AM	WB	704	D	D	C	C	C
Turnpike at Toll Plaza	AM	SB	63	E	F	C	D	D
Turnpike at Toll Plaza	AM	NB	127	D	E	C	C	D
I-95 B/W GGI and Miami Gardens Dr	AM	SB	28	F	F	D	D	D
I-95 B/W GGI and Miami Gardens Dr	AM	NB	48	F	E	C	C	D
I-95 South of NW 151 St	AM	NB	42	D	E	D	D	D
I-95 South of NW 151 St	AM	SB	101	F	F	F	F	F
I-95 B/W GGI and NW 151 St	PM	NB	70	F	F	E	E	F
I-95 B/W GGI and NW 151 St	PM	SB	52	F	F	D	D	D
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	EB	502	E	F	D	D	D
SR 826 B/W NW 17 Ave and NW 12 Ave	PM	WB	704	F	F	D	D	D
Turnpike at Toll Plaza	PM	SB	63	C	C	B	B	C
Turnpike at Toll Plaza	PM	NB	127	C	C	B	B	C
I-95 B/W GGI and Miami Gardens Dr	PM	SB	28	F	F	D	D	D
I-95 B/W GGI and Miami Gardens Dr	PM	NB	48	F	F	D	D	E
I-95 South of NW 151 St	PM	NB	42	E	E	E	E	E
I-95 South of NW 151 St	PM	SB	101	E	E	F	E	E

Weaving analysis results using HCS 2010 are provided in **Table 8-54**. The improvements applied to SR 7 in the Build Alternatives are beneficial to operations of the weaving segments along the NB and SB SR 7, decreasing the LOS from LOS F in 2040 No Build to LOS E in 2040 Ultimate Build. In the interim builds 2030, the Turnpike connector SB weaving segment operates at LOS F in the AM peak period and LOS B in the PM peak period in all Build Alternatives except for Build 3C which includes the additional improvement of the direct express lane connection between the Turnpike SB to I-95 SB Express.

Table 8-54
Weaving Operational Analysis Results Comparison

#	Mainline		Weave Length	No Build 2030		No Build 2040		Builds 2030		Ultimate Build 2040	
				AM	PM	AM	PM	AM	PM	AM	PM
				LOS	LOS	LOS	LOS	LOS	LOS	LOS	LOS
1	SR 7 NB		350	C	E	E	E	C	D	B	C
2	SR 7 SB		1387	E	D	E	E	D	C	E	D
3	SR 7 SB		800	E	E	F	E	D	C	E	D
4	Turnpike Connector SB	3A	1530	F	F	F	F	F	B	-	-
		3B	2530	-	-	-	-	F	B	-	-
		3C	2530	-	-	-	-	C	B	F	B
		4	1675	-	-	-	-	F	B	-	-
5	NW 167th St to Tpk		1130	F	C	F	C	F	C	F	C
6	Turnpike Connector NB		1800	B	C	B	C	B	B	B	B

The weaving segment on Turnpike connector SB (Segment 4) for Alternative 4 and Ultimate Build was design to incorporate the NW 12 Avenue Ramp. This original design would have led to a multi-weaving segment in conjunction with a merge segment, which is one of the listed limitations of the Highway Capacity methodologies, as outlined in the Highway Capacity Manual (2010), page 12-9. For the purpose of Highway Capacity Analysis, this merge was assumed to take place upstream of the expected point of convergence. While the results in the Highway Capacity Analysis do not reflect the practical application of the design, it is shown for informative purposes only. Ultimately, the results from the CORSIM analysis at this section should supersede the HCS analysis results. **Table 8-55** provides the densities from the CORSIM simulation for the average of the 2-hour peak period for Weaving Segment 4.

Table 8-55
CORSIM Weaving Analysis Results Comparison for Turnpike Connector SB

Alternative	CORSIM Nodes	Weave Length	2030		2040		2030				2040			
			Density (veh/mi/ln) (Speed (mph))				Volume (veh/hr)							
			AM	PM	AM	PM	AM		PM		AM		PM	
							Demand	Processed	Demand	Processed	Demand	Processed	Demand	Processed
No Build	303-305	1530	35 (34)	28 (38)	28 (39)	71 (22)	6084	3441	3842	3258	6079	3231	3839	2856
3A	303-305	1530	54 (32)	41 (37)	-	-	7660	6312	4837	5528	-	-	-	-
3B	303-305	2530	39 (41)	38 (40)	-	-	7660	6352	4837	6096	-	-	-	-
3C	303-305	2530	32 (42)	28 (42)	-	-	6369	5352	4022	4784	-	-	-	-
4	303-305	1675	55 (29)	40 (35)	-	-	7660	6750	4837	6720	-	-	-	-
Ultimate Build	303-305	2530	-	-	34 (37)	28 (40)	-	-	-	-	6436	5650	4064	5380

From the CORSIM analysis results, for this weaving segment, Build 3C provides the lowest density value in 2030 at 31.71 veh/mi/ln and the Ultimate Build in year 2040 still results in a comparable density to 2030 interim build CORSIM results. The low density values for this weaving segment shown in Build 3C and the Ultimate Build can be attributed to the improvements at the intersection of Turnpike Connector off-ramp terminal at SR 7 and to the additional direct Turnpike express lane to I-95 Express connection in these alternatives.

The CORSIM analysis also indicated that for the AM peak period, the processed volumes were generally lower than the demand volumes. This may be due to recurring hotspots along the I-95 SB segments continue to result in some congestion within this interchange along with tens of thousands of vehicles held at the entry nodes and not entering GGI. The District recently began a planning study along the I-95 segment within Miami-Dade County to evaluate future alternative improvements that will mitigate these recurring hotspots. For the PM peak periods, the processed volumes were generally higher than the demand volumes. This may be due to the fact that the turning volumes in CORSIM are based on percentages and not absolute volumes, hence the demand and processed volumes will not be identical in all cases.

The travel times and average speeds were extracted for all years from the ten (10) CORSIM runs. Build Alternatives 3A, 3B and 3C and 4 will have a significant benefit in reducing travel times and increasing average speeds for the southbound connector between the Turnpike and I-95 (Routes 2 and 5) and between the Turnpike and NW 167 Street (Route 1). Compared to the No Build alternative, the travel time is cut by more than half and the average speed increased by a range of 2mph to 15mph for Alternatives 3A and 3B due to the additional lane serving the southbound movement on Route 2. The additional flyover proposed in Alternative 3C results in further improvement in capacity and speed as travel times on the flyover are reduced by 77% compared to No Build conditions. The benefits in reduced delays and higher speeds are maintained in the Ultimate Build conceptual design in spite of the increase in traffic volume between 2030 and 2040.

The new flyover connecting SR 826 eastbound to I-95 northbound provides a system-to-system connection that is shorter and faster compared to the existing connector that is interrupted by a traffic signal at the Park and Ride lots and subject to friction from multiple merging and weaving sections. As expected, the travel times on the flyover are less than half of the old route. The higher speed will insure adequate level of service and carrying capacity to handle future traffic demand as Turnpike's traffic is anticipated to grow at a faster rate than SR 826 and I-95. The Ultimate Build design that improves connectors and provides a new system-to-system connection between the managed lanes for the same eastbound SR 826 to northbound I-95 route by increasing the capacity of the system even further and the tolls would insure adequate levels of service throughout the service life of the project as well as provide support for a network of express buses needed for future multimodal regional mobility.

8.4.7 System Performance

The traffic operational analysis, for the system-wide performances, comparing No Build and Build Alternatives for the 2030 AM and PM peak periods are provided in **Tables 8-56** and **8-57.**

Table 8-56
Traffic Operational Results (2030 AM Peak)

Network-Wide Statistics	Alternatives				
	No-Build	Interim Build Alternative 3A	Interim Build Alternative 3B	Interim Build Alternative 3C	Interim Build Alternative 4
Total Veh-Miles	345,567	466,585	470,169	472,960	470,840
Move Time (Veh-Hrs)	6,867	9,164	9,249	9,213	9,255
Delay Time (Veh-Hrs)	10,846	3,975	4,003	2,822	4,247
Total Time (Veh-Hrs)	17,713	13,139	13,251	12,035	13,503
Average Speed (mph)	19.55	35.53	35.50	39.31	34.89
Move/Total Ratio	0.39	0.70	0.70	0.77	0.69
Delay (min/mile)	1.89	0.51	0.51	0.36	0.54
Total Time (min/mile)	3.08	1.69	1.69	1.53	1.71

Table 8-57
Traffic Operational Results (2030 PM Peak)

Network-Wide Statistics	Alternatives				
	No-Build	Interim Build Alternative 3A	Interim Build Alternative 3B	Interim Build Alternative 3C	Interim Build Alternative 4
Total Veh-Miles	350,620	465,097	473,983	481,882	454,239
Move Time (Veh-Hrs)	7,011	9,161	9,362	9,440	8,975
Delay Time (Veh-Hrs)	13,701	8,753	9,990	10,029	11,086
Total Time (Veh-Hrs)	20,712	17,914	19,352	19,469	20,061
Average Speed (mph)	16.93	26.00	24.51	24.77	22.71
Move/Total Ratio	0.34	0.51	0.48	0.49	0.45
Delay (min/mile)	2.34	1.13	1.26	1.25	1.47
Total Time (min/mile)	3.55	2.31	2.45	2.42	2.65

The results shown above indicate that for 2030 AM peak period, the overall delay (min/mile) within the Golden Glades Interchange influence area will decrease by approximately 73%, 73%, 81% and 71% under Interim Build Alternatives 3A, 3B, 3C and 4 respectively compared to the No-Build Alternative. Also, the network average speed (mph) is projected to increase by approximately 82%, 82%, 101% and 78% under Interim Build Alternatives 3A, 3B, 3C and 4 respectively compared to the No-Build Alternative. These results represent significant improvements over the No-Build conditions.

Similar operational analysis results were obtained for the 2030 PM peak period. The overall delay (min/mile) within the Golden Glades Interchange influence area will decrease by approximately 52%, 46%, 47% and 37% under Interim Build Alternatives 3A, 3B, 3C and 4 respectively compared to the No-Build Alternative. Also, the network average speed (mph) is projected to increase by approximately 54%, 45%, 46% and 34% under Interim Build Alternatives 3A, 3B, 3C and 4 respectively compared to the No-Build Alternative. These results represent significant improvements over the No-Build conditions.

8.5 Environmental Impacts

The following sections summarize the environmental evaluations performed as part of the PD&E Study. The detailed analysis and evaluation results are documented in the corresponding environmental report.

8.5.1 Air Quality Impacts

The State of Florida is currently in attainment for all of the pollutants for which National Ambient Air Quality Standards (NAAQS) have been developed. It has been determined that as of June 2005, Miami-Dade County is located in an area which is designated attainment for all of the National Ambient Air Quality Standards under the criteria provided in the Clean Air Act. Therefore, the Clean Air Act conformity requirements do not apply to the project. As a result, air quality impacts are not expected to occur as a result of this project.

8.5.2 Endangered Species Impacts

The project corridor is located within the Core Foraging Area (CFA) of two active wood stork colonies. However, direct impacts to wood storks and their critical habitat are not anticipated in association with any of the Interim Build Alternatives. Minor impacts to wood stork Suitable Foraging Habitat (SFH) in association with the proposed improvements may result from construction activities that directly impact existing swales, ditches and dry retention ponds adjacent to the interchange, as these stormwater features may serve as potential wood stork SFH. However, these impacts will be mitigated through the construction of new stormwater features and the implementation of best management practices for road and bridge construction projects

The West Indian manatee (*Trichechus manatus)* is listed as endangered by both the USFWS and the FWC. Manatee's habitat includes coastal waters, bays, rivers, canals, and (occasionally) lakes. The designated critical habitat for the manatee includes all of the marine and freshwater areas of Miami-Dade and Monroe Counties. The proposed improvements under the Interim Build Alternatives will widen or replace the bridge over the Biscayne (C-8) Canal, which is potentially inhabited by the federally endangered West Indian manatee. In addition, a bridge culvert is proposed across the NW 17th Avenue Canal at NW 165th Street. These improvements may affect, but are not likely to adversely affect manatees within these canals.

The eastern indigo snake frequents several habitat types, including forested uplands and wetlands as well as wet and dry prairies. It also occurs in human-altered habitats. Generally, in xeric (very dry environment) habitats, the presence of indigo snakes is associated with gopher tortoise (*Gopherus polyphemus*) occurrences, as the burrows provide shelter for the snakes during the winter. Habitat within the project corridors considered to be xeric is limited to portions of the 16 acre vacant lot located to the north of

the NW 7th Avenue Extension corridor. No gopher tortoise burrows were found within the lot. Due to the lack of suitable refugia and the developed/maintained nature of the area, the eastern indigo snake is unlikely to be encountered within and adjacent to the project corridors. Consequently, the proposed improvements under the Interim Build Alternatives are not likely to adversely affect eastern indigo snake.

8.5.3 Contamination Screening Evaluation

A review of the Miami-Dade County Department of Regulatory and Economy Resources (DRER), Florida Department of Environmental Protection (FDEP), and the Environmental Protection Agency (EPA) files identified 118 permitted and/or known contaminated facilities within the primarily transportation-use project corridor including one Superfund site (Anodyne Inc.) within a 1-mile buffer. Agency files were obtained for each site of potential concern for the contamination screening evaluation. The sites were assigned a risk rating for the potential impact to the proposed action after a review of all available data, including DERM, FDEP, and EPA files.

There are nine sites with a contamination history which indicated a high risk and six with medium risk of potential involvement with the proposed project alternatives. Six high risk sites and three medium risk sites are located along the I-95 and SR 7/US 441 corridors. One high risk site and two medium risk sites are located along SR 826. One high risk site is located along the Florida's Turnpike. The remaining high risk and medium risk sites are located along just south of SR 826.

Anodyne Inc. is a superfund site with volatile organic compound groundwater contamination is present and extends off-site. The contamination plume, as estimated in 2010 by the TerranearPMC groundwater remediation study, extends into the western portion of the study corridor. The Florida Department of Environmental protection (FDEP) discourages the use of wet ponds or exfiltration trenches within one mile of a superfund site. As such, water treatment facilities proposed by this study, which fall within the 1-mile Anodyne buffer, will consist of dry-retention and/or dry-detention.

Interim Build Alternative 3A and 4 may be impacted by four high risk and four medium risk sites. Interim Build Alternatives 3B and 3C may be impacted by all eight high risk and six medium risk sites.

8.5.4 Noise Impacts

Existing noise barriers are located adjacent to these neighborhoods with the exception of the residential neighborhood located west of NW 17th Avenue. The noise sensitive area west of NW 17th Avenue will be impacted by the proposed improvements from Interim Build Alternative 3A, 3B, and 3C due to the rerouted traffic from the industrial park to NW 17th Avenue. The single family areas located west of the Turnpike Connector and also west of I-

95 between the Biscayne (C-8) Canal and NW 151st Street will be impacted by all of the proposed interim alternatives. The proposed reconstruction along I-95 southbound under Interim Build Alternatives 3B and 3C will impact the single-family home neighborhood located west of I-95 between NW 151st Street and Opa-Locka Blvd. based on the noise study, additional noise barriers were not recommended because they did not reduce noise levels by at least 7 decibels at one or more benefited receptors in accordance with FDOTs noise level reduction requirement. The existing noise walls on the west side of I-95 between the Biscayne Canal and Opa-Locka Blvd will be reconstructed to accommodate the proposed improvements.

8.5.5 Cultural Resource Assessment Survey (CRAS)

The CRAS' historic resources survey resulted in the identification of 187 historic resources within the Area of Potential Effect (APE). These resources include nine bridges, one canal, one railroad line segment, one parabolic arch, one gas pipeline facility, one historic district, and 173 buildings. Five previously recorded historic resources were identified: *Seaboard Air Line (CSX) Railroad (8DA10753), Bunche Park Historic District (8DA11613), Sunshine State Arch (8DA11167), K&A Diagnostic Medical Centers (8DA5388),* and *Biscayne/C-8 Canal (8DA6537).* One resource, *K&A Diagnostic Medical Centers* has been demolished. The remaining 183 resources identified are newly recorded.

Of the 187 identified historic resources, three (3) are considered eligible for listing on the National Register: *Seaboard Air Line (CSX) Railroad*, *Bunche Park Historic District*, and *Sunshine State Arch.* The remaining newly recorded resources, as well as the previously recorded *Biscayne/C-8 Canal,* are considered ineligible for listing in the National Register, either individually or as part of a historic district.

No previously recorded archaeological sites were identified within the APE. In addition, no locally-designated archaeological sites or zones are located within one mile of the project's archaeological APE.

8.5.6 Water Quality Impact

Possible long-term indirect impacts include water quality impacts to adjacent waters. With the construction of a new stormwater treatment system designed in accordance with the Miami-Dade County code and the SFWMD permitting standards, there will be no impacts in the quality of stormwater runoff after project completion. The Interim Build Alternatives will provide water quality treatment for all new impervious areas. In addition, part of the project design involves the restoration of stormwater treatment features impacted by the construction or rehabilitation activities associated with all the Interim Build Alternatives. The implementation of a new stormwater treatment system with all the Interim Build Alternatives will minimize secondary impacts to adjacent waters.

8.6 Alternatives Comparison

The evaluation of transportation projects to select the most desirable alternative is often based on a wide range of performance criteria (i.e., traffic operations and safety, environmental impacts, construction costs, drainage impacts, travel time reduction etc.). The evaluation methodology used in this study involves a two-step process using both comparative (qualitative) and multi-criteria (quantitative) analysis to determine the recommended alternative.

8.6.1 Comparative Analysis

A comparative (qualitative) analysis of the advantages and disadvantages for the interim build alternatives was conducted based on the engineering and environmental impacts among the alternatives discussed in the previous chapter. **Table 8-58** presents a summary of this analysis.

Table 8-58
Comparative Analysis of Interim Build Alternatives

Alternative	Advantages	Disadvantages
No-Build Alternative	• No roadway design and construction costs • No right of way acquisition cost • No utility impacts • No inconveniences to commuters and adjacent property owners due to construction maintenance of traffic (MOT) • No social, business and neighborhood impacts due to construction	• Traffic operations may continue to deteriorate resulting in more congestion • Decrease in air quality due to increase congestion • Increase in accident rates due to increased congestion may compromise safety • Inconsistent with FDOT and FTE Work Program • Does not meet the purpose and need of the project
Interim Build Alternative 3A	• Significant traffic operational improvements for SR 826 EB to I-95 NB and Florida's Turnpike SB to I-95 SB movements over No-Build • Potential safety benefits due to reduced congestion and improved mobility over No-Build • Lowest overall construction cost compared to Build Alternatives 3B, 3C and 4 • Lowest right of way impacts compared to Build Alternative 3B, 3C and 4 • Lowest structural and drainage impacts compared to Build Alternatives 3B, 3C and 4 • Minimal environmental impacts compared to Build Alternatives 3B, 3C and 4 • Potential to create construction jobs for South Florida economy • Consistent with FDOT and FTE work program	• Relocation required for the Florida Gas Transmission line along the south side of SR 826/Palmetto Expressway • Several design variation and exceptions required to preserve existing roadway facility • Improvements can only accommodate traffic demand up to 2030 interim year • Significant reconstruction required along I-95 SB to accommodate 2040 design year traffic demand • Impacts to utilities and drainage • May impact operations for Sunshine Industrial Park

Table 8-58
Comparative Analysis of Interim Build Alternatives

Alternative	Advantages	Disadvantages
Interim Build Alternative 3B	• Additional traffic operational improvements for SR 826 EB to I-95 NB and Florida's Turnpike SB to I-95 SB movements over Interim Build Alternatives 3A and 4 • Additional safety benefits due to reduced congestion and improved mobility over Interim Build Alternatives 3A and 4 • Lower construction cost compared to Build Alternatives 3C • Lower structural and drainage impacts compared to Build Alternatives 3C • Improved geometry alignments with few design variations and exceptions compared to Interim Build Alternatives 3A and 4 • Less additional construction required to accommodate 2040 traffic demand compared to Interim Build Alternatives 3A and 4 • Potential to create construction jobs for South Florida economy	• Higher construction cost than Build Alternatives 3A and 4 • Significant right of way impacts to several residential and commercial properties along I-95 southbound • Relocation required for the Florida Gas Transmission line along the south side of SR 826/Palmetto Expressway • Additional impact to drainage and utilities compared to Interim Build Alternatives 3A and 4 • Additional environmental impacts compared to Interim Build Alternatives 3A and 4 • Construction of express lane connection between Florida's Turnpike and 95 Express southbound flyover ramp still required to accommodate 2040 traffic demand • May impact operations for Sunshine Industrial Park
Interim Build Alternative 3C	• Express lane connection between Florida's Turnpike and 95 Express southbound flyover ramp accommodates 2040 traffic demand and provides additional traffic operational improvements over Interim Build Alternatives 3A, 3B and 4 • Additional safety benefits due to reduced congestion and improved mobility over Interim Build Alternatives 3A, 3B and 4 • Improved geometry alignments with few design variations and exceptions compared to Interim Build Alternative 3A and 4 • Potential to create construction jobs for South Florida economy	• Highest overall construction cost among the four alternatives • Significant right of way impacts to several residential and commercial properties along I-95 southbound • Relocation required for the Florida Gas Transmission line along the south side of SR 826/Palmetto Expressway • Additional impact to drainage and utilities compared to Interim Build Alternatives 3A and 4 • Additional environmental impacts compared to Interim Build Alternatives 3A and 4 • May impact operations for Sunshine Industrial Park

Table 8-58
Comparative Analysis of Interim Build Alternatives

Alternative	Advantages	Disadvantages
Interim Build Alternative 4	• Relocates and maintains NW 12th Avenue on-ramp to I-95 SB • Potential safety benefits due to reduced congestion and improved mobility over No-Build • Lower construction cost compared to Build Alternatives 3B and 3C • Less right of way impacts compared to Build Alternative 3B and 3C • Lowest structural and drainage impacts compared to Build Alternatives 3B and 3C • Minimal environmental impacts compared to Build Alternatives 3B and 3C • Potential to create construction jobs for South Florida economy • Consistent with FDOT and FTE work program	• Relocation required for the Florida Gas Transmission line along the south side of SR 826/Palmetto Expressway • Several design variation and exceptions required to preserve existing roadway facility • Improvements can only accommodate traffic demand up to 2030 interim year • Significant reconstruction required along I-95 SB to accommodate 2040 design year traffic demand • Impacts to utilities and drainage • Highest impact to Park & Ride East Lot • Additional right of way required within Sunshine Industrial park

8.6.2 Multi-Criteria Evaluation

The quantitative evaluation for the project alternatives based on the multi-criteria evaluation methodology. This methodology involves quantitative analysis to combine the different impacts for each alternative. These performance criteria are not all monetized and usually have different dimensions (units). Consequently, each performance criteria has to be converted to a dimensionless unit.

Several techniques have been proposed for decision making when multiple criteria with both monetary and non-monetary dimensions are involved. For this PD&E study, the Impact Index Method (*Transportation Decision Making – Principles of Project Evaluation and Programming*, Sinha & Labi, 2007) was used to estimate the combined effect of the various performance criteria for each alternative. The Impact Index Method involves establishing weights for each of the performance criterion and scaling or establishing a common unit of measurement so that all the performance criteria can be expressed in commensurable units to enable combination or comparison of the performance criteria.

The first task in this approach is establishing weights for the different performance criteria. The weights assigned to each performance criteria reflect the importance decision makers attach to the different criteria. For each performance criterion, the relative weight (Rj) is given by.

$$R_j = \frac{w_j}{\sum_{j=1}^{J} |w_j|}$$

Where

R_j = Relative weight of each performance criterion.

w_j = Arbitrary weight assigned for each performance criterion by decision makers.

J = 1, 2,…., J (total number of performance criterion under consideration).

For this study, identical weights will be used for the different performance criterion categories to ensure that each factor is of equal importance as follows.

- Engineering – 20%
- Traffic Operation and Safety – 20%
- Socio-Economic – 20%
- Environmental – 20%
- Project Cost – 20%

A negative sign is assigned to the weight if higher measured values for the performance criterion indicate a more negative effect.

The next task in this approach is scaling of the impacts. This involves converting each criterion from its original dimension to one that is uniform and commensurate across all the performance criteria. For each performance criteria, the scale factor is given by:

$$S_j = \frac{1}{Max(X_{1j}, X_{2j}, ..., X_{Nj})}$$

Where

S_j = Scale factor for each performance criterion

X_{ij} = Measured impact of each performance criterion under each alternative. For example, right-of-way acquisition (in acres) for each alternative

N = number of alternatives considered

The measured values for the performance criteria categories will be obtained from the engineering and environmental evaluation of the build alternatives developed for the project.

After all the performance criteria have been weighted and scaled, the product of the relative weight (R_j), scale factor (S_j) and the measured impact (X_{ij}) for each performance criterion under each alternative is computed. This is a dimensionless value which is summed up for the various performance criteria to obtain the Impact Index Value for each alternative and is expressed as:

$$I = \sum_{j=1}^{J} R_j S_j X_{ij}$$

The alternative with the highest Impact Index Value (less negative) is the most favorable alternative.

8.6.3 Performance Evaluation Criteria

Each Build Alternative was evaluated based on several engineering, traffic operations and environmental performance criteria. Construction costs and right-of-way impacts were also factored into this comparative analysis. The various criteria used in the evaluation are summarized below:

Engineering Impacts

- **Geometric Compliance to Design Controls:** Assesses the compliance of the Build alternatives with FDOT design standards (2013) and Plans Preparation Manuals (PPM) and the need for variations.
- **Utility and Facility Impacts:** Measures the utility impacts of the alternatives. This includes potential conflicts and relocation of the utility lines that are located within the project study area.
- **Multi-modal (Transit/Pedestrian/Bicycle Facilities):** Measures how a particular alternative enhances the ability to promote alternate forms of transportation such as transit, pedestrian and bicycle facilities.

Traffic Operation and Safety Impacts

- **Total Delay**: This criterion measures the ability of an alternative to provide adequate capacity and minimize travel time delay through the corridor and to the various access points within the corridor.
- **Average Speed**: This criterion measures the ability of an alternative to provide adequate travel speed through the corridor and to the various access points within the corridor.
- **Total Travel Time**: This criterion measures the ability of an alternative to provide adequate travel time through the corridor and to the various access points within the corridor.
- **Safety Benefits:** This criterion provides consideration for an alternative's physical, geometric and operational features identifying to what extent they would minimize actual or potential safety hazards. For build alternatives 3A, 3B and 4, the potential crash reduction was obtained from the Crash Reduction Factor (CRF) for providing short ramp instead of directional loop ramp (similar to providing a direct connection ramp vs the existing circuitous loop ramp). A slightly higher CRF was used for build alternative 3C since it provides another direct flyover ramp to the 95 express SB lanes. For the No-Build condition, the expected crashes for the critical roadway segments were estimated using a safety performance function for the opening and design year and the average expected increase in crash frequency used (see **Appendix F**.

Socio-Economic Impacts

- **Right-of-way/Business Impacts:** This criterion addresses variations in right-of-way requirements and business impacts among the different alternatives.
- **Economic & Employment Impacts:** This criterion identifies whether an alternative impacts the local economy. The measure of economic impact is the expected number of jobs created by the construction activity. This is based on FHWA estimates of 16.8 jobs per million dollars spent.
- **Visual & Aesthetics:** This criterion measures an alternative's potential effect on the aesthetics of the surrounding communities based on the landscaping improvement cost.
- **Inconvenience for Residents and Businesses:** This criterion measures an alternative's inconvenience to the mobility of residents and businesses.

Environmental Impacts

- **Wetlands/Surface Water Impacts:** This criterion measures an alternative's potential effect on surface water resources within the project limits.
- **Noise & Air Impacts:** This criterion measures the ability of an alternative to meet pre-established noise and air quality standards and the additional number of sites that would be impacted by the proposed project.
- **Contamination:** This criterion measures the potential impact on existing or potential hazardous material sites and or generators.
- **Cultural / Historic / Archaeological:** Measures the degree of impact associated with historic structures or archaeological sites that may be caused by the development of a specific corridor or concept.

Project Cost

- **Right-of-way Costs:** This criterion compares each alternative based on right-of-way costs.
- **Preliminary Construction:** This criterion compares each alternative based on construction costs.
- **Engineering Design:** This criterion compares each alternative based on design costs.
- **Construction Engineering & Inspection:** This criterion compares each alternative based on Construction Engineering & Inspection costs.

8.6.4 Project Alternatives Evaluation Matrix

The evaluation matrix for the project alternatives based on the multi-criteria evaluation methodology is provided in **Table 8-59**.

Table 8-59
Evaluation Matrix for Project Alternatives

Performance Criteria	Units	Weights (wi)	Relative Weights (Rj)	Scale Factor (Sj)	Project Alternatives									
					Measured Impact (Xij)					Impact Index Values (I)				
					No Build	Interim Build Alt. 3A	Interim Build Alt. 3B	Interim Build Alt. 3C	Interim Build Alt. 4	No Build	Interim Build Alt. 3A	Interim Build Alt. 3B	Interim Build Alt. 3C	Interim Build Alt. 4
Engineering														
Geometric Compliance to Design Controls	Locations	-0.067	-0.33	0.029	35	12	12	12	11	-0.333	-0.114	-0.114	-0.114	-0.105
Utility and Facility Impacts	Num	-0.067	-0.33	0.023	0	34	43	44	39	0.000	-0.258	-0.326	-0.333	-0.295
Multi-modal (Transit /Pedestrian / Bicycle Facilities)	Index	0.067	0.33	0.200	1	3	4	5	4	0.067	0.200	0.267	0.333	0.267
Traffic Operation and Safety														
Total Delay	veh-Hours	-0.050	-0.25	0.000	10,846	3,975	4,003	2,822	4,247	-0.250	-0.092	-0.092	-0.065	-0.098
Average Speed	mph	0.050	0.25	0.025	19.55	35.53	35.50	39.31	34.89	0.124	0.226	0.226	0.250	0.222
Travel Time	min/mile	-0.050	-0.25	0.325	3.08	1.69	1.69	1.53	1.71	-0.250	-0.137	-0.137	-0.124	-0.139
Potential Crash Reduction (CRF)	%	0.050	0.25	0.029	-25	30	30	35	30	-0.179	0.214	0.214	0.250	0.214
Socio-Economic														
Business Relocation	Num	-0.050	-0.25	0.053	0	2	19	19	6	0.000	-0.026	-0.250	-0.250	-0.079
Economic & Employment Impacts	Jobs	0.050	0.25	0.000	0	1771	3084	3597	2621	0.000	0.123	0.214	0.250	0.182
Aesthetics & Landscaping (4% of Construction Cost)	$ Million	0.050	0.25	0.159	0	3.47	5.24	6.30	3.80	0.000	0.137	0.208	0.250	0.151
Inconvenience for Residents and Businesses	Index	0.050	0.25	0.200	1	2	4	4	5	0.050	0.100	0.200	0.200	0.250
Environmental														
Wetlands/Surface Water Impacts	Acres	-0.050	-0.25	2.174	0	0.27	0.46	0.46	0.16	0.000	-0.147	-0.250	-0.250	-0.087
Noise Impacts	Sites	-0.050	-0.25	0.250	0	3	4	4	2	0.000	-0.188	-0.250	-0.250	-0.125
Contamination	Sites	-0.050	-0.25	0.071	0	8	14	14	8	0.000	-0.143	-0.250	-0.250	-0.143
Cultural / Historic / Archaeological	Index	-0.050	-0.25	0.333	3	3	3	3	3	-0.250	-0.250	-0.250	-0.250	-0.250
Project Cost														
Right of Way Costs	$ Million	-0.050	-0.25	0.022	0	5.63	32.55	32.55	45.75	0.000	-0.031	-0.178	-0.178	-0.250
Preliminary Construction	$ Million	-0.050	-0.25	0.006	0	86.64	131.07	157.57	94.98	0.000	-0.137	-0.208	-0.250	-0.151
Engineering Design	$ Million	-0.050	-0.25	0.083	0	6.57	9.98	12.00	7.64	0.000	-0.137	-0.208	-0.250	-0.159
Construction Engineering & Inspection	$ Million	-0.050	-0.25	0.083	0	6.57	9.98	12.00	7.64	0.000	-0.137	-0.208	-0.250	-0.159
Sum of Scaled Impacts										**-1.021**	**-0.795**	**-1.392**	**-1.281**	**-0.754**
Ranking										**3**	**2**	**5**	**4**	**1**

9. RECOMMENDATIONS

9.1 Recommended Alternative

Based on the evaluation and analysis of several key evaluation parameters including horizontal and vertical alignment, right of way impacts, construction cost, potential utility impacts, bridge analysis, traffic operations and safety, maintenance of traffic, environmental impacts and transit considerations, in addition to extensive discussions with both FDOT and FTE management, the Interim Build Alternative 4 was selected as the Recommended Interim Build Alternative. The Recommended Interim Build Alternative offers several advantages when compared with the No-Build Alternative including the following:

- **Enhanced Safety:** The safety analysis prepared as part of this study identified five fatal crashes located along the existing SR 826/Palmetto Expressway eastbound ramp to I-95 southbound or SR 7/US 441, which leads to I-95 northbound. The proposed direct connection flyover ramp from SR 826/Palmetto Expressway eastbound to I-95 northbound and widening of the Turnpike Connector southbound lanes will minimize the weaving condition within these roadway segments. The proposed design also eliminates weaving maneuvers by barrier separating NW 12th Avenue on-ramp from three-lane off-ramp from SR 826 eastbound to I-95 northbound and southbound to potentially reduce the frequent angle crashes as well as the resulting fatalities from this crash type. This will potentially mitigate the crash rate and enhance overall public safety within the interchange.
- **Reduced Travel Time and Delays:** The traffic operational analysis performed as part of this study indicated that, for the 2030 analysis year, the improvements proposed as part of Interim Build Alternative 4 will reduce the travel time for the SR 826 eastbound to I-95 northbound movement by 64% and 50% during the AM and PM peak periods respectively. Similarly, for the Florida's Turnpike southbound to I-95 southbound movement, the travel time will be reduced by 67% and 78% during the AM and PM peak periods respectively. These improvements will significantly alleviate traffic congestion, reduce delays and improve mobility for these critical movements.
- **Emergency Evacuation:** The improved mobility resulting from the improvements proposed as part of the Recommended Interim Build Alternative will also facilitate traffic movement during emergency evacuation periods between three freeways (I-95, SR 826 and Florida's Turnpike) and two major principal arterials (SR 9 and SR 7/US-441), all of which are designated evacuation routes for Miami-Dade County residents. In addition, the traffic operational analysis shows significant travel time reduction from either Florida's Turnpike or SR 826/Palmetto Expressway to the NW 2nd Avenue and NW 167th Street intersection. This intersection provides access to the emergency entrance for the Jackson North Medical Center.

Interim Build Alternative 4 also meets the overall project objectives of this PD&E study as well as the purpose and need for this project.

9.2 Recommended Alternative Network Analysis Results

Tables 9-1 through **9-3** show the 2030 comparative traffic operational analysis for both AM and PM peak periods for the No-Build and Recommended Interim Build Alternative.

Table 9-1
Network Measures of Effectiveness

#	Network Statistics	AM Peak			PM Peak		
		No-Build	Recommended Build	% Change	No-Build	Recommended Build	% Change
1	Delay Time (Veh-Hrs)	10,486	4,247	**-60%**	13,701	11,086	**-19%**
2	Average Speed (mph)	19.55	34.89	**78%**	16.93	22.71	**34%**

Table 9-2
Travel Time Comparison

#	Route	AM Peak			PM Peak		
		No-Build	Recom-mended Build	% Change	No-Build	Recom-mended Build	% Change
1	Turnpike SB to NW 2 Avenue/ NW 167 St	20.96	3.10	**-85%**	24.17	3.02	**-88%**
2	Turnpike SB Connector to I-95 SB	16.44	5.48	**-67%**	18.38	4.01	**-78%**
4	SR 826 EB to NW 2 Avenue/ NW 167 St	6.08	3.00	**-51%**	7.07	3.21	**-55%**
5	SR 826 EB to I-95 SB*	2.05	4.10	**100%**	1.96	3.00	**53%**
6	SR 826 EB to I-95 NB (New Ramp)		2.13	**-64%**		1.86	**-50%**
7	SR 826 EB to I-95 NB (Existing Route)*	5.86			3.73		

**No-Build alternative is constrained with traffic backing up at entry nodes, as such, travel times appear better than they are due to limited volume throughput in the system*

Table 9-3
Travel Speed Comparison

#	Route	AM Peak			PM Peak		
		No-Build	Recom-mended Build	% Change	No-Build	Recom-mended Build	% Change
1	Turnpike SB to NW 2 Avenue/ NW 167 St	6.05	41.12	**580%**	4.98	43.66	**777%**
2	Turnpike SB Connector to I-95 SB	34.09	37.85	**11%**	34.64	45.91	**32%**
4	SR 826 EB to NW 2 Avenue/ NW 167 St	9.72	26.96	**177%**	7.86	27.54	**250%**
5	SR 826 EB to I-95 SB*	41.40	33.55	**-19%**	42.59	41.31	**-3%**
6	SR 826 EB to I-95 NB (New Ramp)		36.42	**43%**		37.71	**20%**
7	SR 826 EB to I-95 NB (Existing Route)*	25.42			31.50		

**No-Build alternative is constrained with traffic backing up at entry nodes, as such, travel speeds appear better than they are due to limited volume throughput in the system*

The overall network analysis for the No-Build and Recommended Interim Build Alternative for the year 2030 shows significant improvements in travel times and travel speeds for most of the critical routes within the GGI. The proposed new flyover will reduce travel time by 64% and 50% for AM and PM peak periods respectively for the Recommended Interim Build Alternative compared to the No-Build alternative. The rerouting of the traffic onto the proposed new flyover ramp will also significantly increase the travel speeds for the Turnpike southbound and SR 826 eastbound movements to NW 2 Avenue.

The SR 826 eastbound to I-95 southbound however, shows an increased travel time and reduced travel speed for the Recommended Interim Build Alternative compared to the No-Build. This is due to the fact that in the No-Build model, the entry node sustains starvation due to traffic backup at the upstream node, as such, the travel times and speeds appear better than they are due to limited volume throughput in the system.

9.3 2040 Design Year Evaluation for Interim Build Alternative

9.3.1 Freeway Basic Segment Analysis

An analysis of the traffic operations for the recommended interim design build alternative was performed to determine the performance of the interim build improvements during the design year in case the ultimate design or master plan is never built. This analysis was done as part of the SIMR for the SR 826/Palmetto Expressway PD&E Study from SR 93/I-75 to GGI. The results of the 2040 operational performance for the basic freeway segments within the GGI influence area are summarized in **Table 9-4**. **Appendix J** shows the analysis results obtained from the SIMR for the SR 826/Palmetto Expressway PD&E Study.

Table 9-4
Comparison of 2040 Freeway Segments for Interim and Ultimate Build

SEGMENT	Adopted LOS	Period	Direction	2040 LOS		
				No-Build Alt.	Interim Build Alt 4	Ultimate Build Alt 1
I-95 B/W GGI and NW 151 St	E	AM	NB	E	D	D
I-95 B/W GGI and NW 151 St	E	AM	SB	F	F	D
SR 826 B/W NW 17 Ave and NW 12 Ave	D	AM	EB	F	F	D
SR 826 B/W NW 17 Ave and NW 12 Ave	D	AM	WB	D	D	C
Turnpike at Toll Plaza	D	AM	SB	F	D	D
Turnpike at Toll Plaza	D	AM	NB	E	C	D
I-95 B/W GGI and Miami Gardens Dr	E	AM	SB	F	D	D
I-95 B/W GGI and Miami Gardens Dr	E	AM	NB	E	E	D
I-95 South of NW 151 St	E	AM	NB	E	D	D
I-95 South of NW 151 St	E	AM	SB	F	F	F
I-95 B/W GGI and NW 151 St	E	PM	NB	F	F	F
I-95 B/W GGI and NW 151 St	E	PM	SB	F	E	D
SR 826 B/W NW 17 Ave and NW 12 Ave	D	PM	EB	F	E	D
SR 826 B/W NW 17 Ave and NW 12 Ave	D	PM	WB	F	E	D
Turnpike at Toll Plaza	D	PM	SB	C	D	C
Turnpike at Toll Plaza	D	PM	NB	C	C	C
I-95 B/W GGI and Miami Gardens Dr	E	PM	SB	F	D	D
I-95 B/W GGI and Miami Gardens Dr	E	PM	NB	F	F	E
I-95 South of NW 151 St	E	PM	NB	E	E	E
I-95 South of NW 151 St	E	PM	SB	E	F	E

The HCS 2010 freeway results of the 2040 operational analysis for the Recommended Interim Build Alternative indicates that several segments along I-95 and SR 826/Palmetto Expressway segment will operate at LOS F. In contrast, the 2040 operational analysis results for the Ultimate Build Alternative indicate that all freeway segments of the Ultimate Build Alternative will operate at acceptable LOS E or better, except for the I-95 southbound segment south of NW 151 Street and the northbound segment between NW 151 Street and GGI which operate at LOS F during the AM and PM peak periods respectively.

The results also indicate that generally, all the failing segments under the Interim Build or Ultimate Build operate at a worse LOS under the No-Build Condition with the exception of the I-95 Southbound segment south of NW 151st Street and the Turnpike Southbound segment at the toll plaza that are worse in the PM peak period under the Interim Build Alternative 4 compared to the No Build Alternative in the 2040 design year. This can be attributed to the fact that the No-Build Alternative has less traffic volume compared to both the Interim and Ultimate Build conditions. The future traffic forecast indicates that the improvements to the GGI particularly along the Turnpike southbound will result in increased traffic along this segment of I-95 southbound. Both the No-Build and Interim Build Alternative 4 do not provide any improvements within this segment of I-95, resulting in the degradation of LOS. However, the Ultimate Build Alternative 1 provides an additional auxiliary lane from the south of NW 151st Street to NW 135th Street that improves the LOS within this segment.

9.3.2 Weaving Segment Analysis

The results of the 2040 operational performance for the weaving segments within the GGI influence area are summarized in **Table 9-5**. The detailed analysis results are provided in **Appendix J**.

Table 9-5
Comparison of 2040 Weaving Segments for Interim and Ultimate Build

#	Mainline	Length (ft)	2040 AM LOS			2040 PM LOS		
			No-Build Alt.	Interim Build Alt 4	Ultimate Build Alt 1	No-Build Alt.	Interim Build Alt 4	Ultimate Build Alt 1
1	SR 7 NB	350	E	E	B	E	F	C
2	SR 7 SB	1387	E	E	E	E	D	D
3	SR 7 SB	800	F	F	E	E	F	D
4	Turnpike Connector SB	1530	F	F	F	F	C	B
5	NW 167th Street to Turnpike	1130	F	F	F	C	C	C
6	Turnpike Connector NB	1800	B	B	B	C	C	B

The Weaving segments analysis results for the 2040 design year indicate that for the critical Turnpike Connector SB (segment 4), the no-build, interim and ultimate build alternatives will operate at LOS F during the AM peak period. However, the v/c ratios for the build alternatives are significantly less (25% and 42%) than the no-build. For the PM peak period, both the interim and ultimate build alternatives operate at LOS C or better and provide significant mobility improvements over the LOS F under the no-build conditions.

Some of the weaving segments operate at a lower LOS during the PM peak period for the recommended interim build alternative compared to the no build. This is attributed to the increased traffic volume at these locations for the build conditions without any capacity improvements. For these segments, the improvements proposed under the Ultimate Build decreases the LOS from LOS F to LOS D or better for the PM peak period.

The comparison of the 2040 operational analysis results between the Interim and Ultimate Build Alternatives underscores the need for additional improvements identified in the Ultimate Build Alternative or master plan beyond the Interim Build to accommodate the 2040 traffic demand.

9.4 Conceptual Signing Master Plan

As part of this IMR, a Conceptual Signing Master Plan (CSMP) was developed for the Recommended Interim Build. The plan depicts all the guide signs needed within the study limits. The plan includes the existing signs that will remain and the new signs needed for the proposed improvements. **Appendix K** contains the CSMP developed for the Recommended Interim improvements.

10. FUNDING PLAN

Table 9-4 shows the preliminary construction cost for the Recommended Interim Improvements. The estimates included the major cost components typically associated with highway construction including roadway, bridge and interchange construction. The estimated construction cost was developed using the FDOT Long Range Estimate (LRE).

Table 10-1
Preliminary Cost Estimates

Cost Component	Recommended Interim Build Alternative
Construction	$110,672,000
Engineering Design	$8,854,000
Construction Engineering Inspection (CEI) Service	$8,854,000
Right of Way	$45,752,600
Total Project Cost	**$174,100,000**

The SR 826/Palmetto Expressway eastbound Ramp to SR 9A/I-95 northbound project (FPID 428358-1) is included in the FDOT District Six Five-Year Work Program with funding allocated for design in 2014 ($2,010,808), construction ($106,416,898) in 2017 and construction support ($7,496,612) in 2017-2018. The Florida's Turnpike Enterprise will be contributing funds toward the completion of the GGI PD&E Study and has also identified the Turnpike Connector improvements in the FTE Five Year Work Program (FPID: 423373-2) with funding for design in 2015 ($6,000,000), construction ($54,549,989) in 2017 and construction support ($6,818,750) in 2017. The right of way phase is currently partially funded in 2015-2016.

The PD&E Phase of this project commenced in March 2011 and is anticipated to be completed by Summer 2014 with the approval of the Local Design Concept and Acceptance (LDCA) by FHWA in Summer 2014. The preparation of the final design plans is anticipated to be completed in Summer 2017. The right-of-way acquisition is anticipated to be completed by Fall 2018. Construction is anticipated to begin in 2019 and completed within 24 months.