

Florida Department of Transportation District 6

Districtwide Planning and PD&E Support
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SW 8th Street and SW 87th Avenue Intersection Improvements Concept and Feasibility Study

PHASE 1 – Concept Feasibility Study

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I. EXECUTIVE SUMMARY

The Florida Department of Transportation, District 6, is undertaking a Concept Feasibility Study for the intersection of SW 8th Street/SR-90/US41 and SW 87th Avenue/SR-973. The intersection was identified by the Miami-Dade Metropolitan Planning Organization (MPO) as one (1) out of five (5) intersections in Miami-Dade County to study for the potential for grade separation. The objective of the study is to determine the need and feasibility to improve the intersection and evaluate the merits to move into the Project Development and Environment (PD&E) Phase.

Study Approach and Need

The study was prepared as a two-tiered analysis, first making the determination that despite other transportation improvements in the area, traffic volumes will continue to increase and the poor operating conditions of the intersection today will continue to deteriorate over time, affecting traffic along SW 87th Avenue and along SW 8th Street.

As part of the study a No-Build alternative, three “At-Grade” alternatives, and three “Grade Separation” alternatives were evaluated for a 2020 opening year and a 2040 design year.

The need for this project is to address failing operational conditions at the intersection of SW 87th Avenue and SW 8th Street. The most critical movements are SW 87th Avenue in the southbound direction and SW 8th Street in the westbound direction, both during the PM peak. The analysis indicates that under the No Build scenario, the operation of the intersection will further deteriorate. The main movements will start failing during both peak periods for the year 2020 and most movements will fail during the year 2040.

Alternatives

□ At Grade Alternatives

- Alternative 1A (**FIGURE 6-3**) - Widening of SW 8th Street between SW 92nd Avenue and the ramp to SR 826/Palmetto Expressway; Widening of SW 87th Avenue between SW 8th Street and West Flagler Street. The alternative presents high impacts in terms of right-of-way acquisition.
- Alternative 1B (**FIGURE 6-5**) - Widening of SW 8th Street between SW 92nd Avenue and SW 82nd Avenue. Some right-of-way impacts requiring full and partial acquisition.
- Alternative 3A (**FIGURE 6-11**) - Widening of SW 82nd Avenue between SW 16th Street and Flagler Street from a 2-lane facility to 4-lane facility, and the construction of a new bridge over the C-4 Canal at SW 8th Street and SW 82nd Avenue to provide continuity along SW 82nd Avenue north and south of SW 8th Street. In addition, minor right of way acquisition will result north of the canal to a residential property.

□ Grade Separation Alternatives

- Alternative 2A (**FIGURE 6-7**) – SW 8th Street grade separated over SW 87th Avenue; widening of SW 8th Street between SW 92nd Avenue and SW 82nd Avenue. Similar right-of-way acquisition to Alternative 1B.
- Alternative 2B (**FIGURE 6-10**) - SW 8th Street grade separated over SW 87th Avenue; widening of SW 8th Street between SW 92nd Avenue and the ramp to SR-826/Palmetto Expressway; widening SW 87th Avenue between SW 8th Street and West Flagler Street. Similar right-of-way impacts as Alternative 1A.
- Alternative 3B (**FIGURE 6-12**) - Widening of SW 82nd Avenue between SW 16th Street and Flagler Street from a 2-lane facility to 4-lane facility, and the construction of a new bridge over the C-4 Canal at SW 8th Street and SW 82nd Avenue to provide continuity to SW 82nd Avenue north and south of SW 8th Street. This alternative also includes the following improvements: SW 8th Street grade separated (overpass) over SW 87th Avenue; widening of SW 8th Street between SW 92nd Avenue and SW 82nd Avenue. Similar right-of-way acquisition to Alternative 2A. In addition, minor right of way acquisition will result north of the canal to a residential property.

Alternatives 1A, 1B, 2A and 2B include at-grade and grade separation improvements at the intersection of SW 87th Avenue and SW 8th Street. Upon review of the draft report by the Miami-Dade Metropolitan Planning Organization, a request was received to analyze an alternative network configuration consisting of the addition of a bridge over the C-4 Canal to provide a direct connection between SW 82nd Avenue and SW 8th Street to the north, in essence converting the intersection from a three-leg intersection to a four-leg intersection and providing additional connectivity to the area. The purpose was to assess the benefits that such connection would bring to the intersection of SW 87th Avenue and SW 8th Street as a result of traffic diversion which may result in improved Level of Service without the need for the reconstruction of the overpass recommended by the draft report. Alternatives 3A (at-grade) and 3B (grade separation) were then added to the analysis.

Analysis Summary

The analysis indicates that the At-Grade alternatives only offer marginal improvements over the No Build alternative, and the improvements are expected to have a short life. At-Grade alternatives only offer minor improvements to the movements serving the peak direction of traffic.

The three overpass alternatives (Alternatives 2A, 2B and 3B) offer significant improvements over the No-Build alternative and over the At-Grade alternatives throughout the life of the project. The overpass alternatives operate at very good levels of service addressing the project needs. Alternative 2B, which includes widening SW 87th Avenue north of SW 8th Street, offers better results than Alternative 2A. Alternative 3B, which includes the overpass, the widening of SW 82nd Avenue from Flagler Street to SW 16th Street and a new bridge over the C-4 Canal, offers better results than Alternative 2A and very similar results to Alternative 2B. However, the advantages of Alternatives 2B and 3B over 2A are marginal. Alternative 2B only addresses two additional movements when compared to Alternative 2A and has significantly higher right-of-way impacts along SW

87th Avenue. Alternative 3B offers marginal improvements over Alternative 2A; however, considering the additional improvements at SW 82nd Avenue of Alternative 3B are not mutually exclusive with the improvements of Alternative 2A, this alternative continues to be recommended over Alternative 3B as a stand-alone project. Alternative 2A would benefit of the additional improvements of Alternative 3B but are not required.

The construction of at-grade improvements is not necessarily mutually exclusive with the long term improvements in the form of an overpass (Alternative 2A). Alternatives 1B, at-grade improvements at SW 87th Avenue and SW 8th Street, actually has many of the improvements that are required for the implementation of Alternative 2A and therefore could be considered a phased implementation of Alternative 2A. Similarly with Alternative 3A, even though the improvements are not required for the implementation of Alternative 2A the improvements would actually complement those of the recommended alternative while offering short to midterm relief to SW 87th Avenue.

Conclusion and Recommendation

Alternative 2A operates at very good level of service. Alternative 2A will operate at comparable levels throughout the life of the project to Alternative 2B and 3B with significantly lower right-of-way impacts and cost. Additionally, Alternative 2A offers significant improvements over the No-Build alternative and the At-Grade alternatives.

Based on these results, considering current failure of the main movements, and the expected traffic growth in the area, the conclusion is that the Alternative 2A, overpass, is needed and that it addresses the project needs.

The recommendation is to continue the PD&E study for implementation of grade separation using Alternative 2A subject to refinement during the PD&E phase.

The planning level cost estimate for Alternative 2A is \$26.7 Million in Year 2017 including right-of-way acquisition required for implementation. This estimate only includes direct construction costs and right-of-way, and does not include soft cost (design, CEI, etc.).

1. INTRODUCTION

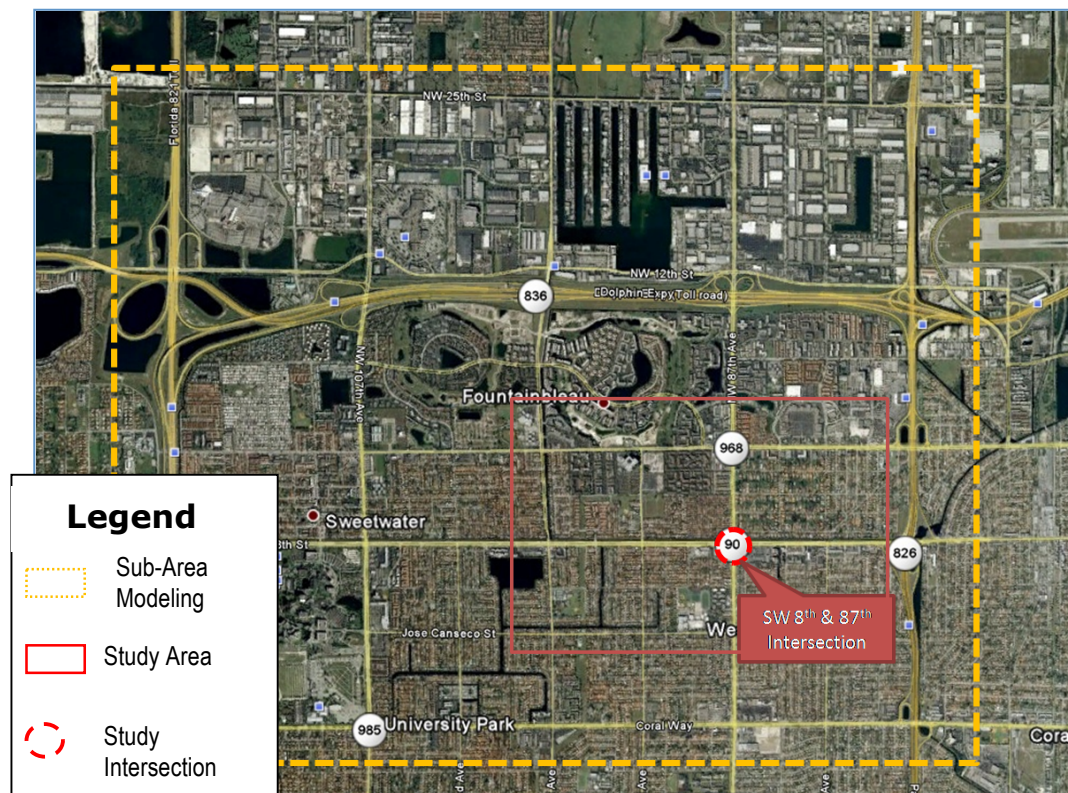
The Florida Department of Transportation, District 6, is undertaking a Concept Feasibility Study for the intersection of SW 8th Street/SR-90/US41 and SW 87th Avenue/SR-973. The intersection was identified by the Miami-Dade Metropolitan Planning Organization (MPO) as one (1) out of five (5) intersections in Miami-Dade County for further study for possible grade separation location. The Florida Department of Transportation (FDOT) has committed to the MPO to study the feasibility of improvement to the intersection inclusive of a grade-separating alternative to evaluate the need and merits of this location and move into the Project Development and Environment (PD&E) Phase, if deemed feasible.

1.1. Project Area Description

The SW 8th Street/SR-90/US41 and SW 87th Avenue/ SR-973 study area is located in unincorporated Miami-Dade County, Florida, and the study area is shown in Figure 1-1. The project study area limits are as follows:

- To the North: Flagler Street
- To the South: SW 16th Street
- To the West: West of the 97th Avenue
- To the East: East of 82nd Avenue

Figure 1-1: Sub-Area Modeling and PD&E Study Area



The FDOT Roadway Segment ID is 87120000 for the SW 8th Street/SR-90/US41 segment between SW 92nd Avenue (MP 8.045) and the southbound entrance ramp to SR-826/Palmetto Expressway (MP 9.864). The FDOT Roadway Segment ID is 87047000 for the SW 87th Avenue/SR-973 segment between SW 16th Street (MP 7.524) and SR-968/W. Flagler Street (MP 8.535).

Please refer to Appendix A for the straight line diagrams for these segments under analysis.

1.2. Project Origin

The Miami-Dade Metropolitan Planning Organization (MPO) completed a Grade Separation Study in June of 2005. The study requested input from the Transportation Planning Committee members of the MPO as well as the following municipalities:

- ☐ Aventura
- ☐ Coral Gables
- ☐ Doral
- ☐ Hialeah Gardens
- ☐ Homestead
- ☐ Key Biscayne
- ☐ Miami Shores
- ☐ Miami Springs
- ☐ Miami Lakes
- ☐ North Miami Beach
- ☐ Opa-Locka
- ☐ Palmetto Bay
- ☐ Pinecrest
- ☐ South Miami
- ☐ Sunny Isles Beach

A total of seventeen (17) intersections were nominated for grade separation improvements and evaluated as part of a Tier 1 analysis based on a criterion that included crash history, traffic volumes on main road and cross streets, right-of-way available, potential impacts to local streets, and impacts to land use.

This Tier 1 analysis resulted in the elimination of twelve (12) intersections and moved five (5) intersections into a more detailed Tier 2 analysis. The Tier 2 analysis determined the feasibility of the grade separation of the SW 8th Street and SW 87th Avenue intersection based on a number of factors including potential benefits to the operation of the intersection, alternatives for minimization of impacts to surrounding properties, access to properties, access management, etc. The recommendation of the Grade Separation Study by the MPO was to move forward the project for a more detailed analysis.

In November of 2006, the FDOT completed a study along SW 8th Street from the Homestead Extension of the Florida's Turnpike (HEFT)/SR-821 to SR-826/Palmetto Expressway. The study considered different at-grade improvements for the signalized

intersections along the corridor and also included the analysis of grade separation at two intersections: SW 107th Avenue and at SW 87th Avenue. The recommendation of the report was that the Department initiates feasibility studies for the implementation of grade separation at both of these intersections. The findings of the study indicated the need for grade separation at SW 87th Avenue.

The FDOT completed a Project Concept Study in June of 2009 for the intersection of SW 87th Avenue and SW 8th Street. The study favored the widening of SW 87th Avenue between SW 8th Street and Flagler Street over the implementation of a grade separation over of the intersection of SW 8th Street and SW 87th Avenue.

1.3. Project Intent and Objectives

The existing intersection of SW 8th Street and SW 87th Avenue currently experiences heavy delays in the northbound and eastbound directions during the AM peak period and in the southbound and westbound directions during the PM peak period. In addition, it is not uncommon to find heavy delays at the intersection during other times of the day.

The project consists of improvements to the intersection of SW 87th Avenue and SW 8th Street along with necessary improvements to the arterial facilities within the study area. Improvements to the intersection are not necessarily limited to at-grade improvements consisting of additional lanes, additional auxiliary lanes, lengthening the storage capacity of auxiliary lanes/turn bays, etc. Grade separation improvements in the form of an overpass structure in the east/west direction is also being considered.

The intent of this report is to document the need for improvements at this intersection based on current safety and operating deficiencies which result in significant delays, as well as using forecasted traffic on this segment.

The project analysis was prepared as a two-tiered travel demand and traffic analysis. The Traffic Level 1 (System Level Analysis) evaluates the impacts of recently completed and committed projects in the area and the resulting impacts on the study intersection. The Traffic Level 1 main objective is to determine if the recently completed and committed projects within the study area will result in significant changes to the traffic patterns at the intersection of the SW 8th Street and SW 87th Avenue. The System Level Analysis evaluates the extent that the existing operating conditions are not expected to further degrade or improve the transportation network, resulting from reduction in traffic volumes. Traffic level 2 (Traffic Operational Analysis) consists of a detailed operational analysis of existing and proposed conditions within the study area. The following are the objectives of the Concept Feasibility Study:

1. Collect Existing Conditions information including roadway characteristics, structures information, traffic and crash data, utilities and land use information
2. Prepare a System Level Analysis – Traffic Level 1 to evaluate the impact of recently completed projects and programmed projects, and the resulting impact at the study intersection. These include the following:

- a. Recently completed 97th Avenue overpass over SR-836
 - b. Benefits of the SR-836/SR-826 Interchange on the SW 8th Street Interchange and resulting benefits to the SW 8th Street Arterial.
 - c. Evaluate the impact of the future connection of NW 82nd Avenue from NW 8th Street to NW 12th Street. An envelope for this improvement is being constructed as part of the SR-826/SR-836 Interchange project. However, no improvements for NW 82nd Avenue have been programmed.
 - d. Evaluate the impact of the future connection of NW 7th Street from east to west of SR-826/Palmetto Expressway. An envelope for this improvement is being constructed as part of the SR-826/SR-836 Interchange project. However, no improvements for NW 7th Street have been programmed.
3. Prepare a traffic operational analysis – Traffic Level 2 to provide a more detailed analysis of existing and proposed conditions at the intersection and study arterials. This will assist in determining if there are external factors affecting the operation of the intersection other than intersection capacity. This may include other downstream intersections or interchanges that may be affecting the operation of the intersection.
 - a. Current Year Analysis
 - Existing Condition
 - b. Opening (2020) and Design Year (2040) Analysis
 - i. No-Build
 - ii. At-Grade Improvements (3 alternatives)
 - iii. Grade Separation (3 alternatives)
4. Develop conceptual roadway alternatives for the intersection:
 - a. SW 8th Street Grade Separation over SW 87th Avenue
 - b. At-Grade Improvements to the SW 8th Street/SW 87th Avenue Intersection
 - c. Eight-laning of SW 8th Street from SW 87th Avenue to SR-826 including improvements to interchange ramp connections.
 - d. Widening of SW 82nd Avenue from SW 16th Street to Flagler Street; including the construction of a new bridge over the Tamiami Canal (C-4) on SW 82nd Avenue from Grand Canal Drive to SW 8th Street.

2. EXISTING CONDITIONS

This chapter presents information on existing conditions and characteristics of the corridor as they relate to the analysis of the intersection of SW 8th Street and SW 87th Avenue and an inventory of the conditions within the study area.

2.1.SW 8th Street and SW 87th Avenue Intersection

SW 8th Street is a divided facility oriented in the east-west direction with a posted speed limit of 45 MPH. East of SW 87th Avenue it is a six-lane divided facility, and west of SW 87th Avenue it is an eight-lane divided facility. In the vicinity of the study area, SW 87th Avenue is a four-lane facility oriented in the north-south direction with a posted speed limit of 40 MPH. It shall be noted that SW 87th Avenue opens up to 3 thru lanes in the northbound direction about 200' before Flagler Street. The Tamiami Canal runs parallel to SW 8th Street on the north side throughout the project limits.

The study intersection has curb ramps on all corners of the intersection. Pedestrian crosswalks are provided on the east and west leg of the intersection to cross SW 8th Street. The crosswalk for SW 87th Avenue is only provided on the south leg of the intersection. Pedestrian pushbuttons and signal heads are provided at the study intersection. Sidewalks along SW 8th Street are provided only on the south side of the road and are 6' wide. On the north side of the road sidewalks are provided only for short segments to provide access to the existing bus bay. Sidewalks along SW 87th Avenue are between 5 and 7 feet wide. There are no bicycle lanes along SW 8th Street in the vicinity of the study area; however, there is a 14-foot wide outside lane (also referred to as wide curb lane) and, in addition, project number 425145-1 is programmed to add dedicated bicycle lanes along SW 8th Street which are expected to be added before the implementation of the improvements studied in this report. No dedicated bicycle lanes are included along SW 87th Avenue. Figure 2-1 includes the lane geometry for the intersections included within the study area. The intersection of SW 87th Avenue and SW 8th Street has the following lane geometry:

Northbound Approach

- ☐ One left-turn lane
- ☐ Two through lanes
- ☐ One right-turn lane

Southbound Approach

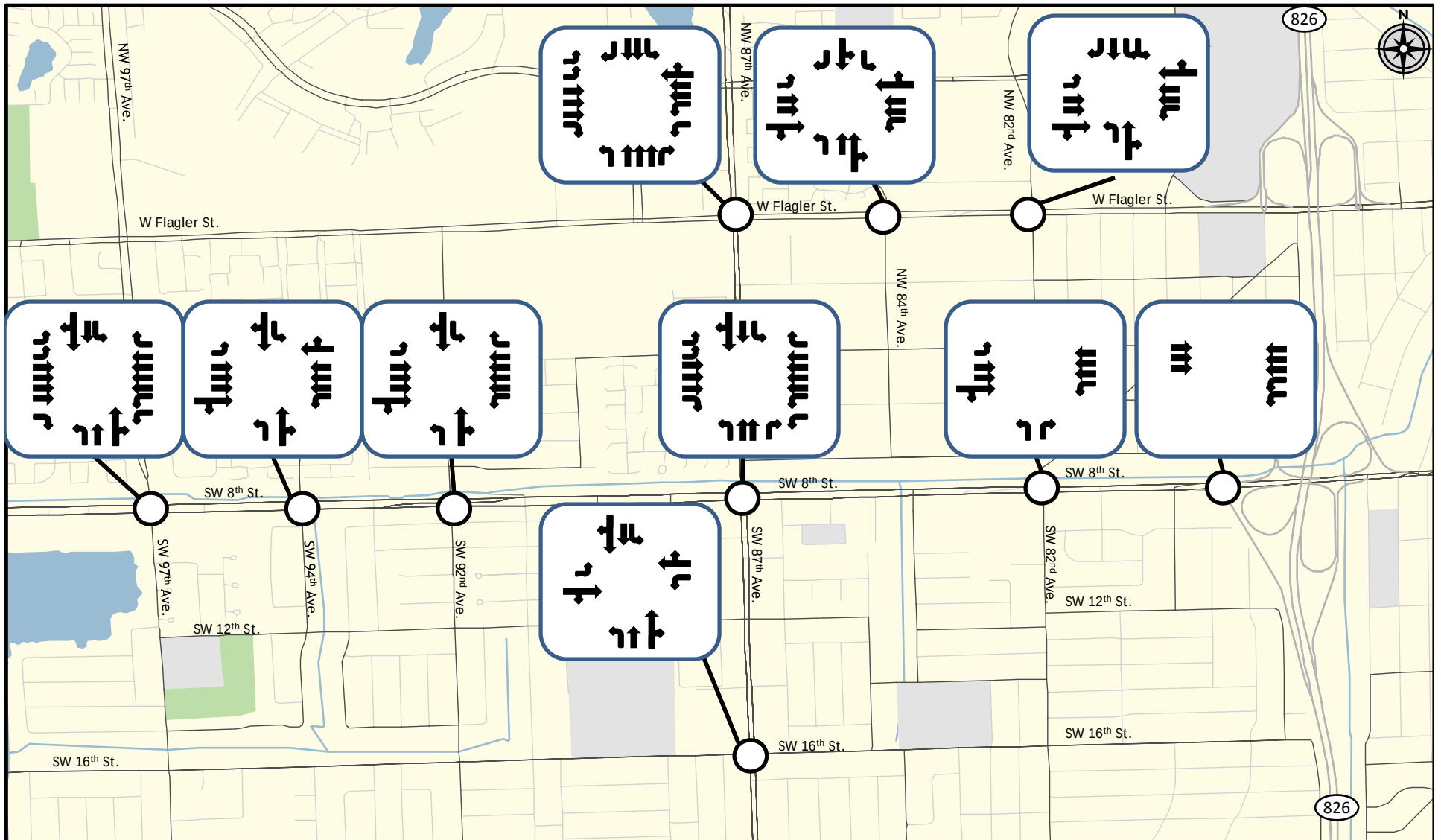
- ☐ One left-turn lane
- ☐ One thru lane
- ☐ One shared thru/right-turn lane

Eastbound Approach

- ☐ Two left-turn lanes
- ☐ Three through lanes
- ☐ One right-turn lane (drop lane)

Westbound Approach

- ☐ Two left-turn lanes
- ☐ Four through lanes
- ☐ One right-turn lane



District 6

Existing Lane Geometry

Figure 2-1

2.2.Land Uses and Activity Centers

A review of the adopted Comprehensive Development Master Plan for Miami-Dade County revealed the future land uses in the study area. The study area has a predominance of residential, business and office land uses to the north (north of the Dolphin Expressway - SR 836), and to the south it is mostly composed of low to medium density residential, with several pockets of business and offices throughout the quadrant, and institutional uses clearly defined by Florida International University to the southwest. Figure 2-2 depicts the Future Land Use Map within the study area.

Land uses adjacent to the SW 8th Street corridor, SW 87th Avenue corridor, and the study intersection can be described generally as urban, consisting of a mixture of commercial, industrial, and residential uses. The residential area consists of single-family and multi-family dwelling units. The commercial and industrial areas consist of non-central business district, with low to medium-density buildings.

Along the SW 8th Street segment between SW 92nd Avenue and SR-826/Palmetto Expressway, the corridor abuts to the north the South Florida Water Management District (SFWMD) C-4/Tamiami Canal. North of the canal the land use is consistently residential predominantly low to mid-density single family homes and multifamily. West of SW 88th Avenue the land uses on the south side of the corridor are also residential consisting of single family homes. East of SW 88th Avenue the land uses consists of a mix of commercial (shopping plazas) and high density residential zones abutting the corridor.

Along SW 87th Avenue between SW 8th Street and West Flagler Street the land use are low density on the east side consisting for the most part of single family units, and mid- density on the west side consisting mostly of townhomes. North of SW 2nd Street the abutting land uses are commercial and office up to West Flagler Street. North of West Flagler Street the land uses are low to mid-density residential consisting of townhomes and multifamily dwelling units.

The land uses along SW 87th Avenue between SW 8th Street and SW 16th Street consist of mainly low density residential on the east side of SW 87th Avenue and low-medium density residential along the west side of SW 87th Avenue. There are pockets of commercial and low-medium density residential in the vicinity of SW 8th Street.

ADOPTED 2015 AND 2025 LAND USE PLAN * FOR MIAMI-DADE COUNTY, FLORIDA

RESIDENTIAL COMMUNITIES

- ESTATE DENSITY (EDR) 1-2.5 DU/AC
- ESTATE DENSITY W/ ONE DENSITY INCREASE (DI-1)
- LOW DENSITY (LDR) 2.5-6 DU/AC
- LOW DENSITY W/ ONE DENSITY INCREASE (DI-1)
- LOW-MEDIUM DENSITY (LMOR) 6-13 DU/AC
- LOW-MEDIUM DENSITY W/ ONE DENSITY INCREASE (DI-1)
- MEDIUM DENSITY (MDR) 13-25 DU/AC
- MEDIUM DENSITY W/ ONE DENSITY INCREASE (DI-1)
- MEDIUM-HIGH DENSITY (MHDP) 25-40 DU/AC
- HIGH DENSITY (HDR) 40-125 DU/AC OR MORE/GROSS AC
- TWO DENSITY INCREASE WITH URBAN DESIGN (DI-2)

INDUSTRIAL AND OFFICE

- RESTRICTED INDUSTRIAL AND OFFICE
- BUSINESS AND OFFICE
- OFFICE/RESIDENTIAL
- INSTITUTIONS, UTILITIES, AND COMMUNICATIONS
- PARKS AND RECREATION
- METROZOO ENTERTAINMENT AREA
- AGRICULTURE
- OPEN LAND
- ENVIRONMENTAL PROTECTION
- ENVIRONMENTALLY PROTECTED PARKS
- TRANSPORTATION (ROW, RAIL, METRO/RAIL, ETC.)
- TERMINALS

EXPRESSWAYS

- MAJOR ROADWAYS (3 OR MORE LANES)
- MINOR ROADWAYS (2 LANES)

EXISTING RAPID TRANSIT / FUTURE RAPID TRANSIT

- REGIONAL
- METROPOLITAN
- COMMUNITY

URBAN CENTERS **

- ADOPTED REGIONAL URBAN CTR
- ADOPTED METROPOLITAN URBAN CTR
- ADOPTED COMMUNITY URBAN CTR

**** Note:** This symbol denotes an urban center where an area plan has been accepted by the Board of County Commissioners within a zoning overlay district that shows the defined boundaries of the center.

2015 URBAN DEVELOPMENT BOUNDARY

2025 EXPANSION AREA BOUNDARY

WATER

CANAL

LEVEE/CANAL

Study Area

Existing transit services in the Town were obtained from the Miami-Dade Transit Agency (MDTA). The study intersection is currently served by two (2) Miami-Dade Transit Metrobus routes, Routes Nos. 8 and 87. The study area is served by an additional nine (9) routes, as follows: 7, 11, 24, 36, 71, 95, 137, 212 and 238. The current existing transit routes are shown in Figure 2-3.



0 1

North of SW 8th Street along SW 87th Avenue there are a total of seven bus stops, three in the northbound direction and four in the southbound direction. None of the designated stop locations is provided with bus bays and buses block one of only two lanes in each direction during scheduled stops. The closest bus stop is located approximately 800' north of SW 8th Street.

2.3.1. Proposed Transit Improvements

As part of the Transportation Development Plan performed by MDT, several routes within the study area were adjusted as part of the system-wide transit improvements in 2008 and 2009. These changes were aimed at improving Miami-Dade Transit's service to reduce duplicate routes, improve service on major corridors, increase ridership within new routes, and greater market penetration while maintaining the Department's budget. Additionally, several routes have improvements planned within the 2011-2015 period. Miami-Dade Transit has also planned for the development of ten (10) regional transit hubs to connect existing routes with feeder routes. Passenger amenities will be afforded at these locations.

Table 2-1 includes pertinent information per route in terms of programmed improvements, and information pertinent to planned transit hubs within the study area or serving the study intersection's main routes.

Table 2-1: Miami-Dade Transit Programmed Improvements

Route 8	Extend service westward to SW 149 and add weekend service to the branch (2011). Provide Express Service
Route 87	No planned improvements
Route 7	No planned improvements
Route 11	No planned improvements
Route 24	Provide limited stop service east of Ponce de Leon Boulevard
Route 36	No planned improvements
Route 71	No planned improvements
Route 95	Increase number of trips between Downtown and the Civic Center (by 10%). Introduce weekend service.
Route 137	No planned improvements
Route 212	No planned improvements
Route 238	Extend westward to Beacon Lakes (2013)
Dolphin Station Transit Hub	Located within the study area, to service 836 Express
Flagler Marketplace and Dadeland Stations Transit Hubs	Serving Routes 8 and 87, respectively

Source: Miami-Dade Transit, Fiscal Year 2010-2019 Transportation Development Plan

2.4. Access Management

SW 8th Street in the vicinity of SW 87th Avenue is classified as an Urban Other Principal Arterial, Access Class 5. SW 87th Avenue is classified as a an Access Class 5 roadway south of SW 8th Street and an Access Class 3 roadway north of SW 8th Street. Pursuant to Rule 14-97, Access Management Standards, the following minimum spacing requirements shall be met for Access Class 3 and 5 facilities based on a posted speed limit if 45 mph or less (Please see Table 2-2):

Table 2-2: Access Management Standards

Class	Medians	Median Openings		Signal	Connections
		Full	Directional		Posted Speed limit of 45 MPH and less
3	Restrictive	2640	1320	2640	440
5	Restrictive	1,320	660	1,320	245

Source: Rule 14-97, Florida Administrative Code

SW 87th Avenue, north of SW 8th Street is mainly a residential area in the vicinity of the study intersection and the facility is designated Access Class 3. Therefore, there are minimum connections and driveways onto the corridor. South of SW 8th Street, SW 87th Avenue is an Access Class 5 facility and shall comply with the requirements as per Table 2-2. These same requirements apply to SW 8th Street. An analysis of the standards along the study intersection revealed that it does not meet the minimum requirements for median spacing, connection spacing and signal spacing, as shown in Table 2-3 for SW 87th Avenue and in Table 2-4 for SW 8th Street.

Table 2-3: Access Management Analysis of SW 87th Avenue

Intersection	Signalized or Non-Signalized Intersection	Location (Milepost)	Opening Type	Distance from Previous Median Opening (Feet)			Required Distance (Feet)		Minimum Spacing Met?	Deviation from Standard
				Signal	Full	Directional	Signal/ Full	Directional		
SW 16th St	Signalized	7.524	Full	2650	1800	260	1320	660	No	61%
SW 14th St	Non-Signalized	7.651	Full		650	920	1320	660	No	51%
Between SW 14th St and SW 12th St	Non-Signalized	7.714	Full		350	1265	1320	660	No	73%
SW 12th St	Non-Signalized	7.777	Full		660	310	1320	660	No	53%
SW 10th St	Non-Signalized	7.893	Directional		590	900	1320	660	No	55%
SW 9th Terr	Non-Signalized	7.930	Directional		765	190	1320	660	No	71%
SW 8th St	Signalized	8.005	Full	2540	1175	420	1320	660	No	36%
SW 5th St	Non-Signalized	8.183	Full		855	1310	2640	1320	No	68%
SW 4th St	Non-Signalized	8.285	Full		528	1860	2640	1320	No	80%
SW 2nd St	Non-Signalized	8.410	Directional		645	2510	2640	1320	No	76%
W Flagler St	Signalized	8.535	Full	2750	1340	670	2640	1320	No	49%

Highlighted cells denote a deviation from the Standard

Table 2-4: Access Management Analysis of SW 8th Street

Intersection	Signalized or Non-Signalized Intersection	Location (Milepost)	Opening Type	Distance from Previous Median Opening (Feet)			Required Distance (Feet)		Minimum Spacing Met?	Deviation from Standard
				Signal	Full	Directional	Signal/Full	Directional		
SW 113th Ave	Signalized	6.417	Full	1220	1220		1320	660	No	8%
SW 112th Ave	Signalized	6.558	Full	745	745		1320	660	No	44%
SW 109th Ave	Signalized	6.795	Full	1250	1250		1320	660	No	5%
SW 107th Ave	Signalized	7.045	Full	1320	1320		1320	660	Yes	0%
Between SW 107th Ave and SW 105th Ave	Non-Signalized	7.139	Directional		495		1320	660	No	63%
SW 105th Ave	Non-Signalized	7.232	Full		990	490	1320	660	No	26%
SW 103rd Pl	Non-Signalized	7.346	Full		600		1320	660	No	55%
SW 102nd Ave	Signalized	7.544	Full	2635	1045		1320	660	No	21%
SW 99th Pl	Non-Signalized	7.690	Full		770		1320	660	No	42%
Between SW 99th Pl and SW 97th Ave	Non-Signalized	7.779	Full		470		1320	660	No	64%
Between SW 99th Pl and SW 97th Ave	Non-Signalized	7.868	Full		470		1320	660	No	64%
Between SW 99th Pl and SW 97th Ave	Non-Signalized	7.956	Directional		470		1320	660	No	64%
SW 97th Ave	Signalized	8.045	Full	2645	935	470	1320	660	No	29%
Between SW 97th Ave and SW 94th Ave	Non-Signalized	8.130	Full		450		1320	660	No	66%
SW 94th Ave	Signalized	8.300	Full	1345	900		1320	660	No	32%
SW 93rd Ave	Non-Signalized	8.430	Full		685		1320	660	No	48%
SW 92nd Ave	Signalized	8.562	Full	1385	700		1320	660	No	47%
SW 90th Ave	Non-Signalized	8.691	Full		680		1320	660	No	48%
SW 89th Ave	Non-Signalized	8.806	Full		605		1320	660	No	54%
SW 88th Ave	Non-Signalized	8.932	Full		665		1320	660	No	50%
SW 87th Ave	Signalized	9.056	Full	2610	655		1320	660	No	50%
Between SW 87th Ave and SW 84th Ave	Non-Signalized	9.201	Full		765		1320	660	No	42%
SW 84th Ave	Non-Signalized	9.346	Full		765		1320	660	No	42%
Between SW 84th Ave and SW 82nd Ave	Non-Signalized	9.435	Directional		470		1320	660	No	64%
Between SW 84th Ave and SW 82nd Ave	Non-Signalized	9.480	Directional		710	235	1320	660	No	64%
SW 82nd Ave	Signalized	9.569	Full	2710	1180	470	1320	660	No	29%
SW 80th Ct	Non-Signalized	9.667	Full		515		1320	660	No	61%
SW 79th Ave	Non-Signalized	9.793	Directional		665		1320	660	No	50%

Highlighted cells denote a deviation from the Standard

2.5. Field Observations

Field observations were performed during the AM and PM peak periods. The AM peak observations were performed between 7:00 AM and 9:00 AM and the PM peak period observations were performed between 4:00 PM and 6:00 PM.

Field observations were performed on Tuesday, July 20th, 2010, on Wednesday, August 25th, 2010 and on Wednesday October 10, 2010. Figure 2-4 includes a photographic reconnaissance performed in the field during the AM peak period. Traffic operations documented below correspond to the October 10, 2010 field visit.

In general, there were several conflicts observed between traffic exiting the driveways located east of SW 87th Avenue and the through traffic heading eastbound on SW 8th Street. The conflicts are due to heavy eastbound traffic volumes, minimal gaps in traffic, driveway openings and median openings located continuously throughout the corridor, which do not meet access management standards.

Details of the AM peak observations are as follows:SW 97th Avenue and SW 8th Street

- The northbound approach experiences queues of up to 12 vehicles per lane and typically all vehicles clear in just one cycle. The left turn movement typically has 4 vehicles in the queue located within the left turn bay and does not block the through lanes. All vehicles making left turns clear within one cycle.
- The southbound approach experiences short queues for the through movement extending approximately 10 to 12 vehicles, all of which clear in one cycle. The left turning vehicles remain for the most part within the left turn bay with occasional spill over into the through lane. Left turning traffic typically clears in one cycle with an occasional vehicle having to wait up to two cycles.
- The eastbound approach experiences short queues consisting of a platoon arriving from the upstream signalized intersection. All vehicles clear the intersection in one cycle. The left turn movement stays within the turn bay and clears in one cycle. There are no blockages downstream that affect the capacity of the intersection.
- The westbound approach experiences short queues with no more than seven vehicles per lane. All vehicles clear the intersection in one cycle. The left turning traffic is light and is always located within the left turn bay clearing in just one cycle.

SW 94th Avenue and SW 8th Street

This intersection has very low volumes on the cross streets. All traffic on the northbound and southbound approach can easily clear in one cycle. Given the very low traffic approaching SW 8th Street (northbound and southbound traffic), the eastbound and westbound traffic flow is only interrupted for short periods of times for red phases and for the most part free flows through this intersection. There are very short queues, if any, in the EB direction. As a result there is excess capacity at this intersection. Left turning traffic is always within the turn bay and clears in one cycle.

SW 92nd Avenue and SW 8th Street

- The northbound approach queues were observed to extend for two short blocks (+/- 350') with all traffic clearing in just one cycle. All left turning vehicles typically stay within the left turn bay and clears in one cycle.
- The southbound approach queues were observed to extend for approximately 400' with all traffic clearing in one cycle. All left turning vehicles typically remains within the left turn bay and clears in one cycle.
- The eastbound approach experiences short queues with no more than seven vehicles per lane and all vehicles clear in one cycle. Left turning vehicles remain within the left turn bay and most of the time all vehicles clear within one cycle with occasional cycles where two or three vehicles remain in the queue.

- The westbound approach experiences longer queues with up to 20 vehicles per lane, but all vehicles clear within one cycle. Very low left turning traffic clears in one cycle.

SW 87th Avenue and SW 8th Street

- The northbound approach experiences long queues extending between four and eight blocks, depending on the day. In the same way, it takes anywhere between three cycles and six cycles to go through the intersection depending on level of congestion. SW 87th Avenue north of SW 8th Street is typically found clear of spill back traffic from West Flagler Street and the congestion at the northbound approach to SW 8th Street is not attributed to downstream traffic. Left turning movement in the northbound direction has low volumes remaining within left turn bay (does not block through lanes) and typically clears in just one cycle.
- The southbound approach queues vary throughout the week with some days experiencing short queues of less than 15 vehicles in length, while other days the queues were as long as 40 vehicles. Depending on the level of congestion, vehicles clear in one to two cycles. Left turning vehicles were, for the most part, found to remain within the left turn bay and require two cycles to clear through intersection.
- The eastbound approach experiences long queues of up to 30 vehicles per lane with all vehicles clearing in one cycle early during the peak period. Past 8:00 AM, spill backs from the SR-826 interchange begin to reach SW 87th Avenue and block the intersection. Left turning traffic is very high and early during the morning remains within the left turn bay and eventually, as traffic increases, starts to extend beyond the left turn bay and block the inside through lane. Left turning vehicles within the bay clear every cycle; however the through traffic queues also blocks the entrance into the bay and limits the capacity of the movement.
- The westbound approach queues for approximately 20 vehicles per lane but all traffic clears the intersection within one cycle. Left turning traffic is rather low with queues less than eight vehicles in length and all vehicles cleared the intersection in one cycle. Traffic remains within the bay.

SW 82nd Avenue and SW 8th Street

- In the northbound direction, most of the traffic clears intersection in two cycles with the queue extending up to two blocks south of the intersection. The operation of the intersection is characterized by aggressive drivers that try to bypass the left turning queue in order to make right turns at intersections.
- Capacity in the eastbound/westbound direction is not a concern and observed queues are the result of either congestion at SW 87th Avenue or congestion at the SR-826 interchange but not attributed to excess capacity at the intersection of SW 82nd Avenue. Westbound traffic making left turn movements do not represent a

high volume, but because of eastbound traffic blocking the intersection, the westbound left turn movement experience delays which occasionally block the westbound through lanes.

Details of the PM peak observations are as follows:

SW 97th Avenue and SW 8th Street

- ☐ The westbound approach queues for approximately 25 vehicles and clears within one cycle. Left turning vehicles remain within left turn bay and clear each cycle.
- ☐ The eastbound approach reported short queues of less than 15 vehicles per lane and cleared within one cycle. The left turning volume is low, remained within bay and clearing in just one cycle.
- ☐ The northbound approach queues are short and cleared within one cycle, including the left turning traffic.
- ☐ The southbound approach queues extended for up to 50 vehicles and typically cleared in two to three cycles. Left turning vehicles typically remained within bay with occasional spill backs into the through lane.

SW 94th Avenue and SW 8th Street

- ☐ The westbound approach experiences very short queues with all vehicles clearing in one cycle. Left turning movement is low with queues remaining within bay and clearing in one cycle. A similar condition was observed for the eastbound direction.
- ☐ The northbound and southbound approaches experience low volumes clearing in one cycle.

SW 92nd Avenue and SW 8th Street

- ☐ The westbound approach experiences very short queue with all vehicles clearing in one cycle. Left turning movement is low with queues staying within bay and clearing in one cycle.
- ☐ The eastbound approach experiences longer queues but all vehicles clear within one cycle and left turns are very low staying within bay and also clearing within one cycle.
- ☐ The northbound approach has very low traffic with very short queues and excess capacity.
- ☐ The southbound approach queues for approximately 25 vehicles most of which clear within two cycles inclusive of the left turning vehicles.

SW 87th Avenue and SW 8th Street

- ☐ The westbound approach experiences very long queues extending to the vicinity of SW 82nd Avenue (almost ½ mile) caused by capacity constraints at the intersection and there are no blockages or spill backs from downstream intersections. Through traffic clears in two to three cycles. The left turn movement remains, for the most

part, within the bay and clears within one cycle. However, the left turning movements are restricted by blockage of the bay by through traffic queues.

- The eastbound approach experiences queues of approximately 50 vehicles in length per lane. Most traffic clears in one cycle with few vehicles clearing in two cycles. The left turning traffic remains within the bay and clears in one cycle.
- The northbound approach experiences short queues and clears within one cycle. Left turning traffic queues outside the left turn bay and it may take up to three cycles to make the left turn movement.
- The southbound approach queues for almost ½ mile to near West Flagler Street and takes approximately three to four cycles to clear the intersection. The left turning movement stays within the turn bay typically clearing the intersection within one cycle or occasionally two cycles.

SW 82nd Avenue and SW 8th Street

- The westbound direction approach queues extended approximately 15 vehicles with all vehicles clearing in one cycle in absence of spill backs from SW 87th Avenue. The left turning traffic is very low and vehicles always remain within the bay and clear in one cycle.
- The eastbound approach queues approximately 15 vehicles per lane with all vehicles clearing in one cycle.
- The northbound approach shows queues of less than 20 vehicles with all vehicles clearing the intersection in one cycle.

Figure 2-5 depicts a photographic reconnaissance of the field observations during the PM peak field observations.



West view of the westbound approach of SW 87th Avenue and SW 8th Street



South view of the northbound approach of SW 87th Avenue and SW 8th Street



East view of the eastbound approach of SW 87th Avenue and SW 8th Street



South view of the northbound approach of the intersection of SW 8th Street and SW 86th Avenue



Easterly view of the intersection of SW 7th Street



Southerly view of the southbound approach of SW 87th Avenue and SW 8th Street



Northerly view of the northbound approach of SW 87th Ave and SW 8th St.



View of the bus bay located on the northwestern corner of the intersection of SW 87th Avenue and SW 8th Street



View of the southeast corner of the intersection of SW 87th Ave and SW 8th St, located 50 feet from the intersection.





View of the queues spilling back from the westbound approach of SW 8th St approaching SW 87th Ave



Northwesterly view of the intersection. Notice the vehicle traversing 3 lanes of traffic to arrive to the left-turn lane



Northerly view of the northbound approach of SW 87th Ave and SW 8th St.



South view of the northbound approach of SW 87th Avenue and SW 8th Street



Easterly view of SW 87th Ave and SW 8th St. Notice that southbound left-turn traffic remained in the center of the intersection waiting for a gap in traffic



Southeasterly view of the intersection of SW 87th Avenue and SW 8th Street.



South view of the southbound approach of SW 87th Avenue and SW 8th Street



Northerly view of the southbound approach of SW 87th Avenue and SW 8th Street



West view of the westbound approach of SW 87th Avenue and SW 8th Street



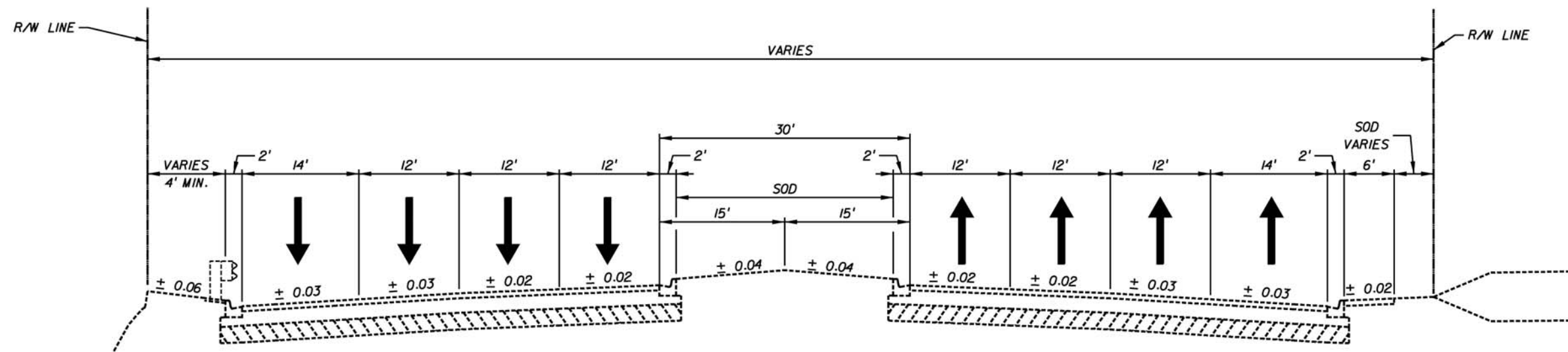
3. ROADWAY CHARACTERISTICS

Roadway characteristics of the study corridor were collected from numerous sources including the Florida Department of Transportation's (FDOT) Roadway Characteristics Inventory (RCI), FDOT's straight line diagrams, aerial photography, as-built records, and field reviews. Table 3-1 summarizes roadway characteristics of SW 8th Street between SW 97th Avenue and the west side of the SR-826 mainline ramps, and SW 87th Avenue between SW 16th Street and West Flagler Street.

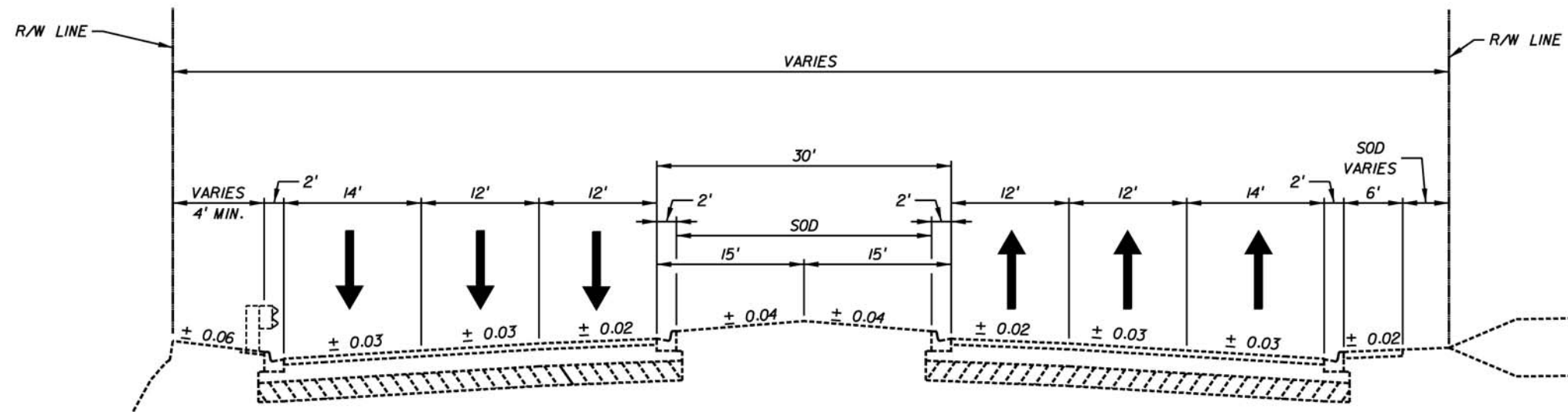
Table 3-1: Existing Roadway Characteristics

Roadway Characteristics	SW 8th Street between Ramp to SR 826 and SW 92nd Avenue	SW 8th Street between Ramp to SR 826 and SW 92nd Avenue
Orientation	East-West	North-South
Functional Classification	Urban Other Principal Arterial	Urban Minor Arterial
Access Management Classification	Class 5	Class 3 (North of 8th Street); Class 5 (South of 8th Street)
Roadway Classification	SHS	SHS
Posted Speed Limit	45 MPH	40 MPH
Design Speed	45 MPH	45 MPH
Typical Section	Six-lane divided facility east of SW 87th Avenue / Eight-lane divided facility west of SW 87th Avenue	Four-lane divided facility
Right-of-Way Width	+/- 150' typical	From 75' to 85' Typical. 100' at NB approach to Flagler Street
Horizontal Alignment	Mainly east to west without curves. Small deflections	Mainly north to south without curves. Small deflections
Vertical Alignment	Flat with minimal differential grades for drainage	Flat with minimal differential grades for drainage and a curve at bridge over C-4 Canal
Pavement Condition	Average Crack Rating: 3.5-9.5, Average Ride Rating: 7.0-7.7	Average Crack Rating: 9.0-10.0, Average Ride Rating: 6.3-7.0
Drainage	Closed system with Curb and Gutter, Curb Type Inlets, and Pipes	Closed system with Curb and Gutter, Curb Type Inlets, and Pipes
Lighting	Cobra Head light poles on north side of the road	Cobra Head light poles on west side of the road north of SW 8th Street and on east side of road south of SW 8th Street
Traffic Control	Existing signals at 92nd Ave, 94th Ave, and 87th Ave are the strain pole with drop box configuration. Signals at 97th Ave, 82nd Ave, and ramp to SR 826 are mast arm type. There are an additional 8 unsignalized intersections stop controlled for cross street (all T intersections).	Existing signal at SW 16th Street and W. Flagler Street are of mast arm type. Existing signal at SW 8th Street is a strain pole with drop box configuration. There are 9 additional unsignalized intersection stop controlled for cross street (5 T intersections and 4 full intersections)
Multi-modal Facilities	Transit Route 8. Bus bay provided on north side (WB) west of SW 97th Ave, SW 94th Ave, SW 92nd Ave, SW 87th Ave, and SW 82nd Ave, and in the EB direction west of SW 82nd Avenue. Total of 12 transit bus bay/transit sign post and bench at remaining locations from SW 97th Ave to SR 826. No bicycle lanes but outside lane is 14' (wide curb lane). Pushbuttons, crosswalks and ADA ramps at signalized intersections. Sidewalk provided on south side of road only (6' wide).	Transit route 87, transit sign and benches. Total of 17 bus stops between SW 16th Street and Flagler Street. Bus bays are not provided. No bicycle lanes. Pedestrian crosswalks at signalized intersections, ADA ramps. Sidewalks provided on both sides of the road (+/- 6' wide)
On-street Parking	No designated on-street parking areas	No designated on-street parking areas

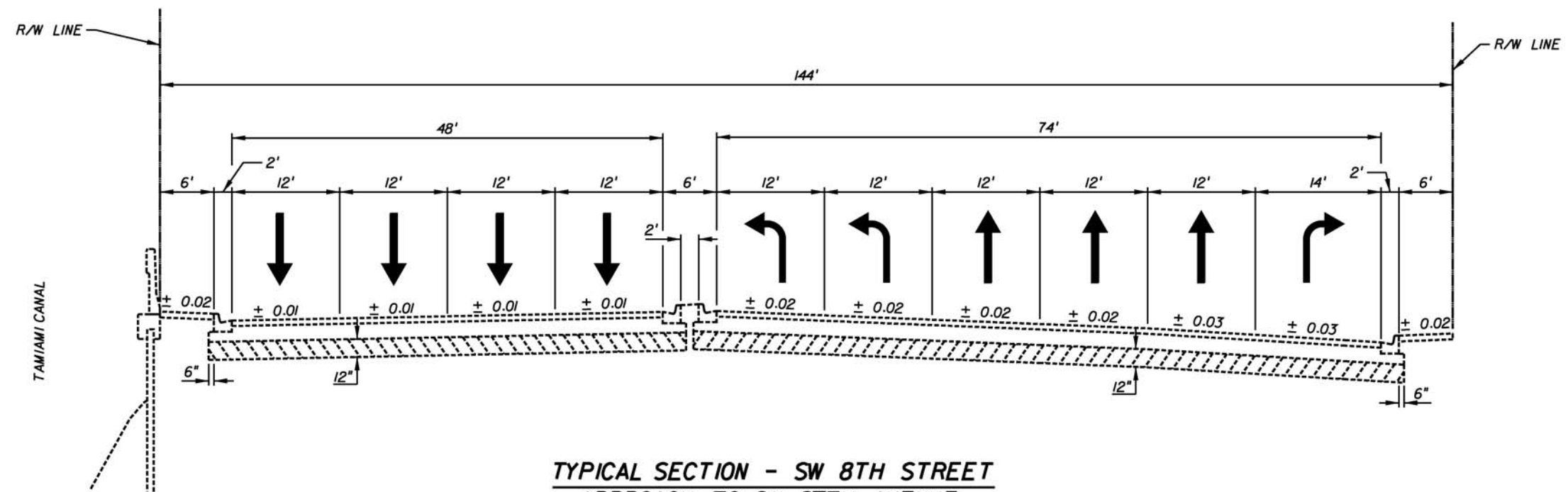
For the existing typical sections along SW 8th Street and SW 87th Avenue refer to Figure 3-1 through Figure 3-3. During field observation visits, a photographic reconnaissance was prepared of the existing roadway conditions and is included in Figure 3-4.



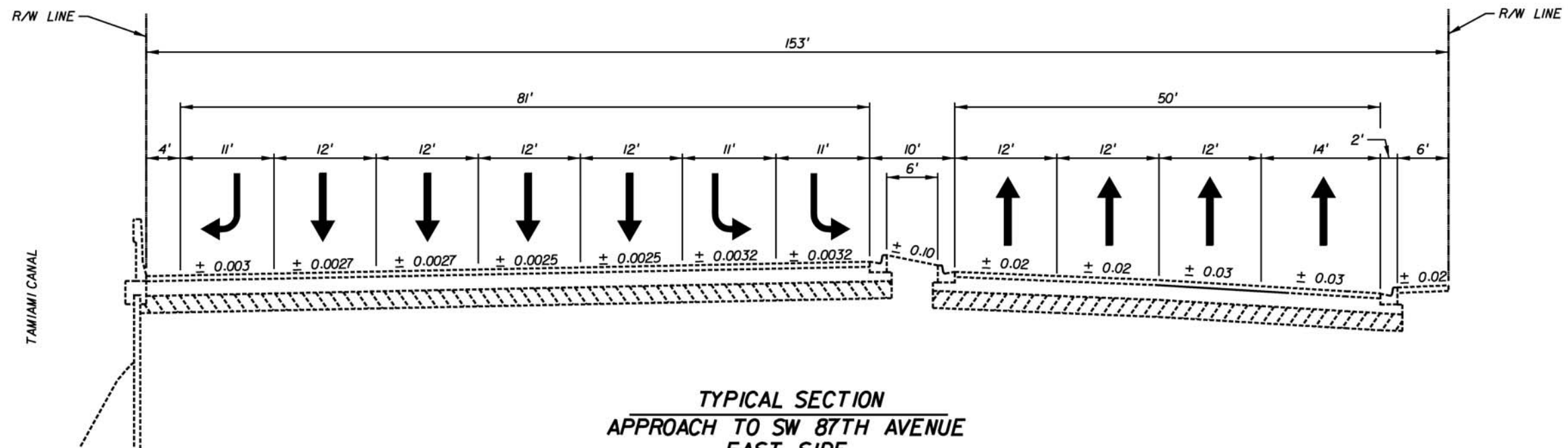
TYPICAL SECTION - SW 8TH STREET
WEST OF SW 87TH AVENUE
DESIGN SPEED = 45 MPH



TYPICAL SECTION - SW 8TH STREET
WEST OF SW 87TH AVENUE
DESIGN SPEED = 45 MPH

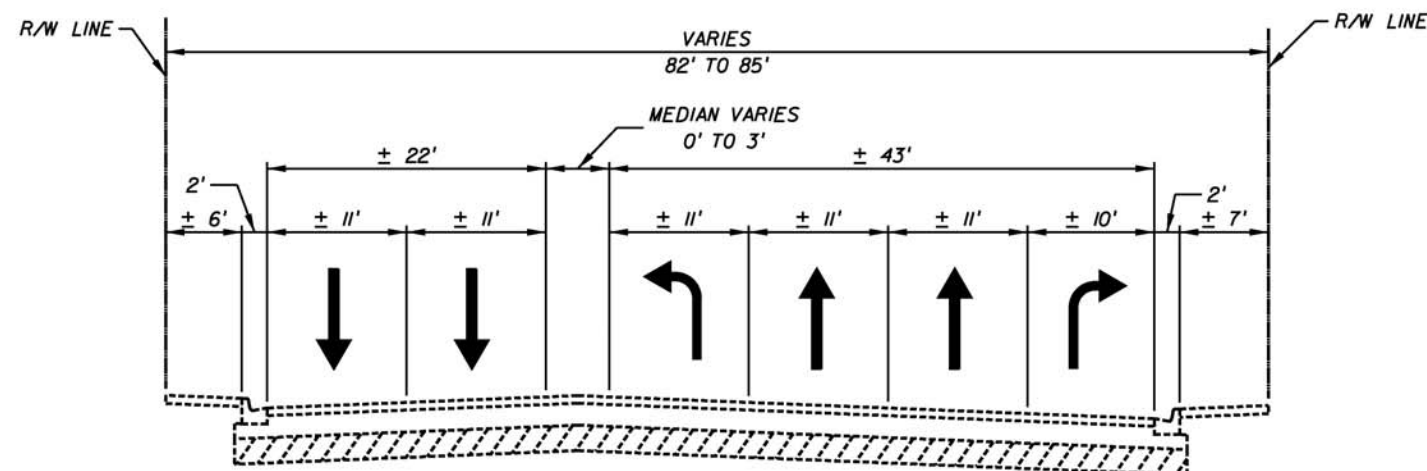


**TYPICAL SECTION - SW 8TH STREET
APPROACH TO SW 87TH AVENUE
WEST SIDE
DESIGN SPEED = 45 MPH**

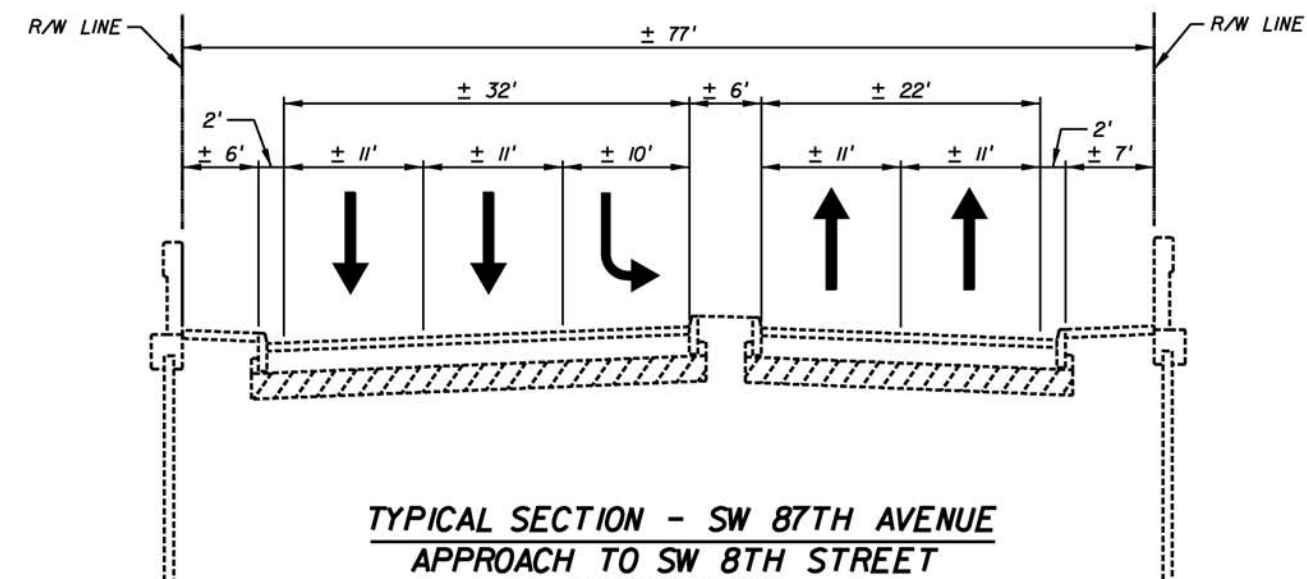


**TYPICAL SECTION
APPROACH TO SW 87TH AVENUE
EAST SIDE
DESIGN SPEED = 45 MPH**

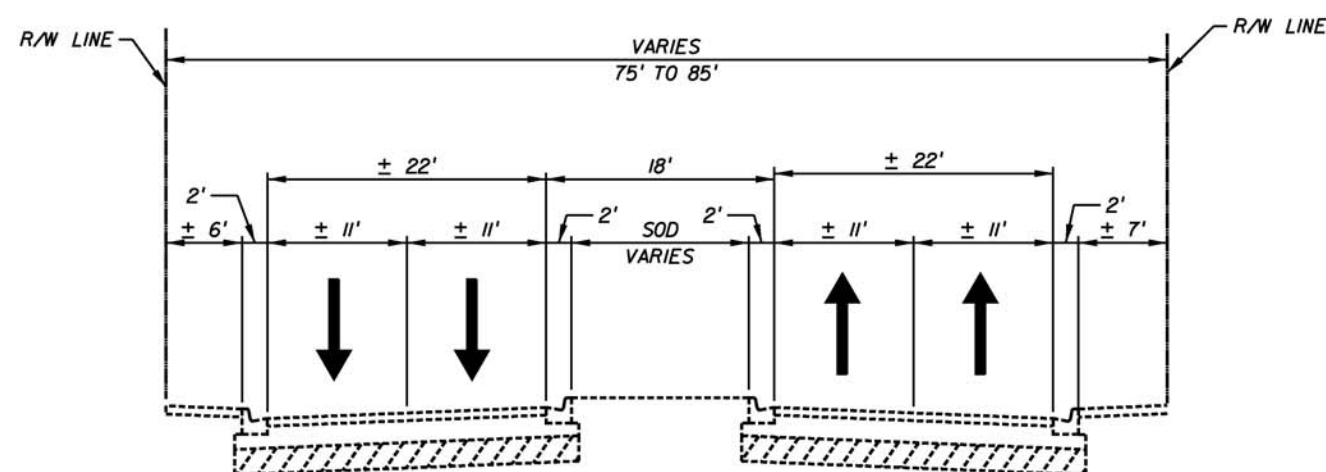




TYPICAL SECTION - SW 87TH AVENUE
APPROACH TO SW 8TH STREET
SOUTH SIDE
DESIGN SPEED = 45 MPH



TYPICAL SECTION - SW 87TH AVENUE
APPROACH TO SW 8TH STREET
NORTH SIDE
DESIGN SPEED = 45 MPH



TYPICAL SECTION - SW 87TH AVENUE
DESIGN SPEED = 45 MPH





Existing ADA ramps within the study area



View of pavement conditions. The study corridors are in fair condition. Milling and resurfacing is recommended along both, SW 87th and SW 8th Street



View of the median along SW 87th Avenue south of SW 8th Street. FPL overhead utilities are located on the eastern side of the road.



This picture depicts the existing pavement, drainage and pavement markings along the study corridor. As can be seen in the picture taken along SW 8th Street, east of SW 87th Avenue, the study area facility is in poor to fair conditions



View of the SW 8th Street corridor east of SW 87th Avenue. From field observations it can be determined that the pavement is in need of milling and resurfacing



Southwesterly view of the signal of SW 8th Street and SW 87th Avenue. The signal is currently mounted on span wire.



4. SAFETY ANALYSIS

A crash analysis was performed along SW 8th Street between SW 92nd Avenue and SW 82nd Avenue. For this purpose, crash data was collected and analyzed from 2004 through 2008. A review of the study segment included in Table 4-1 revealed that there were 560 total crashes along the study segment between 2004 and 2008. Appendix B includes the crash data for the study area.

Table 4-1
Crash Analysis SW 8th Street between SW 92nd Avenue and SW 82nd Avenue

Crashes by Type	Year					Total
	2004	2005	2006	2007	2008	
Rear End	46	61	41	35	45	228
Head On			2	1	1	4
Angle	19	31	28	20	29	127
Left Turn	20	16	11	9	20	76
Right Turn	6	3		1	1	11
Sideswipe	13	7	9	8	14	51
Pedestrian/Bicycle	2	1	2	2	2	9
Fixed Object		1	1		1	3
Sign (Post)			2	1		3
Guardrail		1	1			2
Concrete Barrier Wall	1	1		1		3
Tree/Shrub		1	3	2	1	7
Overtaken	2					2
Utility/Light Pole					1	1
Fatality		1		2		3
Other	7	6	6	9	5	33
Total Crashes per Year	116	129	106	89	120	560
Dry Road Conditions	105	119	97	79	100	500
Wet Road Conditions	11	10	9	10	20	60
Fatalities		1		2		3
Injury⁽¹⁾	68	82	75	46	64	335
Total Injuries⁽²⁾	137	166	138	87	116	644
Property Damage Only	48	46	31	41	56	222

Notes:

(1) Number of crashes that involve at least one injury

(2) Total number of injuries at the analysis intersection during the analysis period

These crashes included 335 (59.82%) injury crashes and 3 (0.54%) fatal crashes, including 222 (12.59%) property-damage only crashes (Please see Figure 4-1). The predominant type of crashes reported in the analysis period were rear ends with a total of 228 (40.71%), followed by 127 (22.68%) angle-type crashes, 76 (13.57%) left-turn crashes, and 51 (9.11%) sideswipes (Please see Figure 4-2).

Figure 4-1: Crashes by Severity along SW 8th Street

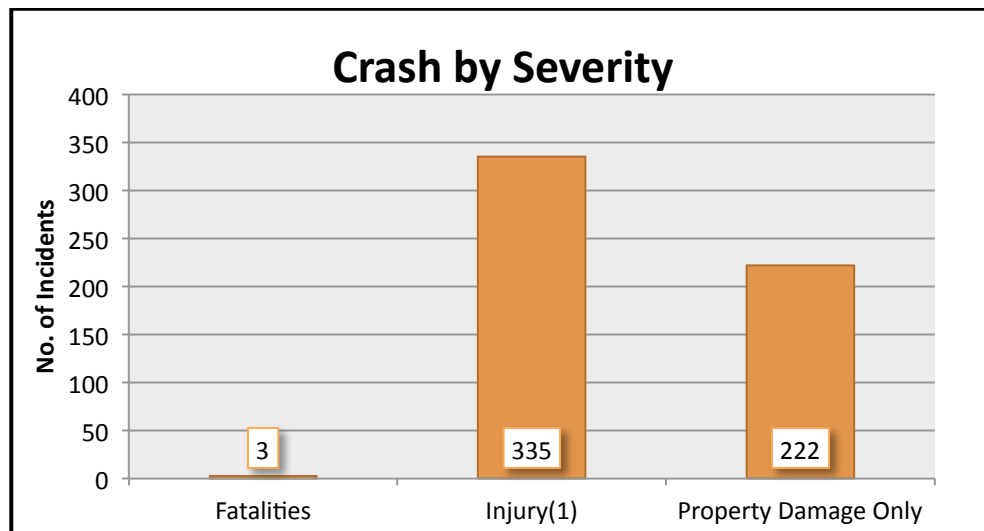
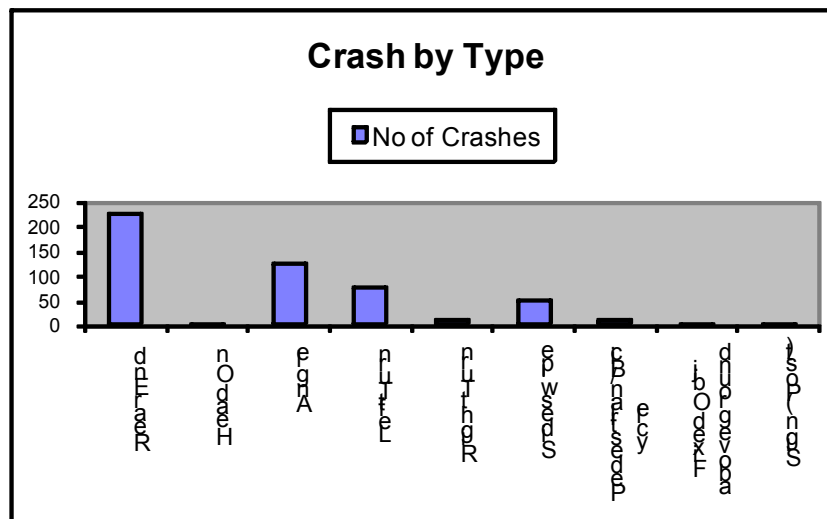


Figure 4-2: Crashes by Type along SW 8th Street



The crash data revealed that sixty (60) or more crashes occurred at the following locations in a five-year period (please see Figure 4-3 and Table 4-2):

- ☐ SW 8th Street and SW 92nd Avenue (121 crashes)
- ☐ SW 8th Street and SW 88th Avenue (68 crashes)
- ☐ SW 8th Street and SW 87th Avenue (145 crashes)
- ☐ SW 8th Street and SW 82nd Avenue (103 crashes)

A more detailed crash analysis of these four (4) locations was performed and is included in the following sections.

Table 4-2
Crash Analysis SW 8th Street between SW 92nd Avenue and SW 82nd Avenue

Crashes by Type	Intersection					Total
	SW 92nd Avenue	SW 88th Avenue	SW 87th Avenue	SW 84th Avenue	SW 82nd Avenue	
Rear End	38	16	83	26	63	226
Head On	2		1		1	4
Angle	35	26	23	7	13	104
Left Turn	25	15	10	6	9	65
Right Turn	1	1	2	2	3	9
Sideswipe	10	3	14	6	9	42
Pedestrian/Bicycle			5		2	7
Fixed Object	2	1		1		4
Sign (Post)	1					1
Guardrail	1					1
Concrete Barrier Wall	2					2
Tree/Shrub				2		2
Overturned		1	1			2
Utility/Light Pole			1			1
Fatality	1			1		2
Other	4	5	5	7	3	24
Total Crashes per Year	121	68	145	57	103	494
Dry Road Conditions	99	61	132	51	91	434
Wet Road Conditions	22	7	13	6	12	60
Fatalities	1			1		2
Injury⁽¹⁾	80	39	70	39	66	294
Total Injuries⁽²⁾	179	82	125	66	120	572
Property Damage Only	41	29	75	18	37	200

Notes:

(1) Number of crashes that involve at least one injury

(2) Total number of injuries at the analysis intersection during the analysis period

Table 4-3 includes an analysis of the safety ratio at the study intersections along SW 8th Street.

Table 4-3
Safety Ratio at the Study Intersections along SW 8th Street

Intersection	Crash Rates/ Safety Ratios	Year				
		2004	2005	2006	2007	2008
SW 8th Street and SW 82nd Ave	Actual	1.037	1.275	1.458	0.879	0.448
	Critical	0.727	0.707	0.729	1.047	0.654
	Safety Ratio	1.426	1.803	2.000	0.840	0.685
SW 8th Street and SW 84th Ave	Actual	0.691	0.614	0.503	0.413	0.598
	Critical	0.727	0.707	0.729	1.047	0.654
	Safety Ratio	0.950	0.868	0.690	0.394	0.914
SW 8th Street and SW 87th Ave	Actual	1.348	1.739	1.115	0.928	1.826
	Critical	1.097	1.083	1.044	0.956	0.940
	Safety Ratio	1.229	1.606	1.068	0.971	1.943
SW 8th Street and SW 88th Ave	Actual	0.565	1.106	0.533	0.354	0.740
	Critical	0.699	0.732	0.721	1.004	0.652
	Safety Ratio	0.808	1.511	0.739	0.353	1.135
SW 8th Street and SW 92nd Ave	Actual	1.131	1.528	1.309	0.928	0.889
	Critical	1.097	1.083	1.044	0.956	0.940
	Safety Ratio	1.031	1.411	1.254	0.971	0.946

Cells highlighted in red reflect a safety ratio greater than 1

4.1.SW 8th Street and SW 87th Avenue

For analysis purposes, this intersection was analyzed including upstream and downstream intersections that affect the operations of the intersection. This is due to the presence of longer storage lengths at left-turning lanes along SW 8th Street specifically at SW 87th Avenue that extend beyond 250 feet of the intersection, and that affect the travel patterns and therefore, the results of the spot crash analysis. The analysis has considered the following limits:

- ☐ To the west (along SW 8th Street): SW 88th Avenue
- ☐ To the east (along SW 8th Street): 250 feet east of SW 86th Court
- ☐ To the north and south (along SW 87th Avenue): 250 feet north and south of SW 8th Street

The total number of crashes within intersection limits could be summarized as follows:

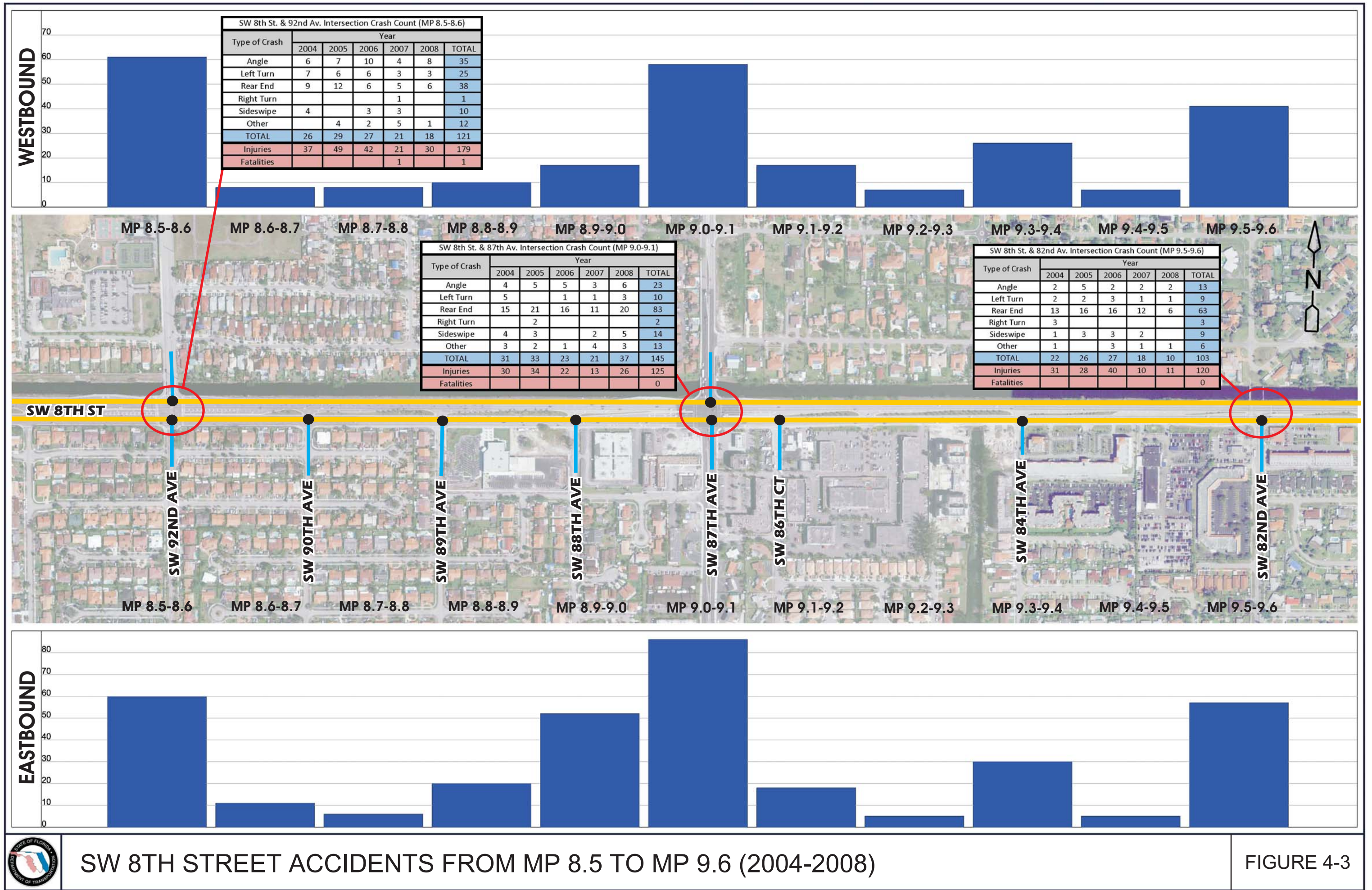
- ☐ SW 8th Street and SW 88th Avenue: 68 crashes
- ☐ SW 8th Street and SW 87th Avenue: 145 crashes
- ☐ SW 8th Street and SW 86th Court: 20 crashes

During the field observations it was noted that the traffic generated by the commercial uses located on the south side of SW 8th Street, and the access to these uses had an impact at the intersection and therefore, the driveway connections to SW 8th Street would be analyzed in terms of crashes to review any impacts to the resulting crash patterns.

A review of the data for the intersection of SW 87th Avenue and SW 8th Street within Table 4-2 reveals that the predominant type of crash in the area are rear-end (83 out of 145), angles (23 out of 145) and sideswipe (14 out of 145) crashes. Due to the high traffic volumes in the area, it was expected that rear-ends would be the predominant type of crash.

There is a predominance of angle-type crashes at full median openings located in the study area. It shall be noted that these median openings and driveways located along the corridor do not meet access management standards. At SW 8th Street and SW 88th Avenue there were a total of 26 over 68 (38%) angle crashes, and at the intersection of SW 8th Street and 86th Court were a total of 8 out of 20 (40%) angle crashes. Channelization and sight distance should be further reviewed at these intersections.

There were a total of 233 crashes along SW 8th Street between SW 88th Avenue and SW 86th Court. The predominant type of crash was rear-ends with a total of 135 (57.93%), followed by angle crashes with a total of 52 (22.32%) and 37 sideswipes (15.88%).



4.2. SW 8th Street and SW 92nd Avenue

A total of 121 crashes were reported on SW 8th Street in the vicinity of SW 92nd Avenue (M.P. 8.5 to 8.6) with a predominance of rear end crashes (38 out of 121) followed by angle crashes (35 out of 121) and left-turn crashes (25 out of 121). It shall be noted that a review of the severity of crashes revealed a high number of injuries (179 injuries for 121 crashes), and 41 crashes with property damage only.

Crashes by type are included in Figure 4-4 and crashes by severity type are included in Figure 4-5.

Figure 4-4: Crashes by Type SW 8th Street and SW 92nd Avenue

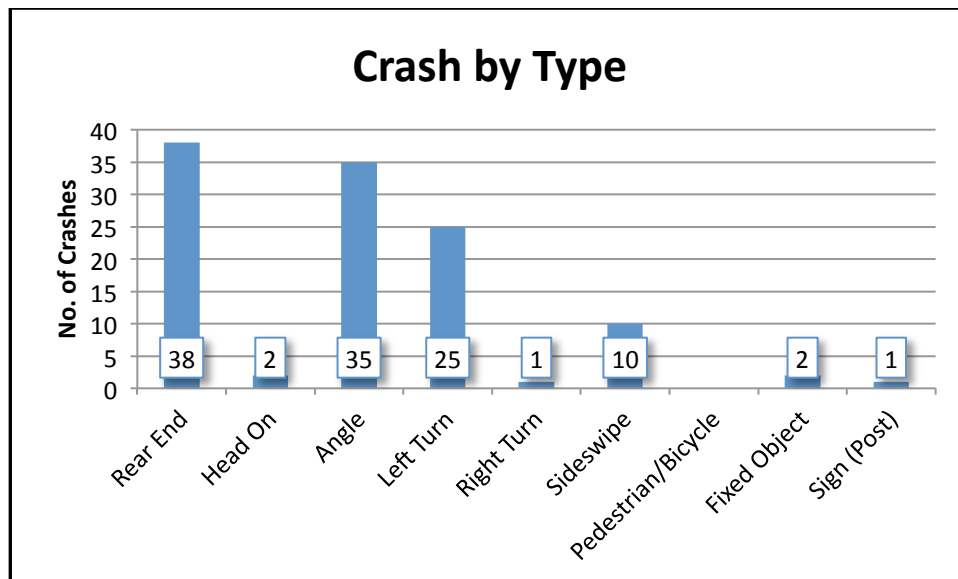
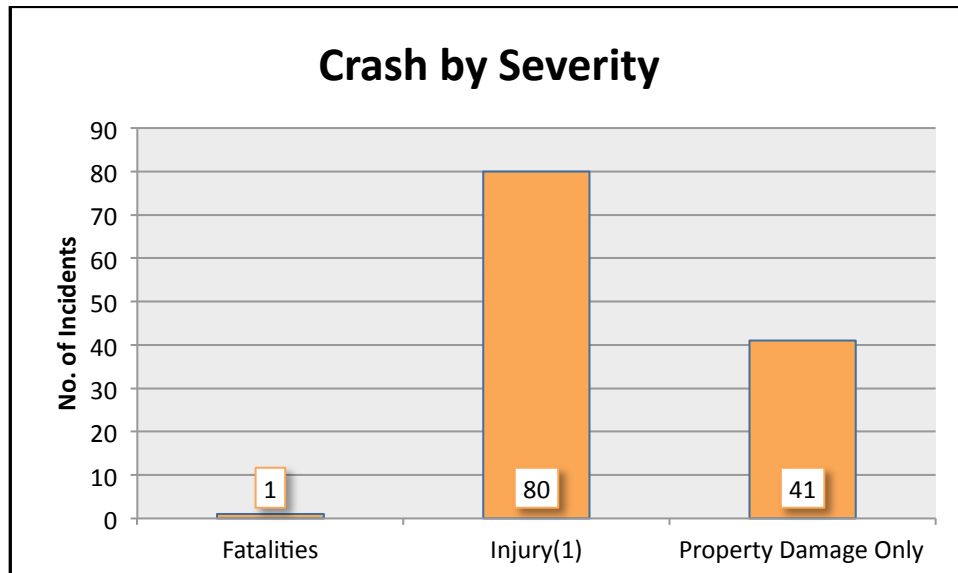


Figure 4-5: Crashes by Severity SW 8th Street and SW 92nd Avenue



4.3. SW 8th Street and SW 82nd Avenue

An analysis of crashes at this location revealed that the majority of crashes represented rear end collisions (63 out of 103), totaling 61.17% of total crashes, followed by 13 out of 103 angle type of crashes (12.62%), 9 sideswipes and 9 left-turns (each corresponding to 8.73% of the total). A review of the severity of crashes revealed that there were 120 injuries in the analysis period and 37 property-damage only crashes.

Figure 4-6: Crashes by Type SW 8th Street and SW 82nd Avenue

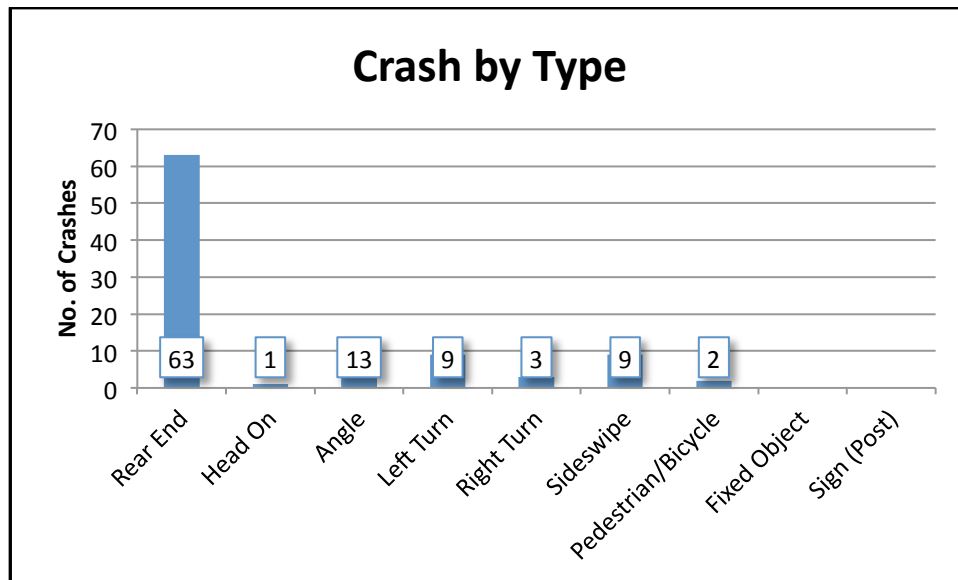
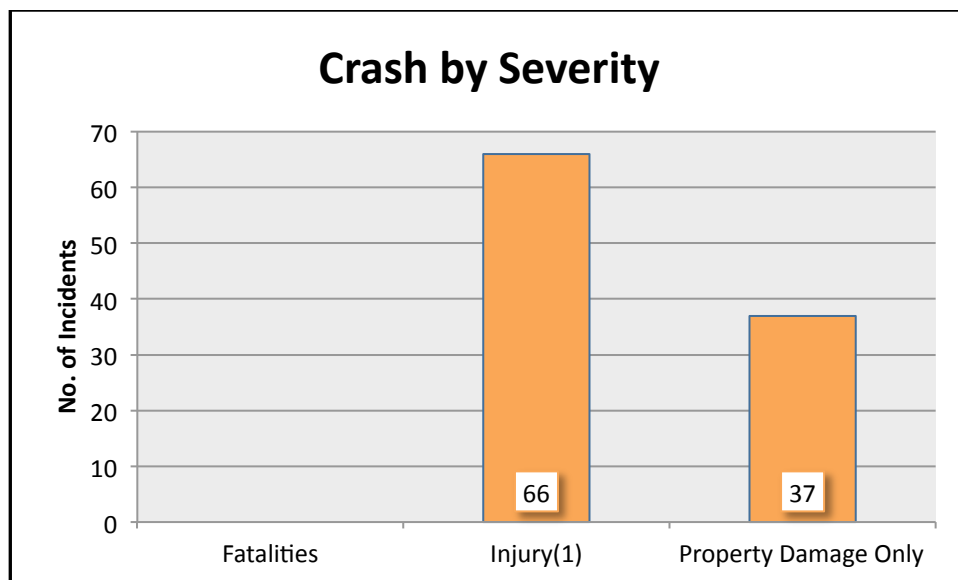


Figure 4-7: Crashes by Severity SW 8th Street and SW 82nd Avenue



5. SYSTEM LEVEL ANALYSIS (TIER 1 ANALYSIS)

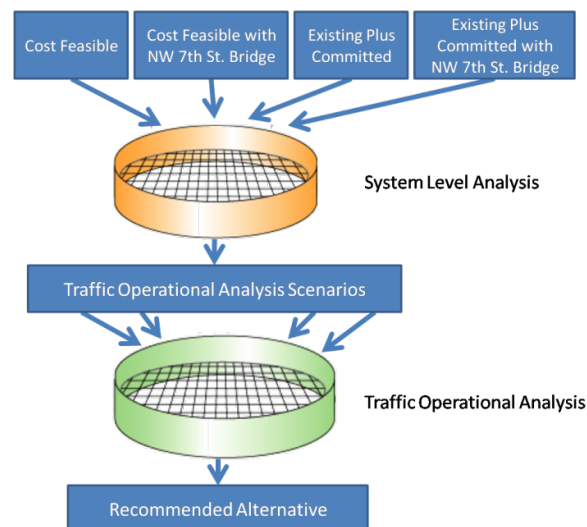
Early during the process and as part of previous studies it has been recognized that FDOT, Miami-Dade Expressway Authority (MDX) and Miami-Dade County Public Works Department (MDCPWD) were in the process or had recently completed major projects that have a regional impact on the roadway network system. The type of project that are referred to, consist of major capacity improvements to limited access facilities and/or new arterial roads which are deemed to have the potential to impact traffic patterns in other corridors. A System Level Analysis (also referred to as Tier 1 Analysis on this report) was prepared as an initial step during this study.

The objective of the Tier 1 Analysis is to assess the impacts that projects recently completed, under construction, and committed as part of the Cost Feasible network will have on the traffic patterns at the intersection of SW 87th Avenue and SW 8th Street and determine if the additional capacity to the network system will result in a decrease in traffic volumes at this intersection. In other words, even though there is a need for improvements at the intersection based on current traffic volumes, the analysis evaluates that the need for improvements will continue to exist upon completion of capacity improvements that may divert traffic to other locations.

This section of the report documents the evaluation at the System Level Analysis within the study area. The purpose of this section is to:

- Develop a baseline transportation planning alternative;
- Update the Southeast Regional Planning Model, Version 6.5 (SERPM 6.5) to develop alternatives and compare the resulting future traffic volumes;
- Assess the viability through a System Level Analysis which will lead to performing a traffic operational analysis of the alternatives.

Figure 5-1 - System and Traffic Level Analysis



5.1. Transportation Planning Model Section

The analysis and evaluation of system level alternatives within the study area is a function of travel demand modeling. The study area is included in four (4) Florida Standard Urban Transportation Model Structure compliant travel demand models:

- ☐ Miami-Dade Metropolitan Planning Organization (MPO) Model
- ☐ Bi-County Model (Broward and Miami-Dade County)
- ☐ Southeast Regional Planning Model (SERPM) Version 6.02
- ☐ Southeast Regional Planning Model (SERPM) Version 6.5

5.1.1. Model Comparison

Comparisons were performed to identify differences between the models and select a travel demand model for the study area. The first step was to identify Base and Future Years and their respective inclusion of LRTP projects. Table 5-1 documents the available models within District Six, the model type, and their Base and Future Years.

Table 5-1 - Available Travel Demand Models within District Six

Model	Base Year	Future Year	Model Type
Miami-Dade MPO	2000	2030	Cost Feasible
Bi-County	N/A	2030	FTA New-Starts
SERPM 6.02	2000	2030	☐ Cost-Feasible ☐ Existing Plus Committed
SERPM 6.5	2005	2035	☐ Cost-Feasible ☐ Existing Plus Committed

5.1.2. Model Selection

The need for the most current and up-to-date network for System Level Analysis for the SW 8th Street and SW 87th Avenue study area and the ability to model the tri-county area lead to the selection of the Southeast Regional Planning Model Version (SERPM) 6.5 Time of Day (TOD) based 24-hour model for the forecast future year volumes. The 2005 Base Year provided a significant advantage for a 2010 study; requiring fewer network and socio-economic modifications and the inclusion of 2030 and 2035 LRTP and locally adopted plans. Additionally, the 2035 Future Year Cost Feasible model within the SERPM 6.5 allows for more flexibility when developing and comparing alternatives for the study area.

5.1.3. Tier I Modeling Years and Growth Analysis

The SERPM 6.5 Time of Day based 24-hour model provides 2005 Base Year and 2035 Future Year modeling scenarios; these model years were used to analyze the Tier I system level analysis.

The SERPM 6.5 consists of network links that represent many of the major and minor roadways within the tri-county area and traffic analysis zones (TAZs) which represent socio-economic data within the model. The socio-economic data represents land uses in the model and consists of population and employment values.

The SERPM 6.5 population was compared for the Base Year 2005 to Future Year 2035 populations to determine the feasibility of growth within the study area. The comparison of the densities for the two model years is presented in Figure 5-2 and Figure 5-3. Additionally, the differences between the two model years was compared by subtracting the Base Year 2005 population from the Future Year 2035 population to highlight areas of significant growth; this comparison is presented in Figure 5-4. A summary of the 2005, 2035 population at the SERPM 6.5, Miami-Dade County, and within the study area is provided in Table 5-2.

Table 5-2 - Population at the SERPM 6.5, Miami-Dade County and Study Area

Population			
Area	2005	2035	% Growth
SERPM 6.5	5,376,884	7,212,218	34%
Miami-Dade	2,359,183	3,278,155	39%
Study Area	139,607	198,938	42%

Figure 5-2 - 2005 Base Year Population Density

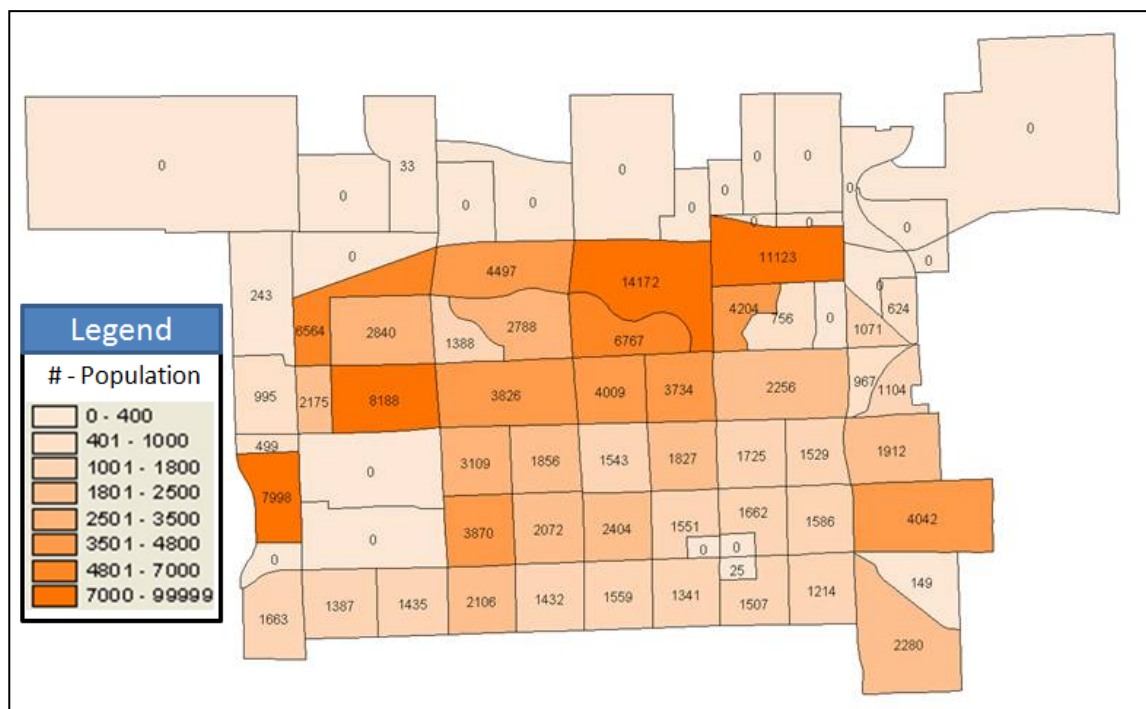


Figure 5-3 - 2035 Future Year Population Density

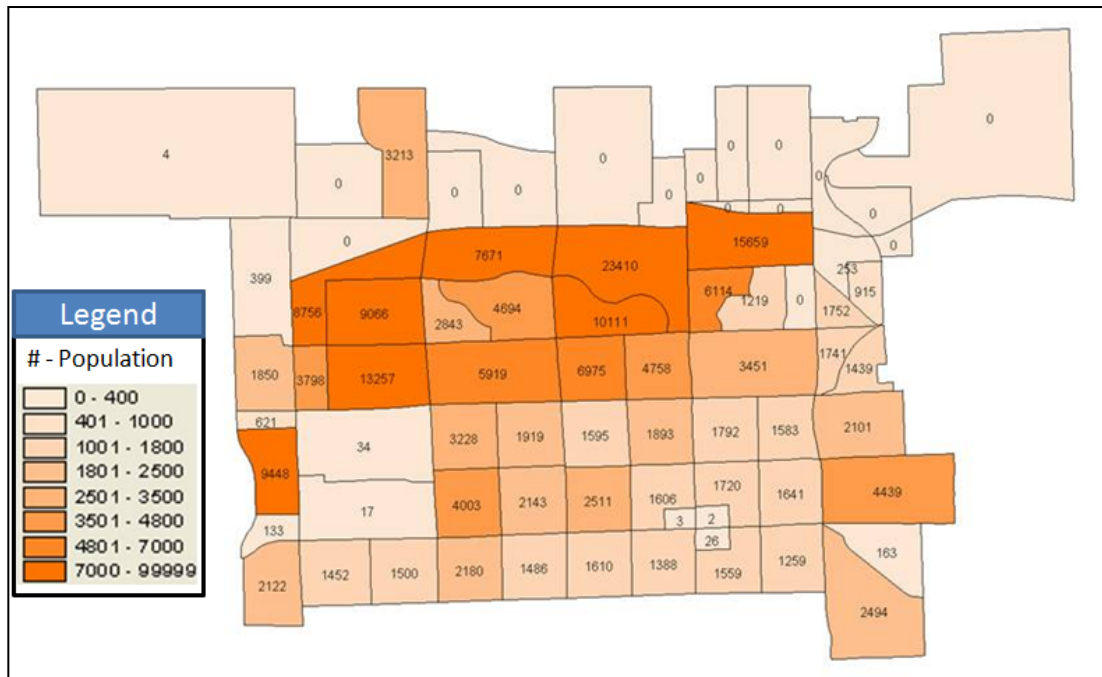
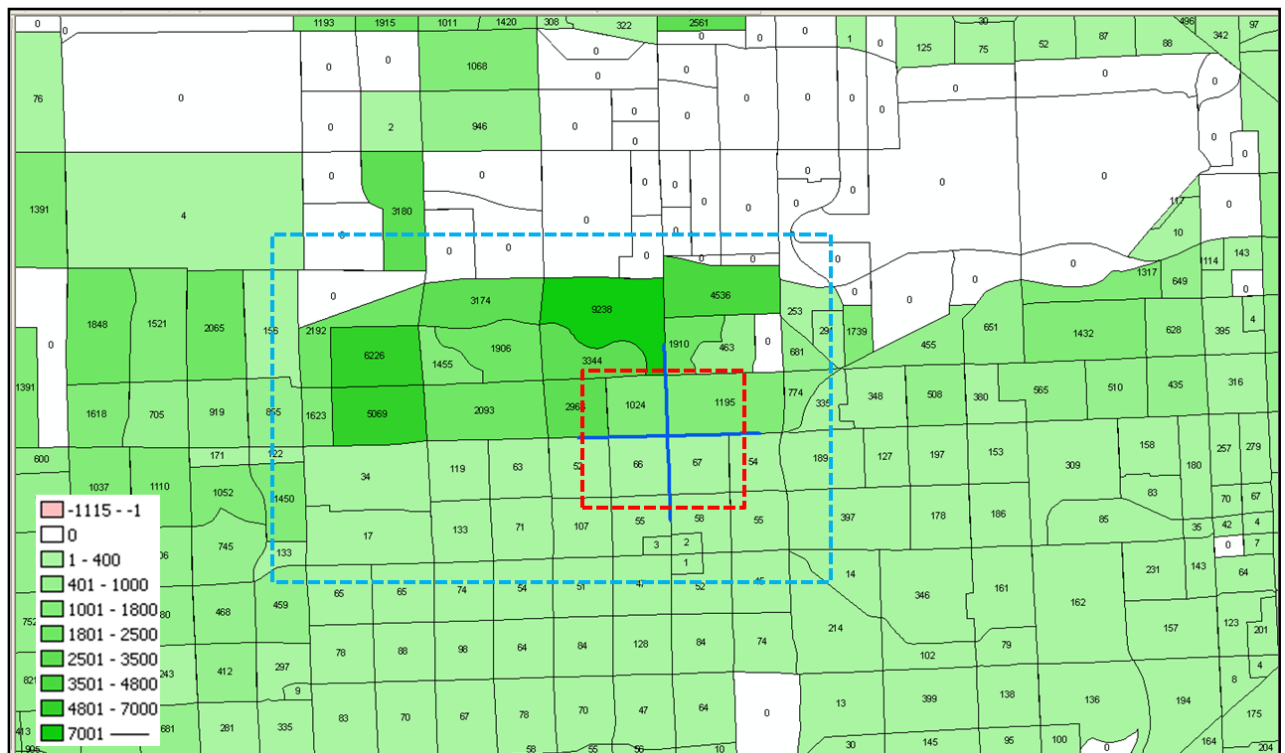


Figure 5-4 - Differences of Base 2005 and Future Year 2035 SERPM 6.5 Population



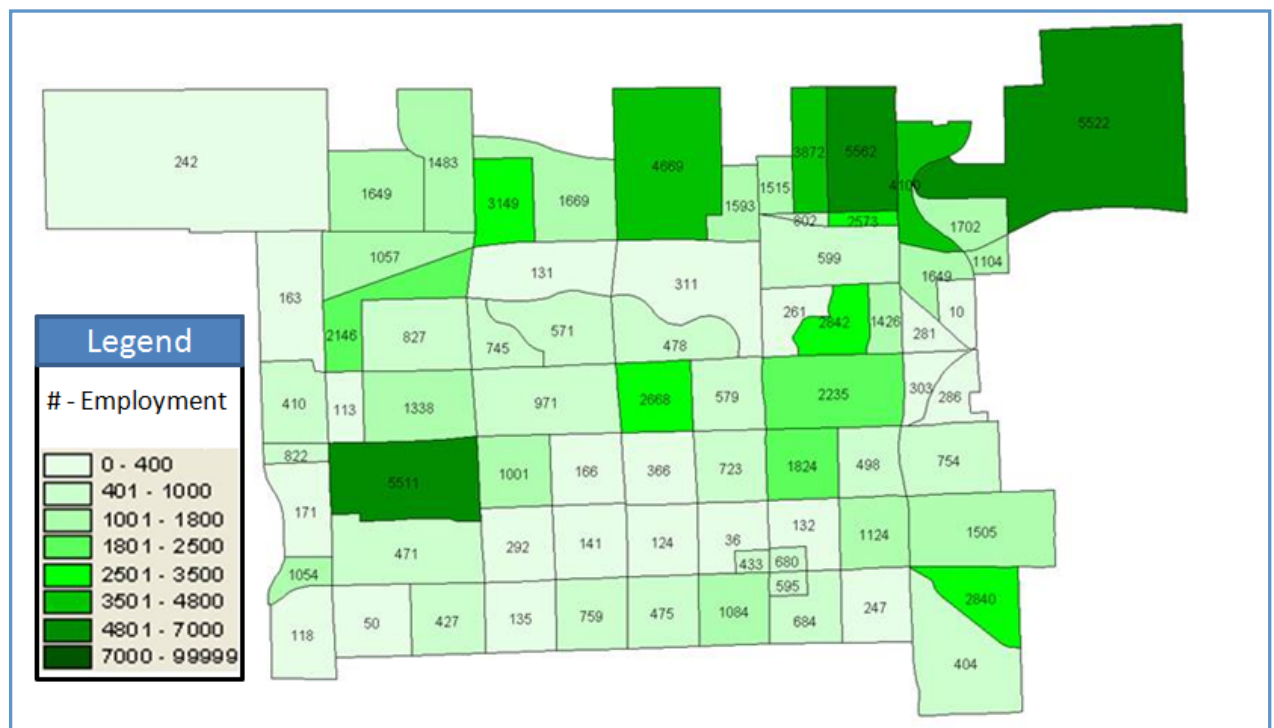
Employment

The SERPM 6.5 employment was compared for the Base Year 2005 to Future Year 2035 employment figures to determine the feasibility of growth within the study area. The comparison of the densities for the two model years is presented in Figure 5-5 and Figure 5-6. Additionally, the differences between the two model years was compared by subtracting the Base Year 2005 employment figures from the Future Year 2035 employment figures to highlight areas of significant employment growth; this comparison is presented in Figure 5-7. A summary of the 2005, 2035 employments, and their percent growth at the SERPM 6.5, Miami-Dade County and within the study areas is provided in Table 5-3.

Table 5-3 - Employment at the SERPM 6.5, Miami-Dade County and Study Area

Employment			
	2005	2035	% Growth
SERPM 6.5	2,659,572	3,805,555	43%
Miami-Dade	1,379,355	1,994,215	45%
Study Area	89,252	128,714	44%

Figure 5-5 - 2005 Base Year Employment Density



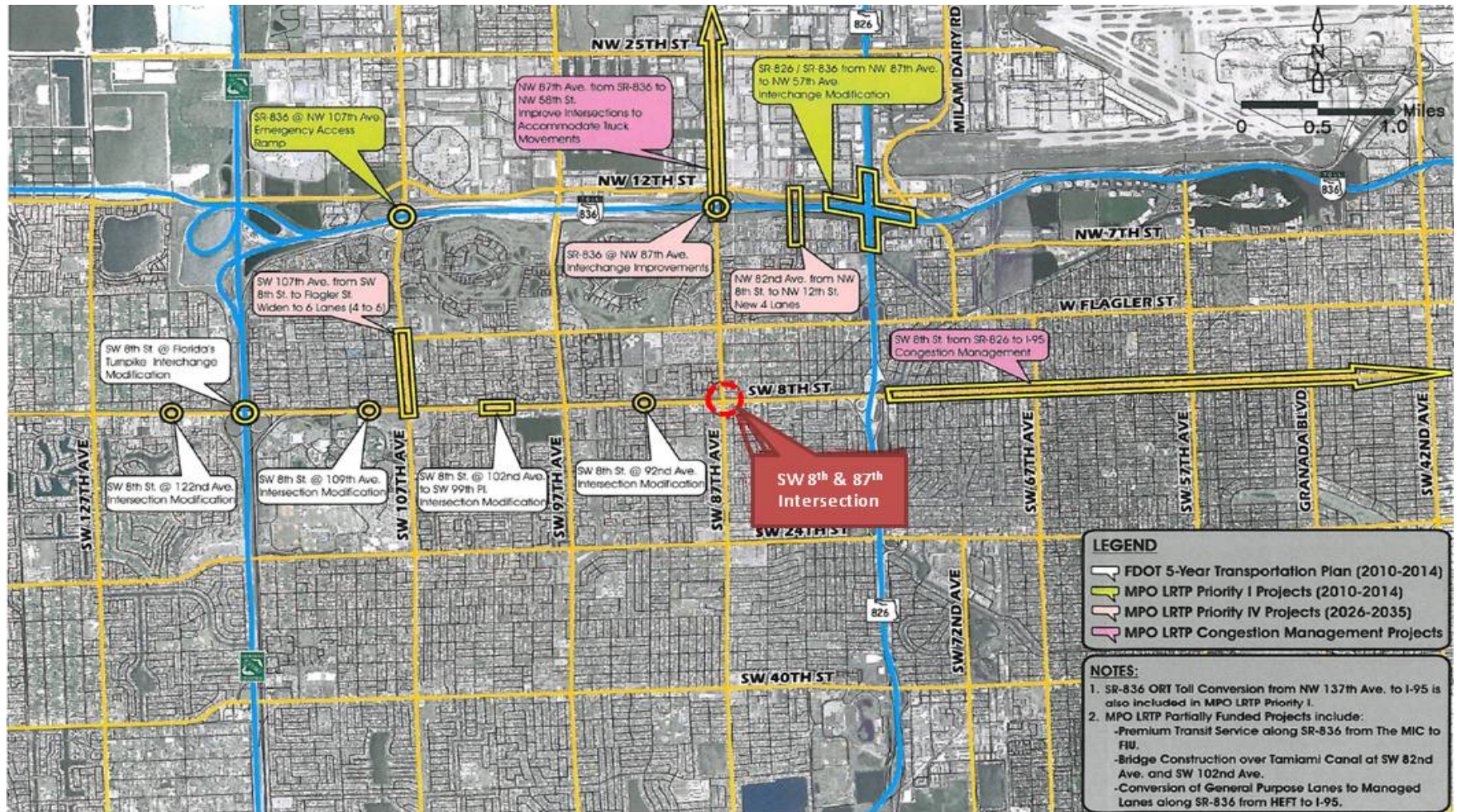
5.2. Future Improvement Plans

The Miami-Dade Metropolitan Planning Organization (MPO), the Miami-Dade Expressway Authority, the Florida Department of Transportation, and a number of other agencies have roadway projects within the study area. Through the development of Long Range Transportation Plans, these roadway projects are prioritized based on criteria developed by the MPO to ensure that the committed projects have a major impact on the entire network and benefit the entire community.

The prioritization of projects for the 2035 Miami-Dade LRTP are separated into four main priorities; each priority level represents a period of time during which certain projects are funded; i.e. Priority I Projects represent years 2010 to 2014. In conjunction with the LRTP, the FDOT has its five-year Work Program, which is included in the MPO's Transportation Improvement Plan (TIP) within the study area. The State's TIP is approved annually by the Federal Highway Administration as an outlay of both, state and federally funded projects.

In the development of alternatives, the inclusion of the aforementioned prioritized LRTP projects and TIPs create Existing plus Committed (E+C) and Cost Feasible (CF) alternatives. An E+C alternative consists of projects that are committed projects for construction and, for this study, includes projects that were prioritized as Priority I in the LRTP. Cost Feasible alternatives include the E+C projects and additional projects, including LRTP projects higher than Priority I projects. An overview of the Miami-Dade MPO Future Improvement Plan within the project study area is illustrated in Figure 5-8.

Figure 5-8 - FDOT & Miami-Dade MPO Future Improvement Plan



5.2.1. Existing plus Committed Alternatives

The SERPM 6.5 Existing plus Committed alternatives include the County's TIP five-year plan and the County's LRTP Priority I projects from 2010 to 2014. In addition to these projects, the NW 97th Avenue overpass at SR 836 was included in the Existing plus Committed network. These projects are presented below in Table 5-4 and have been illustrated in Figure 5-8.

Table 5-4 - Existing plus Committed Projects

Facility/Corridor	From	To	Description	Organization/Plan	Priority
SW 8th St.		FL Turnpike	Interchange Modification	MPO/TIP	5-Yr. Plan (2010-2014)
SW 8th St.		SW 122nd Ave.	Intersection Modification	MPO /TIP	5-Yr. Plan (2010-2014)
SW 8th St.		SW 109th Ave.	Intersection Modification	MPO/TIP	5-Yr. Plan (2010-2014)
SW 8th St.		SW 102nd Ave.	Intersection Modification	MPO /TIP	5-Yr. Plan (2010-2014)
SW 8th St.		SW 92nd Ave.	Intersection Modification	MPO/TIP	5-Yr. Plan (2010-2014)
SW 8th St.		SW 87th Ave.	Intersection Modification	MPO /TIP	5-Yr. Plan (2010-2014)
SR-836		NW 107th Ave.	Emergency Access Ramp	MPO/LRTP	Priority I (2010-2014)
SR-826/SR-836	N. of SW 8 th St. NW 57th Ave.	S. of NW 25 th St. NW 87th Ave.	Interchange Modification	MPO/LRTP	Priority I (2010-2014)
SR-836	NW 137th Ave.	I-95	SR-836 ORT Toll Conversion	MPO/LRTP	Priority I (2010-2014)

Source: BCC Engineering and Miami-Dade County

5.2.2. Cost Feasible

The SERPM 6.5 Cost Feasible alternative included the Existing plus Committed projects and is supplemented with Miami-Dade MPO LRTP projects from 2015 to 2035; only those projects occurring within the study area are presented. These projects are presented below in Table 5-5 and have been illustrated in Figure 5-8.

Table 5-5 - Cost Feasible & Unfunded Projects

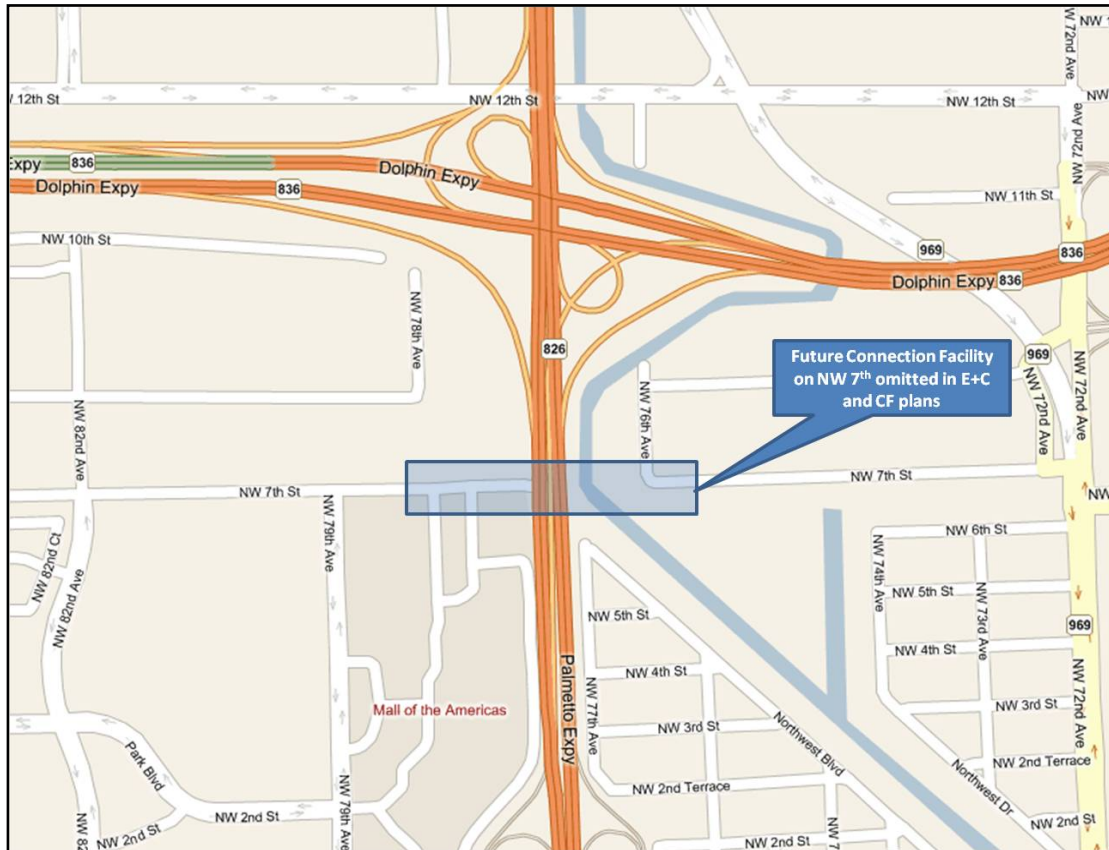
Facility/Corridor	From	To	Description	Organization	Priority
SW 107th Ave.	SW 8th St.	Flagler St.	Widen to 6 Lanes (4 to 6)	MD MPO	Priority IV (2026-2035)
SR-836		NW 87th Ave.	Interchange Modification	MD MPO	Priority IV (2026-2035)
NW 82nd Ave.	NW 8th St.	NW 12th St.	New 4 Lanes	MD MPO	Priority IV (2026-2035)
NW 87th Ave.	SR-836	NW 58th St.	Improve Intersections to Accommodate Truck Movements	MD MPO	Congestion Management Project
SW 8th St.	SR-826	I-95	Congestion Management	MD MPO	Congestion Management Project
Dolphin Corridor	MIC	Vicinity of FIU	Premium Transit Service	MD MPO	Unfunded
SW 82nd Ave.	Tamiami Canal		Bridge Construction	MD MPO	Unfunded
SW 102nd Ave.	Tamiami Canal		Bridge Construction	MD MPO	Unfunded
SR-836	HEFT	SR-826/836 Interchange	Conversion of General Purpose Lanes to Managed Lanes	MD MPO	Unfunded
SR-836/SR-112	SR-826	I-95/I-395	Conversion of General Purpose Lanes to Managed Lanes	MD MPO	Unfunded

Source: BCC Engineering and Miami-Dade County

5.2.3. Additional Projects Alternative

In addition to the Cost Feasible and Existing plus Committed projects, the Florida Department of Transportation as part of the current Section 5 construction project is providing an envelope under the SR-826/Palmetto Expressway mainline for the future at grade connection of NW 7th between east and west of the SR-826/Palmetto Expressway mainline. The study project area is presented in Figure 5-9.

Figure 5-9 - NW 7th Street Connection Project



5.2.4. Overview of Alternatives for Tier 1 Analysis

The Tier 1 Analysis includes then four (4) alternatives:

- ☐ **Existing Plus Committed (E+C):** The existing plus committed alternative, which consists of the existing roadway network with committed improvements or recently completed projects.
- ☐ **Existing Plus Committed (E+C) & NW 7th Street Bridge:** Similar to the existing plus committed alternative, but it also includes the NW 7th Street connection project.
- ☐ **Cost Feasible (CF):** The Cost Feasible alternative, which is comprised of all of the projects within the existing plus committed, plus additional projects that were deemed cost feasible through the Miami-Dade Metropolitan Planning Organization's (MPO) Long Range Transportation Plan (LRTP).
- ☐ **Cost Feasible (CF) & NW 7th Street Bridge:** Similar to the Cost Feasible alternative, but it also includes the NW 7th Street connection project.

Table 5-6 is presented as an overview of the four alternatives developed and tested.

Table 5-6 - List of Alternatives

Alternative	Composition
E+C	Priority I & TIP
E+C & NW 7th Bridge	E+C with NW 7 th St. Connection Project
CF	E+C and LRTP Projects
CF & NW 7th Bridge	CF with NW 7 th St. Connection Project

5.3. Transportation Alternatives Evaluation

The alternatives evaluation involved the execution of the travel demand models for the four alternatives selected in SERPM 6.5. For the “Base” alternative year 2005 was used for the analysis. For all other alternatives including E+C, E+C plus Bridge, CF, and CF plus Bridge, the analysis year is 2035. The selection of the analysis years was based on the intent of the Tier 1 analysis. Analysis of the Base network for year 2005 provides a benchmark. Analysis of year 2035 for all models offers consistency in evaluating the potential impacts and serve the purpose of comparing what, if any, improvement have the potential to reduce congestion in the vicinity of SW 87th Avenue and SW 8th Street.

The impact at the SW 8th Street and SW 87th Avenue intersection study area links results are presented in tabular form in Table 5-7 and in a graphic form in Figure 5-10. Results are also shown for the intersections in the study area in Figure 5-11.

The results of this analysis indicate that traffic volumes for all links are expected to increase or at a minimum remain the same (only for east of SW 87th Avenue) under the E+C alternative and the CF alternative. Even under the alternatives of the new NW 7th Street connection the traffic volumes are expected to increase or remain the same. The conclusion of this Tier 1 Analysis is that traffic volumes will continue to increase at the intersection of SW 87th Avenue and SW 8th Street and congested conditions are only expected to deteriorate in absence of improvements at this location. An additional item that was identified was the amount of growth that may occur within the study area; the study area is currently built out and has surrounding areas that did not appear to facilitate large growth patterns to the roadway, so a capping procedure was discussed and its implementation is discussed further in Section 6. For a summary of the output results from the model in a graphic format for the entire network, refer to Appendix J.

Table 5-7 - SW 8th Street and SW 87th Avenue Intersection

Roadway	Base 2005	E+C 2035	E+C Bridge 2035	CF 2035	CF Bridge 2035
SW 87th Ave. N of SW 8th St.	28,500	37,500	39,500	40,700	40,400
SW 8th St. W of SW 87th Ave.	33,100	47,700	48,400	49,800	49,900
SW 8th St. E of SW 87th Ave.	43,700	50,100	52,200	50,700	51,900
SW 87th Ave. S of SW 8th St.	44,600	49,200	50,500	49,700	49,900
Total	149,900	184,500	190,600	190,900	192,100
Percent Difference from E+C			3%	3%	4%
Percent Difference from Base		23%	27%	27%	28%

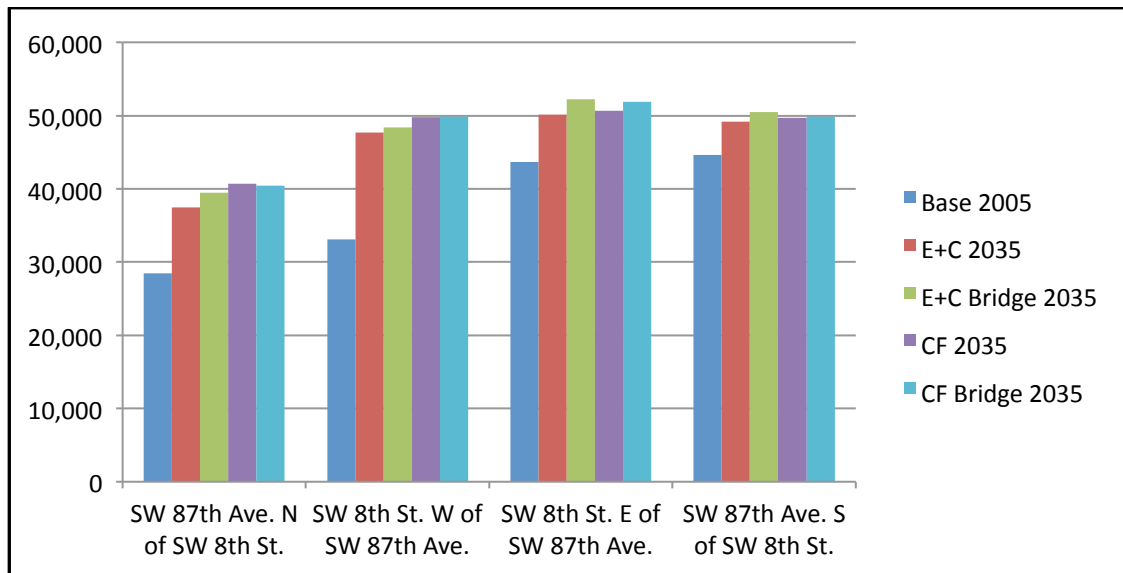
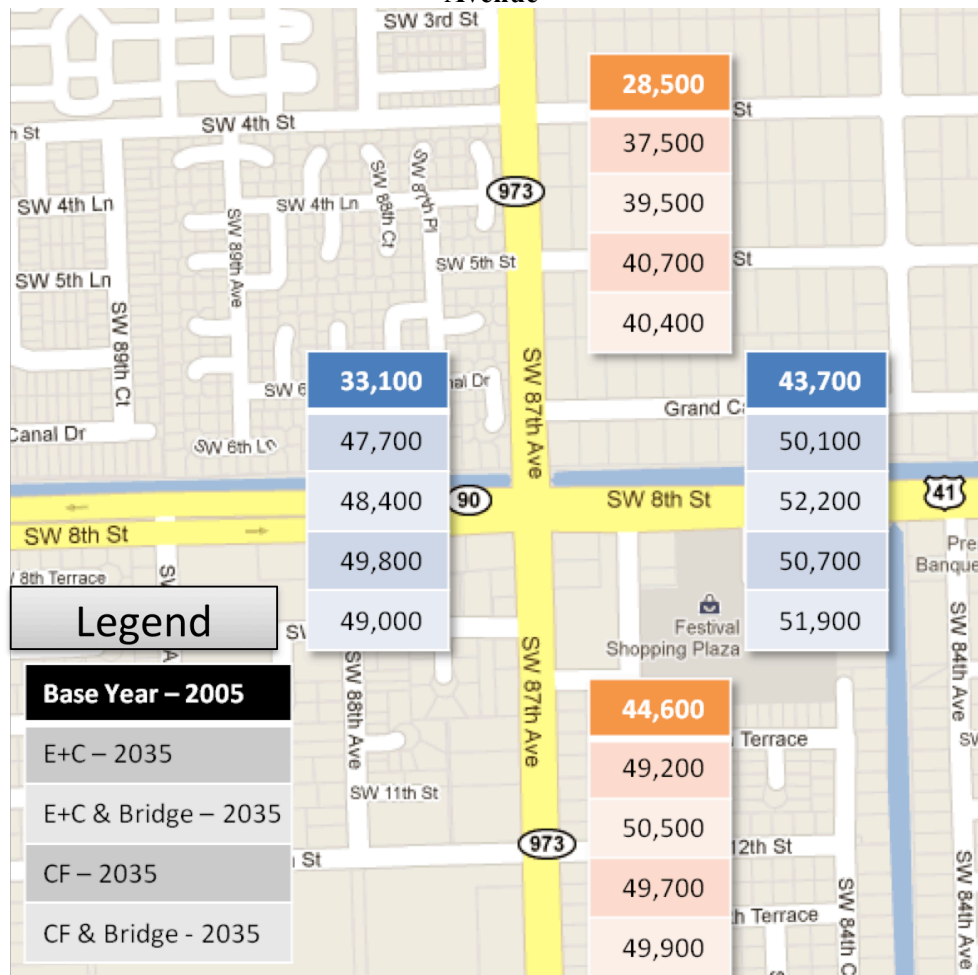
Figure 5-10 - Impact of NW 7th Street Connection Project at SW 8th Street and SW 87th Ave

Figure 5-11 Impact of NW 7th Street Connection Project at SW 8th Street and SW 87th Avenue



5.4. Model Selection

The four alternatives evaluated in Section 5.3 were analyzed to determine if any of the recently completed, under construction or planned projects in the area would have any impacts in the traffic patterns that would in turn reduce the existing congestion in the area. Model volumes were analyzed for each of the Tier I alternatives and can be seen in Figure Appendix J.

The SERPM 6.5 Time of Day based 24-hour Cost Feasible with the NW 7th Street Bridge model alternative was selected to carry forward into the Tier II analysis considering the ongoing project at FDOT/MDX Section 5 already accommodates the overpass at NW 7th Avenue and as such should be considered in the modeling efforts for the purpose of traffic forecasting. Thus, the full model run of the SERPM 6.5 Cost Feasible with NW 7th Street Bridge model volumes were utilized in the evaluation of alternatives in the Tier II analysis.

6. ALTERNATIVES

The object of this project is to address the failing operational conditions at the intersection of SW 87th Avenue and SW 8th Street. The most critical conditions are observed along SW 87th Avenue in particular along the southbound direction during the PM peak period. Even though queues are not as critical as those along SW 87th Avenue, SW 8th Street also experiences heavy delays during the PM peak in the westbound direction. The AM peak period, even though not as critical as the PM peak, also experiences delays in the northbound direction and in the eastbound direction. Left-turning movements are also experiencing significant delays in the eastbound direction during the AM peak and in the northbound direction during the PM peak. One left turn movement that is particularly heavy is the eastbound left turn movement with observed peak volumes of up to 815 vph in the AM peak.

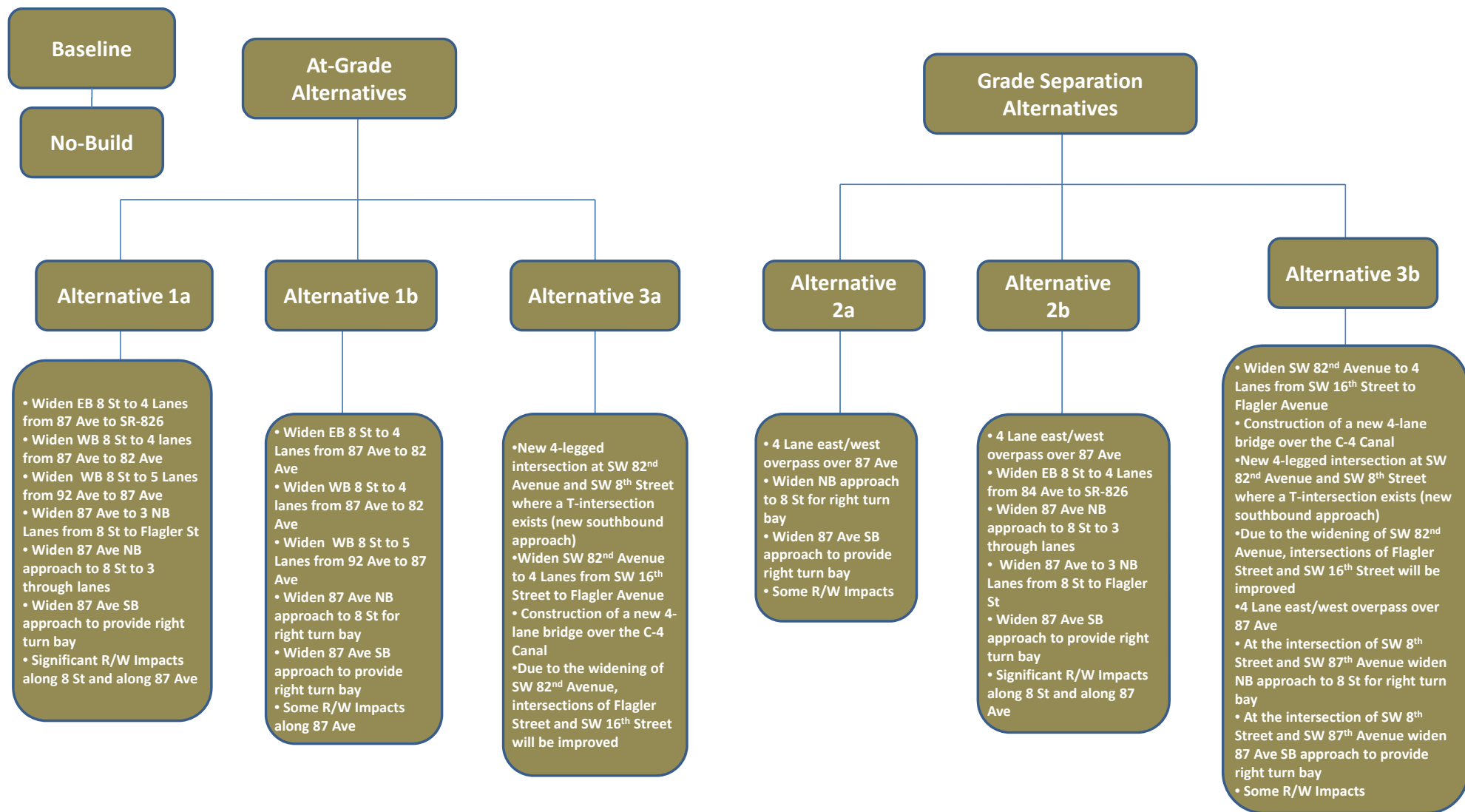
Utilizing the NCHRP 255 methodology, a two point projection was made from the Base Year 2005 to the Future Year 2035 to determine the amount of volume growth that could be expected. Initial reviews of the projected model growth in combination with the design traffic factors demonstrated volume growth at large levels (in excess of 60%), in contrast to a study area that is already built out and does not provide any evidence for volume model growth at these larger levels. The growth obtained was deemed not realistic then when considering other constraints in the roadway network that will not allow these traffic volumes to reach this location. It was decided to cap the growth rate at 1% for the movements as reasonable growth considering that projection are being made to year 2040 as coordinated with the Department.

The development of alternatives was based on the following considerations:

- Capacity along SW 87th Avenue has to be increased either by the addition of travel lanes or by the provision of additional green time to this movement.
- The existing left turn bays do not provide enough storage for the left turning traffic and because of the limited length of the bays; these are frequently blocked by the queue formed by the through traffic.
- To the extent possible, access is to be maintained to the existing business in the form of median openings. However, the introduction of an overpass alternative will inevitably limit the number of median openings near the intersection. It should be noted that the existing median openings do not meet the access management designation for this segment of the road along SW 8th Street.
- Right of way acquisitions will be minimized to the extent possible, but alternatives are not being discarded because of right-of-way impacts.

While beyond the scope of this report, ADA features within the project limits will have to be brought up to current standards upon implementation of the project.

The following sections include a description of the alternatives analyzed in this study, which are summarized in Figure 6-1.



6.1.No-Build Alternative

The No-Build alternative assumes that no improvements are made to the intersection of SW 87th Avenue and SW 8th Street or any other features of the network. This alternative is used as a benchmark for comparison to the build alternatives.

Refer to Sections 2 and 3 for a description of existing conditions and existing typical sections.

6.2.Alternative 1a – At Grade Improvement

This alternative consists of at grade improvements to the intersection and arterials to increase capacity. This alternative essentially maximizes the use of the existing right-of-way along SW 8th Street and requires partial and full acquisitions along SW 87th Avenue, and partial acquisition along SW 8th Street. Figure 6-2 depicts the typical sections for Alternative 1a and Figure 6-3 shows a representation of the proposed improvements. The following is a summary of the proposed improvements:

- ☐ Increase capacity of the arterial segment by widening SW 8th Street from three to four lanes in the westbound direction between SW 87th Avenue and east of SW 82nd Avenue.
- ☐ Increase intersection capacity by widening the westbound approach to SW 87th Avenue to five through lanes. The five lanes are carried through to SW 92nd Avenue where the fifth lane (outside) is dropped as a right turn lane.
- ☐ Eliminate the right turn lane at the eastbound approach to SW 87th Avenue and convert the lane into a shared through/right lane for a total of four through lanes at this approach.
- ☐ Increase capacity of the SW 87th Avenue and SW 8th Street intersection and the arterial segment in the eastbound direction by providing four through lanes between SW 87th Avenue and the ramp to southbound SR-836/Palmetto Expressway.
- ☐ Provide three through lanes at the northbound approach to SW 8th Street.
- ☐ Provide an additional lane in the northbound direction between SW 8th Street and Flagler Street.
- ☐ Provide a dual left turn for the SW 87th Avenue southbound approach to SW 8th Street.
- ☐ Extend the left turn bays at all approaches at the SW 87th Avenue and SW 8th Street intersection.
- ☐ Provide a right-turn bay at the SW 87th Avenue southbound approach to SW 8th Street.

The proposed typical sections consist of the following:

SW 8th Street West of SW 87th Avenue

- ☐ 1.5' Wall and Traffic Railing at top
- ☐ 2.5' Outside Shoulder
- ☐ Five 12' Lanes plus one 4' Bicycle Lane (WB)
- ☐ 30' Median (2' Curb and Gutter, 26' Sod, 2' Curb and Gutter)
- ☐ Four 12' lanes plus one 4' Bicycle Lane (EB)
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk
- ☐ At the eastbound approach to the SW 87th Avenue intersection two 12' left turn lanes are provided

SW 8th Street East of SW 87th Avenue

- ☐ 1.5' Wall and Traffic Railing at top
- ☐ 2.5' Outside Shoulder
- ☐ Four 12' Lanes plus one 4' Bicycle Lane (WB)
- ☐ 30' Median (2' Curb and Gutter, 26' Sod, 2' Curb and Gutter)
- ☐ Four 12' lanes plus one 4' Bicycle Lane (EB)
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk
- ☐ At the westbound approach to the SW 87th Avenue intersection two 12' left turn lanes are provided
- ☐ At the westbound approach to the SW 87th Avenue intersection one additional 12' through lane is provided

SW 87th Avenue North of SW 8th Street

- ☐ 6' Concrete Sidewalk
- ☐ 2' Curb and Gutter
- ☐ Two 11' lanes

- ☐ 16' Median (2' Curb and Gutter, 12' Sod, 2' Curb and Gutter)
- ☐ Three 11' lanes
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk
- ☐ At the southbound approach to the SW 8th Street intersection two 11' left turn lanes are provided
- ☐ At the southbound approach to the SW 8th Street intersection one 11' right turn lane is provided

SW 87th Avenue South of SW 8th Street

The only modification to this section is the conversion of the right-turn lane to a shared through/right lane, which will also require modifications to the proposed shared through/right lane to bring up to current standards (increase length). The proposed typical section at the approach is as follows:

- ☐ 6' Concrete Sidewalk
- ☐ 2' Curb and Gutter
- ☐ Two 11' lanes
- ☐ One 11' left-turn lane
- ☐ Three 11' lanes
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk

Potential Impacts:

- ☐ The existing right-of-way along SW 8th Street allows the addition of the fourth lane in the eastbound direction between SW 87th Avenue and SW 82nd Avenue without right-of-way impacts. This is because there is a buffer area between the existing back of sidewalk on the south side of the road and the existing right-of-way line.
- ☐ The existing right-of-way along SW 8th Street is approximately 150'. In order to provide the four lanes in the westbound direction between SW 82nd Avenue and SW 87th Avenue, and the five lanes between SW 87th Avenue and SW 92nd Avenue, the provision of walls will be required to avoid encroachment into the canal just like the existing ones provided at the existing bus bays on the north side of SW 8th Street.

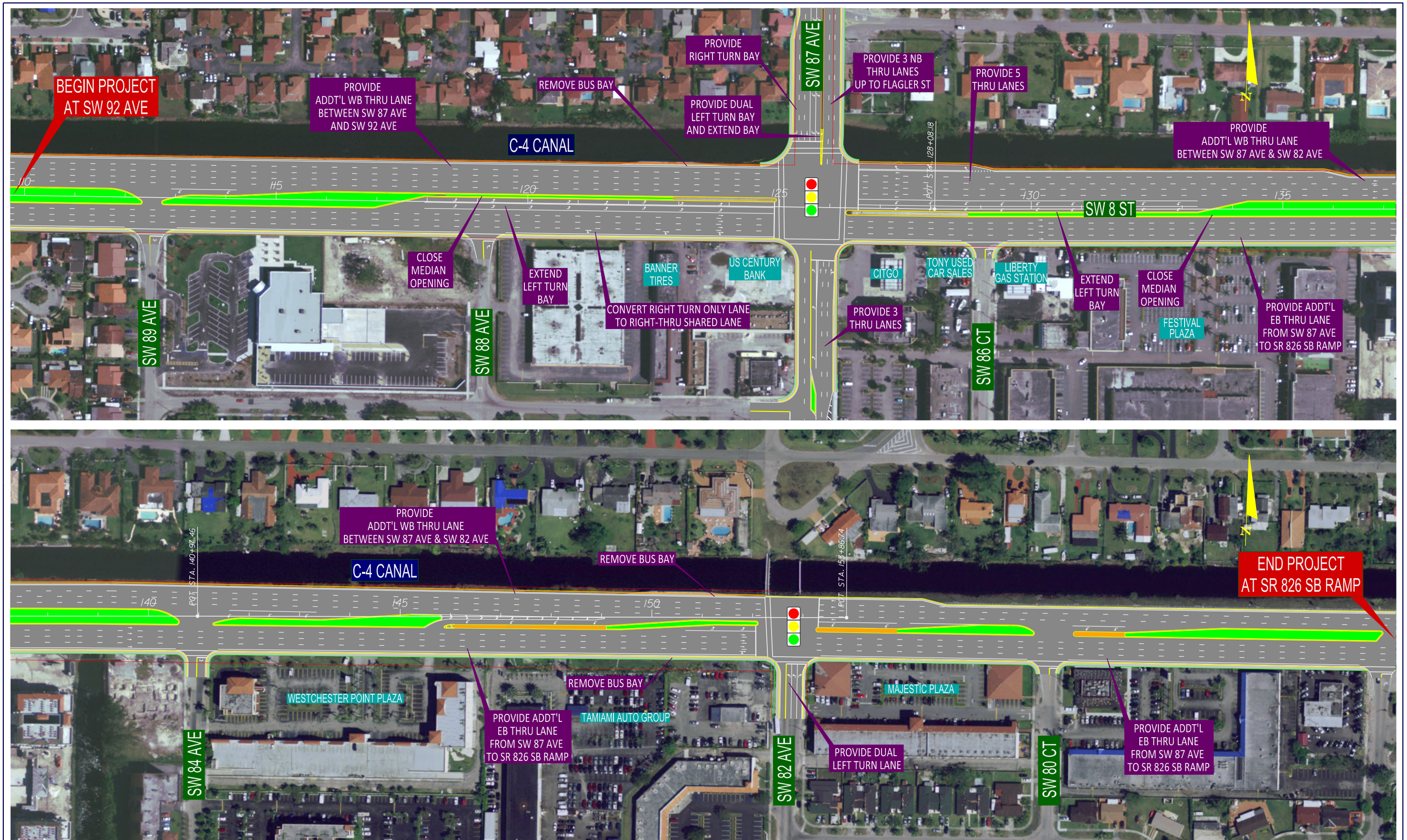
- The existing bus bays on the north side of SW 8th Street would be impacted and likely will not be possible to provide. Removal of the existing bus bays will result in short-term blockage of the outside lane by scheduled bus stops. However, this condition is considered more beneficial than the alternative of not providing the additional through lane since the capacity is only impacted in a temporary basis. Only two bus bays are impacted, one just west of SW 87th Avenue and one just west of SW 82nd Avenue.
- Right-of-way acquisition along SW 87th Avenue for the addition of one through lane in the northbound direction between SW 8th Street and Flagler Street. This includes partial acquisition of 10 single family zoned parcels (6 of them vacant lots at the time of preparation of this report) and partial acquisition at two commercial properties fully developed.
- Requires full right-of-way acquisition of three single family zoned parcels (already developed) on the west side of SW 87th Avenue for the provision of the right-turn lane at the southbound approach.
- Requires partial right-of-way acquisition along SW 87th Avenue from the property located at the southeast corner of the intersection with SW 8th Street (gas station). The acquisition consists of a sliver less than 10' wide for less than the entire length of the property. The acquisition should not impact parking or circulation on this parcel.
- Requires partial right-of-way acquisition between SW 82nd Avenue and the entrance ramp to SR-826/Palmetto Expressway in order to accommodate the additional fourth lane in the eastbound direction. There are a total of five parcels to be impacted consisting of commercial land uses. Potential impacts to these properties include building clips (one-story building facades) and parking.
- The extension of the left turn bays along SW 8th Street will require modification to the current access management in the form of elimination of the median openings just east and west of SW 87th Avenue. The median openings currently consist of full openings not in compliance with the current access management designation for this facility.

Refer to Figure 6-2 for typical sections and to Figure 6-3 for an alternative layout.



ALTERNATIVE 1A - TYPICAL SECTION

FIGURE 6-2



ALTERNATIVE 1A - LAYOUT

FIGURE 6-3

6.3. Alternative 1b – At Grade Improvements (Partial)

This alternative was developed as a right-of-way acquisition minimization alternative and the typical section is depicted in Figure 6-4. The main difference from Alternative 1a can be seen in Figure 6-5 and is described above is as follows:

- There are no proposed right-of-way acquisitions between SW 8th Street and Flagler Street for the addition of a third lane in the northbound direction. Therefore the dual left turn lanes at the southbound approach cannot be provided either. In other words, SW 87th Avenue north of SW 8th Street remains the same as under existing conditions in terms of lane assignment. The extension of the single left turn lane is still implemented as well as the provision of a right-turn bay for the southbound approach.
- The right-of-way impacts on the west side of SW 87th Avenue to accommodate the southbound right-turn lane remain under this alternative
- The northbound approach to SW 8th Street will still require a partial right-of-way acquisitions from the parcel at the SE corner of the intersection. However, instead of providing three through lanes, only two through lanes will be provided with the third lane being used as a right-turn lane.
- The fourth lane in the eastbound direction will be extended to SW 82nd Avenue only and not all the way to SR-826/Palmetto Expressway as under Alternative 1a. This eliminates the right-of-way acquisition east of SW 82nd Avenue while still providing the benefits of a fourth through lane at the SW 87th Avenue eastbound approach.

The typical sections consist of the following:

SW 8th Street West of SW 87th Avenue

- 1.5' Wall and Traffic Railing at top
- 2.5' Outside Shoulder
- Five 12' Lanes plus one 4' Bicycle Lane (WB)
- 30' Median (2' Curb and Gutter, 26' Sod, 2' Curb and Gutter)
- Four 12' lanes plus one 4' Bicycle Lane (EB)
- 2' Curb and Gutter
- 6' Concrete Sidewalk
- At eastbound approach to the intersection of SW 87th Avenue two 12' left turn lanes are provided

SW 8th Street between SW 87th Avenue and SW 82nd Avenue

- ☐ 1.5' Wall and Traffic Railing at top
- ☐ 2.5' Outside Shoulder
- ☐ Four 12' Lanes plus one 4' Bicycle Lane (WB)
 - ☐ 30' Median (2' Curb and Gutter, 26' Sod, 2' Curb and Gutter)
- ☐ Four 12' lanes plus one 4' Bicycle Lane (EB)
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk
- ☐ At approach to intersection two 12' left turn lanes are provided
- ☐ At the westbound approach to the SW 87th Avenue intersection an additional 12' through lane is provided

SW 87th Avenue North of SW 8th Street

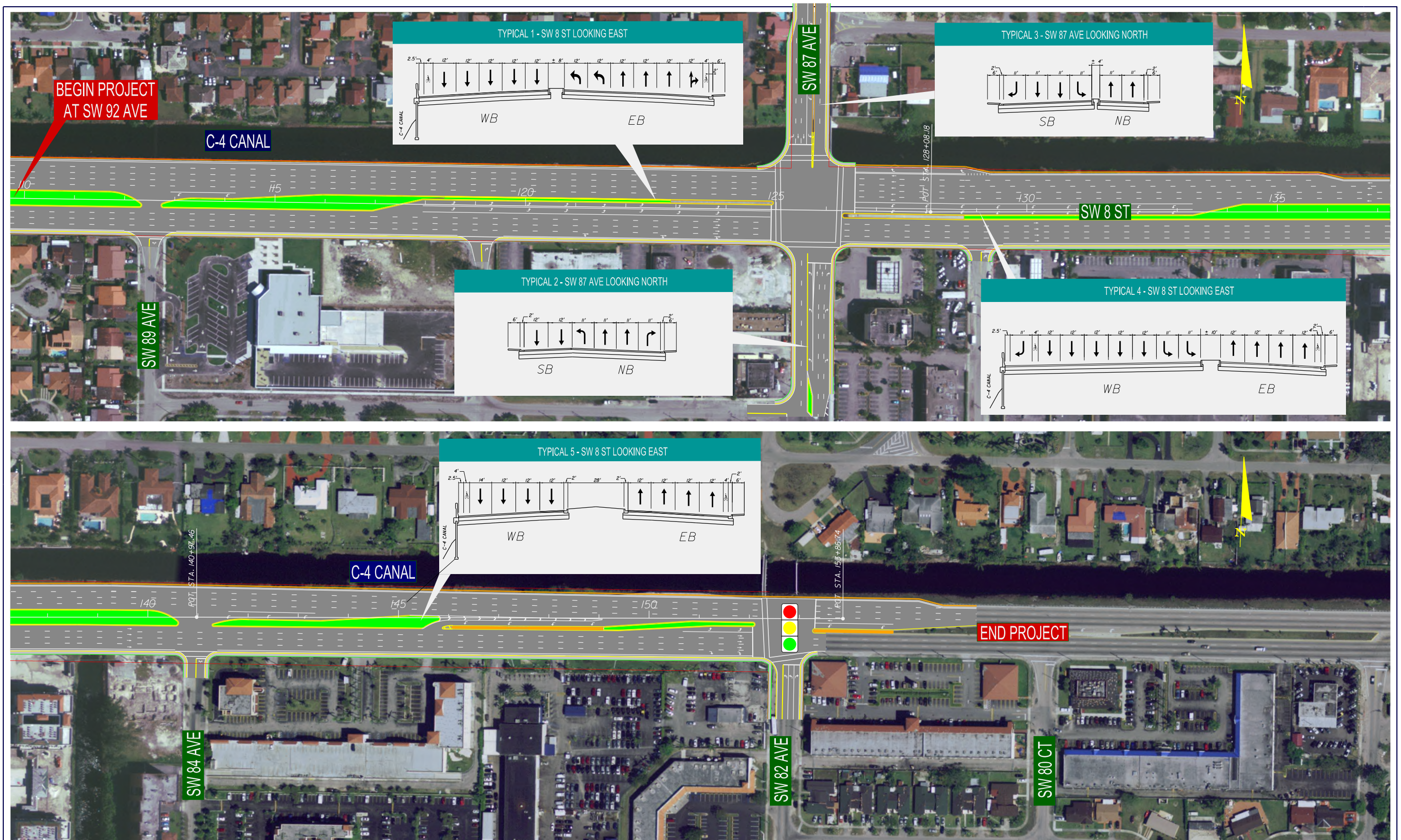
- ☐ 6' Concrete Sidewalk
- ☐ 2' Curb and Gutter
- ☐ Two 11' lanes (SB)
- ☐ 16' Median (2' Curb and Gutter, 12' Sod, 2' Curb and Gutter)
- ☐ Two 11' lanes (NB)
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk
- ☐ At southbound approach to the SW 8th Street intersection one 10' left turn lane is provided
- ☐ At southbound approach to the SW 8th Street intersection one 11' right turn lane is provided

SW 87th Avenue South of SW 8th Street

The only modification to this section is at the northbound approach to the intersection to formalize the existing right turn lane and bring it up to standards to fully provide the benefit of an auxiliary lane (including a standard turn lane with proper width, deceleration and storage length). The existing right turn lane is sub-standard and is only fully developed into a turning lane near the intersection. The proposed typical section at the approach is as follows:

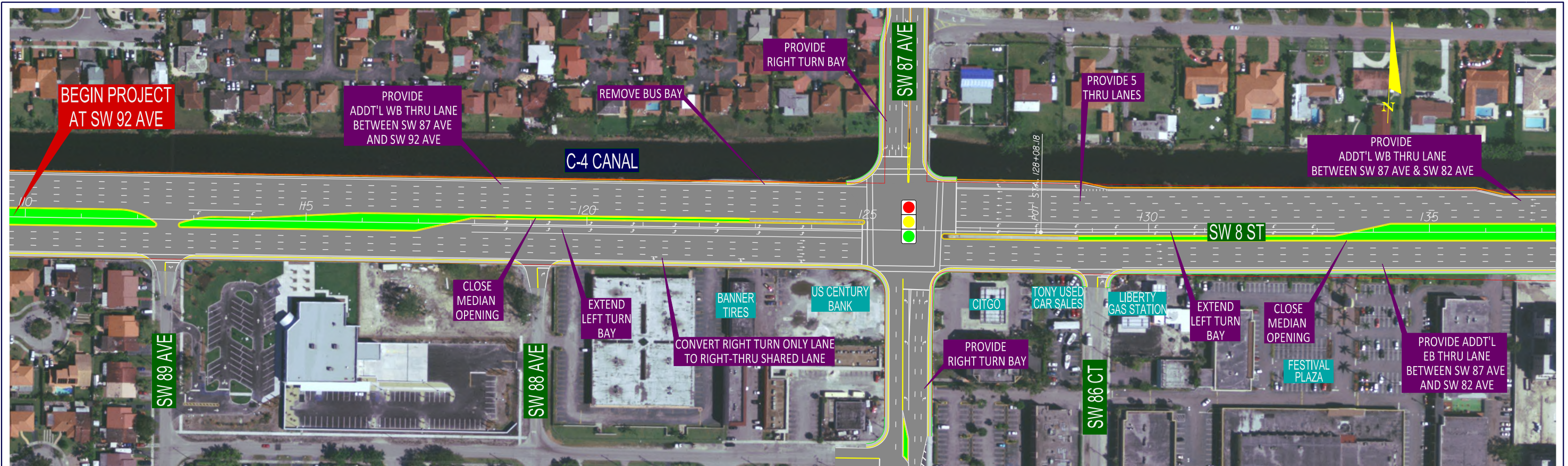
- ☐ 6' Concrete Sidewalk
- ☐ 2' Curb and Gutter
- ☐ Two 11' lanes (SB)
- ☐ One 11' left-turn lane (NB)
- ☐ Two 11' lanes (NB)
- ☐ One 11' right-turn lane (NB)
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk

Refer to Figure 6-4 for typical sections and to Figure 6-5 for an alternative layout.



ALTERNATIVE 1B - TYPICAL SECTION

FIGURE 6-4



ALTERNATIVE 1B - LAYOUT

FIGURE 6-5

6.4. Alternative 2a – Overpass over NW 87th Avenue

This alternative consists of the provision of an overpass bridge spanning over SW 87th Avenue to service the east/west through movements along SW 8th Street. All other movements stay at grade including SW 8th Street left-turn and right-turn movements as well as all SW 87th Avenue movements. The proposed configuration also maintains at grade through lanes to provide access to local businesses in proximity to the SW 8th Street/SW 87th Avenue intersection. Refer to Figure 6-6 for typical sections and to Figure 6-7 for a depiction of the proposed improvements. In developing this alternative the approach was minimization of right-of-way acquisitions. The following is a summary of the proposed improvements:

- ☐ Provide a four-lane overpass (two lane in each direction) serving the SW 8th Street east/west through movement.
- ☐ Maintain a minimum of two lanes at grade on the approach to SW 87th Avenue in each direction. These lanes service turning vehicles at intersection a local traffic (driveways on the south side of SW 8th Street that cannot be accessed from the overpass).
- ☐ Provide dual left-turn lanes at the eastbound and westbound approaches to SW 8th Street.
- ☐ Provide “Texas U-Turn” lanes under the overpass bridge for SW 8th Street traffic. This will provide for u-turn movements to take place without conflicts with traffic at the intersection.
- ☐ Provide longer right-turn bay at the SW 87th Avenue northbound approach to SW 8th Street.
- ☐ Provide four lanes east of the overpass along SW 8th Street up to SW 82nd Avenue. At this location the fourth lane (outside) is dropped as a “right-turn only” lane.
- ☐ Provide a right-turn lane at the SW 87th Avenue southbound approach to SW 8th Street.

The typical section at the embankment section of the overpass will consist of the following:

West of SW 87th Avenue

- ☐ 1.5' Wall and Traffic Railing at top
- ☐ 2.5' Outside Shoulder
- ☐ 15' travel lane and a 4' Bicycle Lane (accommodates bicycle lane and meets minimum width for allocating passing of a stalled vehicle)
- ☐ 2' Curb and Gutter

- ☐ 4.5' sod/buffer
- ☐ 1.5' MSE Wall and Traffic Railing at top
- ☐ 2.5' Outside Shoulder
- ☐ Two 12' lanes (WB)
- ☐ 18' Median (2' Curb and Gutter, 14' Sod/Concrete and 2' Curb and Gutter)
- ☐ Two 12' lanes (EB)
- ☐ 2.5' Outside Shoulder
- ☐ 1.5' MSE Wall and Traffic Railing at top
- ☐ 4.5' sod/buffer
- ☐ 2' Curb and Gutter
- ☐ Two 11' travel lanes and one 4' bicycle lane
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk

East of SW 87th Avenue

- ☐ 1.5' Wall and Traffic Railing at top
- ☐ 2.5' Outside Shoulder
- ☐ 11' Inside Travel Lanes
- ☐ 2' Curb and Gutter
- ☐ 4.5' sod/buffer
- ☐ 1.5' MSE Wall and Traffic Railing at top
- ☐ 2.5' Outside Shoulder
- ☐ Two 12' lanes (WB)
- ☐ 18' Median (2' Curb and Gutter, 14' Sod/Concrete and 2' Curb and Gutter)
- ☐ Two 12' lanes (EB)
- ☐ 2.5' Outside Shoulder

- ☐ 1.5' MSE Wall and Traffic Railing at top
- ☐ 4.5' sod/buffer
- ☐ 2' Curb and Gutter
- ☐ One 4' bicycle lane and two 11' inside travel lane
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk

The at-grade typical section at the approaches to SW 87th Avenue will consist of the following:

West of SW 87th Avenue

- ☐ 1.5' Wall and Traffic Railing at top
- ☐ 6' Concrete Sidewalk (up to bus bay only)
- ☐ 2' Curb and Gutter (2.5' shoulder when no sidewalk provided)
- ☐ One 4' bicycle lane and one 15' travel lane (accommodates bicycle lane and meets minimum width for allocating passing of a stalled vehicle) (WB)
- ☐ 60' Raised Median (2' Curb and Gutter, 56' sod/buffer and 2' Curb and Gutter)
- ☐ Two 12' Left-Turn Lanes
- ☐ Two 11' Inside travel lane and one 4' bicycle lane (EB)
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk

East of SW 87th Avenue

- ☐ 1.5' Wall and Traffic Railing at top
- ☐ 2.5' Outside Shoulder
- ☐ One 4' bicycle lane and two 11' inside travel lane (WB)
- ☐ Two 12' Left-Turn Lanes
- ☐ 60' Raised Median (2' Curb and Gutter, 56' sod/buffer and 2' Curb and Gutter)

- ☐ 11' Inside travel lane (EB)
- ☐ One 4' bicycle lane and two 11' inside travel lane (EB)
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk

The typical sections along SW 87th Avenue consist of the following:

SW 87th Avenue North of SW 8th Street

- ☐ 6' Concrete Sidewalk
- ☐ 2' Curb and Gutter
- ☐ Two 11' lanes (SB)
- ☐ 16' Median (2' Curb and Gutter, 12' Sod, 2' Curb and Gutter)
- ☐ Two 11' lanes (NB)
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk
- ☐ At southbound approach to the SW 8th Street intersection one 10' left turn lane is provided
- ☐ At southbound approach to the SW 8th Street intersection one 11' right-turn lane is provided

SW 87th Avenue South of SW 8th Street

The only modification to this section is at the northbound approach to the intersection to formalize the existing right turn lane and bring it up to standards to fully provide the benefit of an auxiliary lane (deceleration and storage length). The existing right turn lane is sub-standard and is only fully developed into a turning lane near the intersection. The proposed typical section at the approach is as follows:

- ☐ 6' Concrete Sidewalk
- ☐ 2' Curb and Gutter
- ☐ Two 11' lanes (SB)
- ☐ One 11' left-turn lane (NB)
- ☐ Two 11' lanes (NB)

- One 11' right-turn lane (NB)
- 2' Curb and Gutter
- 6' Concrete Sidewalk

Refer to Figure 6-7 for a layout of the alternative and to Figure 6-8 for the plan and profile of Alternative 2a.

Potential Impacts:

- The existing right-of-way along SW 8th Street allows the addition of the overpass and at-grade lanes without right-of-way acquisitions. This is because there is a buffer area between the existing back of sidewalk on the south side of the road and the existing right-of-way line. On the north side there is also a buffer area between the existing roadway features and the canal right-of-way.
- The existing right-of-way along SW 8th Street is approximately 150 feet wide. In order to provide the overpass and maintain at least two lanes at-grade in both approaches on SW 8th Street, walls are required to avoid encroachment into the canal, similar to the existing ones located at the existing bus bays on the north side of SW 8th Street.
- Requires partial right-of-way acquisition along SW 87th Avenue from the property located at the southeast corner of the intersection with SW 8th Street (gas station). The acquisition consists of a sliver less than 10 feet wide for less than the entire length of the property. The acquisition should not impact parking or circulation on this parcel.
- The biggest impact of the overpass are the impacts to access management as follows:
 - The overpass will require the elimination of two median openings west of SW 87th Avenue. These median openings currently service SW 88th Avenue and SW 89th Avenue. Mitigation for the closure of these two median openings is provided in the form of a “Texas U-turn” lane. Vehicles currently making left turn movements from SW 88th Avenue and SW 89th Avenue onto SW 8th Street (westbound) will in the future make a right-turn into eastbound SW 8th Street and then can use the “Texas U-turn” lane to head west on SW 8th Street. Westbound SW 8th Street traffic currently making left turns onto these two roads would have to use alternate route through SW 87th Avenue or make a U-turn at the following median opening.
 - The overpass will require the elimination of one median opening east of SW 87th Avenue. Mitigation for the closure of this median opening is provided in the form of a “Texas U-turn” lane. Westbound vehicles currently making a left-turn movement into the driveway will have to use the “Texas U-turn” lane. Traffic from the driveway making a left-turn movement onto westbound SW 8th Street will have to take SW 8th Street eastbound and make a U-turn at SW 82nd Avenue.



ALTERNATIVE 2A - TYPICAL SECTION

FIGURE 6-6

6.5. *Alternative 2b – Overpass over NW 87th Avenue with Triple Left Turn*

The key differences between this alternative and Alternative 2a are the following:

- ☐ A triple left-turn is provided for the eastbound approach to SW 87th Avenue.
- ☐ Provision of three through lanes in the northbound direction of SW 87th Avenue north of SW 8th Street. This is required for the triple left turn from SW 8th Street. The three lanes are continued all the way to Flagler Street.
- ☐ Provide an additional eastbound lane between SW 82nd Avenue and the entrance ramp to SR-826/Palmetto Expressway.

The typical sections along SW 8th Street remain the same as under Alternative 2a except for the eastbound approach to SW 87th Avenue at-grade where the additional left turn lane is provided (for a triple left-turn configuration), and an additional eastbound lane east of SW 82nd Avenue is provided. The typical section along SW 87th Avenue is modified north of SW 8th Street and remains the same south of SW 8th Street when compared to Alternative 2a. Figure 6-9 depicts the typical sections for Alternative 2b and Figure 6-10 presents the proposed improvements. The following is a description of the typical sections that are different from those provided under Alternative 2a:

West of SW 87th Avenue (Under overpass bridge)

- ☐ 1.5' Wall and Traffic Railing at top
- ☐ 6' Concrete Sidewalk (up to bus bay only)
- ☐ 2' Curb and Gutter (2.5' shoulder when no sidewalk provided)
- ☐ One bicycle lane plus one 15' travel lane (accommodates bicycle lane and meets minimum width for allocating passing of a stalled vehicle) (WB)
- ☐ 60' Raised Median (2' Curb and Gutter, 56' sod/buffer and 2' Curb and Gutter)
- ☐ Three 12' Left-Turn Lanes
- ☐ Two 11' travel lanes plus one 4' bicycle lane (EB)
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk

SW 8th Street East of SW 82nd Avenue

- ☐ 2' Curb and Gutter

- ☐ Three 12' Lanes plus one 4' Bicycle Lane (WB)
- ☐ 22' Median (2' Curb and Gutter, 18' Sod, 2' Curb and Gutter)
- ☐ Four 12' lanes plus one 4' Bicycle Lane (EB)
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk

SW 87th Avenue North of SW 8th Street

- ☐ 6' Concrete Sidewalk
- ☐ 2' Curb and Gutter
- ☐ Two 11' lanes (SB)
- ☐ 16' Median (2' Curb and Gutter, 12' Sod, 2' Curb and Gutter)
- ☐ Three 11' lanes (NB)
- ☐ 2' Curb and Gutter
- ☐ 6' Concrete Sidewalk
- ☐ At approach to the SW 8th Street intersection one 10' left turn lane is provided
- ☐ At approach to the SW 8th Street intersection one 11' right-turn lane is provided

Potential Impacts:

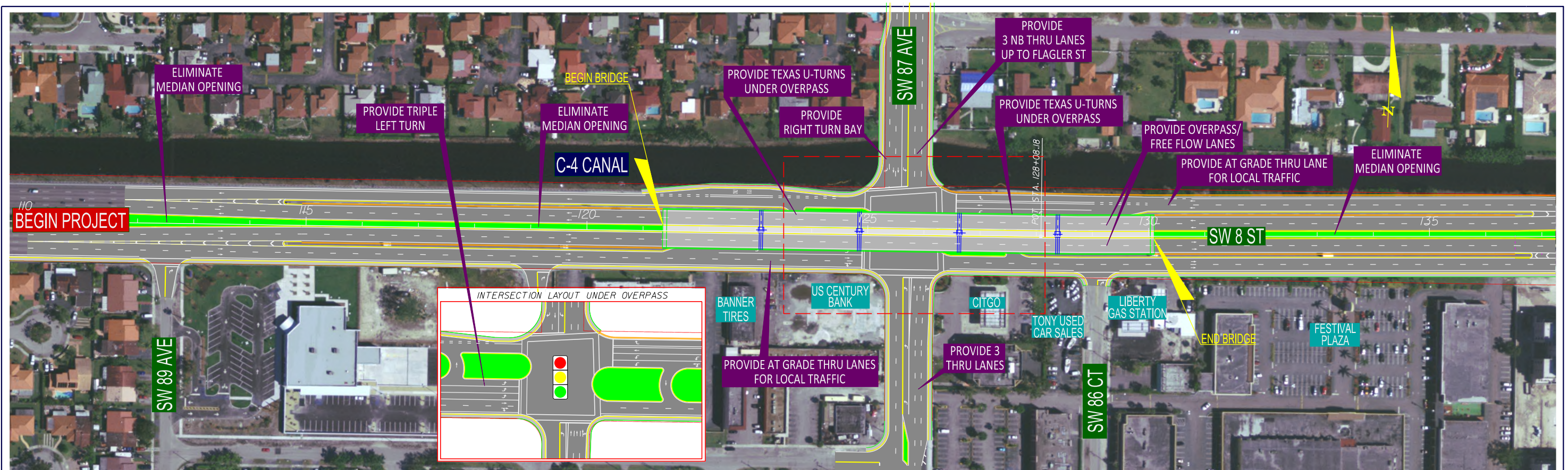
In addition to impacts identified for Alternative 2a, the following are the impacts of this alternative:

- ☐ Right-of-way acquisition along SW 87th Avenue for the addition of one through lane in the northbound direction between SW 8th Street and Flagler Street. This includes partial acquisition of 10 single family zoned parcels (6 of them vacant lots at the time of preparation of this report) and partial acquisition at two commercial properties fully developed.
- ☐ Partial right-of-way acquisition for the additional eastbound lane between SW 82nd Avenue and the entrance ramp to SR-826/Palmetto Expressway. A total of 5 commercial zoned parcels are impacted including potential impacts to buildings and parking.



ALTERNATIVE 2B - TYPICAL SECTION

FIGURE 6-9



ALTERNATIVE 2B - LAYOUT

FIGURE 6-10

6.6. Additional Alternatives – 3a and 3b

The Alternatives previously discussed, 1a, 1b, 2a and 2b include at-grade and grade separation improvements at the intersection of SW 87th Avenue and SW 8th Street. Upon review of the draft report by the Miami-Dade Metropolitan Planning Organization, a request was received to analyze an alternative network configuration consisting of the addition of a bridge over the C-4 Canal to provide a direct connection between SW 82nd Avenue and SW 8th Street to the north, in essence converting the intersection from a three-leg intersection to a four-leg intersection and providing additional connectivity to the area. The purpose is to assess the benefits that such connection would bring to the intersection of SW 87th Avenue and SW 8th Street as a result of traffic diversion which may result in improved Level of Service.

Alternative 3A - SW 82nd Avenue Widening and Bridge over C-4 Canal

This alternative consists of the widening of SW 82nd Avenue between SW 16th Street and Flagler Street from a 2-lane facility to a 4-lane facility, and the construction of a new bridge over the C-4 Canal, at SW 8th Street and SW 82nd Avenue. This alternative does not include any improvements at the intersection of SW 8th Street and SW 87th Avenue, nor does it include any improvements along SW 8th Street other than those in the immediate vicinity of the SW 82nd Avenue intersection. This alternative should maintain the dedicated bicycle lanes programmed to be implemented by project number 425145-1. Figure 6-11 includes the conceptual layout of this alternative. The following is a summary of the proposed improvements:

- ☐ Widening of SW 82nd Avenue between Flagler Street and SW 16th Street from a 2-lane facility to a 4-lane facility.
- ☐ Construction of a new 4-lane bridge over the C-4 Canal. This new bridge will provide a 4-legged intersection (new southbound approach) at the intersection of SW 82nd Avenue and SW 8th Street where a 3-legged intersection currently exists.
- ☐ Reconfiguration of the intersection of SW 82nd Avenue and SW 8th Street to accommodate the new southbound approach and additional traffic.
- ☐ Due to the widening of SW 82nd Avenue, the intersections with Flagler Street and SW 16th Street will also provide for geometric, operational and signalization improvements.
- ☐ The available right of way along SW 82nd Avenue is 70' and would accommodate 6' sidewalks on both sides of the road, curb and gutter, four 11' through lanes, a two-way left turn lane 10' throughout the length of the project.
- ☐ Maintain dedicated bike lanes provided by RRR project 425145-1 along SW 8th St.

Potential Impacts: The only potential impacts associated with this alternative in terms of right-of-way are to one (1) residential property on the north side of the C-4 Canal. No direct impacts to the structure of the residence are expected. Other potential impacts include increased noise levels as a result as an increase in traffic along residential streets.



ALTERNATIVE 3A - LAYOUT

FIGURE 6-11

Alternative 3B - SW 82nd Avenue Widening and Bridge over C-4 Canal plus Overpass at SW 87th Avenue

This alternative consists of the widening of SW 82nd Avenue between SW 16th Street and Flagler Street from a 2-lane facility to a 4-lane facility, and the construction of a new bridge over the C-4 Canal, at SW 8th Street and SW 82nd Avenue, essentially the same improvements as alternative 3A at SW 82nd Avenue. In addition, this alternative includes the improvements part of Alternative 2a (refer to Section 6-4) which include the provision of an overpass bridge spanning over SW 87th Avenue to service the east/west through movements along SW 8th Street. All other movements at the intersection of SW 87th Avenue and SW 8th Street remain at grade including SW 8th Street left-turn and right-turn movements as well as all SW 87th Avenue movements. The proposed configuration also maintains at grade through lanes to provide access to local businesses in proximity to the SW 8th Street and SW 87th Avenue intersection. Section 6-4 includes the proposed typical section at the intersection of SW 87th Avenue and SW 8th Street. In developing this alternative the approach was minimization of right-of-way acquisition at SW 87th Avenue and SW 8th Street. The following is a summary of the proposed improvements:

- ☐ Widening of SW 82nd Avenue between Flagler Street and SW 16th Street from a 2-lane facility to a 4-lane facility.
- ☐ Construction of a new 4-lane bridge over the C-4 Canal. This new bridge will provide a 4-legged intersection (new southbound approach) at the intersection of SW 82nd Avenue and SW 8th Street where a 3-legged intersection currently exists.
- ☐ Reconfiguration of the intersection of SW 82nd Avenue and SW 8th Street to accommodate the new southbound approach and additional traffic.
- ☐ Due to the widening of SW 82nd Avenue, the intersections with Flagler Street and SW 16th Street will also provide for geometric, operational and signalization improvements.
- ☐ The available right of way along SW 82nd Avenue is 70' and would accommodate 6' sidewalks on both sides of the road, curb and gutter, four 11' through lanes, a two-way left turn lane 10' throughout the length of the project.
- ☐ Provide a four-lane overpass at the intersection of SW 87th Avenue and SW 8th Street (two lanes in each direction) serving the SW 8th Street east/west through movements.
- ☐ At the intersection of SW 87th Avenue and SW 8th Street, maintain a minimum of two lanes at grade on the approach to SW 87th Avenue in each direction. These lanes service turning vehicles at intersection a local traffic (driveways on the south side of SW 8th Street that cannot be accessed from the overpass).
- ☐ At the intersection of SW 87th Avenue and SW 8th Street, provide dual left-turn lanes at the eastbound and westbound approaches to SW 8th Street.

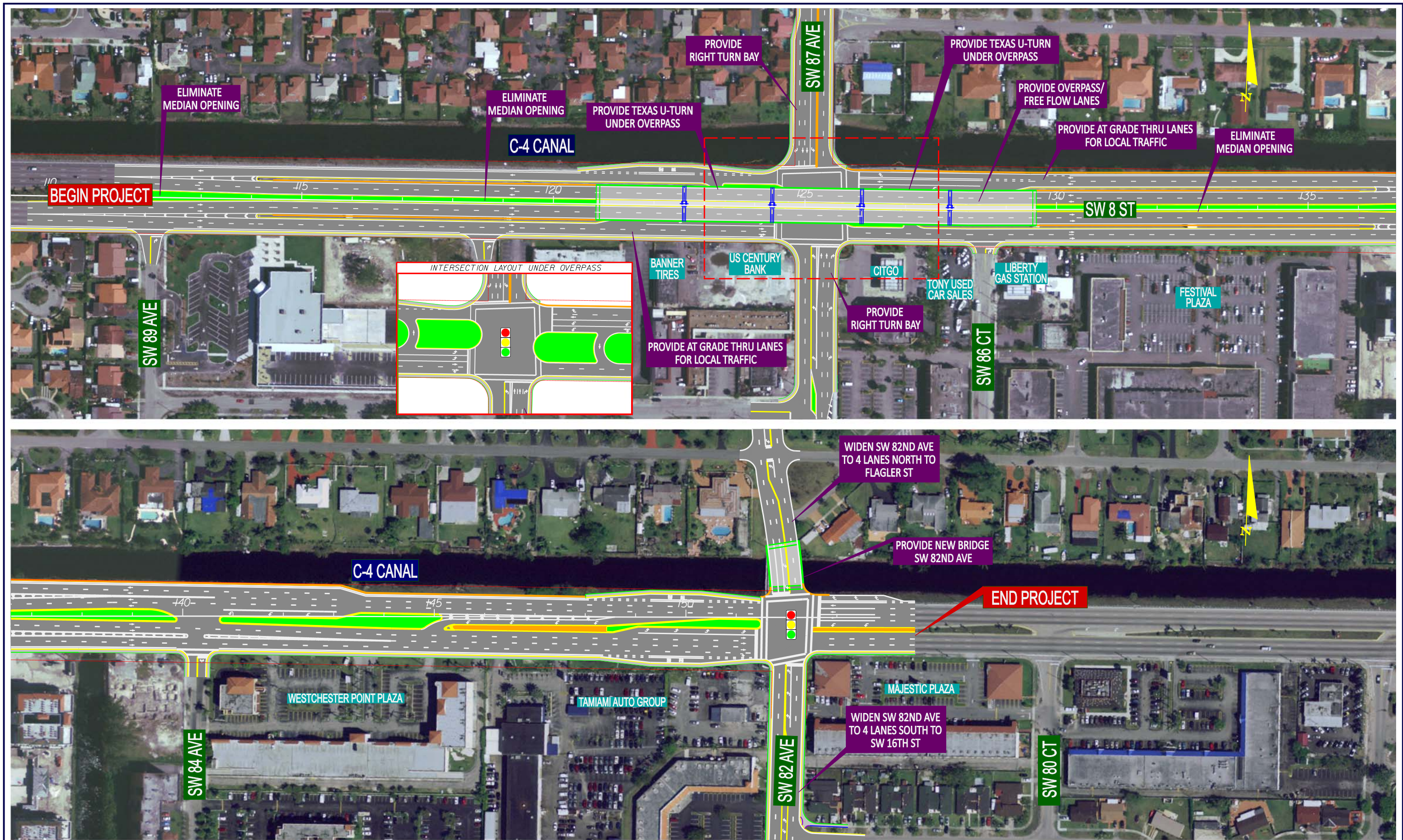
- At the intersection of SW 87th Avenue and SW 8th Street, provide “Texas U-Turn” lanes under the overpass bridge for SW 8th Street traffic. This will provide for u-turn movements to take place without conflicts with traffic at the intersection.
- At the intersection of SW 87th Avenue and SW 8th Street, provide longer right-turn bay at the SW 87th Avenue northbound approach to SW 8th Street.
- At the intersection of SW 87th Avenue and SW 8th Street, provide four lanes east of the overpass along SW 8th Street up to SW 82nd Avenue. At this location the fourth lane (outside) is dropped as a “right-turn only” lane.
- Provide a right-turn lane at the SW 87th Avenue southbound approach to SW 8th Street.
- Maintain dedicated bike lanes provided by RRR project 425145-1 along SW 8th Street.

Potential Impacts:

- The existing right-of-way along SW 8th Street allows the addition of the overpass and at-grade lanes without right-of-way impacts. This is because there is a buffer area between the existing back of sidewalk on the south side of the road and the existing right-of-way line. On the north side there is also a buffer area between the existing roadway features and the canal right-of-way.
- The existing right-of-way along SW 8th Street is approximately 150 feet wide. In order to provide the overpass and maintain at least two lanes at-grade in both approaches on SW 8th Street, walls are required to avoid encroachment into the canal, similar to the existing ones located at the existing bus bays on the north side of SW 8th Street.
- Requires partial right-of-way acquisition along SW 87th Avenue from the property located at the southeast corner of the intersection with SW 8th Street (gas station). The acquisition consists of a sliver less than 10 feet wide for less than the entire length of the property. The acquisition should not impact parking or circulation on this parcel.
- The biggest impact of the overpass are the impacts to access management as follows:
 - The overpass will require the elimination of two median openings west of SW 87th Avenue. These median openings currently service SW 88th Avenue and SW 89th Avenue. Mitigation for the closure of these two median openings is provided in the form of a “Texas U-turn” lane. Vehicles currently making left turn movements from SW 88th Avenue and SW 89th Avenue onto SW 8th Street (westbound) will in the future make a right-turn onto eastbound SW 8th Street and then can use the “Texas U-turn” lane to head west on SW 8th Street. Westbound SW 8th Street traffic currently making left turns onto these two roads would have to use alternate route through SW 87th Avenue or make a U-turn at the following median opening.

The overpass will require the elimination of one median opening east of SW 87th Avenue. Mitigation for the closure of this median opening is provided in the form of a “Texas U-turn” lane. Westbound vehicles currently making a left-turn movement into the driveway will have to use the “Texas U-turn” lane. Traffic from the driveway making a left-turn movement onto westbound SW 8th Street will have to take SW 8th Street eastbound and make a U-turn at SW 82nd Avenue.

In addition to the impacts associated with SW 87th Avenue (essentially those improvements that replicate with alternative 2a and listed above), the only additional potential impact associated with this alternative in terms of right-of-way is to one (1) residential property on the north side of the C-4 Canal. No direct impacts to the structure of the residence are expected. Other potential impacts of this alternative include increased noise levels as a result as an increase in traffic along residential streets, that is, SW 82nd Avenue.



ALTERNATIVE 3B - LAYOUT

FIGURE 6-12

7. TRAFFIC ANALYSIS (TIER 2 ANALYSIS)

This section of the report documents existing and future traffic conditions, using Synchro version 6. The first portion of this section will include the existing conditions for the transportation network, roadway characteristics, development of traffic factors and traffic estimation to develop the future volumes. The report then includes the results of the Synchro analysis for the existing year (2010), and future years (2020 and 2040).

7.1. Methodology

The methodology used in the development of this traffic analysis is as follows:

- Data Collection – Information pursuant to existing conditions within the study area was collected including existing level of service, existing traffic data, and roadway geometry (lane configuration, queues, etc). Refer to Appendix K for travel time data.
- Development of Traffic Factors – The Design Hour Demand (K), Design Hour Directional Demand (D), Truck Factor (T_{24}), Design Hour Truck Factor (T_f), and Peak Hour Factors using historical traffic data were developed and documented.
- Existing Traffic Estimation –The Annual Average Daily Traffic (AADT), Design Hour Turning Movements, and Directional Design Hour Volumes (DDHVs) for existing conditions along roadway segments and intersecting roadways were estimated utilizing the collected data.
- Development of the Sub-area Model – The development of a sub-area model was initiated at the Tier 1 analysis level of this report. As documented in Section 5 of the report, the “SERPM 6.5 Time of Day based 24-hour Cost Feasible Model” with the addition of a NW 7th Street bridge under the SR-826 mainline was used for the purpose of traffic forecasting. A subarea model was developed and validated for the SW 8th Street and SW 87th Avenue study area for the year 2005. Validating parameters were used on the development of the future year 2035 model. The sub-area model validation includes review of socio-economic data, roadway network revision, trip length calibration, and trip assignment evaluation to incorporate the most recently available data from SERPM 6.5 and other sources. For additional information on validation tables refer to Appendix J.
- Future Year Traffic – The future analysis years are 2020 and 2040. Future year traffic volumes were forecasted using trends analysis and the SERPM 6.5 Time of Day based 24-hour Cost Feasible Model (with the addition of a NW 7th Avenue bridge at the SR-826 mainline).
 - Two separate models were developed for the future year 2035. Traffic forecasting was initiated with Model 1 (see below). Utilizing this model and the NCHRP 255 methodology, a two point projection was made from the Base Year 2005 to the Future Year 2035 to determine the amount of volume growth that could be expected. Initial reviews of the projected model growth in combination with the design traffic factors demonstrated volume growth at

large levels (in excess of 60%), in contrast to a study area that is already built out and does not provide any evidence for volume model growth at these larger levels. The growth obtained was deemed not realistic when considering other constraints in the roadway network that will not allow these traffic volumes to reach this location. It was decided to cap the growth rate at 1% for the movements as reasonable growth considering that projections are being made to year 2040.

- Model 1 – This model was developed and used to forecast traffic volumes including the roadway network in the Cost Feasible Plan. That is, the improvement along SW 82nd Avenue and the new bridge over the C-4 Canal included as part of Alternatives 3A and 3B were not coded in this model. Volumes developed from this model were used for the analysis of alternatives **No-Build, 1A, 1B, 2A and 2B**.
- A second model was developed to forecast the expected traffic volumes and changes in patterns resulting from the construction of a bridge connecting SW 82nd Avenue north and south of SW 8th Street. Using the model output from this model and comparing it to the output from Model 1, it was possible to determine the increase/decrease in traffic at each segment of the network. Using these changes in traffic, and using the AADT values obtained in the initial step, the AADTs for alternatives 3A and 3B were developed.
 - Model 2 – This model used Model 1 as the base and was coded to forecast traffic volumes under a scenario in which SW 82nd Avenue is widened from 2 to 4 lanes between SW 16th Street and Flagler Street with the addition of a bridge over the C-4 Canal to provide continuity to SW 82nd Avenue. These improvements are not in the Cost Feasible Network but were considered under Alternatives 3A and 3B. Volumes developed from this model were used for the analysis of alternatives **3A and 3B only**.
- Design Hour Volumes - Design Hour Volumes were developed using the traffic forecasted volumes and the traffic factors established for this study. Two sets of Design Hour Volumes were developed; one set represents the future traffic under a scenario in which SW 82nd Avenue is not modified (alternatives No-Build, 1A, 1B, 2A and 2B), while the second set represents a scenario in which SW 82nd Avenue is widened to four lanes between SW 16th Street and Flagler Street, with the addition of a bridge over the C-4 Canal to provide continuity. The development of the Design Hour Volumes was completed using a proprietary tool developed in a spreadsheet. The tool essentially uses the existing Turning Movement Counts as the basis for distributing the Design Hour Volumes at each intersection approach. Then, through an iterative process, the tool is used to make small modifications to each movement in order to balance the total volumes entering and exiting a link given link/approach while maintaining the resulting K and D factors within a reasonable deviation from the intended design factors. Refer to Appendix G for summary of the results.

- ☐ Level of Service (LOS) Evaluation – Using the Design Hour Volumes, analyze the No-Build and Build scenarios using Synchro for signalized intersection in each of the analysis years (2010, 2020 and 2040).
- ☐ Identification of Recommended Build Geometry – Recommendations for intersection geometry, including intersection turn lane configuration and storage lengths for the 2040 Design Year were developed, including a phased implementation plan.

7.2. Design Period

Through coordination with the Department, the design year was set for the year 2040. The analysis was performed for the following years:

- ☐ Existing Year: 2010
- ☐ Opening Year: 2020
- ☐ Design Year: 2040

7.3. Traffic Volumes

7.3.1. Data Collection

Traffic count information was collected from various sources including:

- ☐ FDOT 2008 Florida Traffic Information (FTI) DVD – Eight (8) State-monitored portable counting units are found within the study area;
- ☐ 72-Hour Counts – Twenty (20) 72-hour counts were conducted in February of 2010;
- ☐ Turning Movement Counts – Eleven (11) turning movement counts were conducted in February of 2010.

The locations of the FDOT FTI DVD station, 72-Hour Counts and Turning Movement Counts (TMC) are listed in Table 7-1, Table 7-2, and Table 7-3 and their locations are illustrated in Figure 7-1. Appendix C includes the raw traffic counts and Appendix I includes the data from the Florida Traffic Information DVD.

Table 7-1 - 2008 FDOT FTI Count Sites

Count Site		
ID	Number	Location
F1	871142	W. Flagler St., E of NW 87th Ave.
F2	870044	SW 87th Ave., S of W. Flagler St.
F3	870092	SW 8th St., E of SW 87th Ave.
F4	870589	SW 8th St., W of SW 87th Ave.
F5	871074	SW 87th Ave., S of SW 8th St.
F6	876203	SB SR-826 to WB SW 8th St.
F7	876229	EB SW 8th St. to SB SR-826
F8	876230	SB SR-826 to EB SW 8th St.

Source: BCC Engineering and Florida Department of Transportation

Table 7-2 –72-Hour Count Sites

ID	Location
B1	W. Flagler St., E of 82nd Ave.
B2	W. Flagler St., E of 84th Ave.
B3	W. Flagler St., W of 87th Ave.
B4	SW 8th St., E of 82nd Ave.
B5	SW 8th St., W of 97th Ave.
B6	SW 8th St., W of 87th Ave.
B7	SW 16th St., E of 87th Ave.
B8	SW 16th St., W of 87th Ave.
B9	SW 87th Ave., N of W. Flagler St.
B10	SW 87th Ave., N of 16th St.
B11	SW 87th Ave., N of SW 8th St.
B12	SW 97th Ave., N of SW 8th St.
B13	SW 97th Ave., N of SW 16th St.
B14	SW 97th Ave., N of W. Flagler St.
B15	SW 92nd Ave., N of SW 8th St.
B16	SW 92nd Ave., S of SW 8th St.
B17	SW 82nd Ave., S of 8th St.
B18	SB SR-826 off ramp to WB SW 8th St.
B19	SB SR-826 off ramp to EB SW 8th St.
B20	EB SW 8th St. on ramp to SB SR-826

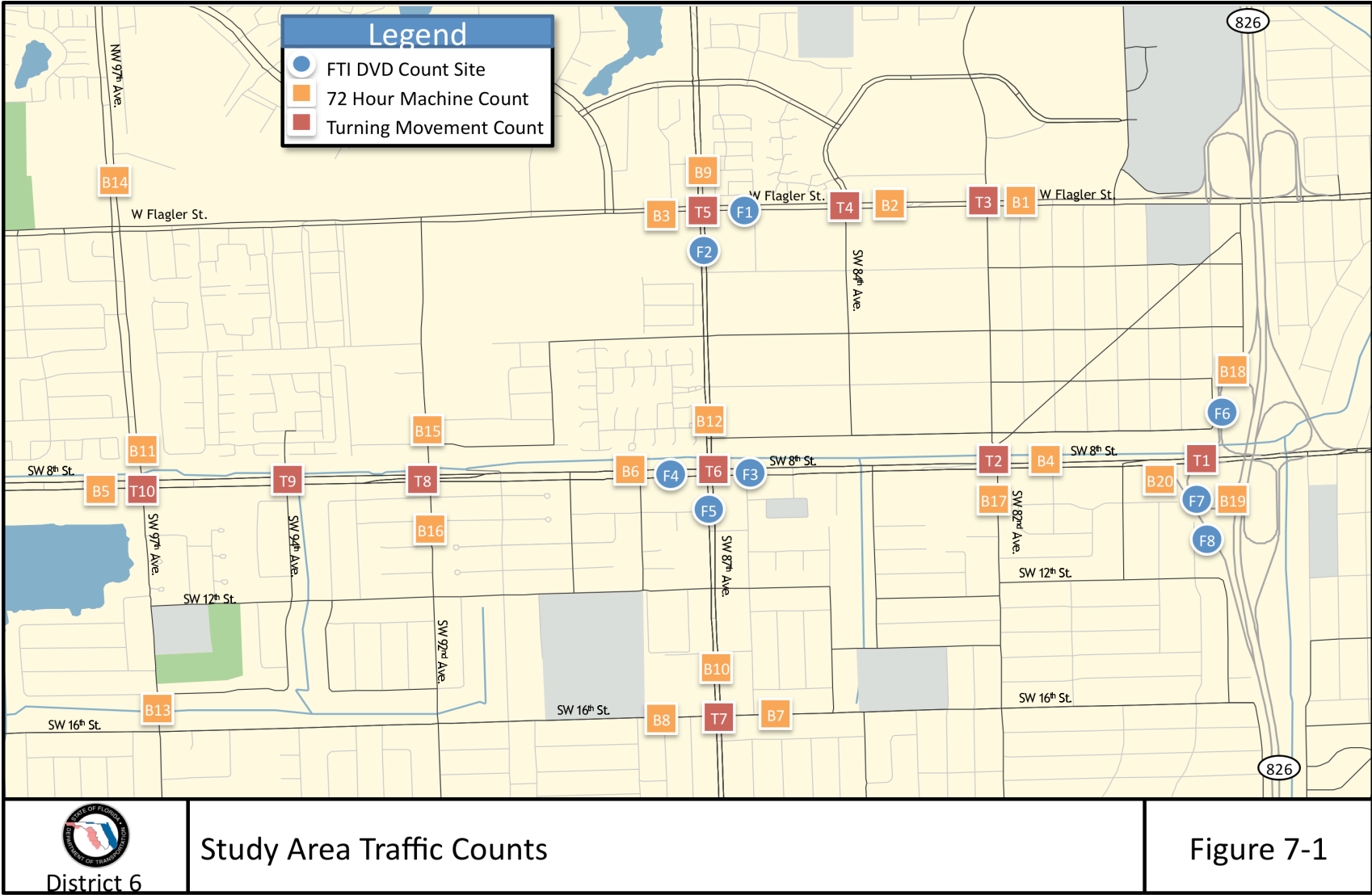
Source: Crossroads Engineering Data, Inc.

Table 7-3 - Turning Movement Counts

ID	Location
T1	SR-826 at SW 8th St.
T2	SW 82nd Ave. at SW 8th St.
T3	SW 82nd Ave. at W. Flagler St.
T4	SW 84th Ave. at SW 8th St.
T5	SW 84th Ave. at W. Flagler St.
T6	SW 87th Ave. at W. Flagler St.
T7	SW 87th Ave. at SW 8th St.
T8	SW 87th Ave. at SW 16th St.
T9	SW 92nd Ave. at SW 8th St.
T10	SW 94th Ave. at SW 8th St.
T11	SW 97th Ave. at SW 8th St.

Source: Crossroads Engineering Data, Inc.

Figure 7-1 - Study Area Traffic Counts



7.3.2. Annual Average Daily Traffic Volumes

The Annual Average Daily Traffic (AADT) volume profile was obtained from Average Daily Traffic (ADT) counts and turning movement counts collected in February of 2010. The ADT counts were adjusted with corresponding seasonal and axle adjustment factors within the study area from the 2008 FDOT Traffic Information Database. The 2010 AADT volumes are shown in Figure 7-4.

Future year traffic volumes were forecasted using trends analysis and SERPM 6.5. Given that there are two different roadway networks and hence the two SERPM 6.5 future year models, two sets of AADT volumes were developed for each year 2020 and 2040.

- Model 1 - One model was developed and used to forecast traffic volumes including the roadway network in the Cost Feasible Plan. That is, the improvement along SW 82nd Avenue and the new bridge over the C-4 Canal included as part of Alternatives 3A and 3B were not coded in this model.
- Model 2 - A second model was coded to forecast traffic volumes under a scenario in which SW 82nd Avenue is widening from 2 to 4 lanes between SW 16th Street and Flagler Street and the construction of a new bridge over the C-4 Canal to provide continuity to SW 82nd Avenue. These improvements are not in the Cost Feasible Network but were considered under Alternatives 3A and 3B. The output from both models was compared and the change in volumes for each link was determined. In essence, the impacts to the AADTs for each link as a result of the new improvements along SW 82nd Avenue were determined. The second set of AADT values was calculated by applying that percentage difference to the original (Model 1) AADTs.

7.3.3. Development of Traffic Factors

Directional Design Hourly Volumes (DDHV) are used to evaluate future traffic operating conditions and are calculated by applying traffic factors to future year AADT volumes. The traffic factors used for developing the design hour traffic are as follows:

- The K_{30} factor, or design hour factor, is the estimated percentage of the AADT that occurs during the 30th highest hour of the year. For the purpose of this report, a K factor based on the 72-Hour traffic counts was determined and used for design purpose.
- The D_{30} factor, or directional distribution factor, is the proportion of traffic in the 30th highest hour of the design year traveling in the peak direction. The 30th highest hour represents the level of traffic that a roadway is typically designed to accommodate. For the purpose of this report, a D factor based on the 72-Hour traffic counts was determined and used for design purpose.
- The T_{24} factor, or truck factor, is the percentage of the AADT that are trucks operating during the day. The Design Hour Truck (DHT) factor, the percentage of truck traffic during the 30th highest hour of the design year, is estimated as half of the T_{24} factor; this is based on previously approved methods recognizing that the percent of trucks within the peak hour is lower than the amount of trucks over the course of a day.

The development of traffic factors followed general traffic engineering standards accepted within the industry. A review of historical traffic factors was completed for FDOT portable traffic monitoring sites (PTMS) for the years 2004 through 2008 (Refer to Appendix I). Maximum and minimum years were identified to quantify a range for the traffic factors and an average of the five years was estimated. The average of each factor was compared to the FDOT's Project Traffic Forecasting Handbook's acceptable range of factors. This process was completed for urban arterials and freeways within the study area and, the results are presented in Table 7-4; including, yearly design traffic factors, recommended ranges, and the design traffic factors selected for use in the analysis of future conditions.

K Factor – Urban Arterial

Portable Traffic Management Systems (PTMS) were identified within the study area and historical data was extracted from these sites for the area's urban arterials. The recommended K-factors included in the Project Traffic Forecasting Handbook are a minimum of 9.2% and a maximum of 11.5%. In congested areas, the peak hour is generally extended to a peak period, which translates into a lower K value. The observed K factors within the study area ranged from 7.39% in 2006 to 8.20% in 2008. The average of the five analysis years (2004 through 2008) was 7.85%, which is below the range of Florida's unconstrained telemetry sites.

The historical K value was used for the development of Design Hour Volumes, since the use of the recommended factors (even the lower range of 9.2%) would result in 100% growth of traffic volumes in an area that is already congested.

D Factor – Urban Arterial

Urban arterials within the study area with historical PTMS were identified and historical data was extracted pertaining to D factors for these sites. The observed D factors within the study area ranged from 58.66% in 2006 to 67.10% in 2008. The average for the five analysis years (2004 through 2008) was 64.18%. The recommended range from the Project Traffic Forecasting Handbook is a minimum of 50.8% and a maximum of 67.1%. Since the observed D factor is within the recommended range, no adjustments were necessary; and the D value used for the study was 64.18%.

Design Hour Truck Factor (T₂₄) – Urban Arterial

Urban arterials within the study area with historical PTMS' were identified and historical data was extracted pertaining to T₂₄ and T_f factors for these sites. The design hour Truck Factor was directly available via FDOT's FTI DVD and was extracted accordingly. Unlike for the K and D factors which are the same for all four sites, the T factor varies at each count site. Therefore, an average for each year was estimated. Also, considering year 2004 in some cases had a truck factor in excess of 17%, the year 2004 counts were excluded for the purpose of truck factor calculations. Refer to Appendix I for a summary table of truck factor calculation as well as a summary sheet with PTMS information. The Design Hour Truck Factor (T_f) average for the five analysis years was calculated to be around 2%.

Table 7-4 - Traffic Factors Comparison and Recommendations

Year	K	D	T ₂₄	T _f ⁽¹⁾
Arterials				
FTI 2008 DVD	8.07	66.31	5.35 (3)	2.68
FTI 2007 DVD	7.90	63.12	5.23 (3)	2.61
FTI 2006 DVD	7.39	58.66	4.30 (3)	2.15
FTI 2005 DVD	7.70	65.70	4.30 (3)	1.44
FTI 2004 DVD	8.20	67.10	-	-
Average for Urban Arterials	7.85	64.18	4.44	2.2
FDOT Recommended Values - Urban Arterial ⁽²⁾				
Low	9.2	50.8		
Average	10.2	57.9		
High	11.5	67.1		
Recommended Initial Traffic Factors Selected for this Study				
Urban Arterial	7.85	64.18	4	2
(1) T _f is estimated to be one-half of T ₂₄				
(2) Source: FDOT Project Traffic Forecasting Handbook, 2002				
(3) Average of four sites, See Appendix I				

7.3.4. Peak Hour Determination

For this study, the arterial volumes were determined by utilizing the highest recorded volume during the AM (07:45 – 08:45) and PM (17:00 – 18:00) peak periods. Using the 24-Hour counts from the data collection section, volumes across the study area were aggregated into 15-minute intervals to determine a peak hour for the AM and PM periods. The initial results for the peak hour determination provided a peak hour for the AM from 7:45 to 8:45, and for the PM from 17:00 to 18:00 and are shown in Figure 7-2.

Recognizing that there may be a bias existing within the study area stemming from the aggregation of lower volume roadways with higher volume roadways, a weighted analysis of the volumes was conducted. Based on volumes and size of roadways within the study area, weights were assigned to the roadways and multiplied against the original volumes for each roadway. The resulting aggregate volume produced a peak hour period that differed from the original by fifteen minutes (07:30-08:30) for the AM and (16:45 – 17:45) for the PM. Refer to Figure 7-3 for a graphic representation of these results. Since the average and weighted peak hours differed by only fifteen minutes, the shifting of the weighted peak period to match the average period was accepted and the Peak Hours were identified as occurring during the AM (07:45-08:45) and during the PM (17:00-18:00).

Using the highest volume approach, or peak hour, constitutes a “worst case” scenario, which provides a conservative basis for conducting the existing and future year LOS analyses. It should be noted that this method does not result in balanced profile volumes; however utilizing this method ensures that the peak traffic is analyzed and reduces the likelihood of under-representing the volume of a given location.

With the selection of a peak hour, an analysis of peak hour directions was conducted for the AM and PM peak hour periods to determine predominant traffic movement patterns within the study area. Predominant peak hour direction traffic movement patterns are used to balance traffic volumes for future year forecasts. The AM and PM peak hour direction shown in Figure 7-5 and Figure 7-6.

Figure 7-2 - Peak Hour Average Volumes

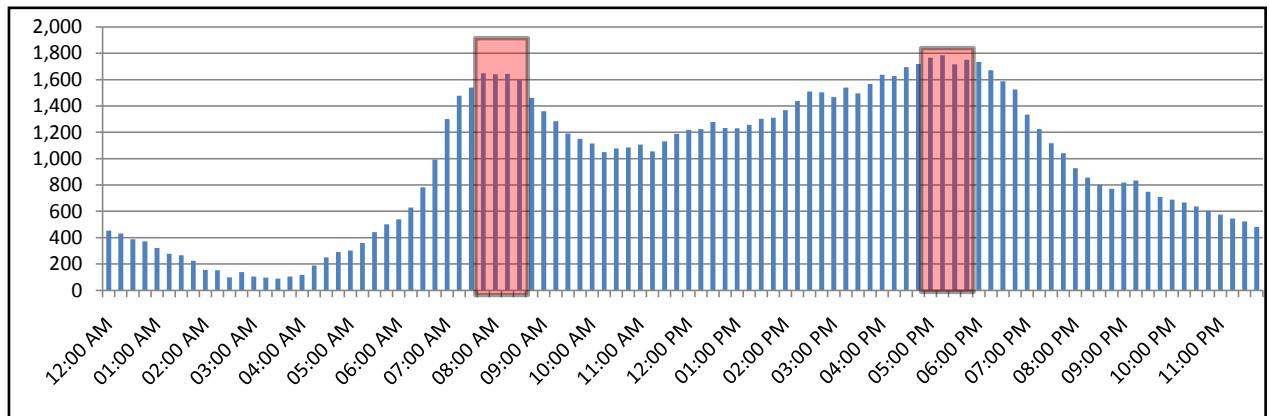
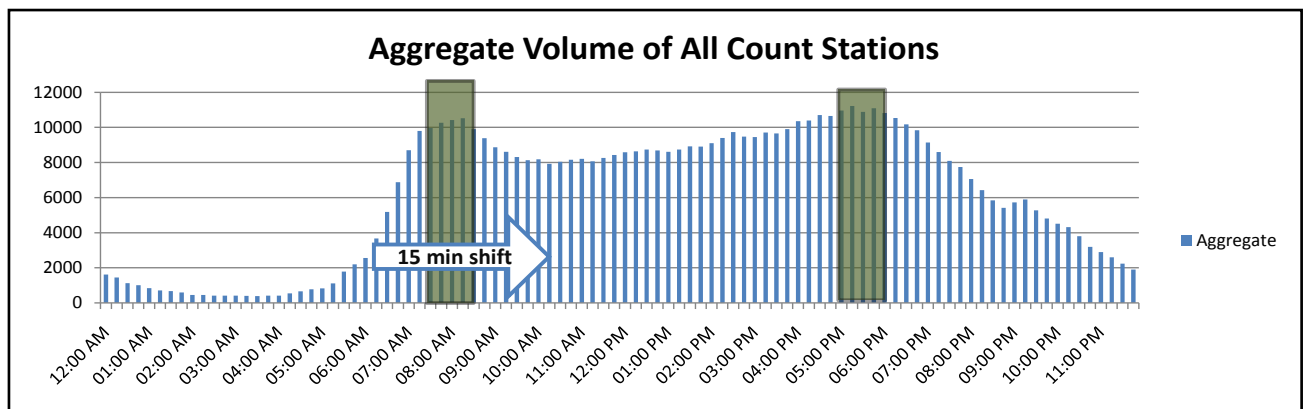


Figure 7-3 - Peak Hour Weighted Volumes

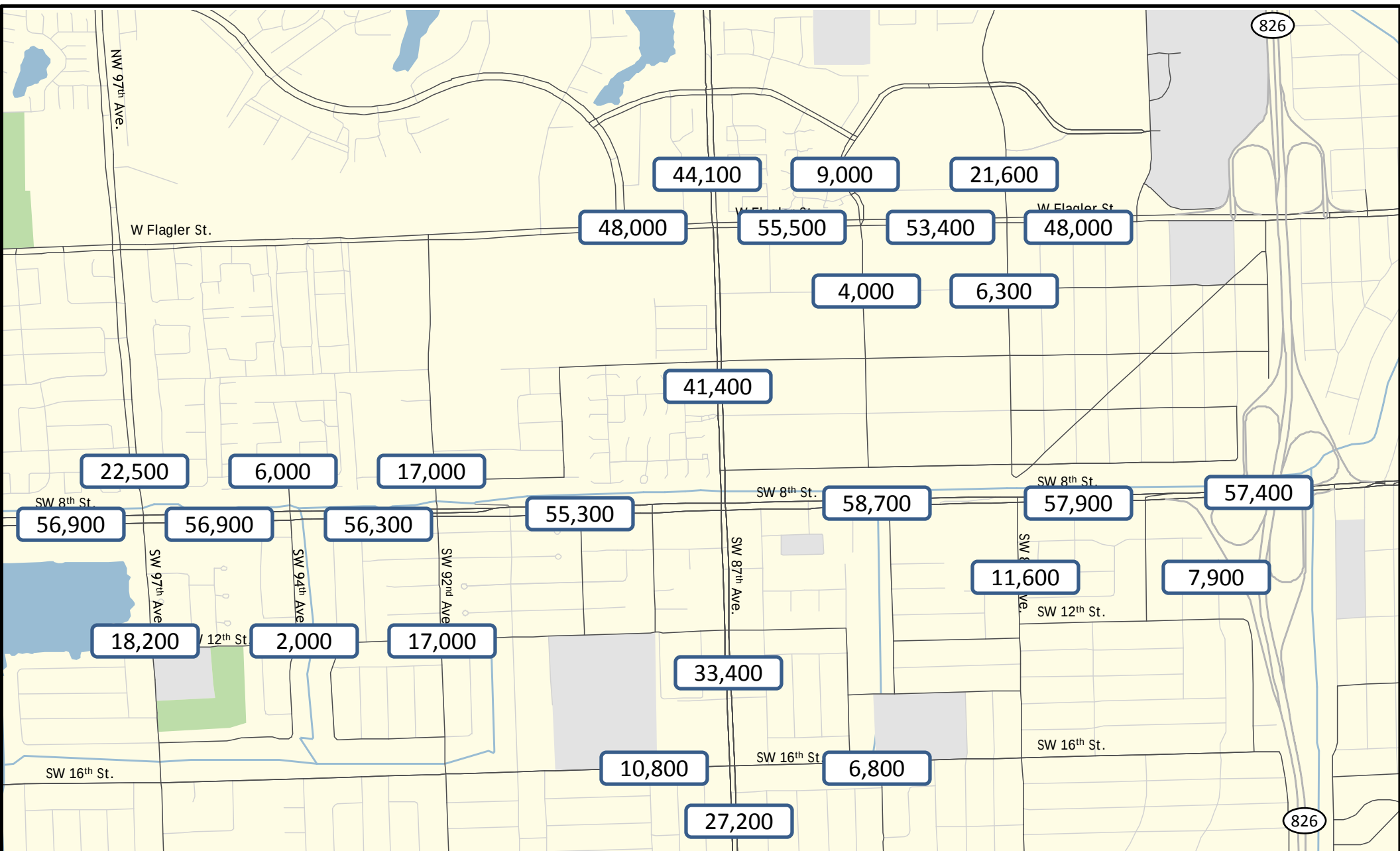


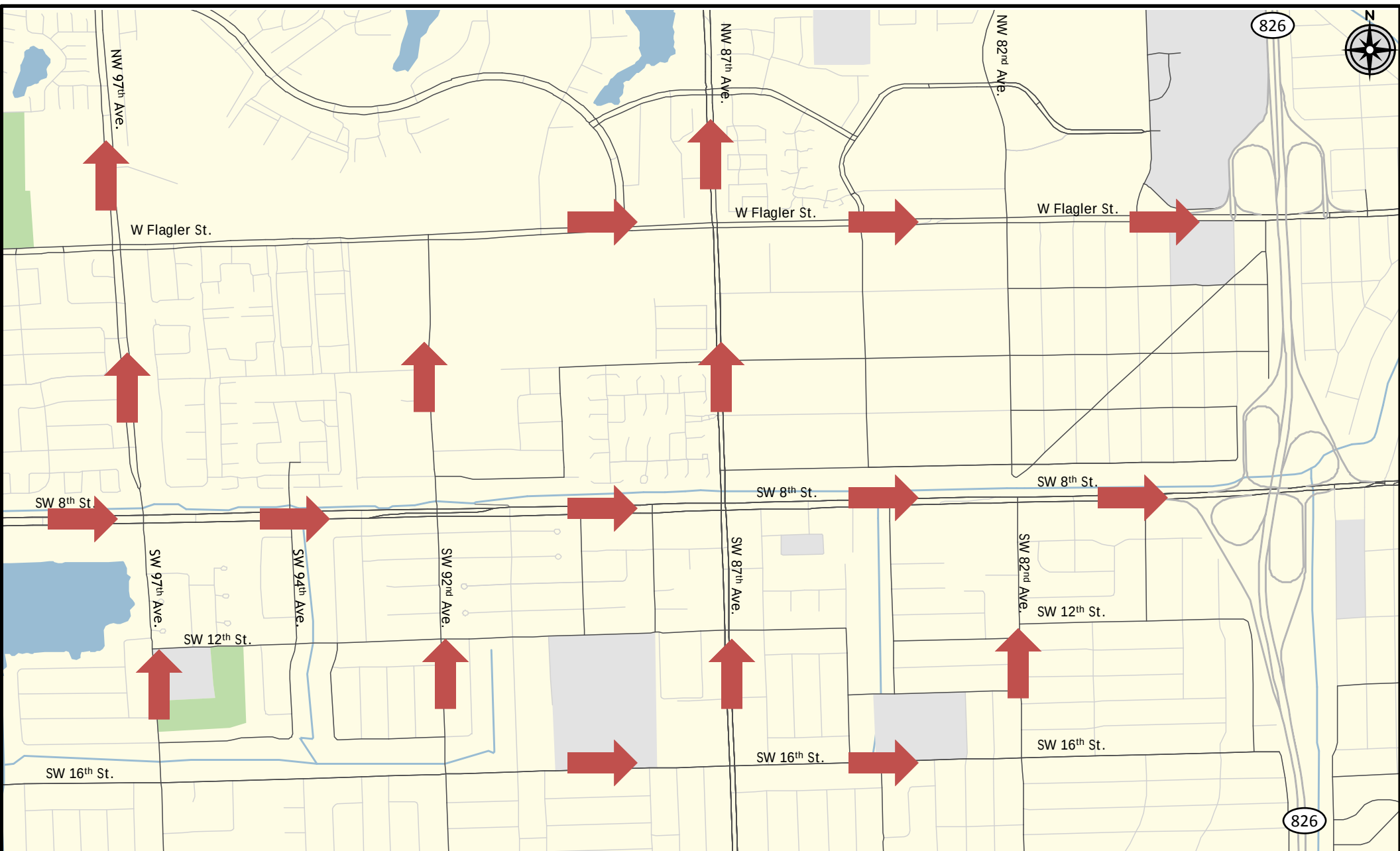
7.3.5. Peak Hour Factor

The Peak Hour Factor (PHF) used for the existing conditions analysis was that obtained directly from the traffic counts at each corresponding location. For all other analysis of alternatives, a single PHF was used. The determination of the PHF was based on the data collected including AM and PM peak Turning Movement Counts. A PHF was determined for each location during the peak hour and the average between AM and PM estimated (see Table 7-5 below for summary). An average of all the PHF was estimated. Therefore, a PHF of 0.91 is to be used for all alternatives analysis for years 2020 and 2040.

Table 7-5 PHF Estimation and Summary

No.	Location	Avg. PHF / Location
1	SW 97TH AVE NORTH OF FLAGLER ST (SB)	0.88
2	SW 97TH AVE NORTH OF FLAGLER ST (NB)	0.93
3	SW 97TH AVE NORTH OF 16TH ST	0.95
4	SW 97TH AVE NORTH OF 8TH ST	0.95
5	SW 92ND NORTH OF 8TH ST	0.92
6	SW 92ND AVE SOUTH OF 8TH ST.xls	0.91
7	SW 87TH AVE NORTH OF SW 16TH.xls	0.96
8	SW 87TH AVE NORTH OF SW 8TH ST.xls	0.93
9	SW 87TH AVE NORTH OF FLAGLER ST (SB)	0.94
10	SW 87TH AVE NORTH OF FLAGLER ST (NB)	0.92
11	SW 82ND AVE SOUTH OF 8TH ST	0.93
12	SW 16TH STREET WEST OF 87TH AV	0.89
13	SW 16TH ST EAST OF SW 87TH AVE	0.81
14	SW 8TH STREET WEST OF SW 87TH AVE (WB)	0.90
14	SW 8TH STREET WEST OF SW 87TH AVE (EB)	0.88
15	SW 8TH STREET WEST OF 97TH AVE	0.95
16	SW 8TH STREET EAST OF SW 82ND AVE	0.93
17	SB SR 826 OFF RAMP TO EB 8TH ST	0.84
18	SB 826 TO WB 8TH STREET	0.90
19	FLAGLER STREET WEST OF 87TH AVE	0.95
20	FLAGLER STREET EAST OF 84TH AVE (WB)	0.94
21	FLAGLER STREET EAST OF 84TH AVE (EB)	0.88
22	FLAGLER STREET EAST OF 82ND AVE	0.97
23	EB SW 8TH ST SB ON RAMP TO 826	0.79
Average		0.91

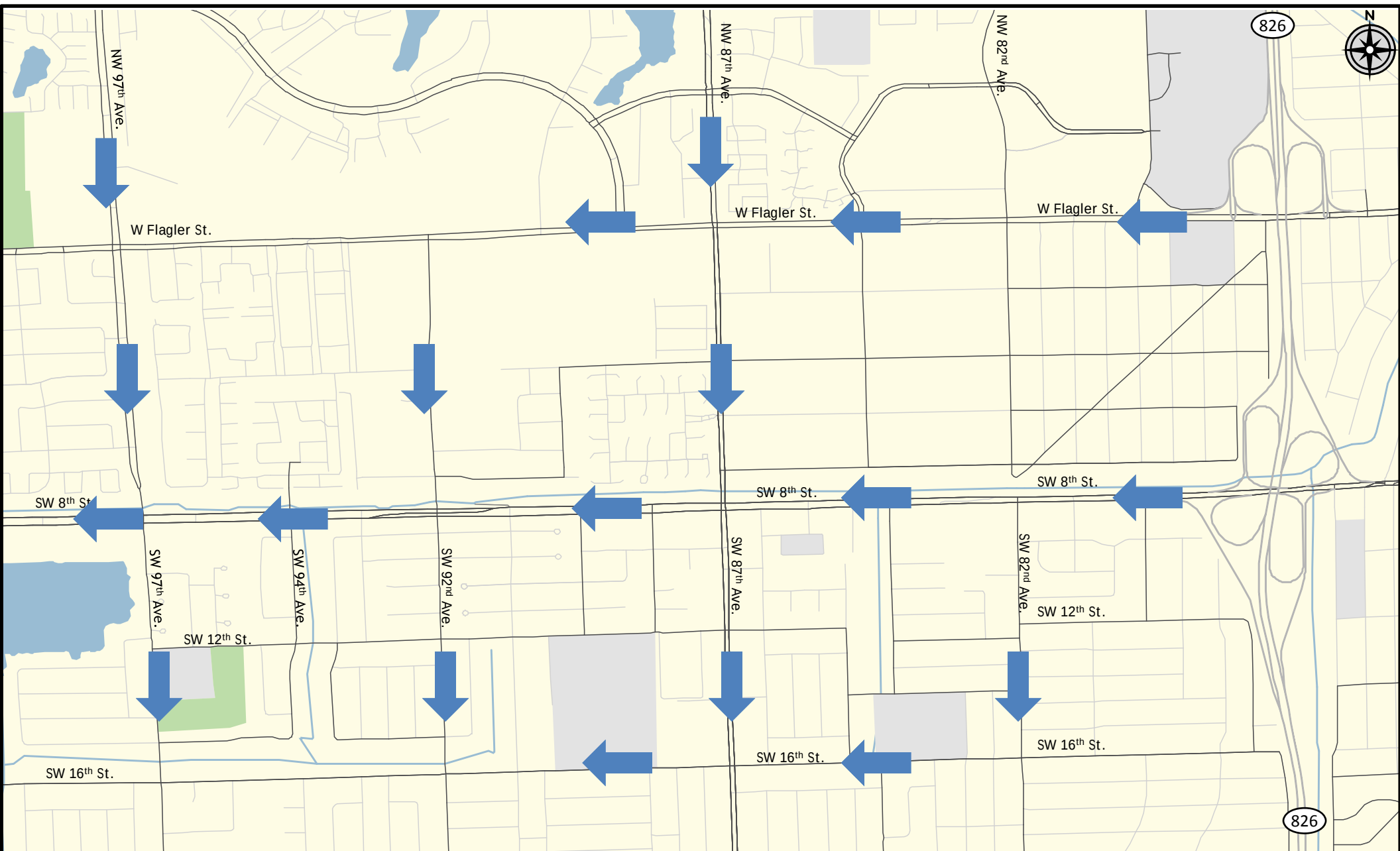


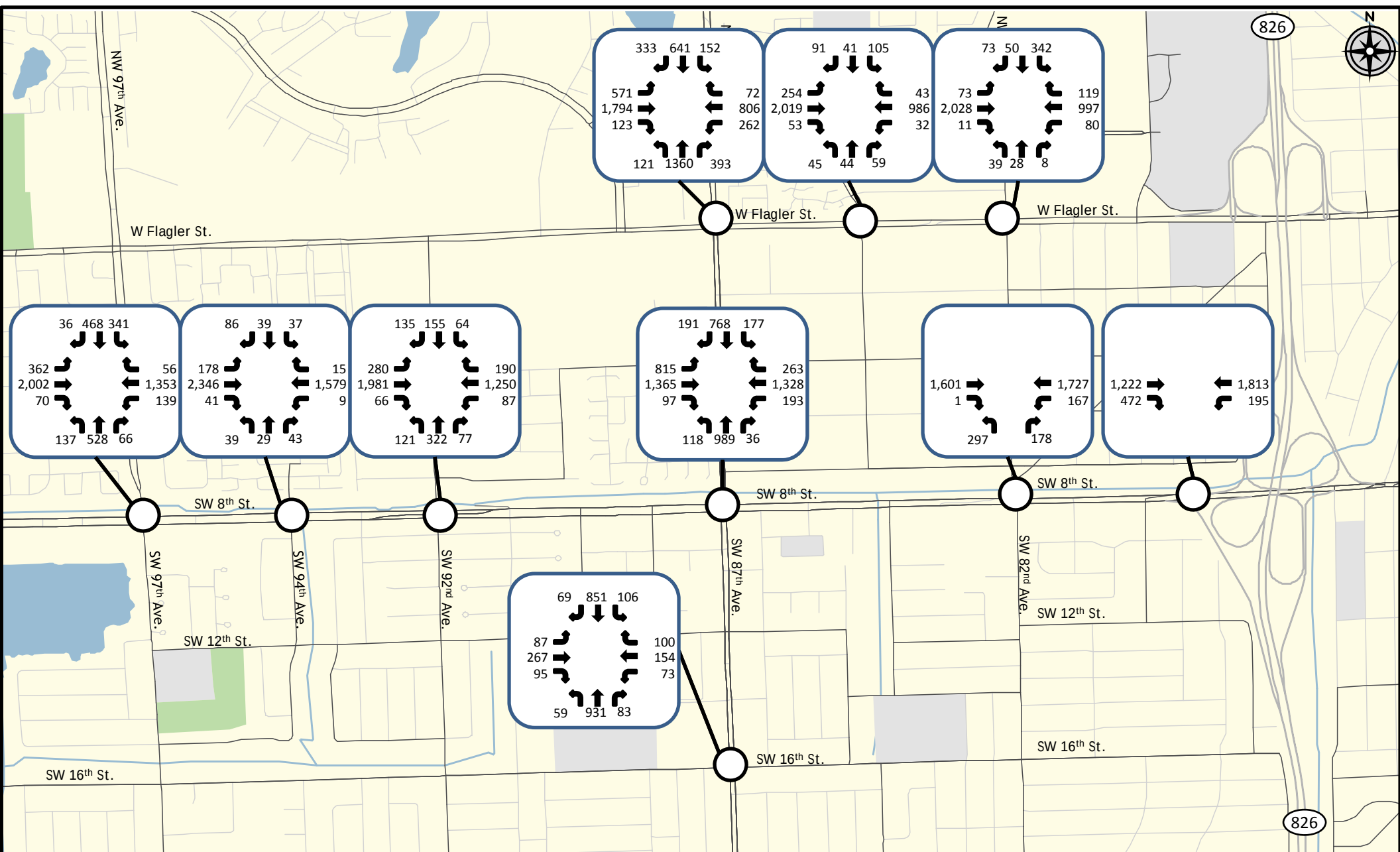


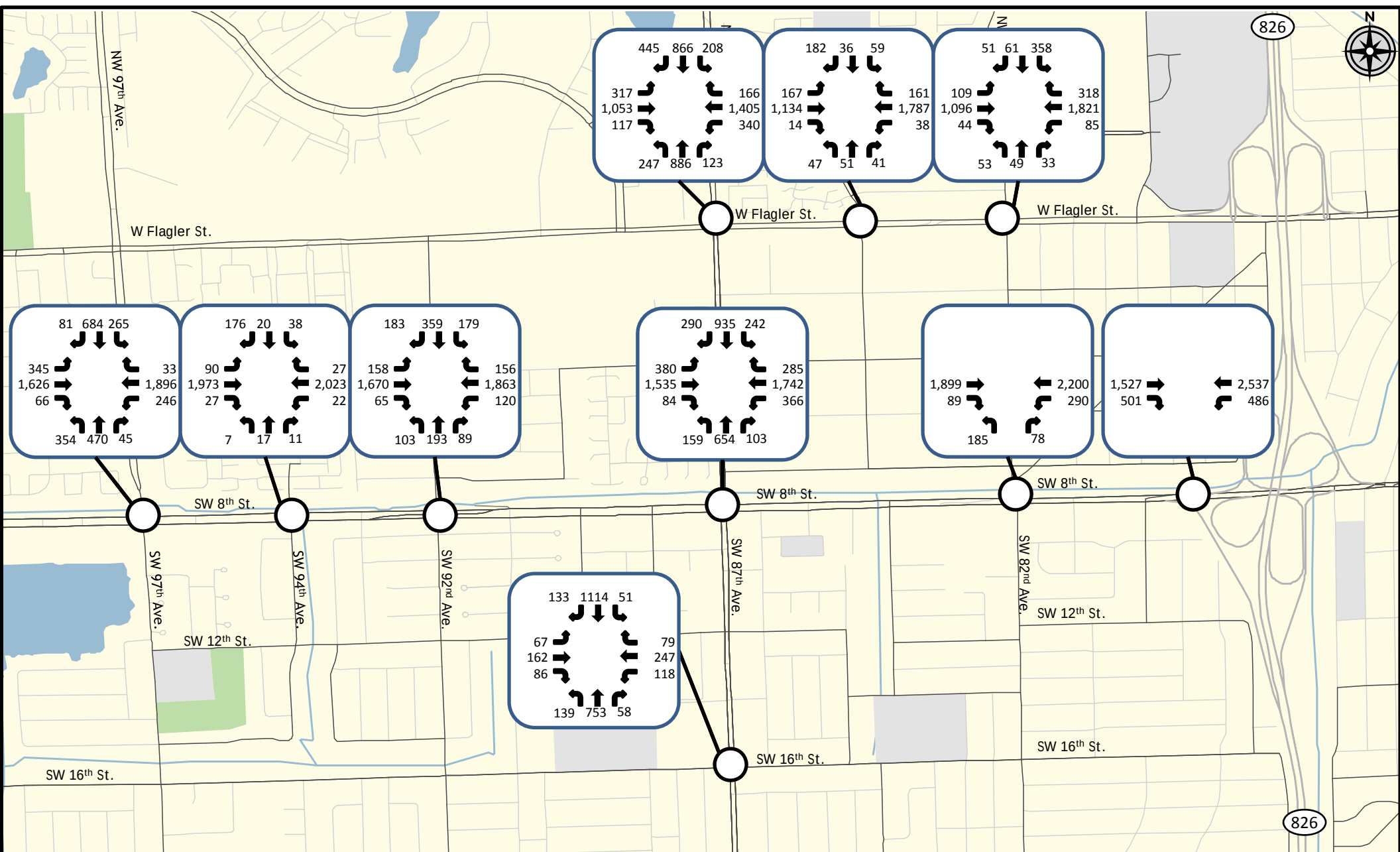
District 6

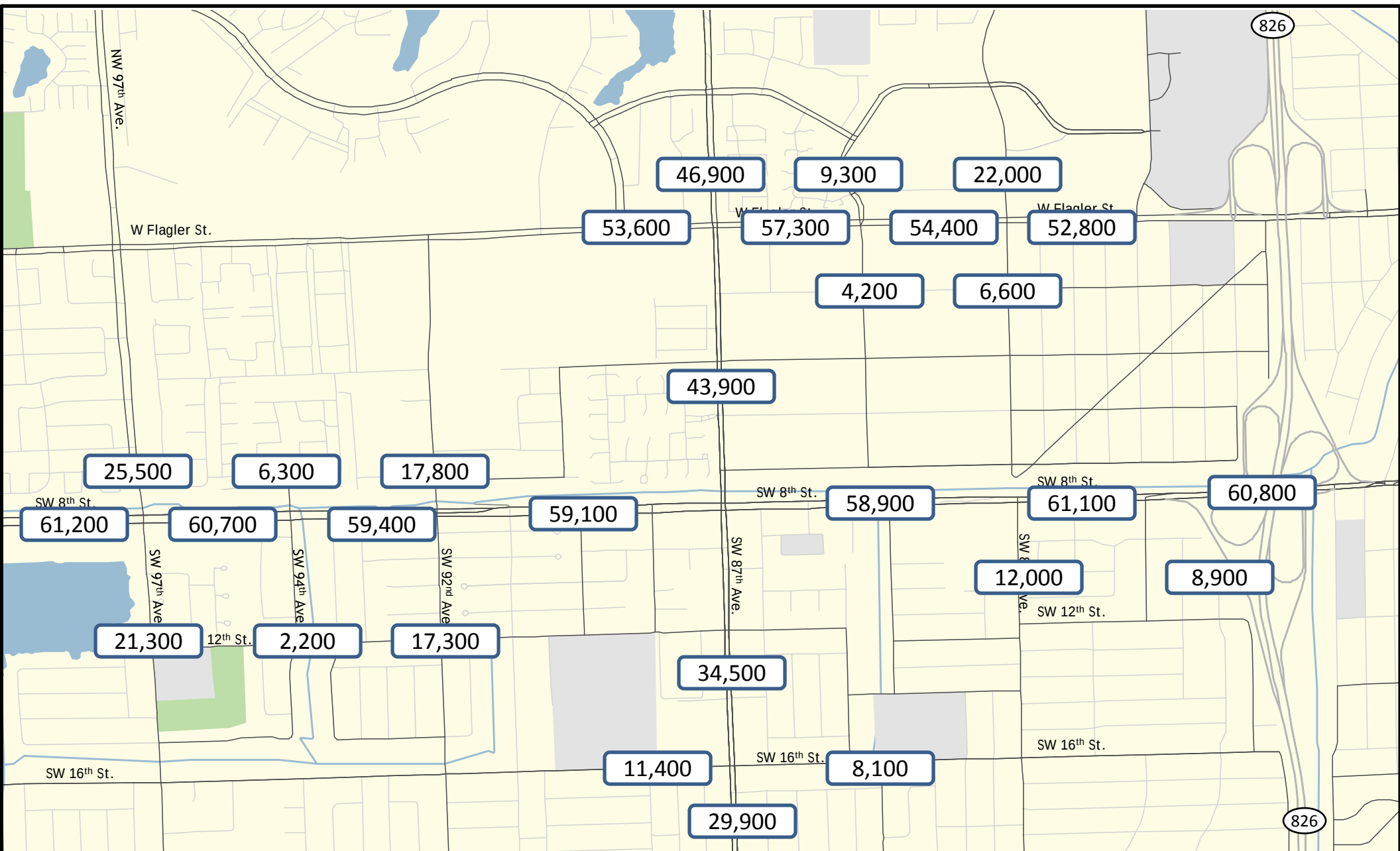
Peak Hour Traffic Direction- AM

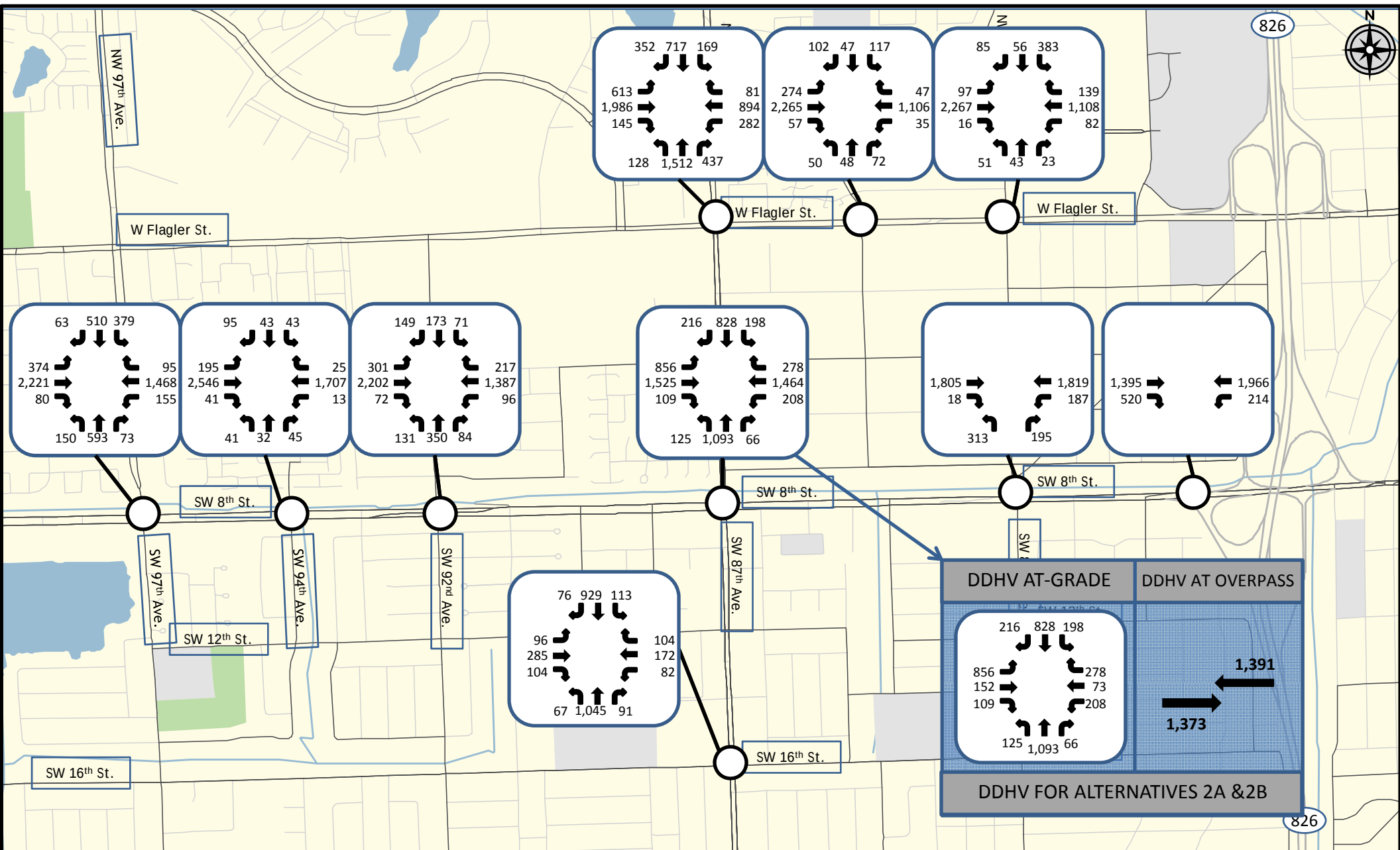
Figure 7-5

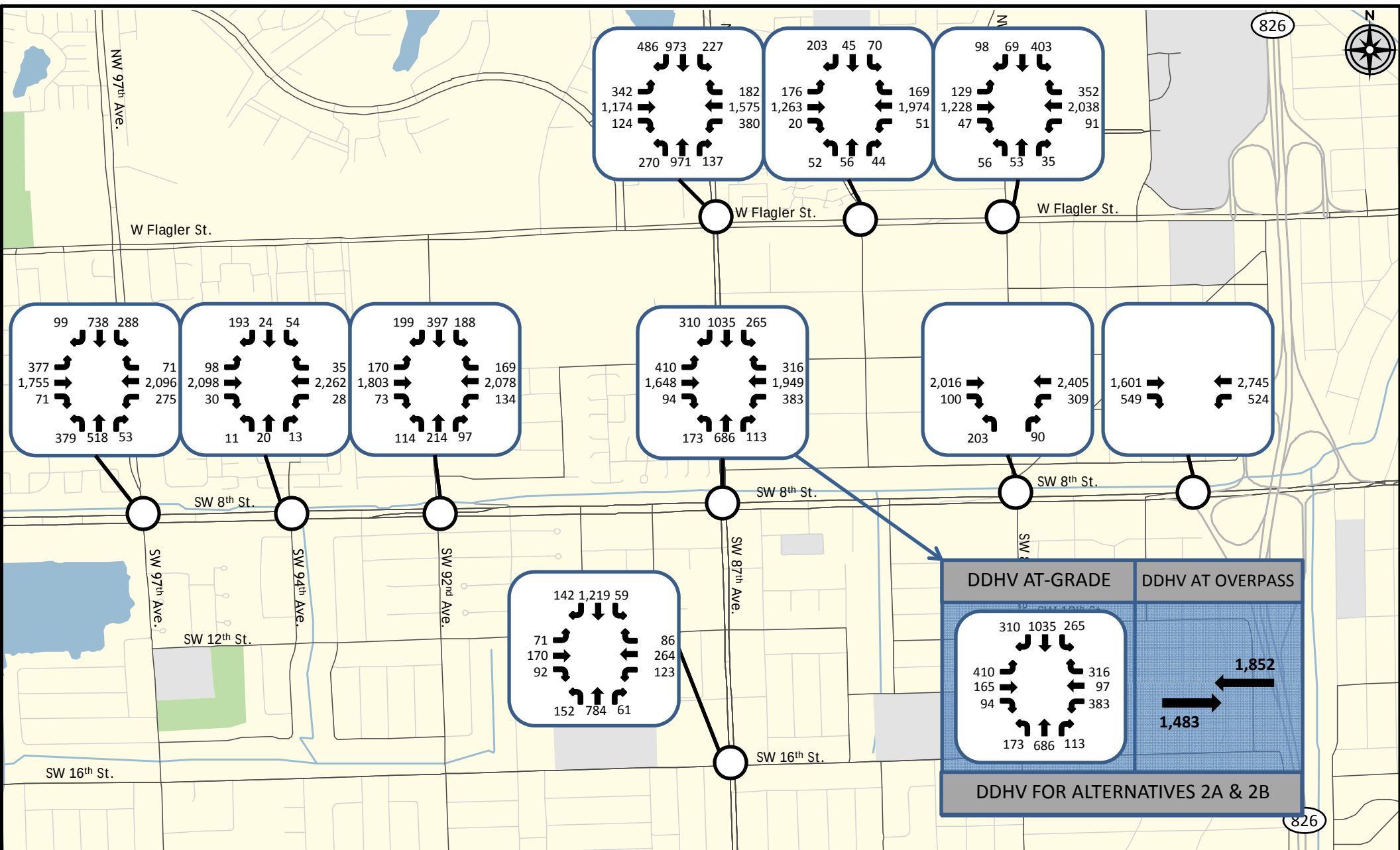


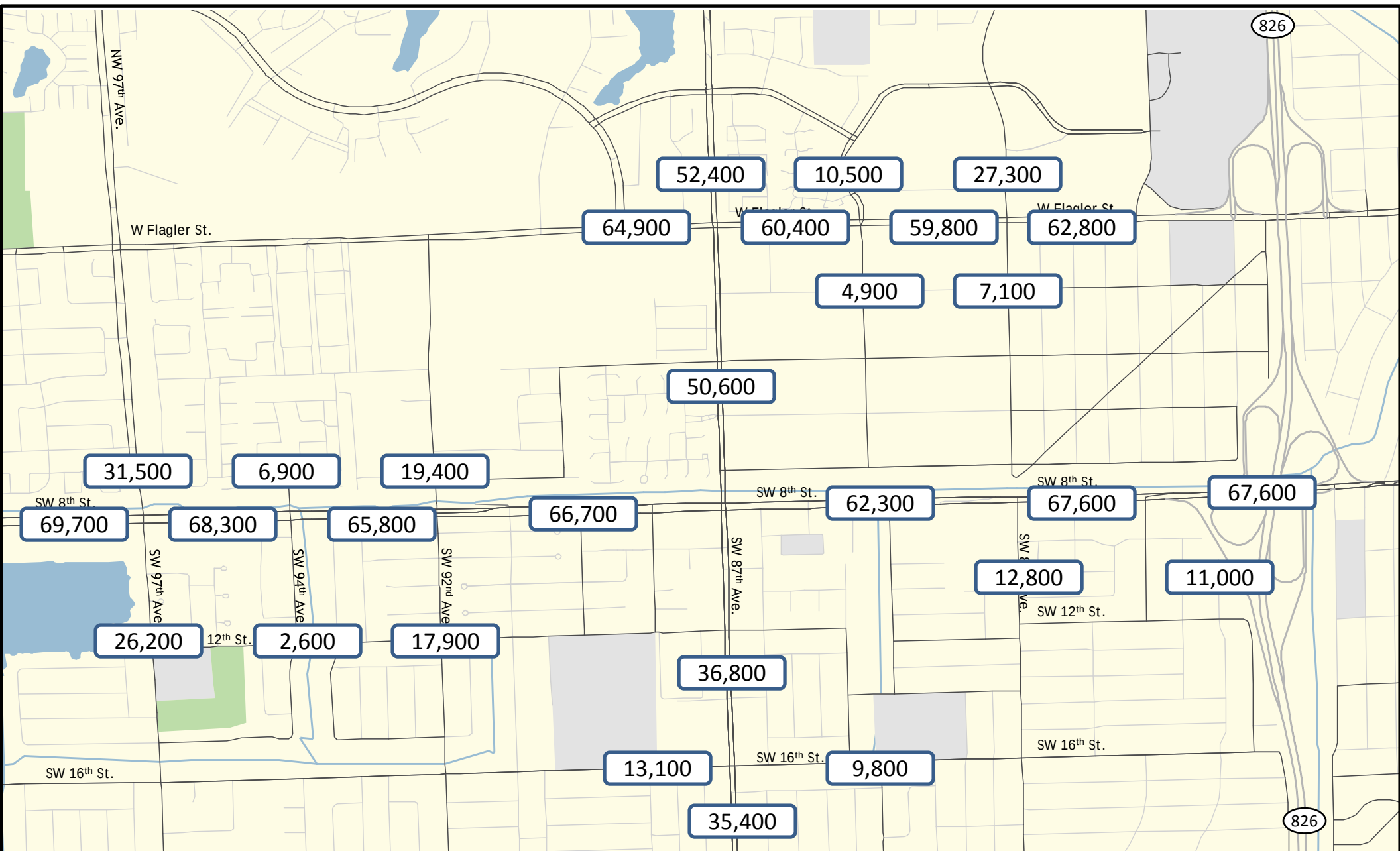


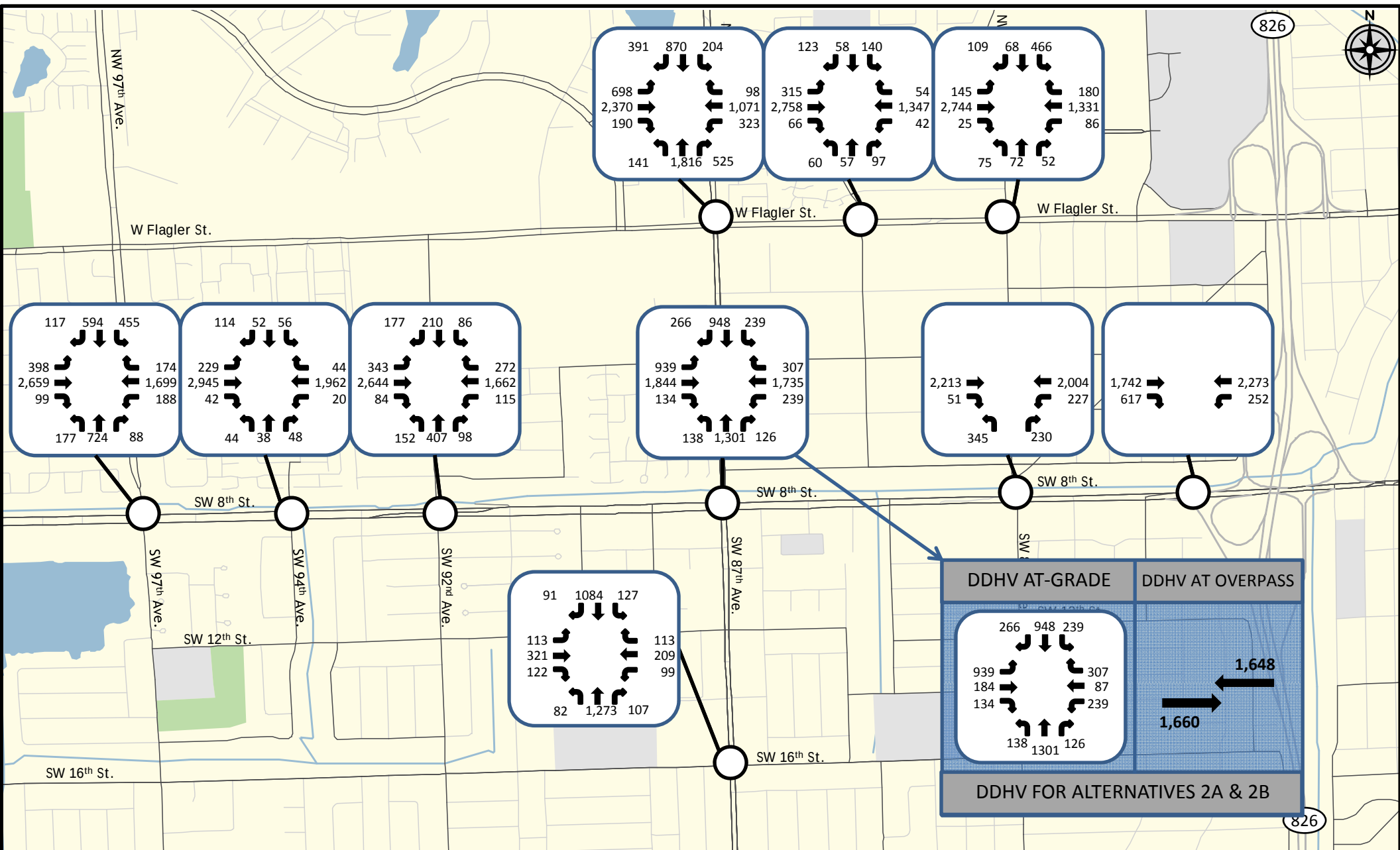


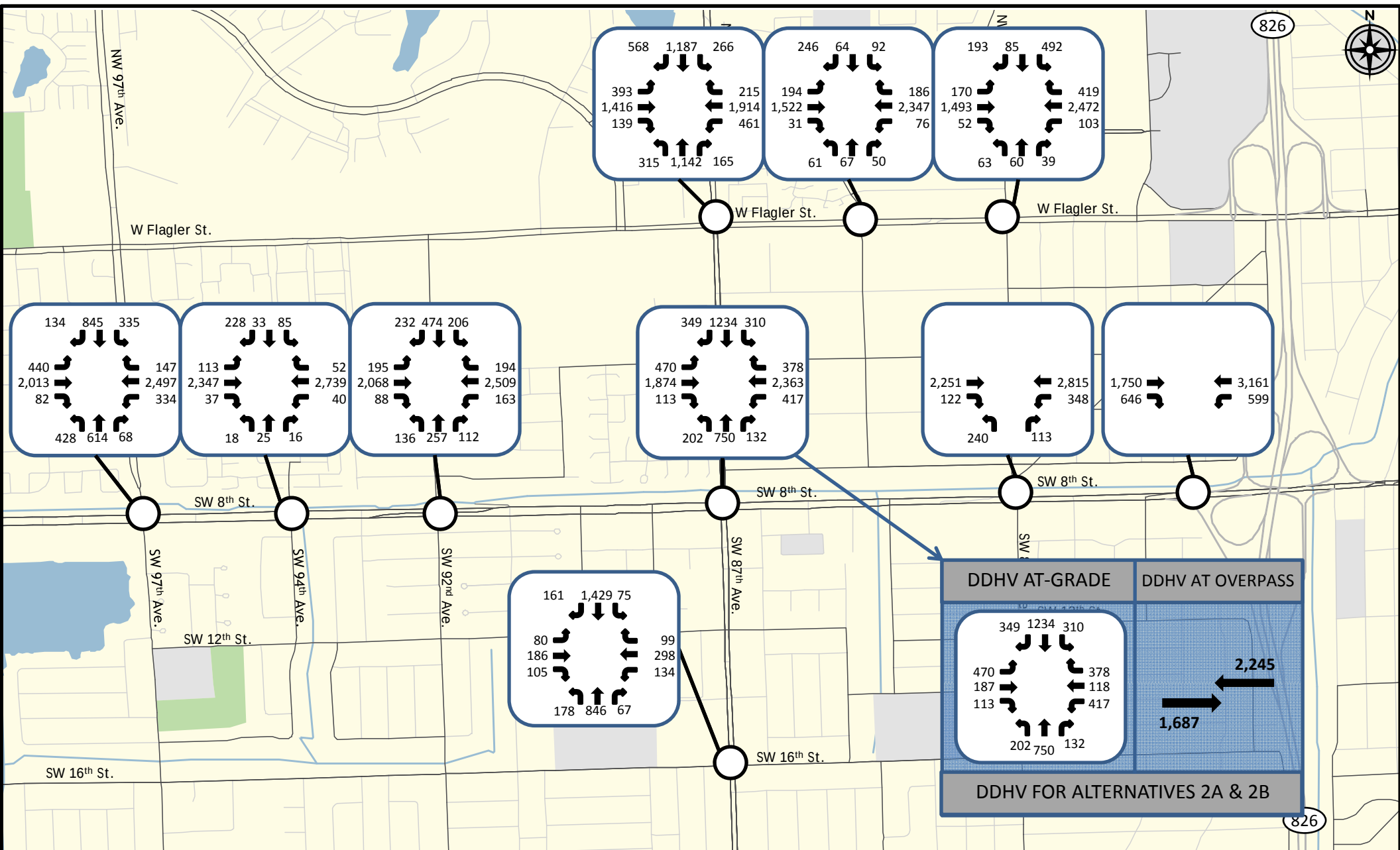


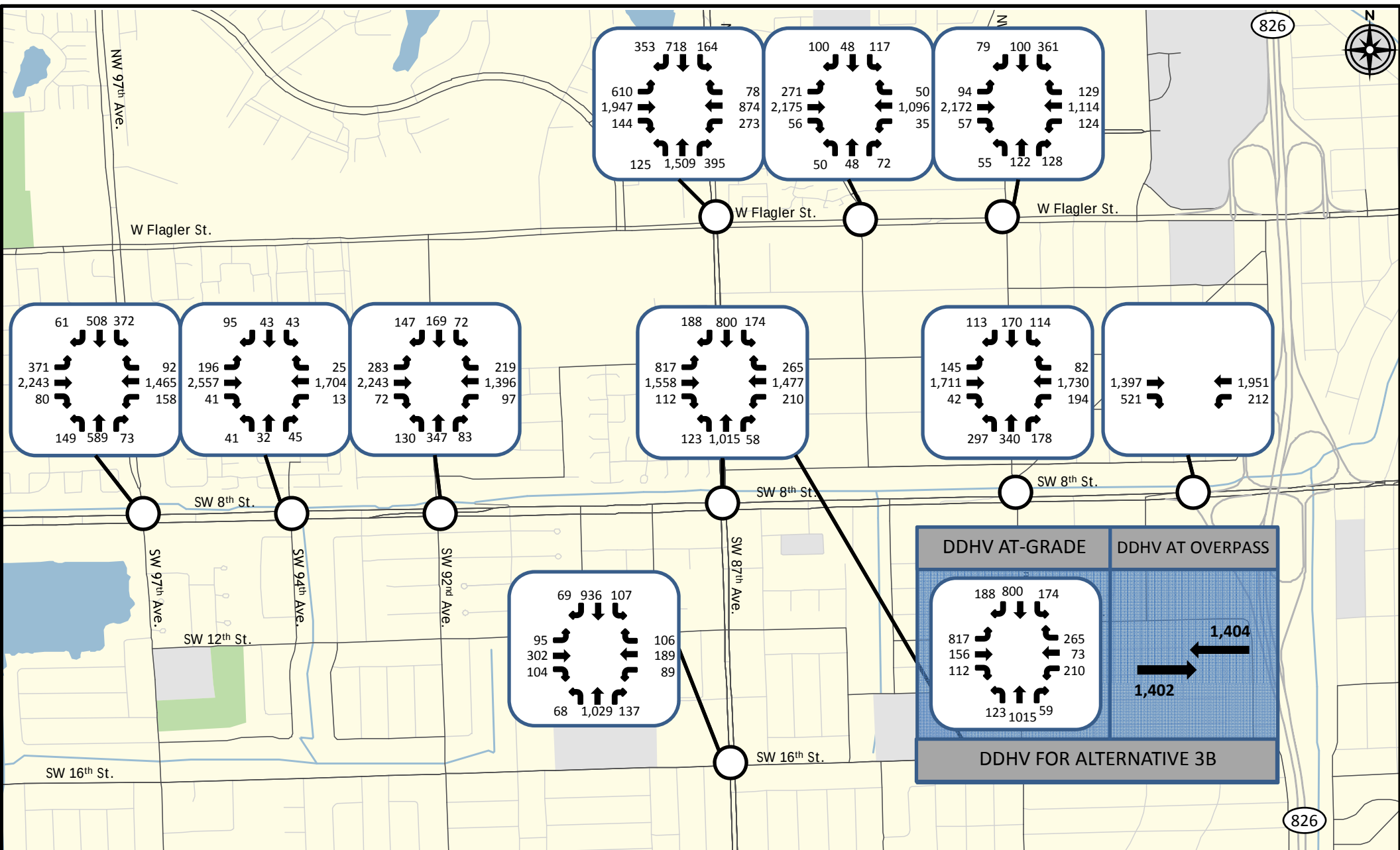


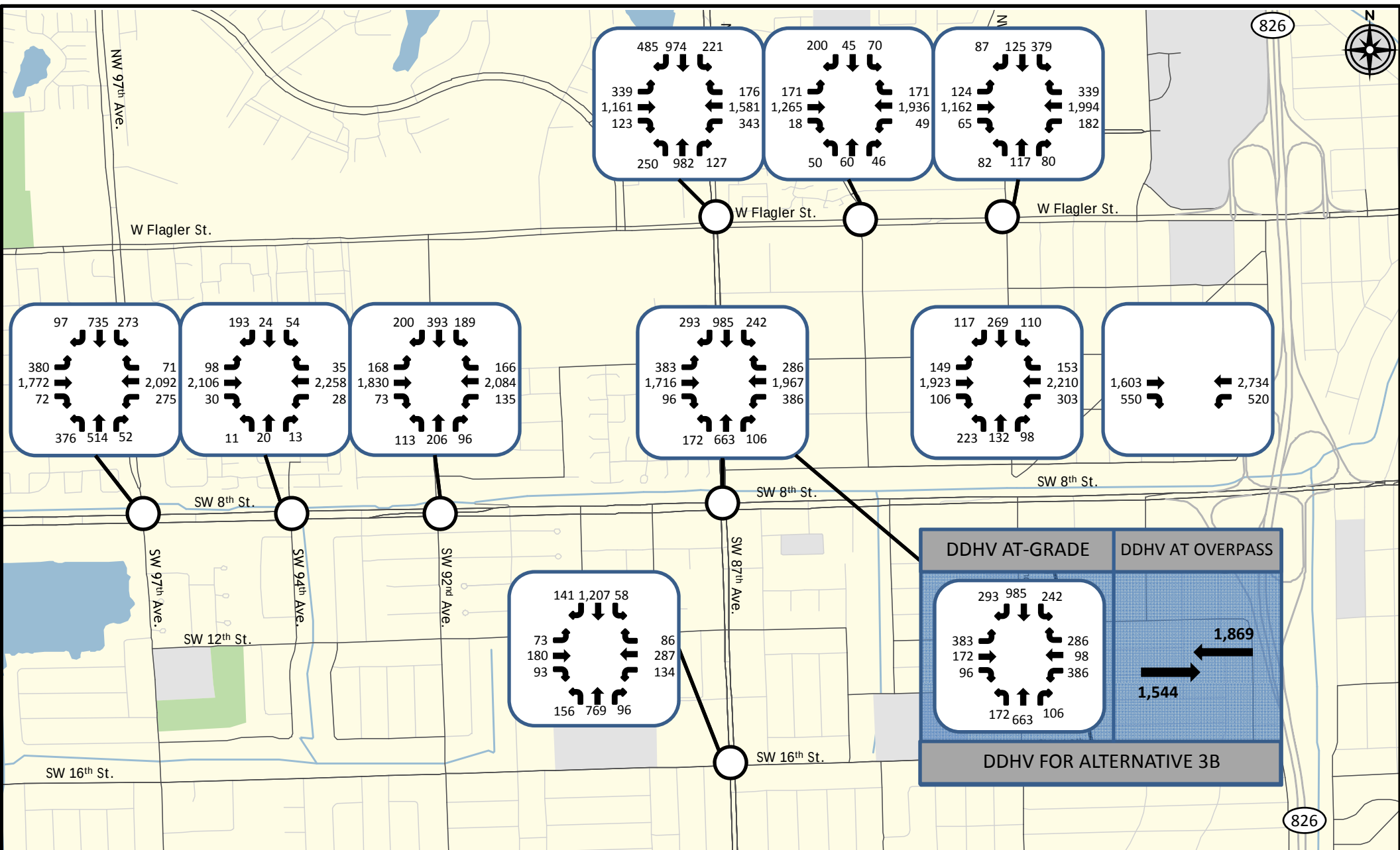


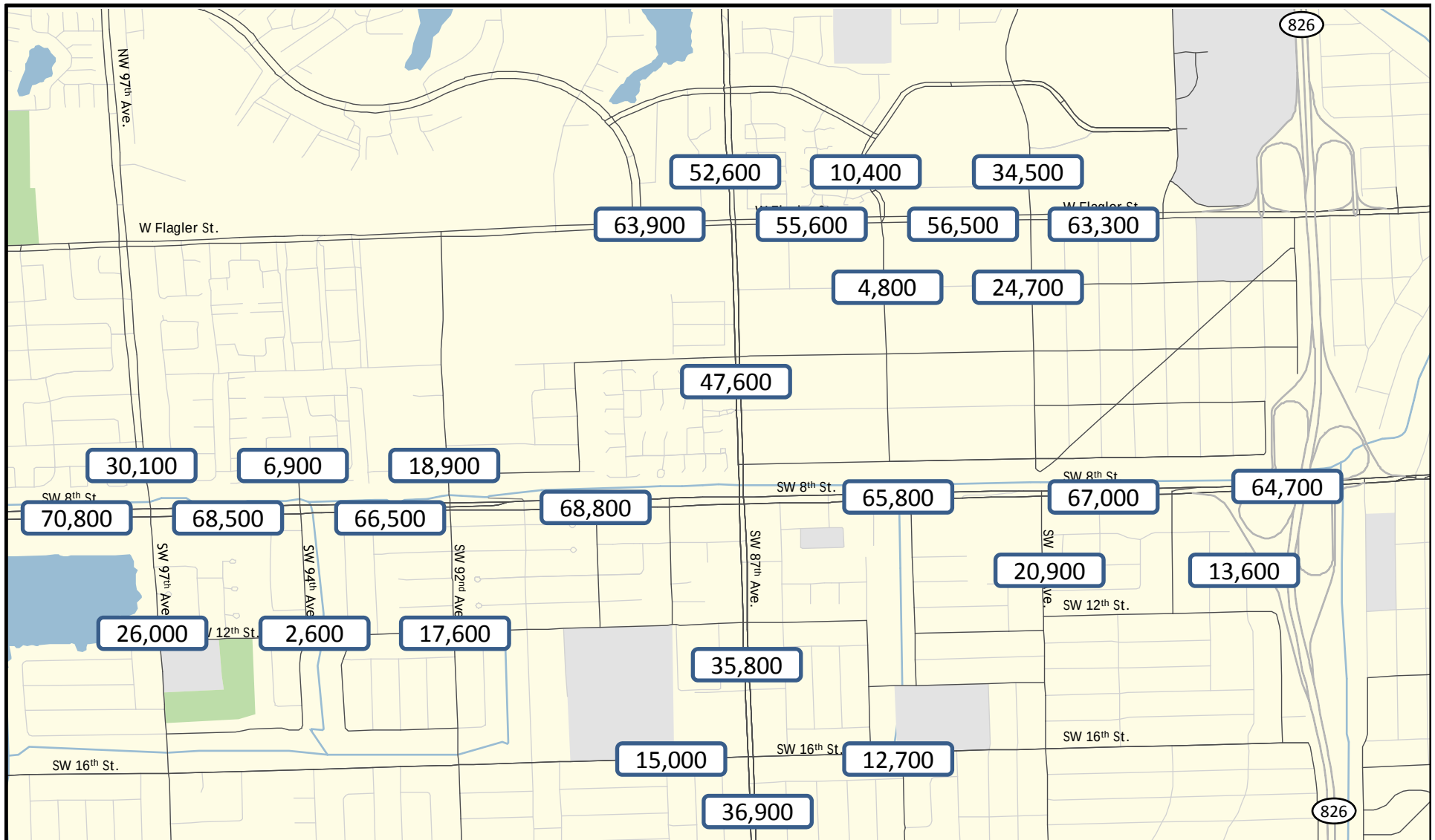








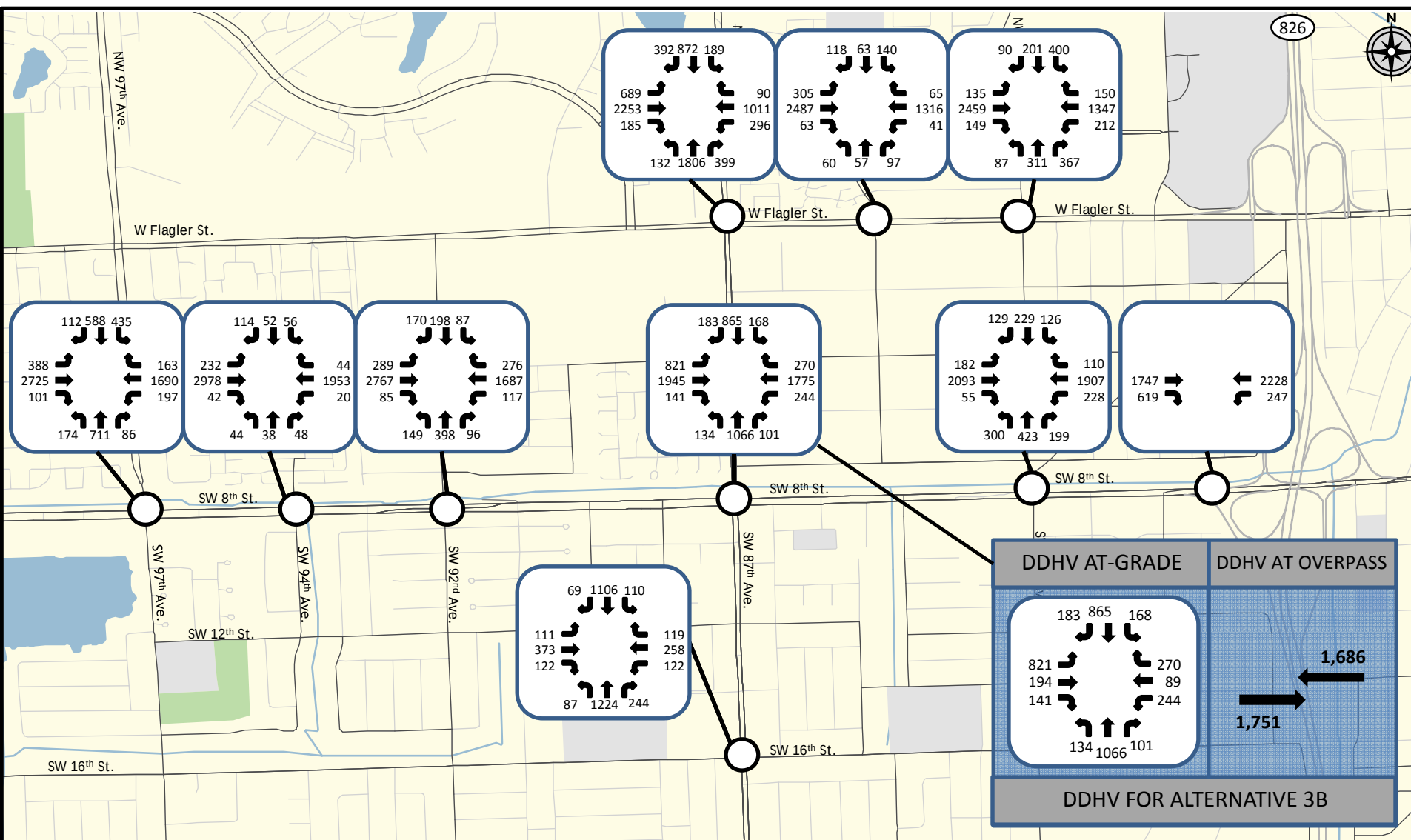




District 6

Design Year 2040 Annual Average Daily Traffic with SW 82nd Avenue Bridge

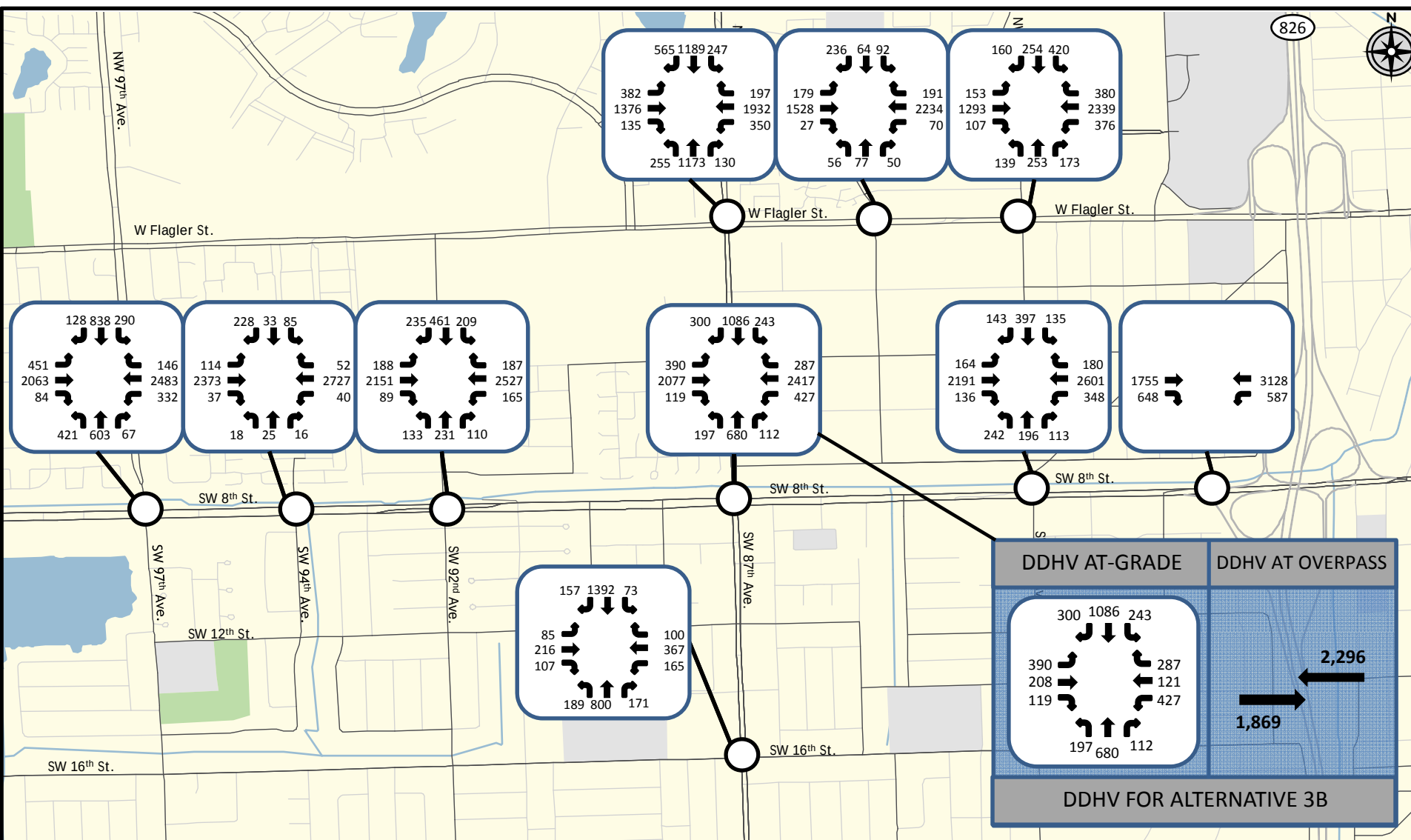
Figure 7-18



District 6

Design Year with SW 82nd Avenue Bridge 2040 – DDHV - AM

Figure 7-19



District 6

Design Year with SW 82nd Avenue Bridge 2040 – DDHV - PM

Figure 7-20

7.4. Existing Operational Analysis (Year 2010)

The existing operational conditions based on the Synchro results are presented in Table 7-6 and Table 7-9 (for Synchro results and additional tables refer to Appendices E and F). The analysis was conducted to document the existing conditions. The analysis uses the existing signal timing at these intersections according to the information obtained from the *Miami-Dade County Public Works Department, Traffic Signals and Signs Division* (included in Appendix D) except for the signal at SW 87th Avenue and SW 16th Street for which no data was available and an optimized signal timing was used. Volumes used correspond to the Turning Movement Counts obtained as part of the data collection effort (included in Appendix C).

AM Peak

The intersection LOS indicates that the intersections at SW 8th Street and SW 97th Avenue and at SW 87th Avenue are operating at LOS “E” for the AM peak. The rest of the signalized intersections between SW 97th Avenue and the entrance ramp to SR-826/Palmetto Expressway are operating at LOS “D” or better. A more detailed analysis of SW 8th Street and SW 87th Avenue indicates that the most critical movements are the NBL, NBT, SBL, SBT, EBL, WBL and WBT. It shall be noted that while the peak directions are the eastbound and northbound; the SBL movement competes with the NBT movement for green time and for that reason this movement experiences high delays despite the rather low volume. A similar condition is experienced by the WBL and WBT movements. These two movements compete for green time with the EBT movement and more importantly with the EBL movement which has a very high volume (over 800 vph) for a left-turn movement and is already exceeding the capacity. For details of the levels of service and delays per movement per approach, please refer to Appendix F, Tables F-1 and F-2.

At the intersection of SW 8th Street and SW 97th Avenue the most critical movements are the SBL and EBL reporting a LOS “F”. The existing signal timing favors the through movements which are experiencing a LOS “D” for all movements except for the WBT movement with a LOS “E”. All other movements operate at LOS “D” or better. The reported average delay for the SBL is 138 seconds while the one for EBL is 201 seconds. These two movements cause the overall intersection to operate at LOS “E” since for the most part the intersection operates at much better levels.

The intersection of West Flagler Street and SW 87th Avenue operates at LOS “D” with the most critical movements being the SBL and the WBL, both operating at LOS “F”. The EBL operates at LOS “E” while the rest of the movements operate at LOS “D” or better. The two movements that are failing at LOS “F” correspond to the movements that compete for green time with the major movements at the intersection which are in the northbound and eastbound direction. Current signal timing favors these movements and hence, the resulting level of service.

In general terms it is observed that the eastbound through movement along SW 8th Street is operating at LOS “B” or better except at the intersections with SW 97th Avenue and at SW 87th Avenue where this movement operates at LOS “D”.

PM Peak

The intersection LOS indicates that the intersections at SW 8th Street and SW 97th Avenue, West Flagler Street at SW 87th Avenue, and SW 8th Street at SW 87th Avenue all operate at LOS “E”. The remaining intersections along SW 8th Street within the study corridor operate at LOS “D” or better.

A more detailed analysis of SW 8th Street and SW 97th Avenue indicates that the most critical movements are the NBL, EBL and WBL operating at LOS “F”. The NBT and SBL movements operate at LOS “E.” It shall be noted that the through movements operate well at LOS “D” or better. This is in part due to the current signal timing which favors the eastbound/westbound movements over the northbound/southbound movements. Also a factor that influences the poor operation of the northbound/southbound movement is that SW 97th Avenue is a two-lane facility south of SW 8th Street, which constraints the capacity at the intersection. North of SW 8th Street, SW 97th Avenue is a four-lane facility. For details of the levels of service and delays per movement per approach, please refer to Appendix F, Tables F-3 and F-4.

The intersection of SW 8th Street and SW 92nd Avenue operates at LOS “D” with the SBT and EBL movements operating at LOS “F.” The NBT, SBL and WBL movements operate at LOS “E.” Traffic volumes in the southbound/northbound direction are relatively small compared to the eastbound/westbound movements and for that reason the signal timing favors these last movements. The WBT movement operates at LOS “A.”

At the intersection of SW 8th Street and SW 87th Avenue the congestion is mainly experienced by the southbound movement during the PM peak period. Despite the LOS “E” reported for the intersection, there are many movements that operate at LOS “F” including the NBL, SBL, SBT, EBL, and WBL. All other movements operate at LOS “D” or better except for the EBT which operates at LOS “E”. The SBT along with the NBL movement are the ones that experience the highest average delays with 103 second for the SBT and 227 seconds for the NBL movement, as these two compete for green time. The EBT movement experiences a LOS “E.” It should be noted that this movement has a higher volume during the PM peak period than during the AM peak period even though the peak direction is westbound during the PM peak.

In general terms, the eastbound traffic experiences a LOS “D” or better at all the intersections along SW 8th Street within the study corridor with the exception of the intersections of SW 87th Avenue (with a reported LOS “E”). In the westbound direction the through movement experiences LOS “D” or better at all intersections. It is also noted that despite the apparent good operation of the WBT movement at SW 8th Street and SW 87th Avenue, field observations indicate this intersection operates at a much worse LOS.

The reason for this is that even though the approach to the intersection has sufficient capacity, the section of the road just east constraints traffic to three travel lanes.

The intersection of West Flagler Street and SW 87th Avenue operates at LOS “E” with the most critical movements being the NBL, EBL and WBL all operating at LOS “F.” Other movements operating at LOS “E” include SBL and SBT. While the signal timing favors the movements in the peak direction, SW 87th Avenue is a four-lane facility south of West Flagler Street and a six-lane facility north of it. The SBT movement is provided with only two through lanes and hence the reported LOS which is worse than the LOS “D” reported for the NBT movement even though the traffic volumes are similar.

Table 7-6 LOS and Delay by Intersection (Year 2010 AM) (Existing Condition)

AM	Existing	
Intersection	SYNCHRO	
	Delay	LOS
SW8 St / SW97 Ave	61.0	E
SW8 St / SW94 Ave	10.0	B
SW8 St / SW92 Ave	44.8	D
SW8 St / SW87 Ave	69.0	E
Flagler St / SW87 Ave	49.1	D
Flagler St / SW84 Ave	18.1	B
Flagler / SW82 Ave	24.1	C
SW8 St / SW82 Ave	26.2	C
SW8 St / SR826 Ramp	7.9	A
SW16 St / SW87 Ave	23.8	C

Table 7-7 LOS and Delay by Intersection (Year 2010 PM) (Existing Condition)

PM	Year 2010 (Existing Year)	
Intersection	SYNCHRO	
	Delay	LOS
SW8 St / SW97 Ave	79.5	E
SW8 St / SW94 Ave	10.9	B
SW8 St / SW92 Ave	51.7	D
SW8 St / SW87 Ave	72.6	E
Flagler St / SW87 Ave	59.9	E
Flagler St / SW84 Ave	18.9	B
Flagler / SW82 Ave	43.8	D
SW8 St / SW82 Ave	39.1	D
SW8 St / SR826 Ramp	5.7	A
SW16 St / SW87 Ave	25.0	C

7.5.Future Conditions

The following sections summarize the Synchro results for each one of the alternatives considered including the No-Build Alternative and six build alternatives (1a, 1b, 2a, 2b, 3a, and 3b – refer to Section 6 for more details on the build alternatives). Section 7.6 compares the results of all alternatives. The following procedure was used to document the Synchro results.

- The Directional Design Hourly Volumes (DDHV) values developed and documented in previous sections of the report were used for the Synchro models.
- The signal timing was established using Synchro to optimize the phase splits and cycle length.
- For Alternatives 2a, 2b and 3b at the intersection of SW 8th Street and SW 87th Avenue the signal timing was manually modified. The reason being that the Synchro optimized phase split consistently provided long green phases for very low volumes of traffic for the through eastbound/westbound movements “at-grade.” These movements remained as part of the model to account for local traffic that will continue to use that phase.
- The following procedure was used for consistency in evaluating all of the alternatives under the different scenarios including 2020 and 2040 AM and PM periods.
- For the SW 87th Avenue and SW 8th Street intersection under the overpass scenario (alternatives 2a, 2b and 3b):
 - Synchro optimized phase splits and cycle lengths were used as starting point.
 - The eastbound/westbound “at-grade” through movements was provided with only 17 seconds for the entire phase inclusive of yellow and all-red time.
 - The eastbound and the westbound left turn movements were provided with the same phase length. The length used was the longest one provided by the optimized phase splits by Synchro to ensure no movement is penalized.
 - The additional green time was allocated entirely to the southbound/northbound through movement.
- For all other intersections, including the SW 8th Street and SW 87th Avenue when no overpass is proposed, the Synchro optimized signal timing was used.
- For the No-Build Alternative and for Alternatives 1a, 1b and 3a the results were summarized from Synchro directly from the summary tables generated by the software.
- For Alternatives 2a, 2b and 3b the results are summarized in the same way as the other alternatives. However, the reported average delay and LOS in the tables correspond only to the operation of the intersection for the traffic that remains at grade, and does not take into consideration the overall delay reductions when considering the improvements experienced by vehicles using the overpass. When applicable, a footnote has been added to the tables to document the average delay and

LOS taking into consideration the traffic on the overpass; which is considered a more accurate representation of the benefits of the alternative.

7.5.1. No-Build Alternative

The No-Build Alternative documents the expected operating conditions of the intersection in absence of any improvements in the future analysis years.

AM Peak

During the AM peak, the operation of the intersections along SW 8th Street is in general good for the year 2020 with the exception of the intersection at SW 87th Avenue which operates at LOS “E.” All other intersections along SW 8th Street continue to operate at LOS “D” or better for the year 2020. The intersection of West Flagler Street and SW 87th Avenue operates at LOS “E” for the year 2020.

For the year 2040 both intersections at SW 87th Avenue and at SW 97th Avenue fail with a LOS “F” while the other intersections along SW 8th Street continue to operate at LOS “D” or better. The intersection at West Flagler Street and SW 87th Avenue also fails with a LOS “F”.

At the SW 8th Street and SW 97th Avenue intersection, the failing movements for the year 2020 include the SBL and WBL movements reporting a LOS “F,” while the NBT operates at LOS “E”. All other movements operate at LOS “D” or better. It shall be noted that for the year 2020 the EBT and WBT still maintained a LOS “D” or better. For the year 2040 movements already experiencing LOS “F” include the NBT, SBL, EBL, EBT and WBL. To highlight, the EBT movement is failing along with the NBT movements, that is, the two main movements are already failing at this intersection for the year 2040. For a detail of failing movements, please refer to the Synchro Summary Sheets provided in Appendix F (Tables F-5 and F-6).

At the SW 8th Street and SW 87th Avenue intersection there are many movements already failing as early as year 2020. The NBL, NBT, SBL and EBL movements operate under LOS “F” while the SBT, WBL and WBT movements operate at LOS “E.” Other movements operate at LOS “D” or better including the EBT movement. However, for the design year 2040 the majority of the movements are operating under LOS “F” with only the right-turn movements (NBR, EBR and WBR) operating at LOS “D” or better and the EBT movement operating at LOS “E.”

The intersection of West Flagler Street and SW 87th Avenue has movements already failing by the year 2020 operating at LOS “F” including the NBT, SBL, EBL and WBL movements. The NBT and EBL movements are in the peak direction for the AM peak while the other two failing movements correspond to the conflicting movements serving the peak direction, that is, the SBL and WBL movements compete for green time with the two main movements which are NBT and EBT. Except for the EBT and SBT movement operating at LOS “E,” the remaining movements are operating at LOS “D” or better. For the year 2040 there are movements operating at LOS “F” including the NBT, SBL, EBL,

EBT and WBL. Except for the WBT, SBR and EBR movements operating at LOS “D” or better, all other movements operate at LOS “E” for the year 2040.

Table 7-8 LOS and Delay by Intersection (Year 2020 - 2040 AM) (No Build)

AM	Year 2020 (Opening Year)		Year 2040 (Design Year)	
Intersection	SYNCHRO			
	Delay	LOS	Delay	LOS
SW8 St / SW97 Ave	42.5	D	90.0	F
SW8 St / SW94 Ave	5.5	A	12.4	B
SW8 St / SW92 Ave	26.0	C	51.8	D
SW8 St / SW87 Ave	72.6	E	116.0	F
Flagler St / SW87 Ave	68.6	E	109.5	F
Flagler St / SW84 Ave	28.1	C	23.6	C
Flagler St/ SW82 Ave	14.2	B	35.5	D
SW8 St / SW82 Ave	18.7	B	23.8	C
SW8 St / SR826 Ramp	2.5	A	2.5	A
SW16 St / SW87 Ave	20.7	C	30.1	C

PM Peak

During the PM peak, the operation of the intersections along SW 8th Street is in general good for the year 2020 with the exception of the intersections at SW 87th Avenue and at SW 97th Avenue operating at LOS “E.” All other intersections along SW 8th Street continue to operate at LOS “D” or better for the year 2020. The intersection of West Flagler Street and SW 87th Avenue also operates at LOS “E.”

For the year 2040 both intersections at SW 87th Avenue and at SW 97th Avenue operate at LOS “F” and the intersection at SW 92nd Avenue operates at LOS “E.” All other intersections along SW 8th Street continue to operate at LOS “D” or better. The intersection at West Flagler Street and SW 87th Avenue also fails with a LOS “F.”

At the SW 8th Street and SW 97th Avenue intersection the failing movements for the year 2020 includes the NBL, SBT, EBL and WBL movements operating at LOS “F.” The peak movement WBT operates at LOS “D” and all other movements operate at LOS “D” or better. For the year 2040 there are only two movements, EBR and WBR operating at LOS “D” or better. The EBT operates at LOS “E” and the rest of the movement fail at LOS “F.” For a detail of failing movements, please refer to the Synchro Summary Sheets provided in Appendix F (Tables F-9 and F-11).

At the SW 8th Street and SW 87th Avenue intersection there are many movements already failing as early as year 2020. The NBL, SBT, EBL, EBT and WBL movements operate at LOS “F” while the WBT operates at LOS “E.” Other movements operate at LOS “D” or better. However, for the design year 2040 the majority of the movements are operating at LOS “F” with only the right-turn movements (NBR, EBR and WBR) and the SBL movement operating at LOS “D” or better and the NBT movement operating at LOS “E.”

The intersection of West Flagler Street and SW 87th Avenue has movements already operating at LOS “F” by the year 2020 including the NBL, SBT and EBL movements. The SBT movement is in the peak direction for the PM peak while the other two failing movements correspond to the conflicting movements serving the peak direction, that is, the NBL and EBL movements compete for green time with the two main movements which are the SBT and WBT. The WBT movement operates at LOS “E” while all other movements operate at LOS “D” or better. For the year 2040 very few movements (EBR, NBT and NBR) operate at LOS “C” or better. The EBT and WBL operate at LOS “E” while all other movements fail at LOS “F.”

Table 7-9 LOS and Delay by Intersection (Year 2020 - 2040 PM) (No Build)

PM	Year 2020 (Opening Year)		Year 2040 (design Year)	
Intersection	SYNCHRO			
	Delay	LOS	Delay	LOS
SW8 St / SW97 Ave	60.4	E	108.9	F
SW8 St / SW94 Ave	8.6	A	12.7	B
SW8 St / SW92 Ave	26.9	C	56.6	E
SW8 St / SW87 Ave	77.9	E	138.2	F
Flagler St / SW87 Ave	56.6	E	105.2	F
Flagler St / SW84 Ave	17.0	B	18.2	B
Flagler St/ SW82 Ave	26.8	C	49.4	D
SW8 St / SW82 Ave	11.8	B	17.2	B
SW8 St / SR826 Ramp	4.7	A	5.9	A
SW16 St / SW87 Ave	18.4	B	29.3	C

7.5.2. Alternative 1A (At Grade Improvements – Full)

This section documents the operating conditions for the years 2020 and 2040 for this alternative. Improvements included in this alternative are concentrated along SW 8th Street in the area between SW 92nd Avenue and the ramp to SR-826/Palmetto Expressway, and along SW 87th Avenue between SW 8th Street and West Flagler Street. Many of the intersections documented in the table in this section including SW 8th Street at SW 97th Avenue and at SW 94th Avenue; West Flagler Street at SW 84th Avenue and at SW 82nd Avenue; and SW 16th Street at SW 87th Avenue remain with the same configuration as the No-Build Alternative and operate the same as under the No-Build Alternative. For that reason, those intersections are not discussed in the analysis and only the intersections affected by this alternative configuration are discussed in the following subsection.

AM Peak

During the AM peak for the year 2020 all intersections along SW 8th Street operate at LOS “D” or better. In particular the intersection at SW 8th Street and SW 87th Avenue operates at LOS “D,” an improvement as compared to the No-Build condition. The intersections of SW 8th Street at SW 82nd Avenue, SW 8th Street at SW 92nd Avenue and SW 8th Street at the ramp to SR-826/Palmetto Expressway also experienced marginal improvements in terms of delay reductions, operating at very good level of service.

For the year 2040, the intersection of SW 8th Street and SW 97th Avenue operates at LOS “F,” while the intersection of SW 8th Street and SW 87th Avenue operates at LOS “E,” an improvement over the No-Build condition where this intersection operated at LOS “F.” The intersection of SW 8th Street and SW 82nd Avenue also improved from a LOS “C” to a LOS “B”. The intersections of SW 8th Street and SW 92nd Avenue and at the ramp to SR-826/Palmetto Expressway both experienced also marginal improvements in terms of delay reductions, both operating at good levels of service.

The intersection of SW 8th Street and SW 87th Avenue is the focus of the improvements included with this alternative. With this alternative configuration for the year 2020 only the SBL movement will experience a LOS “F,” with all other movements operating at LOS “D” or better. For year 2040 the NBL, NBT, SBL and EBL all operate at LOS “F”, while the SBT, WBL and WBT operate at LOS “E”. Only the WBR, EBT and SBR operate at LOS “C” or better. (Refer to Tables F-13 through F-16 in Appendix F for details on the level of service and delay per movement for each intersection).

The intersection at SW 8th Street and SW 82nd Avenue also experiences improvements when compared to the No-Build Alternative in particular for the NBL movement which improves from a LOS “D” to a LOS “C” for year 2020. The NBL also shows significant improvement for year 2040 from a LOS “E” under the No-Build Alternative to a LOS “D” under this alternative.

At West Flagler Street and SW 87th Avenue there are not any improvements in terms of configuration at the approach, even though the NBR and NBL movements appear to benefit from the addition of a third lane in the northbound direction between SW 8th Street and West Flagler Street. This improvement in turn results in slight improvements to the overall intersection benefiting some other movements.

Table 7-10 Level of Service (LOS) and Delay by Intersection Alternative 1A (AM)

AM	Year 2020 (Opening Year)		Year 2040 (design Year)	
Intersection	SYNCHRO			
	Delay	LOS	Delay	LOS
SW8 St / SW97 Ave	42.2	D	90.0	F
SW8 St / SW94 Ave	5.4	A	12.4	B
SW8 St / SW92 Ave	19.3	B	51.0	D
SW8 St / SW87 Ave	37.2	D	70.6	E
Flagler St / SW87 Ave	62.7	E	109.5	F
Flagler St / SW84 Ave	14.9	B	23.6	C
Flagler St/ SW82 Ave	21.0	C	35.5	D
SW8 St / SW82 Ave	7.6	A	14.4	B
SW8 St / SR826 Ramp	2.5	A	2.5	A
SW16 St / SW87 Ave	17.0	B	30.1	C

PM Peak

During the PM peak for the year 2020 all intersections along SW 8th Street operate at LOS “D” or better except for the intersection of SW 8th Street and SW 97th Avenue which operates at LOS “E.” In particular the intersection of SW 8th Street and SW 87th Avenue operates at LOS “D,” which is an improvement over the No-Build condition which operates at LOS “E,” and results in a reduction in the average delay from 78 seconds to 38 seconds. SW 8th Street and SW 82nd Avenue also experiences an improvement operating at LOS “A” when compared to LOS “B” for the No-Build alternative.

For the year 2040 the only intersection along SW 8th Street that operates at LOS “F” is at SW 97th Avenue, unlike under the No-Build Alternative when also the SW 87th Avenue intersection failed at LOS “F”. There is a significant improvement for the SW 87th Avenue intersection from a LOS “F” for the No-Build Alternative to a LOS “E”; the average delay at the SW 87th Avenue intersection is reported at 75 seconds compared to the 138 seconds for the No-Build Alternative.

The intersection of SW 8th Street and SW 87th Avenue is the focus of the improvements under this alternative. Under this alternative configuration none of the movements operate at LOS “F” for year 2020 and only the NBL and WBL operate at LOS “E” with all other movements operating at LOS “D” or better for this year. For year 2040 however, the NBL, SBT, EBL and WBL operate at LOS “F” while the SBL, EBT and WBT operate at LOS “E.” All other movements operate at LOS “D” or better. There is an improvement for the year 2020 with no failing movements when compared to the No-Build Alternative which experiences a number of failing movements. For the year 2040, even though the level of service remains similar for many of the movements at LOS “F”, there are improvements in terms of delay for the major movements. For instance, the NBL delay is reduced from 209 seconds to 169 seconds, the SBT delay is reduced from 168 seconds to 108 seconds, the EBL delay is reduced from 175 seconds to 145 seconds, the EBT delay is reduced from 134 seconds to 69 seconds, the WBL delay is reduced from 204 seconds to 103 seconds, and the WBT delay is reduced from 161 seconds to 70 seconds. (Please refer to Tables F-17 through F-20 located in Appendix F for details of the levels of service and delay by approach movement).

Table 7-11 Level of Service (LOS) and Delay by Intersection Alternative 1A (PM)

PM	Year 2020 (Opening Year)		Year 2040 (design Year)	
Intersection	SYNCHRO			
	Delay	LOS	Delay	LOS
SW8 St / SW97 Ave	63.2	E	111.7	F
SW8 St / SW94 Ave	5.5	A	16.6	B
SW8 St / SW92 Ave	29.2	C	76.0	E
SW8 St / SW87 Ave	37.4	D	75.4	E
Flagler St / SW87 Ave	59.3	E	109.1	F
Flagler St / SW84 Ave	17.6	B	25.7	C
Flagler St/ SW82 Ave	26.6	C	50.7	D
SW8 St / SW82 Ave	8.2	A	17.6	B
SW8 St / SR826 Ramp	4.8	A	3.9	A
SW16 St / SW87 Ave	18.9	B	41.0	D

7.5.3. Alternative 1B (At Grade Improvements - Partial)

This section documents the operating conditions for year 2020 and 2040 under this alternative. Improvements under this alternative are concentrated in the area between SW 92nd Avenue and SW 82nd Avenue along SW 8th Street. Most of the intersections documented in the table in this section remain with the same configuration as the No-Build Alternative and operate the same as under the No-Build Alternative including the following locations: SW 8th Street at SW 97th Avenue, SW 94th Avenue, Flagler Street at SW 84th Avenue, SW 87th Avenue and at SW 82nd Avenue, and SW 16th Street at SW 87th Avenue. For that reason, the intersections listed above are not discussed in the analysis and only intersections affected by this alternative configuration are discussed.

AM Peak

During the AM peak for the year 2020, all intersections along SW 8th Street operate at LOS “D” or better. The intersections being modified as part of this alternative experience changes in terms of level of service, with the most important one being SW 87th Avenue improving from LOS “E” to LOS “D.” All other intersection experiencing improvements in terms of level of service are already operating well at LOS “C” or better.

The results for the year 2040 are very similar to those for year 2020. The only intersection experiencing an improvement in terms of level of service is SW 82nd Avenue which reports LOS “B” compared to the LOS “C” for the No-Build Alternative. Similarly SW 87th Avenue and SW 92nd Avenue report the same level of service as under the No-Build Alternative at LOS “F” and “D” correspondingly. There are no improvements in terms of average delay for the SW 92nd Avenue intersection. Instead, the average delay at SW 87th Avenue is reduced from 116 seconds to 91 seconds.

The intersection of SW 8th Street and SW 87th Avenue is the focus of the improvements under this alternative. Under this alternative configuration the NBT, SBL and EBL operate at LOS “F” for year 2020. All other movements operate at LOS “D” or better. There are improvements in terms of level of service reported at the NBL, NBR, SBT, EBT, WBL, WBT and WBR when compared to the No-Build Alternative with the most important ones being the NBL which improves from LOS “F” to LOS “D” and the SBT which improves from LOS “E” to LOS “C”. WBL and WBT also improve from LOS “E” to LOS “D.” The improvements for the main movements are not really significant. The NBT average delay is reduced from 107 seconds to 96 seconds and the EBL average delay is reduced from 107 seconds to 93 seconds. There are other movements that experience significant improvements, even though these are not the most critical movements for this peak period. These include the SBT with an improvement from 72 seconds to 29 seconds of average delay. (Refer to Tables F-21 through F-24 in Appendix F for details of the level of service and delays per movement).

For year 2040 at the SW 8th Street and SW 87th Avenue intersection there are many movements reporting LOS “F” including the NBT, SBL, EBL, WBL and WBT movements. One of the main movements, EBT, reports a LOS “D” and the NBL movements operates at LOS “E.” All other movements operate at LOS “D” or better.

The intersection at SW 8th Street and SW 82nd Avenue also experiences some improvements when compared to the No-Build Alternative. However, all movements at this intersection operate already at LOS “D” or better under the No-Build Alternative for year 2020. The NBL also shows significant improvement for year 2040 from a LOS “E” under the No-Build Alternative to a LOS “D” under this alternative.

Table 7-12 Level of Service (LOS) and Delay by Intersection Alternative 1B (AM)

AM	Year 2020 (Opening Year)		Year 2040 (design Year)	
Intersection	SYNCHRO			
	Delay	LOS	Delay	LOS
SW8 St / SW97 Ave	42.2	D	90.0	F
SW8 St / SW94 Ave	5.4	A	12.4	B
SW8 St / SW92 Ave	19.2	B	51.0	D
SW8 St / SW87 Ave	50.8	D	91.2	F
Flagler St / SW87 Ave	62.3	E	109.5	F
Flagler St / SW84 Ave	14.9	B	23.6	C
Flagler St/ SW82 Ave	21.0	C	35.5	D
SW8 St / SW82 Ave	8.3	A	16.8	B
SW8 St / SR826 Ramp	2.8	A	2.3	A
SW16 St / SW87 Ave	17.0	B	30.1	C

PM Peak

During the PM peak for year 2020 all intersections along SW 8th Street operate at LOS “D” or better except the intersection at SW 8th Street and SW 97th Avenue which operates at LOS “E.” In particular, the intersection at SW 8th Street and SW 87th Avenue operates at LOS “D,” an improvement over the No-Build condition which operates at LOS “E” resulting in an average delay reduction from 78 seconds to 38 seconds. The intersection of SW 8th Street and SW 82nd Avenue also experiences an improvement operating at LOS “A” when compared to LOS “B” for the No-Build alternative.

For the year 2040 the intersections along SW 8th Street at SW 92nd Avenue and at SW 87th Avenue operate at LOS “E” while the intersection at SW 97th Avenue operates at LOS “F.” There is a significant improvement on the average delay at the SW 87th Avenue intersection with a reported delay of 77 seconds compared to the 138 seconds for the No-Build Alternative.

The intersection of SW 8th Street and SW 87th Avenue is the focus of the improvements under this alternative. For the year 2020 under this alternative configuration none of the movements operate at LOS “F”. However, the NBL, SBL, and WBL movements operate at LOS “E,” while the remaining movements operate at LOS “D” or better. The most significant improvement is to the SBT movement since it is in the peak direction of traffic for this period and is improved from LOS “F” to LOS “C.” In addition, there are other movements that experience significant improvements including the EBL, EBT, NBL and WBL all of which would otherwise fail under the No-Build Alternative. For a detail of failing movements, please refer to the Synchro Summary Sheets provided in Appendix F (Tables F-25 through F-28).

For the year 2040, there are no major improvements at the intersection of SW 8th Street and SW 87th Avenue in terms of level of service from the No-Build Alternative, except the SBL, EBT and WBT all of which improve from a failing LOS “F” under the No-Build Alternative to LOS “E” or better under the proposed configuration. All other movements operating at LOS “F,” under the No-Build Alternative continue to operate at this level of service. However, the reported average delays show improvements for the main movements for this peak period: the SBT and WBT both report reductions from 168 seconds to 103 seconds for the SBT, and from 160 seconds to 76 seconds for the WBT movement.

Table 7-13 Level of Service (LOS) and Delay by Intersection Alternative 1B (PM)

PM	Year 2020 (Opening Year)		Year 2040 (design Year)	
Intersection	SYNCHRO			
	Delay	LOS	Delay	LOS
SW8 St / SW97 Ave	63.2	E	111.7	F
SW8 St / SW94 Ave	5.5	A	16.6	B
SW8 St / SW92 Ave	29.1	C	76.0	E
SW8 St / SW87 Ave	38.3	D	77.1	E
Flagler St / SW87 Ave	59.3	E	109.1	F
Flagler St / SW84 Ave	17.6	B	25.7	C
Flagler St/ SW82 Ave	26.5	C	50.7	D
SW8 St / SW82 Ave	9.8	A	20.8	C
SW8 St / SR826 Ramp	5.0	A	6.6	A
SW16 St / SW87 Ave	18.9	B	41.0	D

7.5.4. Alternative 2A (Overpass – Partial Alternative)

This section documents the operating conditions for the years 2020 and 2040 for Alternative 2A, which consists of the overpass over SW 87th Avenue but without widening of SW 87th Avenue. The improvements are concentrated in the area between SW 92nd Avenue and SW 82nd Avenue along SW 8th Street. Most of the intersections documented in the tables in this section remain with the same configuration and operate the same as the No-Build Alternative. These intersections are listed as follows: SW 8th Street and SW 97th Avenue, SW 8th Street and SW 94th Avenue, Flagler Street and SW 84th Avenue, Flagler Street and SW 87th Avenue, Flagler Street and SW 82nd Avenue, and SW 16th Street and SW 87th Avenue. For that reason, those intersections are not discussed in the analysis and only the intersections affected by this alternative configuration are discussed in this subsection.

AM Peak

During the AM peak for the year 2020, all intersections along SW 8th Street operate at LOS “C” or better except for the intersection of SW 97th Avenue which operates at LOS “D.” The intersection of SW 87th Avenue experiences significant improvements as a result of the overpass, operating at LOS “D” at-grade and an overall LOS “C” when considering traffic using the overpass. At the SW 87th Avenue intersection the average delay is reduced from 73 seconds (No-Build Alternative) to 48 seconds (at-grade operations), and is further reduced to 29 seconds overall when considering traffic on the overpass.

For the year 2040 the intersection at SW 8th Street and SW 97th Avenue operates at LOS “F” and the intersection of SW 8th Street and SW 87th Avenue operates at LOS “E” (LOS “C” when considering the overpass). In the particular case of SW 87th Avenue, the intersection improves from the LOS “F” reported for the No-Build Alternative to a LOS “E” (LOS “C” when considering overpass) and there is a reduction in average delay from 116 seconds (No-Build Alternative) to 58 seconds (at-grade intersection) and to 34 seconds

when considering traffic using the overpass. For both years, 2020 and 2040, the SW 8th Street and SW 82nd Avenue intersection experiences marginal improvements operating at LOS “B” or better when compared to the No-Build Alternative LOS “C” or better. (Refer to Appendix F, Tables F-29 through F-32 for a detail on the LOS and delay per movement)

The intersection of SW 8th Street and SW 87th Avenue is the focus of the improvements included in this alternative. For the year 2020 under this alternative configuration, only the SBL and WBR movement operate at LOS “F” while the EBL movement operates at LOS “E.” All other movements, including the main movements, operate at LOS “D” or better with the added benefits, except for local traffic, that the EBT and WBT movement operate as free flow and experience no delay at this intersection. Even though the SBL movement reports a LOS “F,” it experiences significant reductions in average delay from 161 seconds for the No Build Alternative to 98 seconds under this configuration.

For the year 2040, the SBL, EBL, and WBR movements all operate at LOS “F.” With the exception of the EBL movement, these are minor movements. These failing movements still experience improvements in terms of average delay reporting reductions from 213 seconds to 159 seconds for the SBL and from 219 seconds to 81 seconds for EBL, this last one considered a key movement at this intersection during the AM peak. The major movements that remain at-grade operate at LOS “E” or better including the NBT movement, and the SBT movement operating at LOS “A.” In the particular case of the NBT movement, the reduction in average delay is from 166 seconds to 55 seconds.

Table 7-14 Level of Service (LOS) and Delay by Intersection Alternative 2A (AM)

AM	Year 2020 (Opening Year)		Year 2040 (design Year)	
Intersection	SYNCHRO			
	Delay	LOS	Delay	LOS
SW8 St / SW97 Ave	42.5	D	81.7	F
SW8 St / SW94 Ave	5.5	A	13.0	B
SW8 St / SW92 Ave	26.5	C	40.6	D
SW8 St / SW87 Ave	48.0*	D*	58.1*	E*
Flagler St / SW87 Ave	68.6	E	108.3	F
Flagler St / SW84 Ave	28.1	C	20.1	C
Flagler St/ SW82 Ave	14.2	B	27.0	C
SW8 St / SW82 Ave	9.0	A	12.0	B
SW8 St / SR826 Ramp	2.1	A	5.3	A
SW16 St / SW87 Ave	20.7	C	30.1	C

Note: The reported delay and LOS for the SW 8th Street and SW 87th Avenue intersection only considers at-grade traffic. When considering traffic using overpass the following are the results. 2020 (28.6 seconds, LOS “C”); 2040 (34.4 seconds, LOS “C”)

PM Peak

During the PM peak for the year 2020, all intersections along SW 8th Street operate at LOS “D” or better except for the intersection of SW 97th Avenue which operates at LOS “E.” The intersection of SW 87th Avenue experiences significant improvements as a result of the overpass, operating at LOS “C” at-grade and an overall LOS “B” when considering traffic using the overpass.

For the intersection of SW 87th Avenue and SW 8th Street during the PM peak period of the year 2020, an analysis of each movement by approach reveals that all movements operate at LOS “D” or better (refer to Appendix F, Tables F-33 through F-36 for a detail on the delay and level of service per movement per approach).

Table 7-15 Level of Service (LOS) and Delay by Intersection Alternative 2A (PM)

AM	Year 2020 (Opening Year)		Year 2040 (design Year)	
Intersection	SYNCHRO			
	Delay	LOS	Delay	Delay
SW8 St / SW97 Ave	68.1	E	108.9	F
SW8 St / SW94 Ave	6.6	A	12.8	B
SW8 St / SW92 Ave	36.6	D	67.7	E
SW8 St / SW87 Ave	28.0*	C*	35.6*	D*
Flagler St / SW87 Ave	60.0	E	109.8	F
Flagler St / SW84 Ave	15.5	B	17.6	B
Flagler St/ SW82 Ave	26.5	C	49.5	D
SW8 St / SW82 Ave	11.3	B	13.5	B
SW8 St / SR826 Ramp	5.9	A	6.2	A
SW16 St / SW87 Ave	27.8	C	41.0	D

Note: The reported delay and LOS for the SW 8th Street and SW 87th Avenue intersection only considers at-grade traffic. When considering traffic using overpass the following are the results. 2020 (15.1 seconds, LOS “B”); 2040 (19.0 seconds, LOS “B”)

During the PM peak for the year 2040, the intersections of SW 8th Street and SW 97th Avenue, and Flagler Street and SW 87th Avenue both operate at a LOS “F”. At both of these intersections most movements operate at LOS “F” or “E” with just two exceptions, which are mainly the EBR and WBR for the intersection of SW 8th Street and SW 97th Avenue (both operating at a LOS “B”) and the NBR and EBR for the intersection of Flagler Street and SW 87th Street, operating at LOS “B” and “C” respectively. All other intersections along SW 8th Street operate at LOS “D” or better. In the particular case of SW 87th Avenue it operates at LOS “D” for the at-grade traffic and LOS “B” when considering traffic on the overpass.

For the intersection of SW 87th Avenue and SW 8th Street, during the PM peak period of the year 2040 an analysis of each movement by approach reveals that all movements operate at LOS “D” or better with the exception of the EBL and WBL movements which all operate at LOS “E.” This is still a significant improvement over the LOS “F” reported for these two movements under the No-Build Alternative.

7.5.5. Alternative 2B (Overpass - Full)

This section documents the operating conditions for the years 2020 and 2040 under this alternative. The improvements included in this alternative are mainly concentrated along SW 8th Street between SW 92nd Avenue and the ramp to SR-826/Palmetto Expressway, and along SW 87th Avenue between SW 8th Street and West Flagler Street.

Most of the intersections documented in the table in this section remain with the same configuration as the No-Build Alternative and operate the same as under the No-Build Alternative including the following locations: SW 8th Street and SW 97th Avenue, SW 8th Street and SW 94th Avenue, Flagler Street and SW 84th Avenue, Flagler Street and SW 87th Avenue, Flagler Street and SW 82nd Avenue, and SW 16th Street and SW 87th Avenue. For that reason, those intersections are not discussed in the analysis and only the intersections affected by this alternative configuration are discussed.

AM Peak

During the AM peak for the year 2020, all intersections along SW 8th Street operate at LOS “C” or better with the exception of the intersection of SW 97th Avenue which reported a LOS “D.” The intersection of SW 87th Avenue experiences significant improvements as a result of the overpass, operating at LOS “C” at-grade and an overall LOS “B” when considering traffic using the overpass. The average delay is reduced from 73 seconds for the No-Build Alternative to 28 seconds for at-grade operations, and is reduced to 16 seconds overall when considering traffic on the overpass.

For the year 2040, the intersection of SW 8th Street and 97th Avenue operates at LOS “F” and the intersection of SW 8th Street and SW 87th Avenue operates at LOS “D” (LOS “C” when considering the overpass). In the particular case of SW 87th Avenue, the intersection improves from the LOS “F” experienced for the No-Build Alternative to a LOS “C,” and there is a reduction in the average delay from 116 seconds for the No-Build Alternative to 41 seconds for the at-grade intersection scenario. The average delay is reduced to 24 seconds when considering traffic using the overpass. All other intersections operate at LOS “D” or better.

The intersection of SW 8th Street and SW 87th Avenue is the focus of the improvements considered under this alternative. For the year 2020, only the WBR movement operates at LOS “E.” All other movements operate at LOS “D” or better with the added benefit that except for local traffic, the EBT and WBT movement free flow and experience no delay at this intersection. For a detail of delays and levels of service per approach movements, refer to the Synchro Summary Sheets provided in Appendix F (Tables F-37 through F-40).

For the year 2040, only the WBR movement operates at LOS “F.” The SBL and EBL movements operate at LOS “E” while the rest of the movements operate at LOS “D” or better; a significant improvement from the No-Build Alternative (for which seven of the eleven movements reported operate at LOS “F”). In addition, the WBT and EBT traffic both free flow and experience no delay at this intersection.

Table 7-16 Level of Service (LOS) and Delay by Intersection Alternative 2B (AM)

AM	Year 2020 (Opening Year)		Year 2040 (design Year)	
Intersection	SYNCHRO			
	Delay	LOS	Delay	LOS
SW8 St / SW97 Ave	43.4	D	85.1	F
SW8 St / SW94 Ave	6.2	A	8.2	A
SW8 St / SW92 Ave	28.3	C	39.5	D
SW8 St / SW87 Ave	27.7*	C*	41.2*	D*
Flagler St / SW87 Ave	59.7	E	112.0	F
Flagler St / SW84 Ave	15.3	B	20.2	C
Flagler / SW82 Ave	15.1	B	27.0	C
SW8 St / SW82 Ave	13.7	B	16.2	B
SW8 St / SR826 Ramp	4.1	A	1.7	A
SW16 St / SW87 Ave	18.7	B	30.1	C

Note: The reported delay and LOS for the SW 8th Street and SW 87th Avenue intersection only considers at-grade traffic. When considering traffic using overpass the following are the results. 2020 (16.2 seconds, LOS "B"); 2040 (23.8 seconds, LOS "C")

PM Peak

During the PM peak for the year 2020, the intersections along SW 8th Street operate at LOS "C" or better, with the exception of the SW 97th Avenue intersection which reported a LOS "E," and SW 92nd Avenue intersection operating at LOS "D." The intersection of SW 87th Avenue experiences significant improvements as a result of the overpass, from a LOS "E" for the No-Build Alternative to a LOS "C" at-grade for this alternative, and an overall LOS "B" when considering traffic using the overpass. The average delay is reduced from 78 seconds (for the No-Build Alternative) to 26 seconds for this alternative considering at-grade operations, and is reduced to 14 seconds overall when taking into account traffic on the overpass.

For the year 2040, the intersection at SW 8th Street and 97th Avenue operates at LOS "F" and the SW 8th Street and SW 92nd Avenue intersection operates at LOS "E." The SW 8th Street and SW 87th Avenue operates at LOS "C" (LOS "B" when taking into account overpass). In the particular case of SW 87th Avenue, the intersection improves from the LOS "F" reported for the No-Build Alternative to a LOS "B," and a reduction in average delay from 138 seconds (for the No-Build Alternative) to 32 seconds for the at-grade intersection. The average delay is reduced to 17 seconds when considering traffic using the overpass.

The intersection of SW 8th Street and SW 87th Avenue is the focus of the improvements under this alternative. For the year 2020 all movements operate at LOS "D" or better, in addition to the added benefit of the eastbound and westbound through movement free flowing through this intersection and not experiencing any delay. For the year 2040, the NBL and WBL movements operate at LOS "E." All other movements operate at LOS "D" or better. For a detail of delays and levels of service per approach movements, refer to the Synchro Summary Sheets provided in Appendix F (Tables F-41 through F-44).

Table 7-17 Level of Service (LOS) and Delay by Intersection Alternative 2B (PM)

PM	Year 2020 (Opening Year)		Year 2040 (design Year)	
Intersection	SYNCHRO			
	Delay	LOS	Delay	LOS
SW8 St / SW97 Ave	68.0	E	108.9	F
SW8 St / SW94 Ave	6.6	A	12.8	B
SW8 St / SW92 Ave	36.7	D	67.6	E
SW8 St / SW87 Ave	26.4*	C*	32.3*	C*
Flagler St / SW87 Ave	60.0	E	109.8	F
Flagler St / SW84 Ave	15.5	B	17.6	B
Flagler / SW82 Ave	26.5	C	49.5	D
SW8 St / SW82 Ave	11.0	B	12.8	B
SW8 St / SR826 Ramp	5.3	A	5.7	A
SW16 St / SW87 Ave	27.8	C	41.0	D

Note: The reported delay and LOS for the SW 8th Street/SW 87th Avenue intersection only considers at-grade traffic. When considering traffic using overpass the following are the results. 2020 (13.9 seconds, LOS "B"); 2040 (16.8 seconds, LOS "B")

7.5.6. Alternative 3A (Widening of SW 82nd Avenue and New Bridge over the C-4 Canal)

This section documents the operating conditions for the years 2020 and 2040 under this alternative. The improvements included in this alternative mainly consist of the widening of SW 82nd Avenue between SW 16th Street and Flagler Street from a 2-lane facility to 4-lane facility, and the construction of a new bridge at SW 8th Street and SW 82nd Avenue to provide continuity to SW 82nd Avenue as a north-south facility. This alternative does not include any improvements at the intersection of SW 8th Street and SW 87th Avenue, nor does it include any improvements along SW 8th Street other than the improvements in the immediate vicinity of the SW 82nd Avenue and SW 8th Street intersection. Therefore, the only changes at the remainder of the intersections are a result of the traffic re-distribution due to the widening of SW 82nd Avenue and the new bridge.

AM Peak

For the year 2020 the intersections of SW 8th Street at SW 87th Avenue and Flagler Street at SW 87th Avenue presented improvements in terms of a reduction of the resulting delay and the level of service. The intersections of SW 87th Avenue and Flagler Street, and SW 8th Street and SW 87th Avenue went from a LOS "E" to a LOS "D" in the AM peak period in the year 2020. However, the intersection of SW 8th Street and SW 82nd Avenue degraded in level of service from LOS "B" to LOS "C" as a result of the added traffic along SW 82nd Avenue.

It shall be noted that for this alternative all intersections operate a LOS "D" or better in the AM peak for the year 2020. An analysis of the level of service reported by movement at the intersection of SW 87th Avenue and SW 8th Street revealed that the NBT and SBL operate at a LOS "F" and that the EBL and WBL operate at a LOS "E" in the year 2020.

All other movements at this intersection operate at LOS “D” or better. Also to highlight, all movements at the intersection of SW 82nd Avenue and SW 8th Street operate at LOS “D” or better except for the WBL which operates at LOS “E.” Another intersection to consider due to the added traffic from the proposed improvements is at Flagler Street and SW 82nd Avenue. While there is a general increase in delay and degradation in level of service, only the SBL movements fail at LOS “F” and the NBL movement operates at LOS “E.” All other movements at this intersection operate at LOS “D” or better.

For the year 2040 the intersections reported to fail with a LOS “F” include the intersections of SW 8th Street and SW 97th Avenue, and Flagler Street and SW 87th Avenue, both of which also failed under the No-Build Alternative and reported only marginal improvements in delay. The SW 8th Street and SW 87th Avenue intersection along with the Flagler Street and SW 82nd Avenue intersection reported to operate at LOS “E.” All other intersections report a LOS “D” or better for the year 2040. Under this alternative the intersection of SW 8th Street and SW 87th Avenue would experience improvements at LOS “E” from a LOS “F” under the No-Build alternative (reduction in delay from 116 seconds to 72 seconds). As a result of the additional traffic diverted to SW 82nd Avenue, the intersection of Flagler Street and SW 82nd Avenue will experience a decrease in level of service from a LOS “D” to a LOS “E” under this alternative.

For year 2040, an analysis of the level of service reported by movement at the intersection of SW 87th Avenue and SW 8th Street revealed that most movements fail at LOS “F” including the NBL, NBT, SBL, SBT, EBL, and WBL. Additionally the WBT operates at LOS “E”. It is noted included on this failing movements are key AM peak movements such as NBT and EBL. For this year the intersection of SW 82nd Avenue and SW 8th Street reports failing movements at LOS “F” for NBL and WBL, and a LOS “E” for NBT and EBL. At the intersection of Flagler Street and SW 82nd Avenue there are a total of three movements failing at LOS “F” including NBT, SBL, and WBL. NBL and EBT are reported at LOS “E”. For details on the resulting LOS and delay per movement for all intersection within the study area, refer to Appendix F, Tables F-45 through F-48.

Table 7-18 Level of Service (LOS) and Delay by Intersection Alternative 3A (AM)

AM	Year 2020 (Opening Year)		Year 2040 (design Year)	
Intersection	SYNCHRO			
	Delay	LOS	Delay	LOS
SW8 St / SW97 Ave	42.1	D	82.5	F
SW8 St / SW94 Ave	6.4	A	11.1	B
SW8 St / SW92 Ave	20.6	C	32.0	C
SW8 St / SW87 Ave	50.0	D	71.5	E
Flagler St / SW87 Ave	54.8	D	93.0	F
Flagler St / SW84 Ave	14.7	B	18.0	B
Flagler St/ SW82 Ave	27.4	C	68.4	E
SW8 St / SW82 Ave	27.0	C	37.6	D
SW8 St / SR 826 Ramp	4.8	A	3.1	A
SW16 St / SW87 Ave	17.7	B	31.9	C

PM Peak

During the year 2020 most of the intersections operate at a LOS “D” or better with the exception of the intersections of SW 8th Street and SW 97th Avenue, and SW 8th Street and SW 87th Avenue, both of which operate at a LOS “E.”

In comparison to the No Build condition in the year 2020, the intersection of Flagler Street and SW 82nd Avenue went from a LOS “E” to LOS “D,” while the SW 8th Street and SW 82nd Avenue intersection went from a LOS “B” to LOS “D” as a result of the increase in traffic and movements at this intersection. Improvement in terms of delay at SW 8th Street and SW 87th Avenue are marginal with an average delay reduction of only 8 seconds.

An analysis of the movements per intersection for year 2020 reveals that for the PM peak period few movements will fail at the intersection of SW 8th Street and SW 87th Avenue with a LOS “F” but includes movements such as NBL, SBT and WBL some of which are major movements at this intersection. Movements operating at LOS “E” include the EBL and EBT, while all other movements, including the main movement WBT, operate at LOS “D” or better. At the SW 82nd Avenue and SW 8th Street intersection only one movement, WBL, is expected to operate at a LOS “F.” All other movements operate well at LOS “D” or better despite the additional traffic and movements added to this intersection.

During the year 2040 a total of three intersections operate at LOS “F.” When comparing to the No-Build Alternative only one intersection, SW 87th Avenue and SW 16th Street, reports improvements in terms of level of service with all other intersection remaining the same or actually experiencing degradation in level of service, including among these the SW 82nd Avenue intersections at Flagler Street and at SW 8th Street. Improvements in terms of average delay are not observed or are not significant. The intersection of SW 8th Street and SW 87th Avenue, the main focus of this study, reports marginal improvement in average delay with a reduction from 138 seconds to 118 seconds.

An analysis of the movements per intersection for year 2040 reveals that for the PM peak period most of these, including the main movements, will fail at the intersection of SW 8th Street and SW 87th Avenue with a LOS “F”; these include NBL, SBT, EBL, EBT, WBL and WBT. The NBT will operate at LOS “D”. The intersection of SW 82nd Avenue and SW 8th Street is expected to operate at a LOS “E” in the year 2040. Five movements will operate at LOS “F” and one at LOS “E”. The remaining three movements operate at LOS “D” or better.

Details of the LOS and delay per approach movement can be found in Appendix F, Tables F-49 through F-52.

Table 7-19 Level of Service (LOS) and Delay by Intersection Alternative 3A (PM)

PM	Year 2020 (Opening Year)		Year 2040 (design Year)	
Intersection	SYNCHRO			
	Delay	LOS	Delay	LOS
SW8 St / SW97 Ave	66.6	E	109.6	F
SW8 St / SW94 Ave	6.7	A	16.7	B
SW8 St / SW92 Ave	26.0	C	77.3	E
SW8 St / SW87 Ave	65.1	E	118.8	F
Flagler St / SW87 Ave	53.9	D	102.2	F
Flagler St / SW84 Ave	14.5	B	37.1	D
Flagler St / SW82 Ave	33.5	C	60.4	E
SW8 St / SW82 Ave	48.6	D	76.1	E
SW8 St / SR 826 Ramp	4.8	A	6.4	A
SW16 St / SW87 Ave	20.9	C	51.6	D

7.5.7. Alternative 3B (Widening of SW 82nd Avenue and Bridge over the C-4 Canal plus Overpass)

This section documents the operating conditions for the years 2020 and 2040 under this alternative. The improvements included in this alternative mainly consist of the widening of SW 82nd Avenue between SW 16th Street and Flagler Street from a 2-lane facility to a 4-lane facility, and the construction of a new bridge at SW 8th Street and SW 82nd Avenue to provide continuity to SW 82nd Avenue as a north-south facility. This alternative also includes the following improvements: SW 8th Street grade separated over SW 87th Avenue; and the widening of SW 8th Street between SW 92nd Avenue and SW 82nd Avenue. These additional improvements at SW 87th Avenue and along SW 8th Street essentially mimic those of Alternative 2A.

AM Peak

During the AM peak for the year 2020, all intersections within the study area operate at LOS “D” or better. The intersection of SW 87th Avenue experiences significant improvements as a result of the overpass, operating at LOS “D” at-grade and an overall LOS “C” when considering traffic using the overpass. When compared to the No Build scenario, seven out of the ten intersections analyzed operate at the same level of service, one improves the level of service (SW 87th Avenue at SW 8th Street), and two experience a degradation of level of service, that is Flagler Street at SW 82nd Avenue and SW 8th Street at SW 82nd Avenue both of which degrade to LOS “D” from a LOS “B” under the No-Build condition. The degradation in level of service at these intersections is attributed to the additional traffic on SW 82nd Avenue. In terms of average delay, the main intersection under analysis, SW 8th Street at SW 87th Avenue experiences a significant reduction from 72 seconds under the No-Build scenario to 42 seconds under this alternative. More importantly, when traffic free flowing through the overpass is included in the calculation, the average delay for the intersection is only 24 seconds. An analysis of level of service by movement at SW 8th Street and SW 87th Avenue reveals that only three movements do not operate at a LOS “D” or better and these are the SBL, EBL and WBR all of which operate at LOS “E.”

For the year 2040, most intersections experience a reduction of the delay and in some cases an overall improvement in the resulting level of service, with the exception of the intersections of Flagler Street and SW 82nd Avenue and SW 8th Street and SW 82nd Avenue; these two intersections, a result of the additional traffic that is expected at this location due to the roadway widening and the new bridge over the C-4 Canal, experience a degradation in LOS and delay. The intersection at SW 8th Street and SW 82nd Avenue reports a LOS “D” under this alternative from the LOS “C” under the No-Build Alternative, and the delay increases from 24 seconds to 41 seconds. Similarly for the intersection of Flagler Street and SW 82nd Avenue, the level of service degrades from a LOS “D” to a LOS “E” while the average delay increases from 36 seconds to 72 seconds. The intersection of SW 8th Street and SW 87th Avenue reported a LOS “D” when considering the at-grade traffic. However, when considering the traffic using the overpass, the resulting level of service improves to an LOS “C.” This is a significant improvement when compared to the LOS “F” for the No-Build Alternative.

An analysis of the level of service by movement at SW 8th Street and SW 87th Avenue reveals that only the SBL and WBR movements operate at LOS “F” while the EBL operates at LOS “E.” The major concern is the EBL movement. This alternative offers significant improvements to the average delay for this movement from 219 seconds under the No-Build Alternative to just 70 seconds under this configuration. Additional improvements to this movement would require widening of SW 87th Avenue to accommodate a triple left-turn. All other movements operate at LOS “D” or better.

To highlight for year 2040 is that the intersections at Flagler Street and SW 87th Avenue reports failing movements in most directions. The importance lies on the failing conditions of this intersection and how these conditions may affect the operation of the intersection at SW 8th Street and SW 87th Avenue.

A detail of the LOS and delay per approach movement can be found in Appendix F, Tables F-53 through F-56.

Table 7-20 Level of Service (LOS) and Delay by Intersection Alternative 3B (AM)

AM	Year 2020 (Opening Year)		Year 2040 (design Year)	
Intersection	SYNCHRO			
	Delay	LOS	Delay	LOS
SW8 St / SW97 Ave	46.3	D	85.1	F
SW8 St / SW94 Ave	9.5	A	8.4	A
SW8 St / SW92 Ave	31.1	C	36.4	D
SW8 St / SW87 Ave	41.7*	D*	44.0*	D*
Flagler St / SW87 Ave	56.6	E	98.6	F
Flagler St / SW84 Ave	27.7	C	19.0	B
Flagler St/ SW82 Ave	43.3	D	72.1	E
SW8 St / SW82 Ave	41.3	D	40.8	D
SW8 St / SR826 Ramp	3.1	A	3.2	A
SW16 St / SW87 Ave	21.9	C	31.9	C

Note: The reported delay and LOS for the SW 8th Street and SW 87th Avenue intersection only considers at-grade traffic. When considering traffic using overpass the following are the results. 2020 (24.2 seconds, LOS "C"); 2040 (24.0 seconds, LOS "C")

PM Peak

For year 2020 all intersections operate at a LOS "D" or better with the exception of SW 8th Street and SW 97th Avenue, and Flagler Street and SW 87th Avenue, both resulting in a LOS "E" for the year 2020. The two intersections at SW 82nd Avenue experienced degradation of level of service from LOS "C" and "B" to an LOS "D", a condition that is expected considering the additional traffic on SW 82nd Avenue. SW 16th Street and SW 87th Avenue also reported a LOS "D" from an LOS "C" under the No-Build scenario. SW 8th Street at SW 87th Avenue experienced a significant improvement from LOS "E" to LOS "C", and when including traffic using the overpass the reported level of service is LOS "B". Average delays are reduced from 78 seconds to just 27 seconds under this alternative and to 14 seconds when including the traffic on the overpass.

When analyzing individual movements, at SW 8th Street and SW 87th Avenue all movements operate at LOS "D" or better. At the intersection of SW 8th Street and SW 97th Avenue the WBL and WBT movements already report LOS "F" and LOS "E" which at some point may impact or offset the benefits of the overpass at SW 87th Avenue in particular for the westbound traffic.

For the year 2040, only two intersections reported an LOS "F" including SW 8th Street and SW 97th Avenue, and Flagler Street and SW 87th Avenue. Several intersections reported a LOS "E" including the following: SW 8th Street and SW 92nd Avenue, Flagler Street and SW 82nd Avenue, and SW 8th Street and SW 82nd Avenue. For intersections along SW 82nd Avenue the degradation in level of service was expected as a result of the added traffic. The intersections of most concern are at Flagler Street and SW 87th Avenue, SW 8th Street

and SW 97th Avenue, SW 8th Street and SW 92nd Avenue, and SW 8th Street and SW 82nd Avenue considering failing conditions downstream of the SW 8th Street and SW 87th Avenue intersection could have an impact on the operation of this intersection. SW 8th Street at SW 87th Avenue experiences significant improvements operating at LOS “C”, or LOS “B” when including traffic on the overpass.

A more detailed analysis by movements reveals the following. SW 8th Street at SW 97th Avenue shows failing movements in all directions including NBL, SBT, EBL, WBL and WBT. Of most concern are the westbound movements due to the potential to impact or offset the benefits by the project at SW 87th Avenue. Similarly, SW 8th Street and SW 92nd Avenue begins to show at least one failing movement in each direction and report LOS “F” for the WBL movement and LOS “E” for the WBT movement. This intersection being much closer to the overpass has more potential to impact the operation at SW 87th Avenue. Flagler Street and SW 87th Avenue shows most movements operating at LOS “E” or “F” with only three movements, NBR, EBT and EBR, operating at LOS “D” or better. However, considering the peak is in the southbound direction, the concern at this intersection is not being able to process all the traffic but will not affect the operation of SW 8th Street and SW 87th Avenue. The last intersection of concern is SW 8th Street and SW 82nd Avenue which has failing movements at LOS “F” including NBL, SBT, EBL and WBL. While additional congestion is expected as a result of the additional traffic on SW 82nd Avenue, the gains at SW 87th Avenue will be partially offset by additional delays at the SW 82nd Avenue intersection for the east-west movements. Tables F-57 through F-60 included in Appendix F contain details of the LOS and delay per approach movement for this alternative.

Table 7-21 Level of Service (LOS) and Delay by Intersection Alternative 3B (PM)

PM	Year 2020 (Opening Year)		Year 2040 (design Year)	
Intersection	SYNCHRO			
	Delay	LOS	Delay	LOS
SW8 St / SW97 Ave	66.9	E	110.4	F
SW8 St / SW94 Ave	11.2	B	14.3	B
SW8 St / SW92 Ave	44.0	D	67.2	E
SW8 St / SW87 Ave	27.2*	C*	29.6*	C*
Flagler St / SW87 Ave	60.9	E	97.1	F
Flagler St / SW84 Ave	24.6	C	25.0	C
Flagler St/ SW82 Ave	43.0	D	55.4	E
SW8 St / SW82 Ave	50.8	D	57.3	E
SW8 St / SR826 Ramp	4.7	A	5.9	A
SW16 St / SW87 Ave	28.6	C	51.6	D

Note: The reported delay and LOS for the SW 8th Street and SW 87th Avenue intersection only considers at-grade traffic. When considering traffic using overpass the following are the results. 2020 (14.2 seconds, LOS “B”); 2040 (14.4 seconds, LOS “B”)

7.5.8. Comparison of Alternatives

2020 AM

Table 7-22 below and Figure 7-21 contrasts all of the alternatives considered in the study for the year 2020 in the AM peak period using the level of service reported in Synchro as a comparison measurement. Improvements are observed at SW 8th Street and SW 87th Avenue essentially under all of the alternatives.

One common improvement for alternatives 1A, 1B, 2A and 2B is the addition of a left turn lane to provide a dual left-turn lane at the SW 8th Street and SW 82nd Avenue NB approach.

From the results reported in Table 7-22 and those included in Table F-61 in the appendices, it can be concluded that the alternative that reports the best level of service for the SW 8th Street and SW 87th Avenue intersection is Alternative 2B. When considering all traffic inclusive of that using the overpass, Alternative 2B reports an LOS “B” and is followed by alternatives 2A and 3B which report an LOS “C” with all traffic included (refer to foot note for level of service including all traffic). Alternative 1A, 1B and 3A rank last.

Table 7-22 LOS by Intersection by Alternative (2020 AM)

2020 AM	Level of Service						
Intersection	No-Build	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B
	SYNCHRO						
SW8 St / SW92 Ave	C	B	B	C	C	C	C
SW8 St / SW87 Ave	E	D	D	D*	C*	D	D*
Flagler St / SW87 Ave	E	E	E	E	E	D	E
SW8 St / SW82 Ave	B	A	A	A	B	C	D
SW8 St / SR826 Ramp	A	A	A	A	A	A	A

*Note: * The reported LOS for the SW 8th Street and SW 87th Avenue intersection only considers at-grade traffic. When considering traffic using overpass the following are the results. Alt 2A (LOS C); Alt 2B (LOS B); Alt 3B (LOS C)*

When analyzing the results of the improvements in terms of delay, there are marked differences among alternatives. It shall be noted that the SW 8th Street and SW 87th Avenue intersection delay is reduced to as low as 16 seconds for Alternative 2B, to 24 seconds for Alternative 3B and to 29 seconds for Alternative 2A. Alternative 1A also shows significant improvements, reducing the average delay to 37 seconds. Alternative 1B, even though it also offers delay reductions, it only reports marginal improvements (from 73 seconds in the No Build Alternative to 51 seconds with the improvements).

A summary of delays reported in Synchro by Alternative can be found in Appendix F for the Year 2020, Tables F-61 and F-62.

Ranking the alternatives based on improvements as measured by Average Delay for the intersection of SW 8th Street and SW 87th Avenue, the alternatives rank as follows:

Table 7-23- 2020 AM - Ranking Based on Average Delay at Intersection for SW 87th Ave and SW 8th St

Ranking	Alternative	Avg. Delay (veh/s) SW 8 St/87 Ave
1 st	Alternative 2B	16*
2 nd	Alternative 3B	24*
3 rd	Alternative 2A	29*
4 th	Alternative 1A	37
5 th	Alternative 3A	50
5 th	Alternative 1B	51
7 th	No-Build	73

** Note: The reported Synchro delay for SW 8th Street and SW 87th Avenue intersection only considers at-grade traffic. Average delay calculated to include traffic using overpass.*

No Build – Year 2020



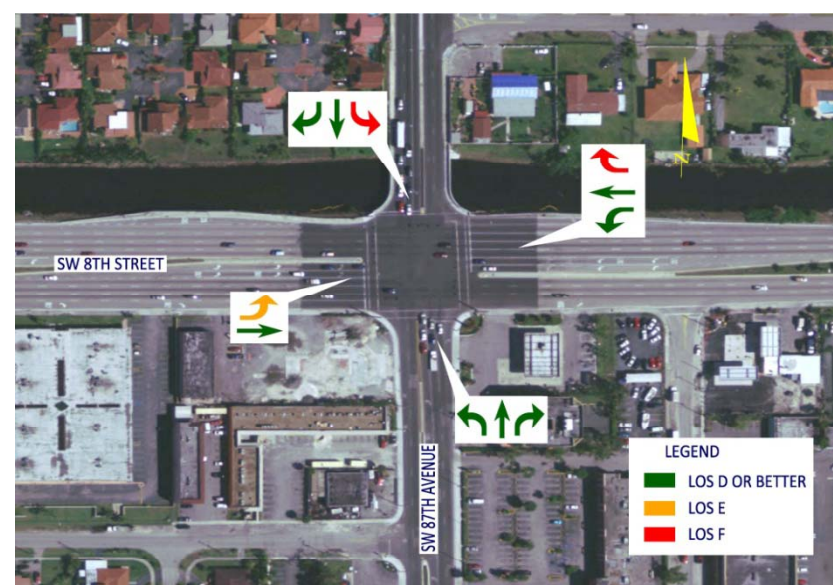
Alternative 1A – Year 2020



Alternative 1B: Year 2020



Alternative 2A: Year 2020



Alternative 2B: Year 2020



Alternative 3A: Year 2020



Alternative 3B: Year 2020



2020 PM

Table 7-24 below and Figure 7-22 contrasts all of the alternatives considered in the study for the year 2020 in the PM peak period using the level of service reported in Synchro as a comparison measurement. Improvements are observed at SW 8th Street and SW 87th Avenue essentially under all of the alternatives except for Alternative 3A.

When comparing the results for the intersection of SW 8th Street and SW 87th Avenue, they indicate that for the year 2020 PM peak period, Alternatives 2A, 2B and 3B are the best alternative in terms of level of service, all with LOS “B” (see footnote on table below) followed by Alternatives 1A and 1B, both with LOS “D”. Alternative 3A shows no improvements in terms of level of service. Under this alternative the improvements take place at SW 82nd Avenue and the only way the intersection of SW 8th Street and SW 87th Avenue benefits is from diverted traffic. From the level of service measure the benefits are marginal and the intersection continues to operate at LOS “E.”

Table 7-24 LOS by Intersection by Alternative (2020 PM)

2020 PM	No-Build	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B
Intersection	SYNCHRO						
	Level of Service						
SW8 St / SW92 Ave	C	C	C	D	D	C	D
SW8 St / SW87 Ave	E	D	D	C*	C*	E	C*
Flagler St / SW87 Ave	E	E	E	E	E	D	E
SW8 St / SW82 Ave	B	A	A	B	B	D	D
SW8 St / SR826 Ramp	A	A	A	A	A	A	A

*Note: *The reported LOS for the SW 8th Street and SW 87th Avenue intersection only considers at-grade traffic. When considering traffic using overpass the following are the results. Alt 2A (LOS B); Alt 2B (LOS B), Alt 3B (LOS B)*

When analyzing the results of the improvements in terms of delay, the results for the best performing alternatives are very similar and all three alternatives, 2A, 2B and 3B, are considered to be equivalent in terms of operation. All three alternatives report an average delay of 26 to 28 seconds. When the overpass traffic is included the average delay reported by the three alternatives is approximately 14 seconds. There are no major differences in average delay and therefore considered equivalent. Similarly alternatives 1A and 1B report a very similar average delay of 37 to 38 seconds. Alternative 3A improvements are very marginal with an average reduction in delay from 78 seconds to 65 seconds only.

A summary of delays reported in Synchro by Alternative can be found in Appendix F for the Year 2020, in Tables F-61 and F-62.

Ranking the alternatives based on improvements as measured by Average Delay for the intersection of SW 8th Street and SW 87th Avenue, the alternatives rank as follows:

Table 7-25- 2020 PM - Ranking Based on Average Delay at Intersection of SW 87th Ave and SW 8th St

Ranking	Alternative	Avg. Delay (veh/s) SW 8 St/87 Ave
1 st	Alternative 3B	14*
1 st	Alternative 2A	15*
1 st	Alternative 2B	14*
4 th	Alternative 1A	37
4 th	Alternative 1B	38
6 th	Alternative 3A	65
7 th	No-Build	78

** Note: The reported Synchro delay for SW 8th Street and SW 87th Avenue intersection only considers at-grade traffic. Average delay calculated to include traffic using overpass.*

2040 AM

Table 7-26 on the following page and Figure 7-23 contrasts all of the alternatives considered in the study for the year 2040 in the AM peak period using the level of service reported in Synchro as a comparison measurement. Improvements are observed at SW 8th Street and SW 87th Avenue under most alternatives. Alternative 1B reports the same failing level of service as the No-Build alternative.

As traffic increases for the year 2040, the difference in performance at the SW 8th Street and SW 87th Avenue intersection is greater than in the 2020 analysis. For this period, the No-Build Alternative already fails at LOS “F” and Alternative 1B, even though it reports an average delay reduction from 116 seconds to 91 seconds, still operates at LOS “F.” Alternative 1A, while demonstrating improvement and a reduction in delay from 116 seconds to 71 seconds, operates at LOS “E” and shows improvements as compared to the No-Build Alternative and to Alternative 1B. Similarly Alternative 3A demonstrates reduction of average delay to 71 seconds and an LOS “E.” The improvements for Alternatives 2A, 2B and 3B are much more significant and these operate at LOS “C” when considering the traffic on the overpass.

A detail of the resulting delays per alternative for the Year 2040 can be found in Appendix F, Tables F-63 and F-64.

Table 7-26 LOS by Intersection by Alternative (2040 AM)

2040 AM	Level of Service						
Intersection	No-Build	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B
	SYNCHRO						
SW8 St / SW92 Ave	D	D	D	D	D	C	D
SW8 St / SW87 Ave	F	E	F	E*	D*	E	D*
Flagler St / SW87 Ave	F	F	F	F	F	F	F
SW8 St / SW82 Ave	C	B	B	B	B	D	D
SW8 St / SR826 Ramp	A	A	A	A	A	A	A

*Note: *The reported LOS for the SW 8th Street and SW 87th Avenue intersection only considers at-grade traffic. When considering traffic using overpass the following are the results: Alt 2A (LOS C); Alt 2B (LOS C), Alt 3B (LOS C)*

When analyzing the results of the improvements in terms of delay, the results indicate that the best performing alternative is actually Alternative 2B, followed by 3B and a close third for Alternative 2A. Alternatives 1A and 3A are ranked fourth and show significant improvements compared to the No-Build Alternative, while Alternative 1B is ranked last showing marginal improvements over the No-Build Alternative.

Ranking the alternatives based on improvements as measured by Average Delay for the intersection of SW 8th Street and SW 87th Avenue, the alternatives rank as follows:

Table 7-27- 2040 AM - Ranking Based on Average Delay at Intersection of SW 87th Ave and SW 8th St

Ranking	Alternative	Avg. Delay (veh/s) SW 8 St/87 Ave
1 st	Alternative 2B	24*
1 st	Alternative 3B	24*
3 rd	Alternative 2A	34*
4 th	Alternative 1A	71
4 th	Alternative 3A	71
6 th	Alternative 1B	91
7 th	No-Build	116

** Note: The reported Synchro delay for SW 8th Street and SW 87th Avenue intersection only considers at-grade traffic. Average delay calculated to include traffic using overpass.*

No Build – Year 2020



Alternative 1A – Year 2020



Alternative 1B: Year 2020



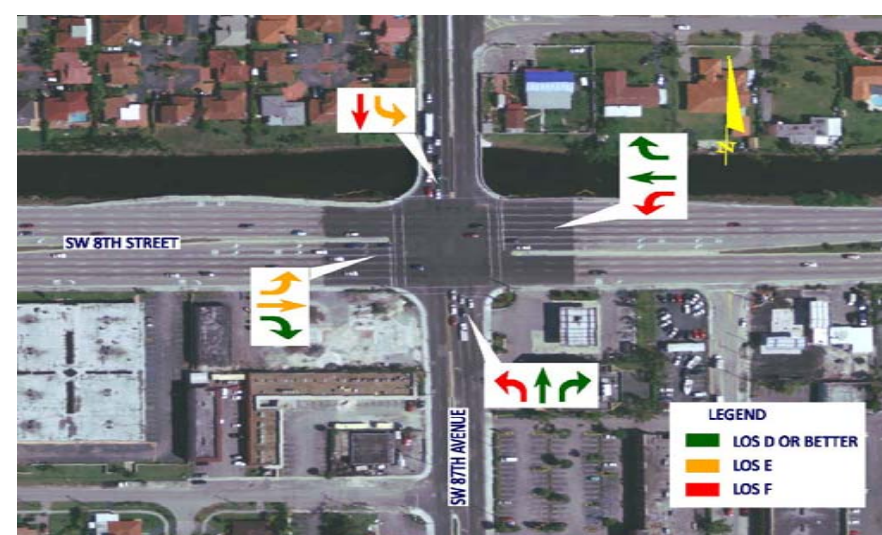
Alternative 2A: Year 2020



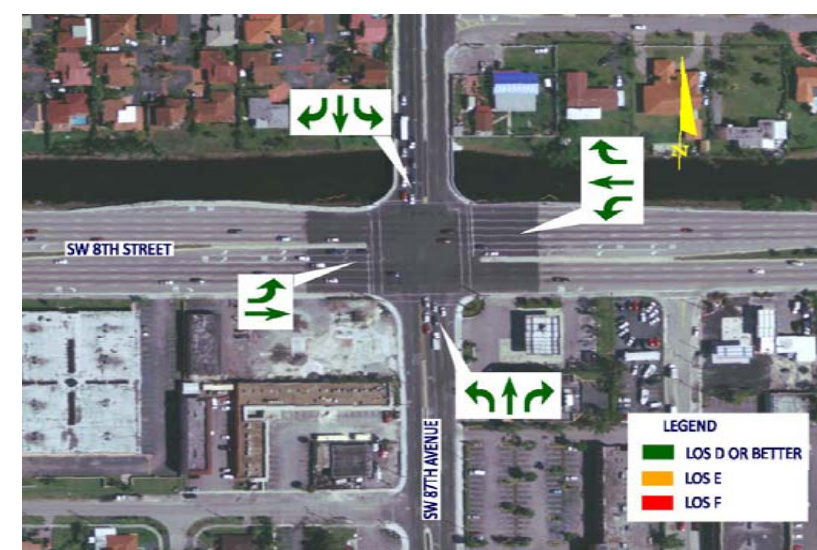
Alternative 2B: Year 2020



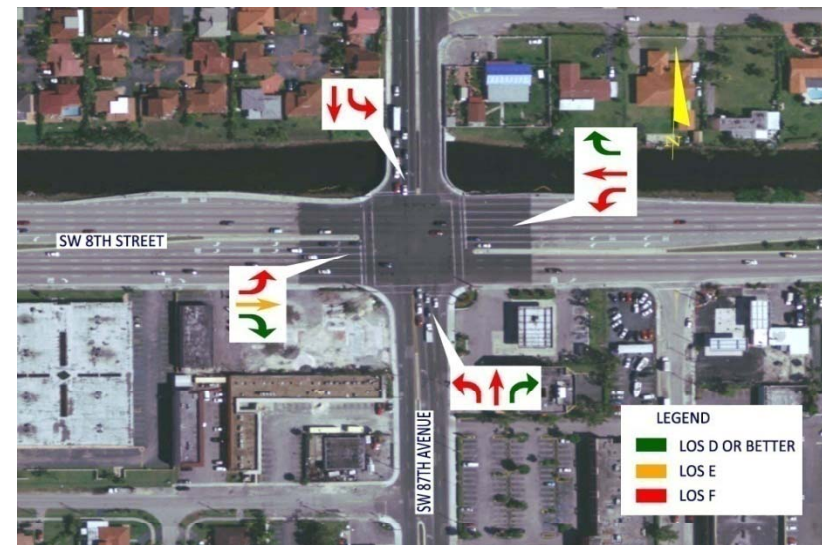
Alternative 3A: Year 2020



Alternative 3B: Year 2020



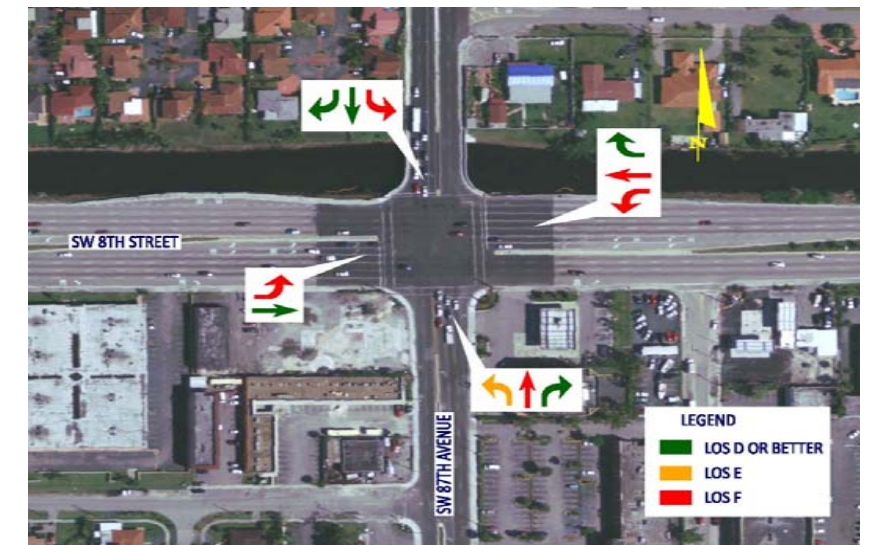
No Build – Year 2040



Alternative 1A – Year 2040



Alternative 1B: Year 2040



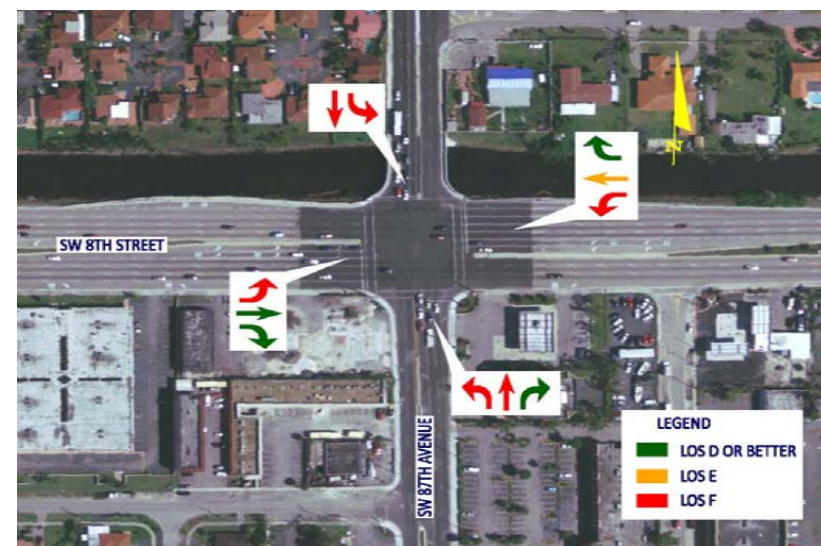
Alternative 2A: Year 2040



Alternative 2B: Year 2040



Alternative 3A: Year 2040



Alternative 3B: Year 2040



2040 PM

Table 7-28 below and Figure 7-24 contrasts all of the alternatives considered in the study for the year 2040 in the PM peak period using the level of service reported in Synchro as a comparison measurement. Improvements are observed at SW 8th Street and SW 87th Avenue in terms of level of service for all alternatives except Alternative 3A. The overpass alternatives 2A, 2B and 3B actually report an excellent level of service at LOS “B” when considering the vehicles in the overpass. The other two at grade alternatives, 1A and 1B, report an LOS “E.” an improvement over the failing LOS “F” of the No-build Alternative.

In terms of average delay at intersection, the three overpass alternatives 2A, 2B and 3B report significant improvements at 19 seconds, 17 seconds and 14 seconds correspondingly and are considered equivalent in operation. Alternatives 1A (75 seconds average delay) and 1B (77 seconds average delay), while showing a significant improvement over the No-build Alternative (138 seconds average delay), report an LOS “E.” Alternative 3A is the worst performing and only shows a marginal improvement over the No-Build Alternative with an average delay of 119 seconds, that is, a reduction of only 19 seconds in average delay.

A detail of the resulting delays per alternative for the Year 2040 can be found in Appendix F, Tables F-63 and F-64.

Table 7-28 LOS by Intersection by Alternative (2040 PM)

2040 PM	Level of Service						
Intersection	No-Build	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B
	SYNCHRO						
SW8 St / SW92 Ave	E	E	E	E	E	E	E
SW8 St / SW87 Ave	F	E	E	D*	C*	F	C*
Flagler St / SW87 Ave	F	F	F	F	F	F	F
SW8 St / SW82 Ave	B	B	C	B	B	E	E
SW8 St / SR826 Ramp	A	A	A	A	A	A	A

*Note: *The reported LOS for the SW 8th Street and SW 87th Avenue intersection only considers at-grade traffic. When considering traffic using overpass the following are the results. Alt 2A (LOS B); Alt 2B (LOS B); Alt 3B (LOS B)*

Ranking the alternatives based on improvements as measured by Average Delay for the intersection of SW 8th Street and SW 87th Avenue, the alternatives rank as follows:

Table 7-29- 2040 PM - Ranking Based on Average Delay at Intersection of SW 87th Ave and SW 8th St

Ranking	Alternative	Avg. Delay (veh/s) SW 8 St/87 Ave
1 st	Alternative 2A	19*
1 st	Alternative 2B	17*
1 st	Alternative 3B	14*
4 th	Alternative 1A	75
4 th	Alternative 1B	77
6 th	Alternative 3A	119
7 th	No-Build	138

** Note: The reported Synchro delay for SW 8th Street and SW 87th Avenue intersection only considers at-grade traffic. Average delay calculated to include traffic using overpass.*

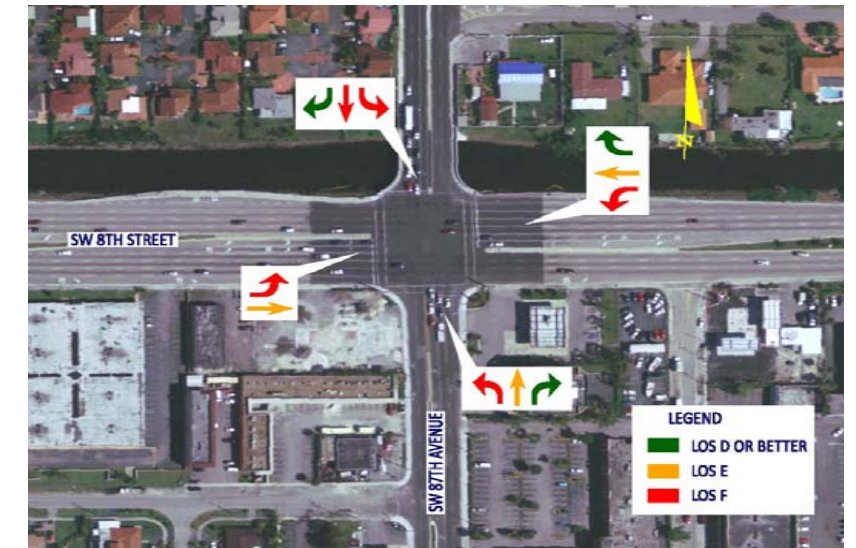
No Build – Year 2040



Alternative 1A – Year 2040



Alternative 1B: Year 2040



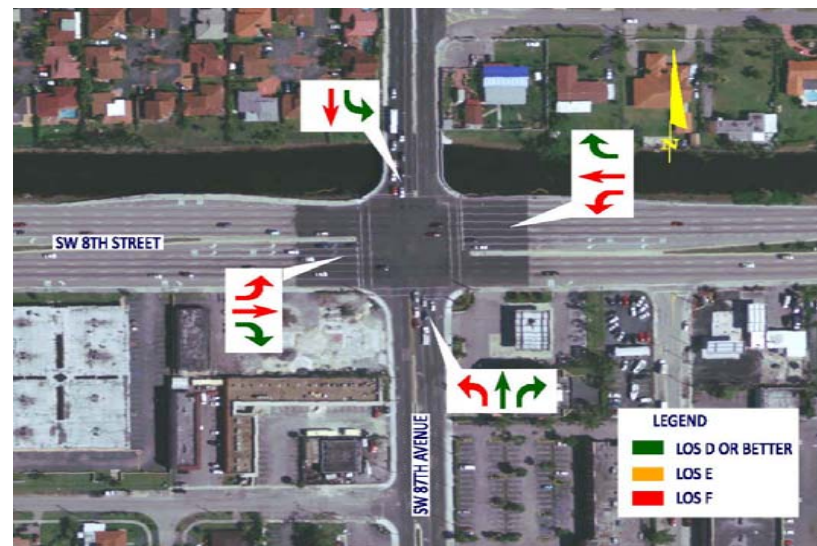
Alternative 2A: Year 2040



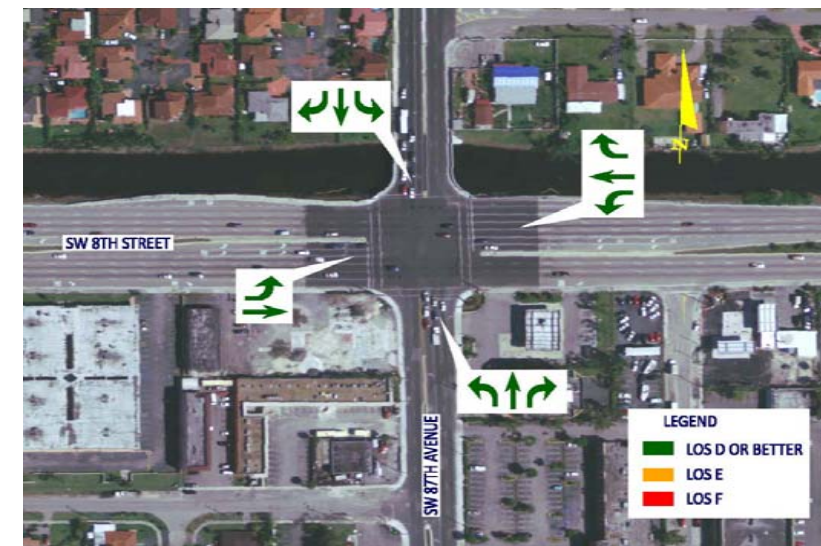
Alternative 2B: Year 2040



Alternative 3A: Year 2040



Alternative 3B: Year 2040



SW 87th Avenue and SW 8th Street Analysis by Movement

Table 7-30 below compares each movement for the intersection of SW 8th Street and SW 87th Avenue for year 2020 during the AM peak period. One key finding from this table is that for the most critical movements on the AM peak, NB and EB direction, only the overpass alternative 2A, 2B and 3B and the at-grade alternative 1A (which includes widening of SW 87th Avenue) provide a significant improvement and operate for the majority of the movements at LOS “D” or better. Alternatives 1B and 3A fail to address the operational issues. Even though these alternatives offer improvements in terms of average delay, the improvements are considered marginal.

For details of a comparison of the delays per movement for each alternative please refer to Table F-65 located in Appendix F.

Table 7-30 Level of Service (LOS) by Movement by Alternative (2020 AM)

Level of Service (2020 AM)								
Intersection	Movement	No-Build	Alt 1A	Alt 1B	Alt 2A	Alt 2B	Alt 3A	Alt 3B
SW8 St / SW87 Ave	NBL	F	D	D	C	B	D	C
	NBT	F	D	F	D	C	F	D
	NBR	C	-	A	A	-	B	A
	SBL	F	F	F	F	D	F	E
	SBT	E	D	C	C	C	D	C
	SBR	-	A	A	A	A	-	A
	EBL	F	D	F	E	C	E	E
	EBT	C	B	B	B*	B*	C	B*
	EBR	A	-	-	-	-	A	-
	WBL	E	D	D	D	D	E	D
	WBT	E	D	D	D*	D*	D	D*
	WBR	D	C	C	F	E	B	E

*Note: * These LOS refers to local through movement at-grade. The majority of the traffic is free flowing at overpass with no delay experienced.*

Table 7-31 on the following page compares each movement for the intersection of SW 8th Street and SW 87th Avenue for year 2020 during the PM peak period. The most critical movements on the PM peak are SB and WB, even though the traffic volumes observed in the EB direction are also significant in the PM peak. It is clear that Alternative 3A fails to address one of the main movements, SBT. All other alternatives address for the most part the failing movements during the opening year.

For details of a comparison of the delays per movement for each alternative please refer to Table F-66 located in Appendix F.

Table 7-31 Level of Service (LOS) by Movement by Alternative (2020 PM)

Level of Service (2020 PM)								
Intersection	Movement	No-Build	Alt 1A	Alt 1B	Alt 2A	Alt 2B	Alt 3A	Alt 3B
SW8 St / SW87 Ave	NBL	F	E	E	D	D	F	C
	NBT	D	C	D	C	C	D	C
	NBR	B	-	A	A	-	B	A
	SBL	D	D	E	C	B	E	B
	SBT	F	C	C	C	C	F	C
	SBR	-	A	A	A	A	-	A
	EBL	F	D	D	D	D	E	D
	EBT	F	C	C	C	C	E	C
	EBR	A	-	-	-	-	A	-
	WBL	F	E	E	D	D	F	D
	WBT	E	D	D	C*	C*	D	C*
	WBR	B	B	B	C	C	B	C

Note: * These LOS refers to local through movement at-grade. The majority of the traffic is free flowing at overpass with no delay experienced.

Table 7-32 on the following page compares each movement for the intersection of SW 8th Street and SW 87th Avenue for year 2040 during the AM peak period. The most critical movements on the AM peak are NB and EB, even though on the No-Build Alternative the through movements in the WB direction also fail along with turning movements in all directions.

It is clear that the only alternatives addressing the operational issues at this intersection are the overpass alternatives, that is, alternatives 2A, 2B and 3B. All three at-grade alternatives provide no improvements in terms of level of service even though it is recognized that they offer some improvements in terms of average delay.

For details of a comparison of the delays per movement for each alternative please refer to Table F-67 located in Appendix F.

Table 7-32 Level of Service (LOS) by Movement by Alternative (2040 AM)

Level of Service (2040 AM)								
Intersection	Movement	No-Build	Alt 1A	Alt 1B	Alt 2A	Alt 2B	Alt 3A	Alt 3B
SW8 St / SW87 Ave	NBL	F	F	E	C	C	F	C
	NBT	F	F	F	E	C	F	D
	NBR	C	-	B	A	-	C	A
	SBL	F	F	F	F	E	F	F
	SBT	F	E	D	A	C	F	C
	SBR	-	A	A	A	A	-	A
	EBL	F	F	F	F	E	F	E
	EBT	E	C	D	B*	C*	D	B*
	EBR	A	-	-	-	-	A	-
	WBL	F	E	F	E	D	F	D
	WBT	F	E	F	E*	D*	E	D*
	WBR	D	D	D	F	F	C	F

*Note: * These LOS refers to local through movement at-grade. The majority of the traffic is free flowing at overpass with no delay experienced.*

Table 7-33 on the following page compares each movement for the intersection of SW 8th Street and SW 87th Avenue for year 2040 during the PM peak period. The most critical movements on the PM peak are SB and WB, even though on the No-Build Alternative the through movements in the EB direction also fail along with many of the turning movements.

Similar to the 2040 AM results, it is clear that the only alternatives addressing the operational issues at this intersection are the overpass alternatives, that is, alternatives 2A, 2B and 3B. At-grade alternatives 1A and 1B provide improvement in terms of average delay even though not necessarily in terms of level of service as movements continue to fail at LOS "F." Alternative 3A does not offer improvements.

For details of a comparison of the delays per movement for each alternative please refer to Table F-68 located in Appendix F.

Table 7-33 Level of Service (LOS) by Movement by Alternative (2040 PM)

Level of Service (2040 PM)								
Intersection	Movement	No-Build	Alt 1A	Alt 1B	Alt 2A	Alt 2B	Alt 3A	Alt 3B
SW8 St / SW87 Ave	NBL	F	F	F	E	E	F	D
	NBT	E	D	E	C	C	D	C
	NBR	C	-	A	A	-	C	A
	SBL	D	E	F	C	C	D	B
	SBT	F	F	F	C	C	F	C
	SBR	-	B	B	A	A	-	A
	EBL	F	F	F	E	D	F	D
	EBT	F	E	E	C*	C*	F	C*
	EBR	C	-	-	-	-	B	-
	WBL	F	F	F	D	E	F	D
	WBT	F	E	E	D*	D*	F	D*
	WBR	D	C	B	D	D	B	C

Note: * These LOS refers to local through movement at-grade. The majority of the traffic is free flowing at overpass with no delay experienced.

The tables below, Table 7-34 and Table 7-35, summarize the LOS and average delay for all analyzed alternatives for the AM and PM peak periods.

In summary, while Alternatives 1A and 1B offer improvements over the No-Build Alternative during the year 2020 and 2040, the intersection reports overall LOS “E” and “F” for year 2040 with associated individual movement failures. That is, somewhere between the opening year and the design year the intersection will begin experiencing failing operating movements. Alternative 3A, while offering some improvements during the 2020 AM period, shows little to no improvements during the 2020 PM and 2040 AM periods. For year 2040 the intersection fails at similar levels of service to the No-Build condition. Only the overpass alternatives show a significant improvement over the No-Build Alternative and show an acceptable level of service at LOS “B” or better.

Table 7-34 LOS All Alternatives (All Peak Periods)

SW 8 th St/SW 87 th Ave	No-Build	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B
2020 AM	E	D	D	C*	B*	D	C*
2020 PM	E	D	D	B*	B*	E	B*
2040 AM	F	E	F	C*	C*	E	C*
2040 PM	F	E	E	B*	B*	F	B*

Note: * LOS calculated using the free flow traffic on overpass.

Table 7-35 Delay/Vehicle (Seconds) All Alternatives/Peak Periods

SW 8 th St/SW 87 th Ave	No-Build	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B
2020 AM	72.6	37.2	50.8	28.6*	16.2*	50.0	24.2*
2020 PM	77.9	37.4	38.3	15.1*	13.9*	65.1	14.2*
2040 AM	116.0	70.6	91.2	34.4*	23.8*	71.5	24.0*
2040 PM	138.2	75.4	77.1	19.0*	16.8*	118.8	14.4*

Note: * Average delay calculated using the free flow traffic on overpass.

The following table summarizes the total delay experienced by vehicles at the intersection for each one of the alternatives. As expected, Alternatives 2B and 3B offers the highest benefits. Alternative 2A offers significant improvements also over the No-Build Alternative. Alternatives 1A, 1B and 3A while showing significant improvements over the No-Build alternative, lag significantly behind the overpass alternatives. One key finding of this table is that Alternative 3A actually compares to Alternative 1A while implementation of Alternative 3A is expected to have much lower impacts.

Table 7-36 Total Delay for Peak Hour (in hours) All Alternatives/Peak Periods

SW 8th St/SW 87th Ave	No Build	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B
2020 AM	149.7	77.8	107.7	60.9	34.6	100.9	50.2
2020 PM	165.0	82.3	85.2	33.9	31.3	136.0	31.5
Total 2020	314.7	160.1	192.9	94.8	65.9	236.9	81.7
2040 AM	283.5	171.7	227.1	86.3	59.7	163.7	56.6
2040 PM	344.3	194.0	200.1	49.7	44.0	286.3	36.6
Total 2040	627.8	365.7	427.2	136	103.7	450	93.2

7.6. Ranking of Alternatives

The following table summarizes the ranking of all of the alternatives based on traffic alone and using the comparisons previously discussed. The No-Build Alternative was always ranked seventh since all of the alternatives offer added benefits to the operation of the intersection in terms of delay. Alternatives that are considered to operate the same were ranked the same.

The results indicate that the overpass combined with improvements along SW 87th Avenue, will result in the highest benefits to the intersection of SW 8th Street and SW 87th Avenue, that is, Alternative 2B. Second in ranking is Alternative 3B which offers significant improvements and a very good level of service for most movements through the design year. Alternative 3B essentially provides a similar overpass as 2A but also provides a wider SW 82nd Avenue and continuity to this road effectively diverting traffic from the SW 87th Avenue intersection. Even though very close, this alternative outranked Alternative 2A which was ranked third. Alternative 1A ranks fourth and even though it works for the opening year 2020 it is expected to fail at some point prior to the design year 2040. Alternative 1B ranks fifth and is also expected to fail sometime between opening year and design year and is followed by Alternative 3A which offers only indirect benefits to the intersection under consideration through diversion of traffic into SW 82nd Avenue.

Table 7-37 Ranking All Alternatives

SW 8 th St/SW 87 th Ave	No-Build	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B
2020 AM	7	4	5	3	1	5	2
2020 PM	7	4	4	1	1	6	1
2040 AM	7	4	6	3	1	4	1
2040 PM	7	4	4	1	1	6	1
Overall	28	16	19	8	4	21	5
Ranking	7 th	4 th	5 th	3 rd	1 st	6 th	2 nd

8. COST ESTIMATES

Planning level cost estimates were developed for the proposed alternatives based on the Florida Department of Transportation's Generic Cost per Mile Models. The cost estimates were based on the year 2010 values. Table 8-1 presents the results of the Alternatives Cost Estimates.

Cost estimates include construction costs, maintenance of traffic, mobilization and right-of-way costs. Right-of-way costs are based on market values obtained from the Miami-Dade County Property Appraiser's website, with a factor of "2" to account for unwilling sellers.

Costs were initially estimated at Present Day Costs (Year 2010 costs). Then an inflation factor was applied as provided by the Department's Office of Policy Planning in the "Transportation Costs Report". This inflation factor is used to account for a construction year of 2017 (Future Value Costs), which is the year the project is anticipated to go to bid and start construction. The project is scheduled to open to traffic in the Year 2020. The Department's Transportation Cost Report is included in Appendix H.

A detail of the preliminary cost estimates is included in Appendix H for Alternatives 1A through 3B.

Table 8-1 Alternatives Cost Estimates

ALTERNATIVE	CONSTRUCTION COST (Millions)	R/W COST (Millions)	TOTAL: Present Day Costs (Millions)	COST OPENING YEAR ¹ - Future Value Costs
1A (At grade + SW 87 th Avenue)	\$11.1	\$9.6	\$20.7	\$25.98
1B (At grade)	\$9.5	\$1.5	\$11.0	\$13.81
2A (Overpass)	\$19.8	\$1.5	\$21.3	\$26.73
2B (Overpass + SW 87 th Avenue)	\$23.1	\$9.6	\$32.7	\$41.04
3A (Bridge over C-4 Canal plus widening of SW 82 nd Avenue from Flagler to SW 16 th Street)	\$7.84	\$0.21	\$8.05	\$10.10
3B (Bridge over C-4 Canal plus widening of SW 82 nd Avenue from Flagler to SW 16 th Street; plus Overpass)	\$26.7	\$1.7	\$28.4	\$35.64

¹ Costs for Opening Year were calculated based on FDOT's Office of Policy Planning "Transportation Costs Report" which estimates inflation factors and Present Day Costs multipliers that are applied to the Department's Work Program for highway construction costs expressed in 2010 dollars.

9. CONCLUSION

The analysis was conducted using Synchro for the study area with an emphasis on the intersection of SW 8th Street and SW 87th Avenue which experiences high delays under the existing conditions. More specifically, it is recognized that the intersection of SW 8th Street and SW 87th Avenue experiences heavy delays during the morning peak period with the northbound movement and eastbound left turn movement being the most critical, while the southbound direction, eastbound direction and westbound direction all experience heavy delays during the afternoon peak. In particular the southbound direction requires up to four cycles for a typical vehicle to be processed during the afternoon peak while traffic on the westbound direction requires up to two cycles to clear the intersection.

The projected traffic growth in the area indicates that this condition will only exacerbate over time. This was corroborated through the analysis conducted for years 2020 and 2040 for the No-build condition, and in an attempt to improve the condition, a number of alternatives were considered using Synchro as the analysis tool.

The alternatives considered included the following:

- Alternative 1A: At-grade improvements concentrated along SW 8th Street between SW 92nd Avenue and the ramp to SR 826/Palmetto Expressway, and along SW 87th Avenue between SW 8th Street and West Flagler Street, with high impacts in terms of right-of-way acquisition;
- Alternative 1B: Including at-grade improvements along SW 8th Street between SW 92nd Avenue and SW 82nd Avenue, minimizing right-of-way acquisition even though not completely avoiding them;
- Alternative 2A: Includes a SW 8th Street overpass at SW 87th Avenue, with improvements along SW 8th Street between SW 92nd Avenue and SW 82nd Avenue. The overpass minimizes right-of-way impacts, even though it does not avoid all acquisition;
- Alternative 2B: This alternative includes a SW 8th Street overpass at SW 87th Avenue, with additional improvements concentrated along SW 8th Street between SW 92nd Avenue and the ramp to SR-826/Palmetto Expressway, and along SW 87th Avenue between SW 8th Street and West Flagler Street. Alternative 2B has similar impacts in terms of right-of-way acquisition as Alternative 1A;
- Alternative 3A: Widening SW 82nd Avenue between SW 16th Street and Flagler Street from a 2-lane facility to 4-lane facility, and the construction of a new bridge over the C-4 Canal at SW 8th Street and SW 82nd Avenue to provide continuity along SW 82nd Avenue north and south of SW 8th Street. Minor right-of-way acquisition will result north of the canal to a residential property;
- Alternative 3B: Widening SW 82nd Avenue between SW 16th Street and Flagler Street from a 2-lane facility to 4-lane facility, and the construction of a new bridge

over the C-4 Canal at SW 8th Street and SW 82nd Avenue to provide continuity along SW 82nd Avenue north and south of SW 8th Street. This alternative also includes the following improvements: SW 8th Street grade separated (overpass) over SW 87th Avenue; Widening of SW 8th Street between SW 92nd Avenue and SW 82nd Avenue. Similar right-of-way acquisition to Alternative 2A. In addition, minor right of way acquisition will result north of the canal to a residential property.

The At-grade alternatives offer marginal improvements over the No Build alternative and are expected to have a rather short life after the opening year. More importantly, the At-grade alternatives offer little improvements to the most critical movements corresponding to those movements serving the peak direction of traffic.

Of the three overpass alternatives considered (2A, 2B, and 3B), Alternative 2B has significant impacts on SW 87th Avenue in terms of right-of-way acquisition and even though it operates at a very good level of service, the improvements over Alternative 2A are rather marginal. During the afternoon peak, both alternatives actually operate very similar and little or no differences are expected for major movement during this period. It is only during the morning peak that Alternative 2B, with the higher right-of-way impacts, operates better than Alternative 2A. The additional right-of-way acquisition for Alternative 2B along SW 87th Avenue offer small improvements and for that reason, Alternative 2A is recommended over Alternative 2B.

When comparing Alternative 2A to Alternative 3B, the two are considered to operate very similar since the configuration at SW 87th Avenue and SW 8th Street is the same. The additional benefits of Alternative 3B over Alternative 2A at the SW 87th Avenue and SW 8th Street intersection result from the reduced traffic at this intersection because of diverted traffic to SW 82nd Avenue. However, it is noted that Alternative 2A operates well and addresses the objective and need of the project, offering congestion relief at SW 87th Avenue and SW 8th Street, and is therefore considered an acceptable solution. This is not to say that the improvements at SW 82nd Avenue are not beneficial, but those improvements alone (Alternative 3A) do not address in a significant way congestion at SW 87th Avenue. Considering the improvements at SW 82nd Avenue are not mutually exclusive with the improvements at SW 87th and the overpass, Alternative 2A continues to be recommended over Alternative 3B.

When comparing the At-grade alternatives with Alternative 2A, the improvements that the later offers are very significant for both, SW 87th Avenue traffic and for SW 8th Street traffic. Considering that the intersection shows the main movements already failing and traffic is expected to continue to grow despite other capacity improvements on alternate routes, the conclusion is that the overpass recommended by Alternative 2A is needed and addresses the project needs. This is not to say that the At-grade alternatives cannot be implemented as a phased approach to the project. For instance, Alternative 1B offers improvements over the no build condition and in many aspects can be considered a phased construction of Alternative 2A. Similarly, the widening of SW 82nd Avenue and construction of a new bridge over the C-4 Canal could be considered early works for

implementation of Alternative 3B and clearly offers benefits, even though marginal, to the operation of SW 87th Avenue.

One of the concerns of the implementation of the overpass is that the congestion at the adjacent intersections will not allow an efficient use of the facility. This would be the case if queues spill back from downstream intersections and traffic traveling along the overpass experience additional delays due to these spillbacks. The results indicate that the intersections of SW 94th Avenue, SW 92nd Avenue and SW 82nd Avenue operate at acceptable levels of service, in particular in the westbound direction for the through movements. The intersections downstream of the overpass, west of SW 87th Avenue, are not expected to affect operations of this. Spill backs are not expected because of higher capacity (additional through lanes) at the downstream intersections than that provided at the SW 87th Avenue intersection, and because the cross streets at the downstream intersections carry less traffic than SW 87th Avenue; this allows a higher allocation of green time for the through east-west movements and hence a better operation of these. Only during the year 2040 will the SW 97th Avenue intersection experience failing levels of service for the through movements. Therefore, the SW 8th Street corridor signal progression needs to maximize the westbound traffic to ensure the efficient operations of the overpass. In the eastbound direction there are spill backs from SW 8th Street east of SR-826 that currently extend to SW 87th Avenue. This will prevent the overpass alternatives from developing their full potential in the eastbound direction during the AM peak period.

Probably the most important factor to consider is that the most critical movement at SW 8th Street and SW 87th Avenue is the southbound approach. Movements along SW 87th Avenue, and movements to and from SW 87th Avenue are not impacted by the operation of adjacent intersections along SW 8th Street and the full benefit of the overpass is obtained for those movements. In other words, even if the full benefit is not obtained for the eastbound movement, the fact that the movement does not conflict with the SW 87th Avenue traffic provides significant improvements to the intersection.

In terms of short term solutions, the improvement that has the biggest impact on the operation of the intersection, and in particular for the movement that experiences the highest delays, is the addition of an exclusive right turn lane in the southbound direction; however, this improvement entails right-of-way acquisition. This improvement also has the advantage of being fully compatible with the recommended Alternative 2A. Another improvement that is fully compatible with the overpass alternative, and for which right-of-way is available, consists of extending the four lanes in the eastbound direction between SW 87th Avenue and SW 82nd Avenue providing four through lanes at the eastbound approach of the SW 8th Street and SW 87th Avenue intersection.

In summary, Alternative 2A is the recommended alternative. Alternative 1B, which consist of At-grade improvements compatible with the recommended Alternative 2A, could be implemented as an interim solution. Lastly, Alternative 3A, which consist of improvements along SW 82nd Avenue, would offer some improvements to SW 87th Avenue but it is not recommended as a direct solution to SW 87th Avenue.

Appendix A

Straight Line Diagrams

Appendix B

Crash Data

Appendix C
Traffic Data

Appendix D

Signal Timing Data

Appendix E

Synchro Runs

Appendix F

Synchro Analysis Tables

Appendix G

Design Hour Volumes (Development Tables)

Appendix H

Transportation Costs Report

Appendix I

Florida Traffic Information DVD - PTMS

Appendix J

SERPM 6.5 Model Outputs

Appendix K

Travel Times (Field Data)