Technical Memorandum

No.5

Multimodal Alternatives Analysis

SR 90/SW 7th Street/SW 8th Street
from SR 5/US 1/Brickell Avenue
to SR 9/SW 27th Avenue

Miami-Dade County, Florida

FM No. 432639-5-22-01

Prepared For:
Florida Department of Transportation, District Six

June 2015

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1 Introduction

1.1 Objective

The purpose of this technical memorandum is to present the process by which conceptual engineering alternatives, developed for SR 90/SW 7th Street and SW 8th Street from SR 5/Brickell Avenue to SR 9/SW 27th Avenue and presented in Technical Memorandum No. 4 (Conceptual Engineering Alternatives), were evaluated and narrowed down to a selected few to be further analyzed during the Project Development and Environment (PD&E) phase of this study.

Based on existing conditions analysis and feedback received from the assembled Project Advisory Team (PAT), a group of representatives from key stakeholders, four conceptual alternatives have been developed for the SR 90/SW 7th Street and SW 8th Street corridor and I-95 interchange to be compared to a No-Build condition. These alternatives were ranked based on operational conditions, estimated construction and capital cost, general constructability and geometry, and on the modal priorities for the corridor that were defined during this study and recorded in Technical Memorandum No. 3. Because, these alternatives will be further analyzed in the PD&E phase, no benefit cost was conducted in this phase. This technical memorandum presents the evaluation matrix containing analyses performed for each alternative. The most feasible alternatives will be selected for further development in the PD&E study.

1.2 Project Description

The study focuses on the segment of SR 90/SW 7th Street and SW 8th Street, sections 87120001 and 87120000 respectively, from SR 5/Brickell Avenue to SR 9/SW 27th Avenue. This segment of SR 90 is an east-west urban principal arterial consisting of a one-way pair, with SW 7th Street operating as SR 90 westbound and SW 8th Street operating as SR 90 eastbound.

This dense urban corridor, from SR 5/Brickell Avenue to SR 9/SW 27th Avenue, includes over 30 signalized intersections. Located near SW 3rd Avenue and SW 4th Avenue, the interchange with I-95 has a significant impact on operations along the corridor as well as on traffic volumes as it acts as the main access to the Brickell area for commuters via the regional transportation system. Moreover, the Brickell area serviced by SR 90/SW 7th Street and SW 8th Street has seen significant growth in the last decade with high-density high-rise developments, which have contributed to changes in the operations of the study corridor. Additionally, several new major development projects are currently proposed within the Brickell area, all of which can further impact operations and increase traffic volumes along this already congested corridor.

1.2.1 Purpose

The project efforts ultimately consist of developing and evaluating corridor alternatives and providing recommendations to improve existing and future physical, operational, and safety deficiencies of the corridor. The project will focus on preserving future expansion needs for multimodal transportation facilities and enhancing mobility of the corridor, including the movement of freight and goods. It will also focus on conducting intergovernmental coordination with an emphasis on communication with key decision makers and stakeholders.

1.3 Study Segment

The study area consists of a half-mile buffer around the segment of SR 90 extending from SR 5/Brickell Avenue to SR 9/SW 27th Avenue. This area includes the existing interchange with I-95, located near SW 3rd Avenue and SW 4th Avenue as well as two major north-south corridors, SR 933/SW 12th Avenue and SR 7/SW 8th Avenue. Figure 1-1 exhibits the limits of the SR 90 study segment as well as the half-mile buffer study area.

Figure 1-1: Study Area

The SR 90 study segment is located entirely within the City of Miami, in Miami-Dade County. Though located only within one municipality, the study segment passes through six (6) different neighborhoods: West Flagler, Shenandoah, Little Havana, Riverside, The Roads, and Brickell.

Additionally, there are segments of the study corridor around which, a substantial number of historic structures are located within a 350 feet buffer. These segments are between SW 12th Avenue and SW 10th Avenue, with a total of 22 historic structures; and between SW 2nd Avenue and Brickell Avenue, with a total of 33 historic structures.

Based on the year 2010 Census data, the study area consists of a total population of 39,628. This represents approximately 1.5 percent of Miami-Dade County's total population, which was estimated at 2,496,457 by the 2010 Census. The highest concentration occurs to the north of the corridor from SW 22nd Avenue to SR 7/SW 8th Avenue. This high density area is located within the neighborhoods of West Flagler and Little Havana, which are mostly residential.

The existing land use directly adjacent to the study corridor is predominantly multifamily residential, highway infrastructure (i.e. I-95), and commercial. Furthermore, the land use along eastbound SR 90 is predominantly commercial on either side of the street. In contrast, the land use along westbound SR 90 is predominantly commercial with scattered residential east of I-95 and primarily residential west of I-95. The residential area is composed of multifamily buildings.

1.3.1 Existing Infrastructure

The study segment of SR 90 is classified as an Urban Other Principal Arterial with a posted speed of 30 miles per hour (MPH). The existing typical section elements are portrayed in Figures 1-2 and 1-3. Additionally, existing available right-of-way (ROW) along eastbound SR 90 ranges from 58 feet to 80 feet, with an average of 70 feet, and along westbound SR 90 from 50 feet to 60 feet, with an average of 60 feet.

Figure 1-2: Existing Roadway Typical Section of Eastbound SR 90 (SW 8th Street)

Figure 1-3: Existing Roadway Typical Section of Westbound SR 90 (SW 7th Street)

2 Conceptual Engineering Alternatives Development

The development of conceptual alternatives aims at improving conditions in terms of safety, mobility, connectivity, and livability for the different modes of transportation within the study corridor. Input from the PAT prioritizes pedestrians and transit and its vision is to provide SR 90 with desirable and reliable infrastructure for both. Conceptual alternatives were created based on the overall vision of the corridor, Florida Department of Transportation (FDOT) performance measures, and the existing conditions analysis results. Alternatives development for this planning phase did not consider major right-of-way acquisition except for areas adjacent to the I-95 Interchange.

2.1 Corridor Priorities, Multimodal Mobility Goals and Performance Measures

Setting a vision for the corridor consisted of a two-step process:

1. Identifying and prioritizing modal needs for the corridor
2. Identifying segments within the corridor needing the most attention in terms of operation, transportation connectivity, safety, community character, etc.

In order to identify the envisioned corridor, obtain feedback on existing conditions and corridor performance, and define corridor priorities, the project team met with PAT members and key stakeholders. During that meeting, a question-and-answer session was carried out. Figure 2-1 shows an excerpt question from PAT meeting No. 2. For the complete questionnaire, refer to Technical Memorandum No. 6 (Intergovernmental Coordination Summary), Appendix A.

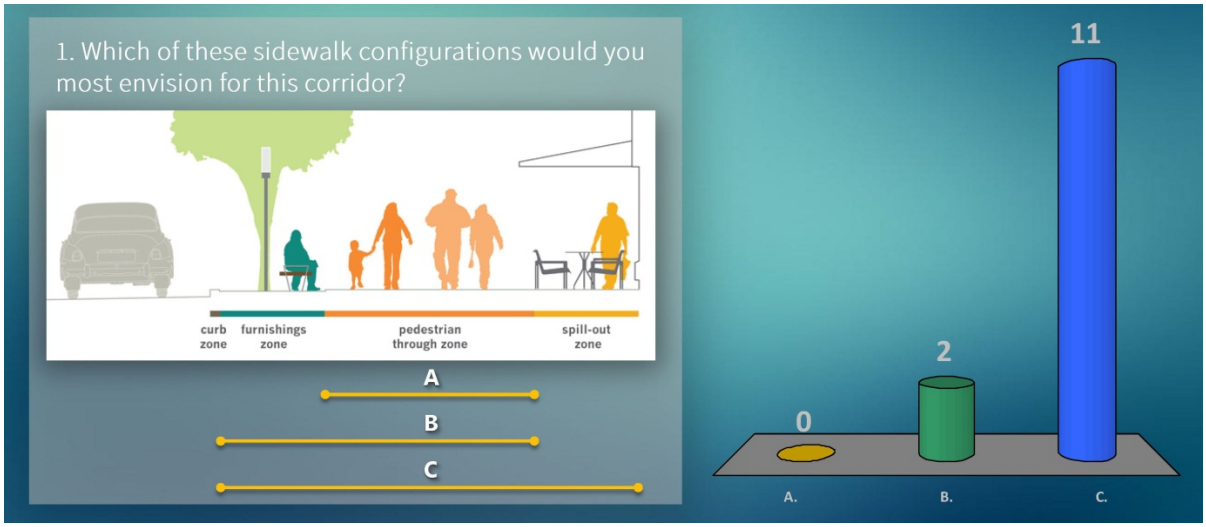


Figure 2-1: Intergovernmental Coordination Sample Question

Questions were specific to areas of the corridor identified as having unique characteristics (see Table 2-1). Hence the corridor was divided accordingly into three (3) different segments based on these characteristics (see Figure 2-2). The typical sections of SW 7th Street and SW 8th Street are essentially the same throughout the limits of the study. However, as SR 90 moves eastbound it exhibits major differences based on land use, development activity, traffic volumes, interchange access, and pedestrian and bicyclists behavior.

Segments	Limits	Description
Segment 1A	From SW 27th Avenue to SW 17th Street	Consists of high residential activity, retail
Segment 1B	From SW 17th Street to SW 5th Avenue	Consist of high residential activity, high retail, tourists, high use of on-street parking, cultural events
Segment 2	From SW 5th Avenue to SW 2nd Avenue	High traffic volumes, I-95 Major Interchange Access
Segment 3	From SW 2nd Avenue to Brickell Avenue	High rises, major development, urban, high density

Table 2-1 Study Corridor Segments Classification

Figure 2-2: Study Corridor Segments

The following conclusions were made in terms of modal priority and are ranked based on their importance as expressed by PAT members:

1. Pedestrians: sidewalks and pedestrian safety are the highest priority for this corridor.
2. Bicyclists: bicycle facilities should be provided.
3. Transit: service frequency must be increased; i.e. Bus Rapid Transit (BRT) implementation.
4. Automobiles and On-street Parking: travel lane and parking lane repurposing for other modes should be considered granted further analysis takes place.

It should be noted that out of all the priorities identified by PAT members, on-street parking scored the lowest when compared to other needs of the corridor. However, as part of the outreach program of this study, more meetings with other stakeholders suggested the need of on-street parking for the retail areas on SR 90/SW 8th Street. Consideration should be given to repurposing on-street parking lanes to be used for wider sidewalks, bicycle facilities and/or transit enhancements. Nonetheless, in order to evaluate the number of parking spaces and their location on or off-street, needed for retail and general use, a separate study should be conducted during further phases of this project.

For a detailed explanation on how strategies for the corridor were defined, please refer to Technical Memorandum No. 3 (Preliminary Conceptual Alternatives Strategies).

While the study segment of SR 90 is entirely within the limits of the City of Miami in Miami-Dade County, it is a state facility and the FDOT has jurisdiction over it. As such, the study segment of SR 90 should maintain the Department's vision that a corridor's primary function is to provide mobility for people and goods. FDOT defines mobility as the ease with which people and goods move throughout their community, state, and world; and believes that mobility is valuable because it provides access to jobs, services, and markets.

To represent and measure the success of its transportation system, FDOT has defined mobility through four (4) different dimensions: quantity, quality, accessibility, and utilization. These dimensions are described herein as they are presented in the FDOT's Multimodal Mobility Performance Measures 2013 Source Book:

- Quantity of Travel – Length and time people utilize a transportation system
- Quality of Travel – How the user perceived the experience of using this corridor
- Accessibility – How easy it is for users to engage in activities
- Utilization – Supply and Demand, user's assessment of congestion levels

Corridor mobility, from a multimodal perspective, requires the assessment of all the performance measures from the four (4) dimensions. A detailed explanation of Mobility Goals and Performance Measures is presented in Technical Memorandum No. 4 (Conceptual Engineering Alternatives).

Using the vision and strategies defined by coordinating with the PAT and with key stakeholders, the conclusions from the existing condition analysis on performance, and the performance measures defined by FDOT, the study team developed potential build scenarios consisting of groups of typical sections for SR 90/SW 7th and SW 8th Street and alternatives for the SR 90 and I-95 interchange.

2.2 Alternatives Development

Conceptual alternatives were developed with a multimodal perspective, focusing on the individual needs of all travel modes served by the study corridor: automobiles, transit, bicycles, and pedestrians. The alternatives consisted of three (3) main components:

Main Component	Description
Typical Section (All Study Segments)	Using the existing available Right-of-Way, an array of typical sections were develop, each prioritizing one or multiple modes of transportation.
Conceptual Alternatives for the SR 90 and I-95 Interchange (Segment 2)	Consists of "what if scenarios" in terms of new ramp connections between SR 90 and I-95 that could improve existing conditions by overpassing certain intersections that are anticipated to fail based on the expected growth in the corridor.
Traffic Flow requirements (All Study Segments)	Based on previous studies conducted for the corridor and information gathered through the public outreach process the following traffic flows were considered: 1. Existing Flow 2. Flow Reversal on SW 7th and SW 8th Street 3. Two-way on SW 7th and SW 8th Street

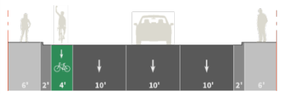
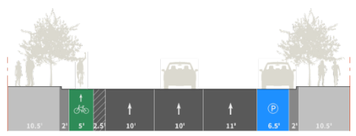
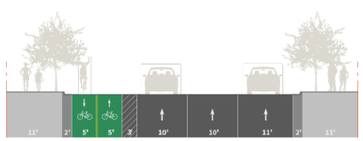
3 Conceptual Alternative Screening

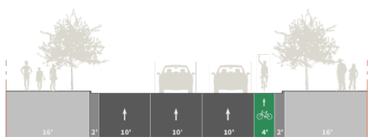
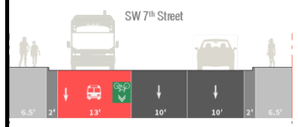
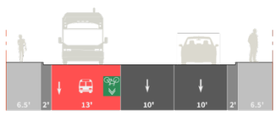
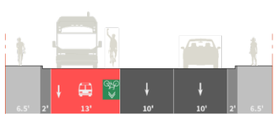
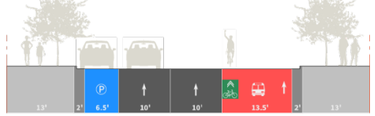
All typical sections developed for this study were graded based on existing conditions examination and corridor priorities set by the PAT and key stakeholders. The evaluation process involved a matrix of Typical Section groups and the priorities involved. To distinguish them from I-95 Interchange conceptual alternatives, typical section alternatives have been identified as "**groups**". Each group from A through L comprises a pair of typical sections; existing flow and its reverse flow equivalent (not shown on the matrix). Groups N and M consist of two-way flow. For detailed explanations on Groups and Interchange Alternatives please refer to Technical Memorandum No.4 (Conceptual Engineering Alternatives).

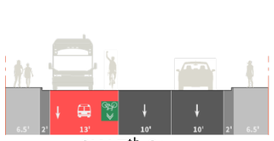
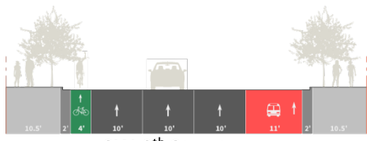
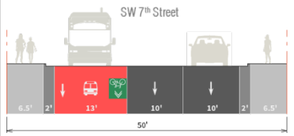
In order to represent the hierarchy of the priorities, wider score ranges were assigned to the higher prioritized modes.

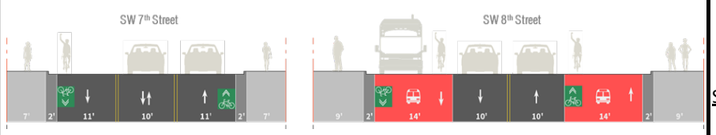
- Pedestrian Features (-1 to 4)
- Bicycle Facilities (-1 to 3)
- Transit Exclusive Lanes (-1 to 2)
- Consideration for Parking (-1 to 2)

A (-1) was applied to features in a typical section that would negatively affect a mode. This was done to account for cases in which a typical section would disproportionately favor a mode without considering a *complete streets* approach.

Typical Section Groups	Proposed Improvements	Expected Benefits	Pedestrian Facilities are the highest priority (-1 to 4)	Bicycle Facilities are incorporated (-1 to 3)	Increase service frequency for Transit and provide exclusive lanes (-1 to 2)	Consideration for automobile (Street Parking and Travel Lanes (-1 to 1)	Total Score
Group A	 SW 7th Street  SW 8th Street	SW 7th Street ▪ 4 feet bicycle lane. ▪ 6 feet sidewalks on both sides. ▪ Wider pavement width. SW 8th Street ▪ Repurposing of one (1) out of two (2) existing on-street parking lanes to provide a two-way cycle track separated from traffic by a 1.5 feet buffer. ▪ Providing one 11 feet outside lane to accommodate large vehicles such as buses and trucks. ▪ 9 feet sidewalks on both sides. ▪ Existing pavement width.	(0) Widening of sidewalks provides more space for pedestrians on SW 8th Street but not on SW 7th Street.	(+3) Bicycles facilities are incorporated in SW 7th and SW 8th Street.	(0) Transit will run in mix traffic.	(+1) On-street parking is being provided on one side of the road along SW 8th Street.	4
Group B	 SW 7th Street  SW 8th Street	SW 7th Street ▪ 4 feet bicycle lane. ▪ 6 feet sidewalks on both sides. ▪ Wider pavement width. SW 8th Street ▪ Repurposing of one (1) general use travel lane to provide a two-way cycle track separated from an on-street parking lane by a 3 feet buffer. ▪ Providing one 11.5 feet outside lane to accommodate large vehicles such as buses and trucks. ▪ 9 feet sidewalks on both sides. ▪ Existing pavement width.	(0) Widening of sidewalks provides more space for pedestrians on SW 8th Street but not on SW 7th Street wide for crossings and minor vehicle conflicts.	(+3) Bicycles facilities are incorporated in SW 7th and SW 8th Street.	(-1) Transit will run in mix traffic and one additional lane is being repurposed for the use of bicycles and parking affecting the operation of buses in mixed traffic.	(+1) On-street parking is being provided on both sides of SW 8th Street.	3
Group C	 SW 7th Street  SW 8th Street	SW 7th Street ▪ 4 feet bicycle lane. ▪ 6 feet sidewalks on both sides. ▪ Wider pavement width. SW 8th Street ▪ Repurposing one (1) out of two (2) existing on-street parking lanes to provide a bicycle lane separated from traffic by a 2.5 feet buffer. ▪ Providing one 11 feet outside lane to accommodate large vehicles such as buses and trucks. ▪ 10.5 feet sidewalks on both sides. ▪ Narrower pavement width.	(+2) Widening of sidewalks provides more space for pedestrians on SW 8th Street but not on SW 7th Street.	(+3) Bicycles facilities are incorporated in SW 7th and SW 8th Street.	(0) Transit will run in mix traffic.	(+1) On-street parking is being provided on one side of the road along SW 8th Street.	6
Group D	 SW 7th Street  SW 8th Street	SW 7th Street ▪ 4 feet bicycle lane. ▪ 6 feet sidewalks on both sides. ▪ Wider pavement width. SW 8th Street ▪ Repurposing of one (1) of the two (2) existing on-street parking lanes to provide a two-way cycle track separated from traffic by a 3 feet buffer. ▪ Providing one 11 feet outside lane to accommodate large vehicles such as buses and trucks. ▪ 11 feet sidewalks on both sides. ▪ Narrower pavement width.	(+2) Widening of sidewalks provides more space for pedestrians on SW 8th Street but not on SW 7th Street.	(+3) Bicycles facilities are incorporated in SW 7th and SW 8th Street.	(0) Transit will run in mix traffic.	(0) No on-street parking is being provided.	5

Typical Section Groups	Proposed Improvements	Expected Benefits	Pedestrian Facilities are the highest priority (-1 to 4)	Bicycle Facilities are incorporated (-1 to 3)	Increase service frequency for Transit and provide exclusive lanes (-1 to 2)	Consideration for automobile (Street Parking and Travel Lanes (-1 to 1)	Total Score
Group E	 SW 7th Street  SW 8th Street	<u>SW 7th Street</u> ▪ 4 feet bicycle lane. ▪ 11 feet sidewalks on both sides. ▪ Narrower pavement width. <u>SW 8th Street</u> ▪ 4 feet bicycle lane. ▪ 16 feet sidewalks on both sides. ▪ Narrower pavement width.	(+4) Widening of sidewalks provides more space for pedestrians on SW 8th and SW 7th Street.	(+3) Bicycles facilities are incorporated in SW 7th and SW 8th Street.	(-1) Transit will run in mix traffic and a travel lane was repurposed along SW 7th Street.	(-1) No on-street parking is being provided.	5
Group F	 SW 7th Street  SW 8th Street	<u>SW 7th Street</u> ▪ Repurposing of one (1) general use travel lane to provide an exclusive 13 feet shared bus and bicycle lane. ▪ 6.5 feet sidewalks on both sides. ▪ Existing pavement width. <u>SW 8th Street</u> ▪ Repurposing of one (1) of the two (2) existing on-street parking lanes to provide a two-way cycle track separated from traffic by a 1.5 feet buffer. ▪ Repurposing of one (1) general use travel lane to provide an exclusive 11 feet bus only outside lane. ▪ 9 feet sidewalks on both sides. ▪ Existing pavement width.	(0) Widening of sidewalks provides more space for pedestrians on SW 8th Street but not on SW 7th Street.	(+2) Bicycles facilities are incorporated along the north side of SW 8th Street. Sharrows are incorporated on the north side of SW 7th Street. Sharrows, however, are not are not considered bicycle facilities.	(+2) Transit will have exclusive lanes in SW 8th and SW 7th Street.	(+1) On-street parking is being provided on one side of the road along SW 8th Street.	5
Group G	 SW 7th Street  SW 8th Street	<u>SW 7th Street</u> ▪ Repurposing of one (1) general use travel lane to provide an exclusive 13 feet shared bus and bicycle lane. ▪ 6.5 feet sidewalks on both sides. ▪ Existing pavement width. <u>SW 8th Street</u> ▪ Repurposing of one (1) of the two (2) existing on-street parking lanes to provide a contra-flow bicycle lane separated from traffic by a 2 feet buffer. ▪ Repurposing of one (1) general use travel lane to provide an exclusive 14.5 feet shared bus and bicycle only outside lane. ▪ 9 feet sidewalks on both sides. ▪ Existing pavement width.	(0) Widening of sidewalks provides more space for pedestrians on SW 8th Street but not on SW 7th Street.	(+1) Bicycles facilities are incorporated along the north side of SW 8th Street. Sharrows are provided on the north side of SW 7th and the south side of SW 8th Street. Sharrows, however, are not considered bicycle facilities.	(+2) Transit will have exclusive lanes in SW 8th and SW 7th Street.	(+1) On-street parking is being provided on one side of the road along SW 8th Street.	4
Group H	 SW 7th Street  SW 8th Street	<u>SW 7th Street</u> ▪ Repurposing of one (1) general use travel lane to provide an exclusive 13 feet shared bus and bicycle lane. ▪ 6.5 feet sidewalks on both sides. ▪ Existing pavement width. <u>SW 8th Street</u> ▪ Repurposing of one (1) of the two (2) existing on-street parking lanes to provide wider sidewalks of 13 feet in width on both sides. ▪ Repurposing of one (1) general use travel lane to provide an exclusive 13.5 feet shared bus and bicycle only outside lane. ▪ Narrower pavement width.	(+2) Widening of sidewalks provides more space for pedestrians on SW 8th Street but not on SW 7th Street.	(0) Sharrows are incorporated on the north side of SW 7th and the south side of SW 8th Street. Sharrows are not considered bicycle facilities.	(+2) Transit will have exclusive lanes in SW 8th and SW 7th Street.	(+1) On-street parking is being provided on one side of the road along SW 8th Street.	5

Typical Section Groups	Proposed Improvements	Expected Benefits	Pedestrian Facilities are the highest priority (-1 to 4)	Bicycle Facilities are incorporated (-1 to 3)	Increase service frequency for Transit and provide exclusive lanes (-1 to 2)	Consideration for automobile (Street Parking and Travel Lanes (-1 to 1)	Total Score
Group I	 SW 7th Street  SW 8th Street	<u>SW 7th Street</u> ▪ Repurposing of one (1) general use travel lane to provide an exclusive 13 feet shared bus and bicycle lane. ▪ 6.5 feet sidewalks on both sides. ▪ Existing pavement width. <u>SW 8th Street</u> ▪ Repurposing both existing on-street parking lanes to provide an exclusive 11 feet bus only outside lane and a 4 feet bicycle lane. ▪ 10.5 feet sidewalks on both sides. ▪ Narrower pavement width.	(+2) Widening of sidewalks provides more space for pedestrians on SW 8th Street but not on SW 7th Street.	(+1) Bicycles facilities are incorporated along the north side of SW 8th Street. Sharrows are incorporated along the north side of SW 7th. Sharrows are not considered bicycle facilities.	(+2) Transit will have exclusive lanes in SW 8th and SW 7th Street.	(0) No on-street parking is being provided.	5
Group J	 SW 7th Street  SW 8th Street	<u>SW 7th Street</u> • Repurposing of one (1) general use travel lane to provide an exclusive 13 feet shared bus and bicycle lane. • 6.5 feet sidewalks on both sides. • Existing pavement width. <u>SW 8th Street</u> • Repurposing both existing on-street parking lanes to provide an exclusive 11 feet bus only outside lane and a two-way cycle track separated from traffic by a 3 feet buffer. • 11 feet sidewalks on both sides. • Narrower pavement width.	(+2) Widening of sidewalks provides more space for pedestrians on SW 8th Street but not on SW 7th Street.	(+1) Bicycles facilities are incorporated along the north side of SW 8th Street. Sharrows are incorporated along the north side of SW 7th Street. Sharrows are not considered bicycle facilities.	(+2) Transit will have exclusive lanes in SW 8th and SW 7th Street.	(0) No on-street parking is being provided.	5
Group K	 SW 7th Street  SW 8th Street	<u>SW 7th Street</u> • Repurposing of one (1) general use travel lane to provide a two-way cycle track separated from traffic by a 2 feet buffer. • 7 feet sidewalks on both sides. • Narrower pavement width <u>SW 8th Street</u> • Repurposing both existing on-street parking lanes to provide an exclusive 14 feet shared bus and bicycle only outside lane and an exclusive 14 feet shared bus and bicycle only contra-flow lane. • 9 feet sidewalks on both sides. • Existing pavement width	(+1) Widening of sidewalks provides more space for pedestrians on SW 8th Street and SW 7th Street. Minor widening on SW 7th Street.	(+2) Bicycles facilities are incorporated along the south side of SW 7th Street. Sharrows are incorporated along both sides of SW 8th Street. Sharrows are not considered bicycle facilities.	(+2) Transit will have exclusive lanes on SW 8th but not on 7th Street.	(-1) No on-street parking is being provided while repurposing of lanes is being used for other modes.	5

Typical Section Groups	Proposed Improvements	Expected Benefits	Pedestrian Facilities are the highest priority (-1 to 4)	Bicycle Facilities are incorporated (-1 to 3)	Increase service frequency for Transit and provide exclusive lanes (-1 to 2)	Consideration for automobile (Street Parking and Travel Lanes (-1 to 1)	Total Score
Group L	 SW 7th Street SW 8th Street	<u>SW 7th Street</u> • Repurposing of one (1) general use travel lane to provide a reversible lane • 7 feet sidewalks on both sides. • Narrower pavement width. <u>SW 8th Street</u> • Repurposing both existing on-street parking lanes to provide two exclusive transit lanes • 9 feet sidewalks on both sides. • Existing pavement width.	(+1) Widening of sidewalks provides more space for pedestrians on SW 8th Street but not on SW 7th Street.	(0) Sharrows are incorporated on both sides of SW 8th and SW 7th Street. Sharrows are not considered bicycle facilities.	(+2) Transit will have exclusive lanes on SW 8th but not on 7th Street.	(0) No on-street parking is being provided.	3
Group M	 SW 7th Street SW 8th Street	<u>SW 7th Street</u> • Repurposing of one (1) general use travel lane to convert to two-way continuous turning lane. • 6.5 feet sidewalks on both sides. • Existing pavement width. <u>SW 8th Street</u> • Repurposing both existing on-street parking lanes to provide a median and bike lanes • 9 feet sidewalks on both sides. • Existing pavement width.	(+2) Widening of sidewalks provides more space for pedestrians on SW 8th Street but not on SW 7th Street, medians are safe for pedestrians.	(+2) Bicycles facilities are incorporated on both sides of SW 8th Street. Sharrows are incorporated on both sides of SW 7th Street. Sharrows are not considered bicycle facilities.	(-1) Transit will run in mix traffic.	(0) No on-street parking is being provided.	3
Group N	 SW 7th Street SW 8th Street	<u>SW 7th Street</u> • Repurposing of one (1) general use travel lane to convert to two-way continuous turning lane. • 6.5 feet sidewalks on both sides. • Existing pavement width. <u>SW 8th Street</u> • Repurposing both existing on-street parking lanes to provide a median and keep a parking lane on one side • 9 feet sidewalks on both sides. • Existing pavement width	(+2) Widening of sidewalks provides more space for pedestrians on SW 8th Street but not on SW 7th Street, medians are safe for pedestrians.	(0) No bicycle facilities along SW 8th Street. Sharrows are incorporated on both sides of SW 7th Street. Sharrows are not considered bicycle facilities.	(-1) Transit will run in mix traffic with less capacity for vehicles.	(+1) On-street parking is being provided on one side of the road along SW 8th Street.	2

Overall, Group C Typical Section scored the highest. Please refer to the Evaluation Matrix for details. Additionally, all evaluated typical sections were presented in the PAT meeting held on October 28, 2014. Information gathered from the meeting was used to apply some changes to this proposed typical section. These changes included the use of a curb Type D (6"), instead of a curb & gutter Type F, and one-foot shoulders to gain an additional foot for the outside lane and better accommodate large vehicles on SW 7th Street. Miami Dade Transit (MDT) expressed concerns regarding the use of a 10-foot outside lane on SW 7th Street; the transit agency suggests it would not be adequate for buses. It should be noted that the use of curb Type D "6" should be analyzed further during the PD&E phase of this project from a drainage perspective, and close coordination with the Department's design group should take place to study the feasibility of its use.

Additionally, although Group C showed the buffer separated bicycle facility on the north side of SW 8th Street at the time of the evaluation, further discussions with the Department deemed it more appropriate to show the bicycle facility on the south side, as this configuration will better address driver and rider expectancy. Figures 3-3 and 3-4 portray a conceptual representation of how Group C would appear from a plan view perspective. Treatment for the proposed bicycle facilities should be analyzed and designed more in detail during the PD&E phase of this project.

The following items and figures describe and portray the modified Group C typical section.

Group C Typical Sections

- One-way bicycle lanes in each direction
- Wider sidewalks on south side of SW 8th street
- 12 ft. wide outside lane to accommodate large vehicles on SW 8th Street
- Bicycle lane on SW 8th street separated from parking lane by physical buffer
    - The provision of this bicycle facility implies the repurposing of an existing on-street parking lane. It should be noted that the Little Havana Merchant Alliance and certain City of Miami officials have expressed concerns regarding this configuration. Should this alternative move forward during the PD&E phase of this project, it is recommended that close coordination take place with these entities to discuss and provide options for the repurposing of on-street parking.
- Curb Type D (6") and a 1 ft. shoulder on SW 7th Street to provide an 11 ft. wide outside lane to accommodate large vehicles

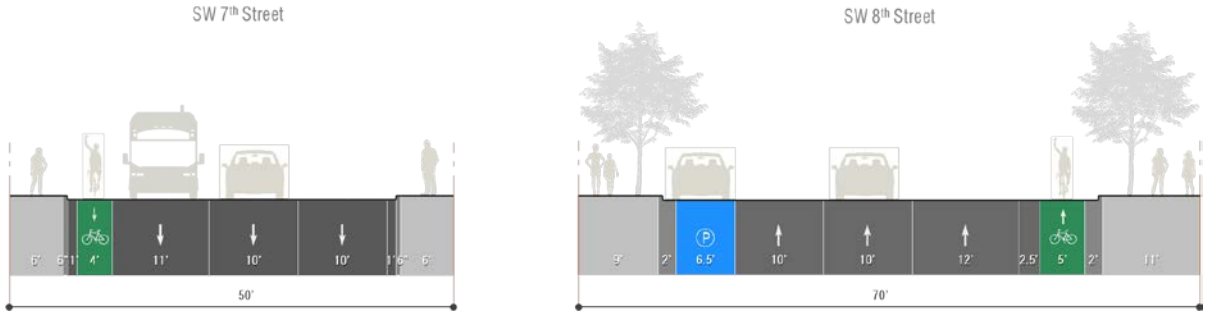


Figure 3-1: Group C Typical Section

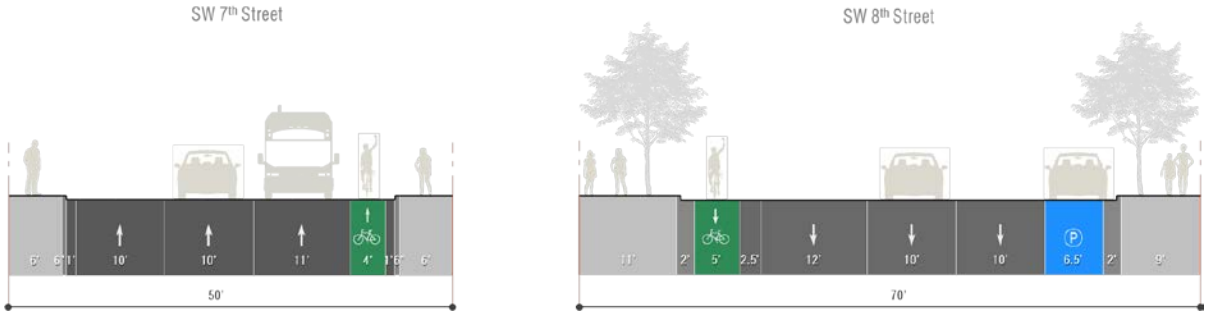
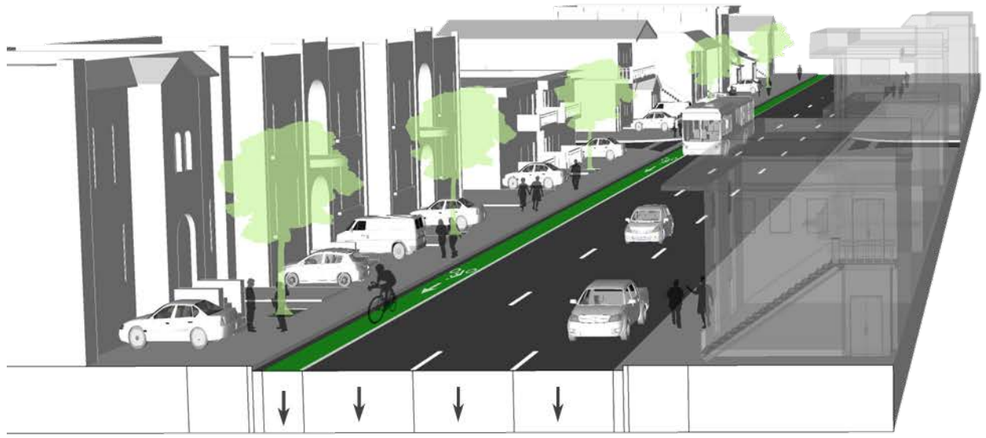
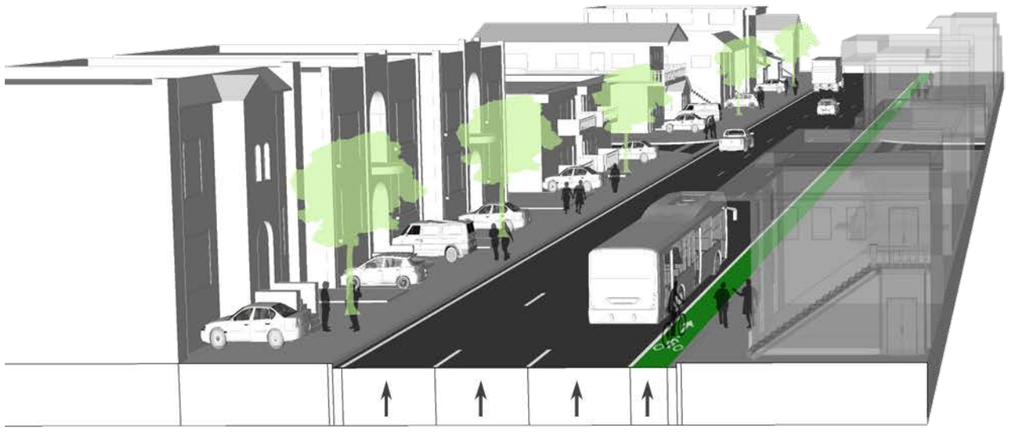


Figure 3-2: Group C Typical Section (Reversed Flow)





Mixed Traffic Flow Direction

Figure 3-3: Group C Plan View

Mixed Traffic Flow Direction

Figure 3-4: Group C (Reversed Flow) Plan View

The concept of flow reversal presents design challenges when approaching the western limits of the study corridor. The existing configuration approaching SR 9/SW 27th Avenue, in which SR 90 becomes a two-way street, should be carefully analyzed and designed to adequately accommodate reversed directions of the corridor. Traffic flow reversal within this area could translate into high implementation costs since the acquisition of right-of-way may potentially be required. For a more detailed explanation about flow reversal refer to Technical Memorandum No. 4. Figure 3-5 depicts the conceptual configuration of SR 90 as it approaches SW 27th Avenue with reverse traffic flow. This concept was developed under the notion that no additional right-of-way would be required to implement flow reversal and was used to perform the traffic analysis for Build Scenario 3 (3 Lanes Reversed Alternative 3). In addition, the outreach process of this study revealed interest in more elaborate concepts for this area of the corridor. Concepts presented ideas regarding roundabout implementation as well as providing a more intricate and defined gateway to "Calle 8". While these concepts were not elaborated during this phase of the project, later stages should review their plausibility.

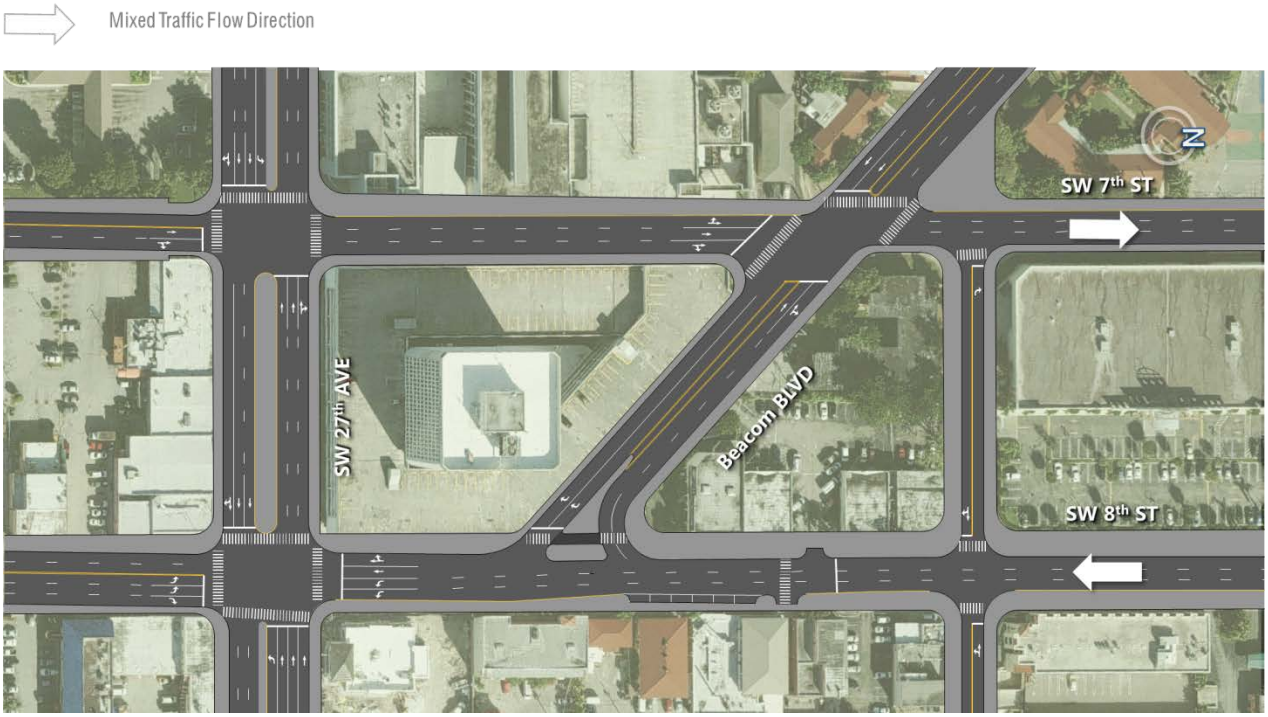


Figure 3-5: Group C (Reversed Flow) Plan View as SR 90 Approaches SW 27th Avenue

In this section, I-95 Interchange concepts are referred in this section as alternatives. Although four alternatives were presented in Technical Memorandum No. 4, Alternative 3 and Alternative 4 (See Figure 3-6) were selected for further study. Alternative 3 was developed to accommodate the reverse traffic flow and two way traffic flow scenarios. Alternative 4 was developed to accommodate the existing traffic flow scenarios. These alternatives represent the better options in terms of providing superior geometry for a direct connection to I-95. In addition, these alternatives may be further developed in subsequent study phases. For this study, Alternative 4 (Existing Flow) mainly represents direct access from westbound SW 7th Street to northbound I-95 and direct access from southbound I-95 to SW 8th Street by overpassing SW 4th Avenue and SW 8th Street west of I-95.

Figure 3-6: I-95 Interchange Concepts (Alternatives 3 and 4)

As this study progressed, the team was asked to develop a concept for the I-95 interchange that would provide as much "free-flow" direct movement on SR 90 to and from the freeway. The objective for this concept was that it would be developed under the notion that right-of-way (ROW) constraints would not be an issue for its implementation. This "ultimate" interchange configuration provides direct ramps on SR 90 to and from I-95 and is described in Figure 3-7. Should this concept move forward during the PD&E phase of this project, it is recommended that detailed analysis be performed for the development of its conceptual design. This analysis should take into consideration potential ROW acquisition, horizontal and vertical design criteria of the potential ramps, vertical clearances (in particular the vertical clearance for the Miami River), etc. Additionally, extensive coordination should take place with all involved stakeholders, especially with the City of Miami, as large developments will take place within this area and also the concept proposes to go over Jose Marti Park.

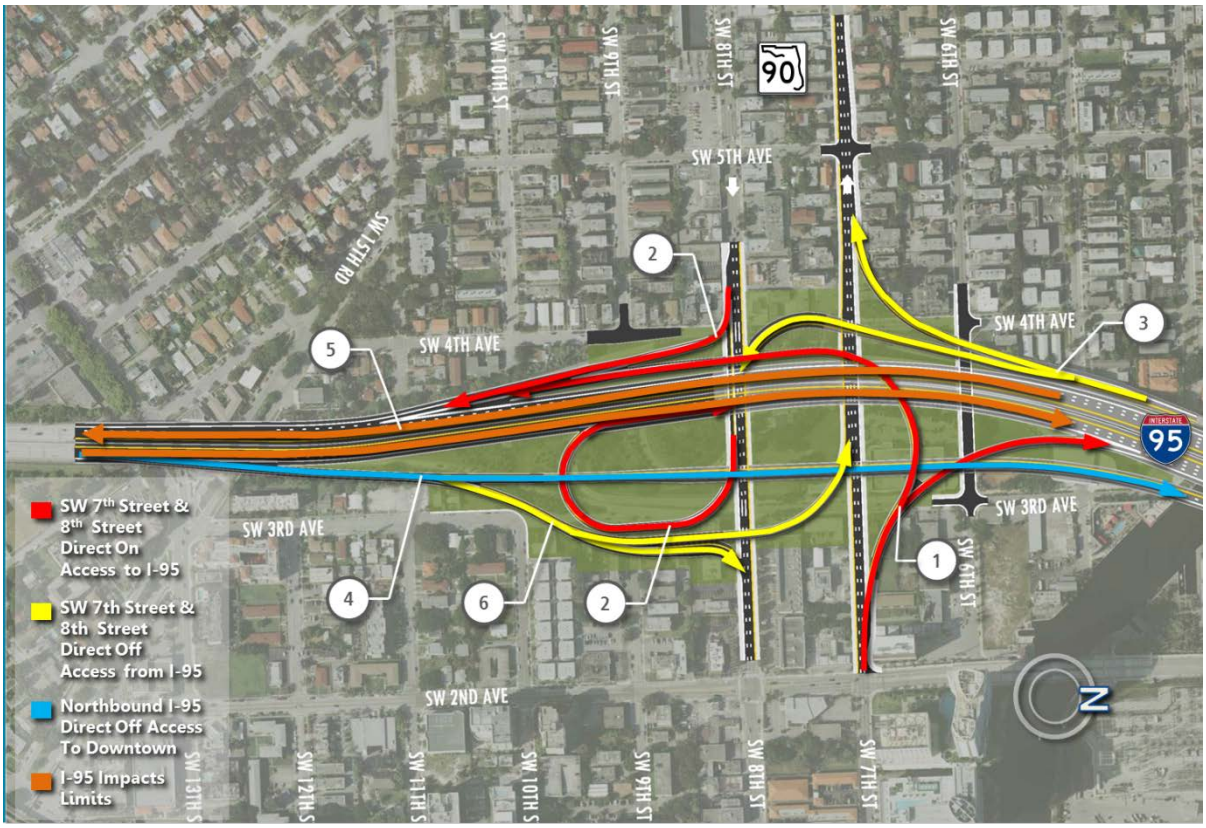


Figure 3-7: I-95 "Ultimate" Interchange Concept

1. Northbound and southbound I-95 direct on-ramp from westbound SR 90 (SW 7th Street)
2. Northbound and southbound I-95 direct on-ramp from eastbound SR 90 (SW 8th Street)
3. Southbound I-95 direct off-ramp to eastbound and westbound SR 90
4. Northbound I-95 detached direct off-ramp to eastbound and westbound SR 90, and to the existing off-ramps to Downtown
5. Reconstruction and/or realignment (vertically and horizontally) of I-95 to accommodate the proposed improvements
6. Northbound I-95 direct off-ramp to eastbound and westbound SR 90

3.1 Additional Public Outreach Alternatives

Figure 3-7 depicts two conceptual configurations of the intersection of SR 90 and Brickell Avenue. This concept was suggested by the City of Miami during the last PAT meeting and consists of constructing either an underpass (tunnel) or an overpass to provide a free flow movement for vehicles making a left turn from northbound Brickell Avenue onto westbound SW 7th Street. This concept assumes that the existing traffic flow will be maintained.

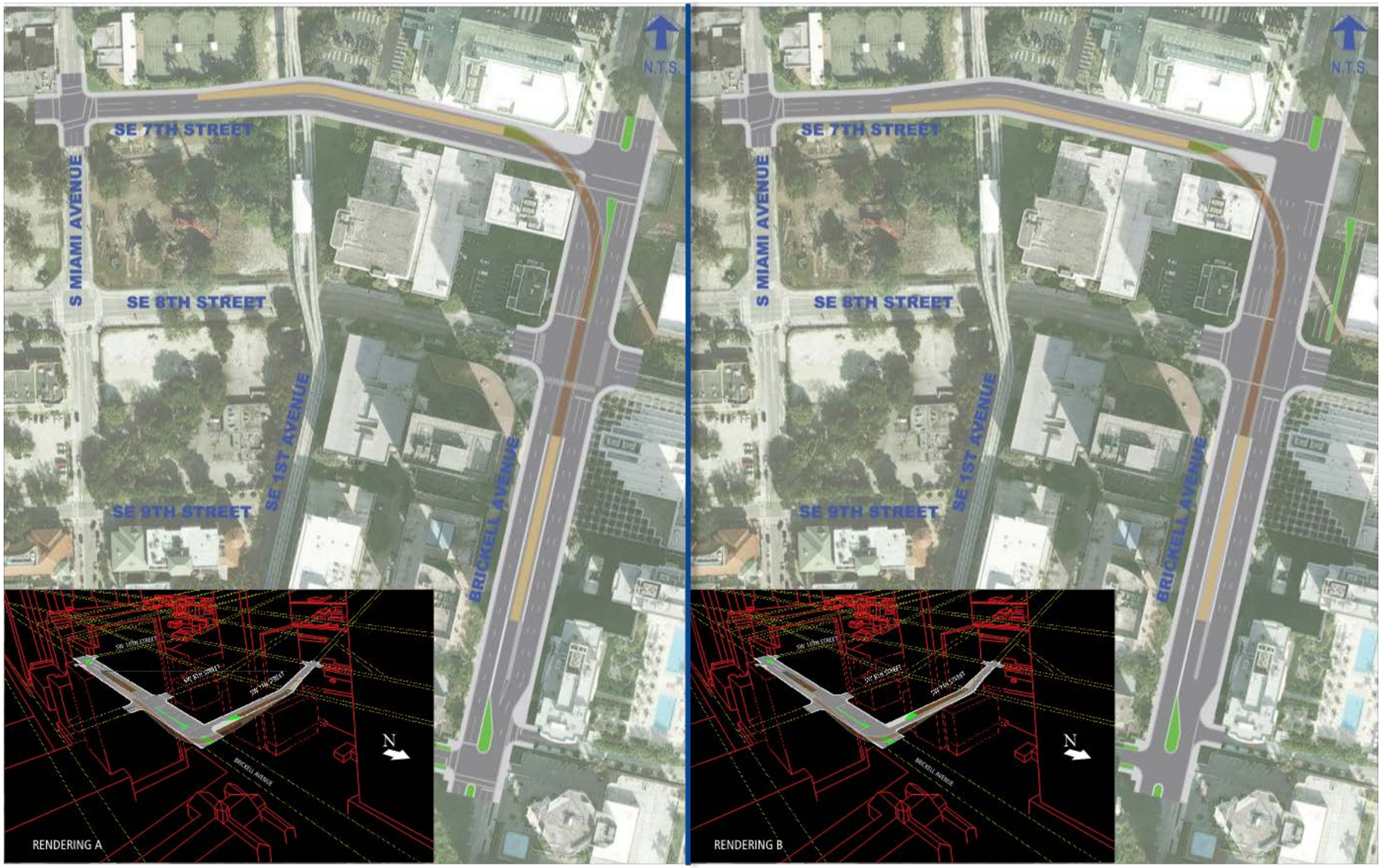


Figure 3-8: Underpass (Tunnel)/Overpass Concept for the Intersection of SR 90 and Brickell Avenue

Further coordination with PAT members and key stakeholders suggested the need to study other typical sections. Miami-Dade Transit (MDT) provided a service plan to the project team suggesting future Bus Rapid Transit (BRT) to run within the study limits of the SR 90 corridor. MDT plans to run two additional Routes: Route 15 BRT and Route 19 BRT. Typical sections with transit options scored fairly well in the evaluation matrix. Build Scenario 1 (2 lanes + Transit Alternative 3) assumes a BRT service with an exclusive transit lane on SR 90. Figures 3-8 and 3-9 portray this scenario with an exclusive contra-flow transit lane running on both SW 7th and 8th Street simply because this was the preferred configuration by MDT as this would bring both parts of the existing split transit line/route(s) closer together resulting in a reduction in walking distance between bus stops. The main objective of this scenario however to study the repurposing of one mixed-use traffic lane for any of the others transportation modes, in this case it is shown for an exclusive lane. Should this alternative or any other alternative deriving from this one move forward during the PD&E phase, detailed analysis should take place to determine its feasibility. Figures 3-9 portrays a conceptual representation of how Build Scenario 1 would appear from a plan view perspective. Treatment for the proposed facilities should be analyzed and designed more in detail during the PD&E phase of this project.

Additionally, concerned community members and commerce representatives through the outreach program suggested the need for a traffic flow conversion of SR 90 from a pair of one-way streets to two-way streets. These groups indicated that in order to improve pedestrian safety and stimulate business in the area, a two-way scenario may be beneficial to their community, especially on SW 8th Street (Calle 8). A previous study conducted by the City of Miami suggested that these premise may have merit. The Build Scenario 2 (2-Way + Alternative 3) considers a two-way option for the SR 90 Corridor. Figures 3-10 and 3-11 graphically depict how SR 90 would appear if it would be converted into two-way streets. It should be noted that Figure 3-11 portrays a conceptual representation of how Build Scenario 2 would appear from a plan view perspective, and any treatment for the proposed configuration should be analyzed and designed more in detail in the PD&E phase of this project during which, the determination can be made as to whether or not variations and/or exception may be needed. Moreover, mid-block median opening on Figure 3-11 are shown conceptually to represent potential access to businesses' driveways.

The following items and figures describe and portray the two scenarios formulated based on PAT and key stakeholders input which are being recommended for further analysis.

Build Scenario 1 (2 Lanes + Transit Alternative 3) Typical Section (Refer to Figure 3-9 for Conceptual Plan View)

- One-way bicycle lanes in each direction on SW 8th Street
- Bicycle lane on SW 7th Street
- Exclusive transit lane on both SW 7th Street and 8th Street flowing in the opposite direction of mixed traffic lanes
- Curb Type D (6") and a 1 ft. shoulder on SW 7th Street to provide an 11 ft. wide exclusive transit lane
- Curb Type D (6") on SW 8th Street to provide ample space for bicycle lanes
- Parking lane is eliminated at major intersections to accommodate left-turn lanes

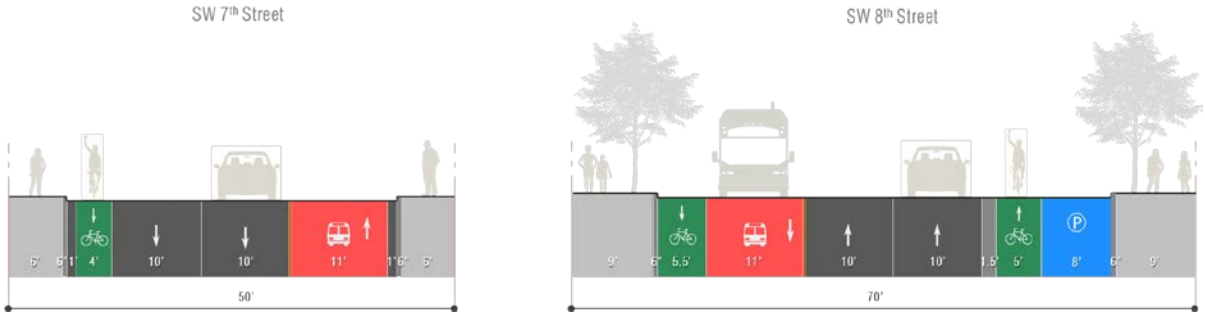
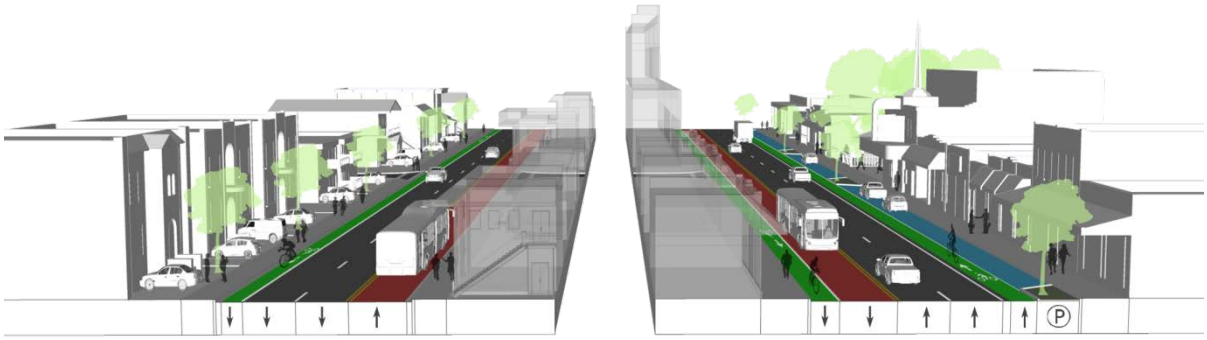


Figure 3-9: Build Scenario 1 (2 lanes + Transit Alternative 3) Typical Section



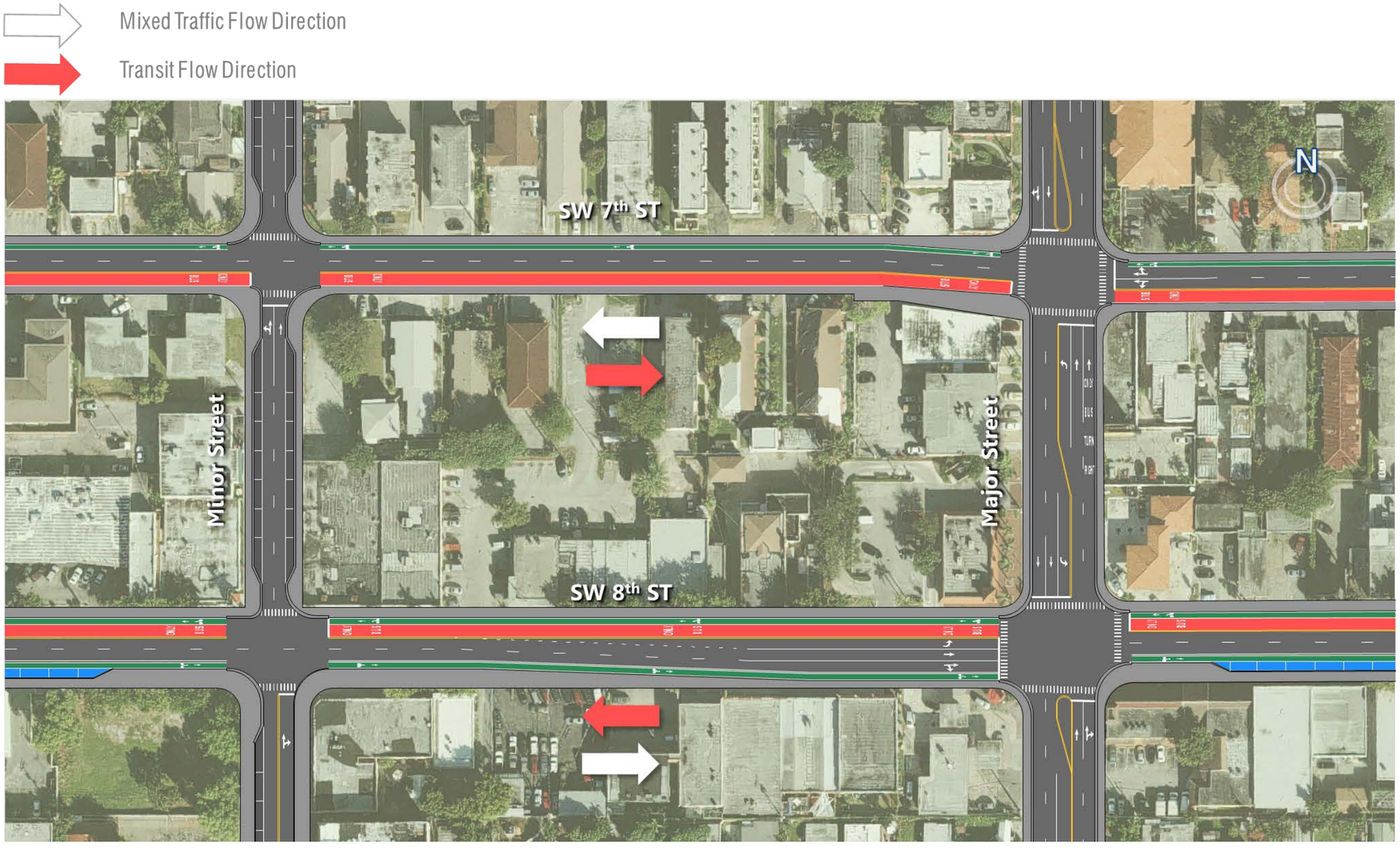


Figure 3-10: Build Scenario 1 (2 lanes + Transit Alternative 3) Plan View

Build Scenario 2 (2-Way Alternative 3) Typical Section (Refer to Figure 3-11 for Conceptual Plan View)

- One-way bicycle lanes in each direction on SW 8th Street
- 12.5 ft. "Sharrow" Lanes in each direction on SW 7th Street
- 12 ft. wide median on SW 8th Street to accommodate left-turn lanes (This median width is substandard as per FDOT requirements and may require a variance.)
- Two-way continuous left-turn lane on SW 7th Street
- Curb Type D (6") and a 1 ft. shoulder on SW 7th Street to provide wider lanes

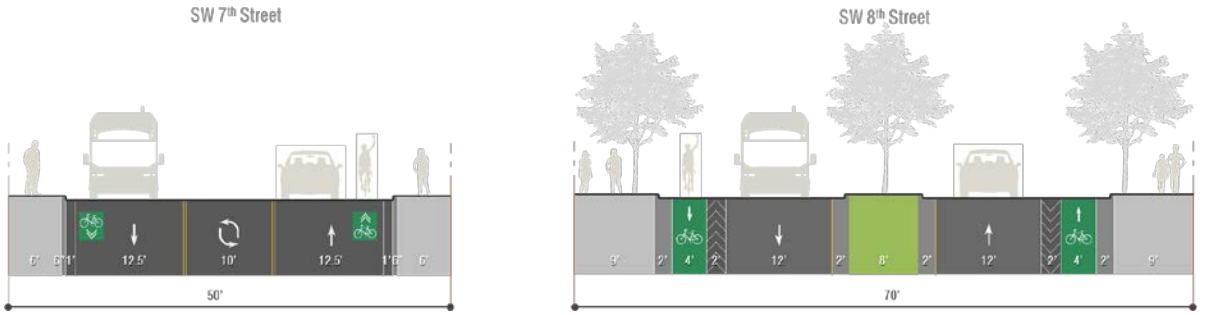
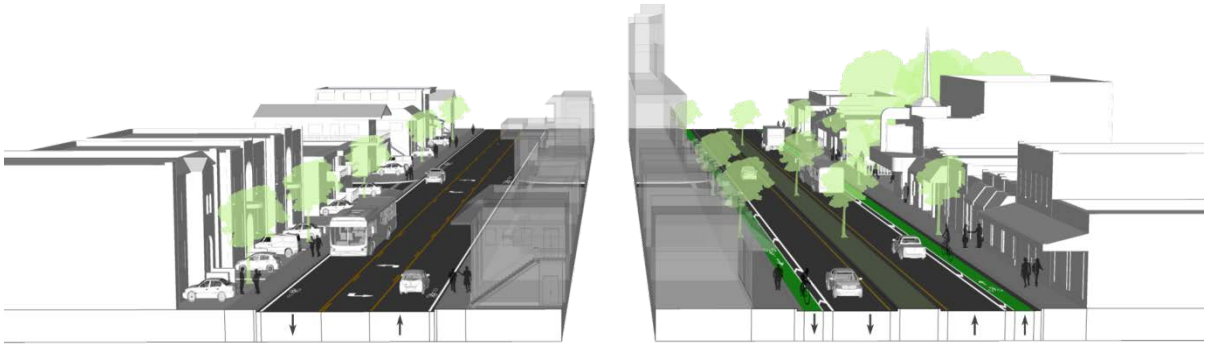


Figure 3-11: Build Scenario 2 (2-Way Alternative 3) Typical Section



Mixed Traffic Flow Direction

Figure 3-12: Build Scenario 2 (2-Way Alternative 3) Plan View

4 Level of Service (LOS)

Level of Service (LOS) analysis for the signalized intersection and roadway segments along the study corridor was conducted. For details regarding the LOS analysis, please refer to Technical Memorandum No. 2 (Preliminary Project Traffic Report). The following diagrams portray the Intersection, Approach, and Segment LOS for the four (4) different scenarios that resulted from the evaluation as well as the No-Build scenario. LOS analysis was conducted for the years 2020 and 2040.

The following is concluded:

SW 7th Street

Automobile Mode

1) Of all the scenarios, Build Scenario 4 (3 Lanes Alternative 4) is expected to have the least number of roadway segments operating at LOS F.
2) Build Scenario 1 (2 Lane and Transit Alternative 3) is expected to provide better LOS on some segments during the opening year (i.e., between SW 1st Avenue and SR 7/SW 8th Avenue) when compared against the No Build scenario. However, Build Scenario 1 (2 Lane and Transit Alternative 3) will have several segments operating at LOS F during the design year.
3) Build Scenario 2 (2 Way Alternative 3) and Build Scenario 3 (3 Lane Reverse Alternative 3) do not appear to operate at a better LOS than the No Build scenario.

Pedestrian Mode

1) Several segments on Build Scenario 4 (3 Lanes Alternative 4) for the opening and design years will operate at LOS C.
2) Build Scenario 2 (2 Way Alternative 3) was expected to provide better LOS for the pedestrian mode since traffic volumes on the roadway are lower than those of the other alternatives, and a wide separation between the through lane and the sidewalk was utilized for the ARTPLAN analyses. However, the analyses show that SW 7th Street is expected to have several segments operating at LOS E during both the opening and design years. In addition, SW 7th Street between Brickell Avenue and SW 1st Avenue are expected to operate at LOS F for the pedestrians.

Bicycle Mode

1) Build Scenario 1 (2 Lane and Transit Alternative 3) is expected to provide a better LOS for bicyclists since the analyses assumed that the exclusive transit lane would operate as an exclusive bicycle lane.
2) Build Scenario 2 (2 Way Alternative 3) is expected to be perceived to have several segments operating at LOS E.

Transit Mode

1) Overall, the ARTPLAN analyses show that the No Build and Build scenarios are expected to be perceived at a LOS C or better in several segments.

SW 8th Street

Automobile Mode

1) Build Scenario 1 (2 Lane and Transit Alternative 3) and Build Scenario 3 (3 Lanes Reversed Alternative 3) are expected have fewer segments failing between SR 9 and SW 3rd Avenue. However, most of the roadway segments located east of SW 3rd Avenue are expected to operate at LOS F for all the scenarios during the opening and design years.
2) Build Scenario 2 (2 Way Alternative 3), on SW 8th Street, and Build Scenario 4 (3 Lane Alternative 4), on SW 7th Street and SW 8th Street, are expected have fewer segments failing between SR 9 and SW 3rd Avenue. However, several segments are expected to be perceived to operate at LOS F during the design year.

Pedestrian Mode

1) Overall, some segments in the Build Scenario 1 (2 Lane and Transit Alternative 3), Build Scenario 2 (2 Way Alternative 3), and Build Scenario 3 (3 Lanes Reversed Alternative 3) are expected to operate at a better LOS when compared against the No Build scenario.
2) The No Build scenario and Build Scenario 4 (3 Lane Alternative 4) are expected to operate at very similar LOS.

Bicycle Mode

1) Overall, most of the roadway segments of Build Scenario 1 (2 Lane and Transit Alternative 3), Build Scenario 2 (2 Way Alternative 3), and Build Scenario 3 (3 Lanes Reversed Alternative 3) are expected to operate at better LOS than those of the No Build scenario and Build Scenario 4 (3 Lane Alternative 4) alternatives.
2) All the segments of the No Build scenario and Build Scenario 4 (3 Lane Alternative 4) are expected to operate at the same LOS.

Transit Mode

1) Overall, the ARTPLAN analyses show that the No Build and Build scenarios are expected to operate at acceptable LOS.

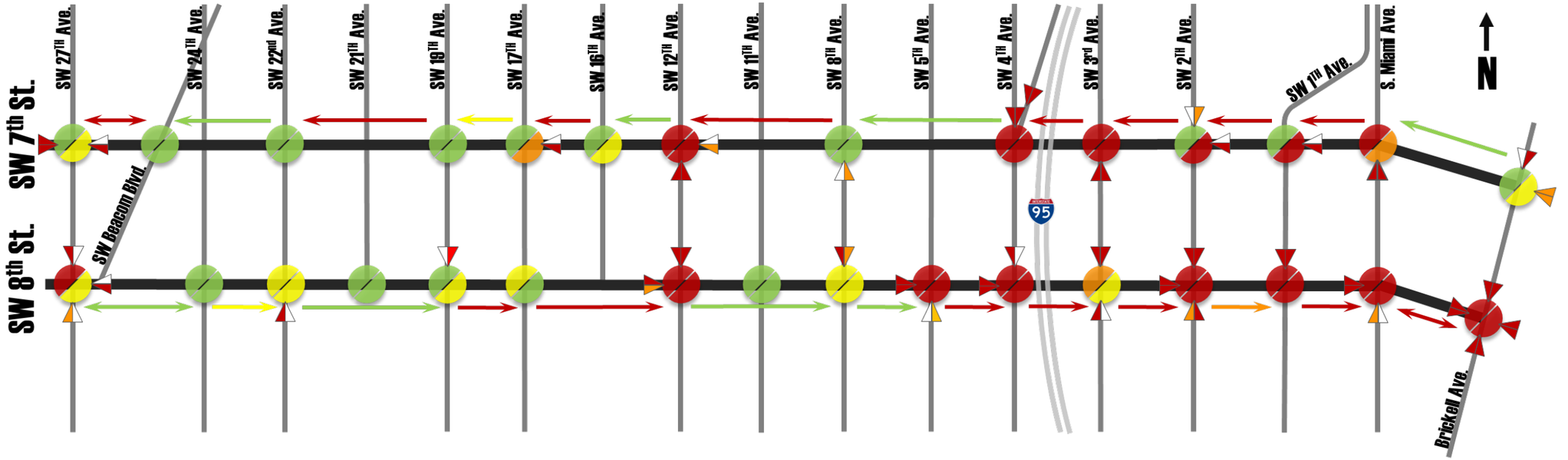
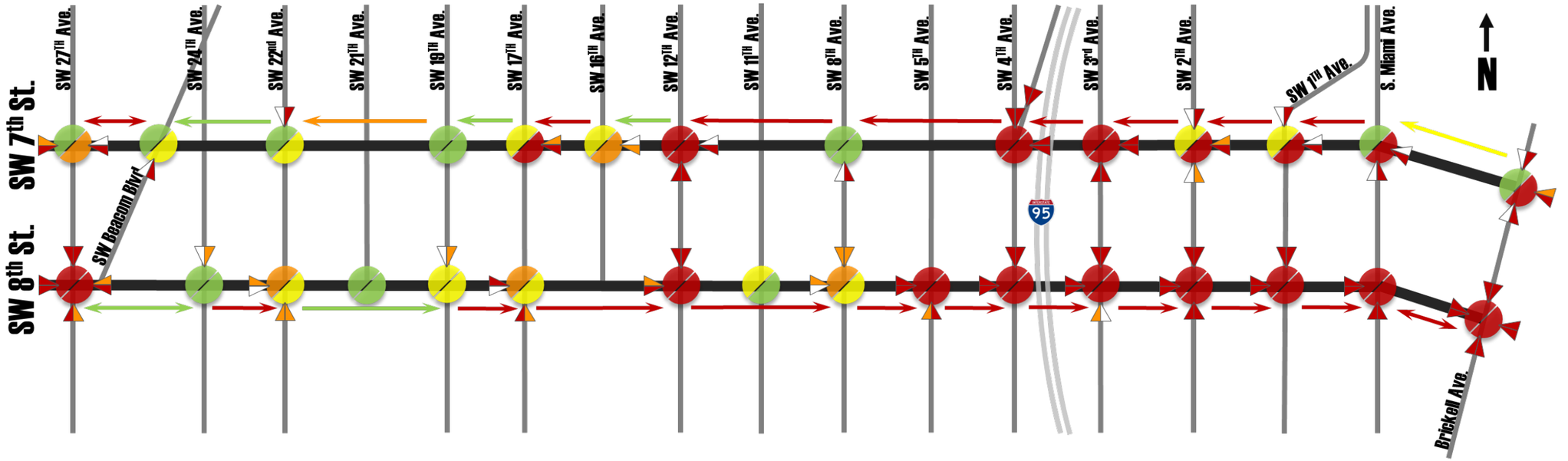


Figure 4-1: No-Build Scenario 2020 LOS



Level of Service – "No Build" Alternative

2040

LEGEND:

- Segment LOS
- AM / PM - Approach LOS (Morning and Evening Time Period)
- AM / PM - Intersection LOS (Morning and Evening Time Period)

Level of Service Ranks:

- C or Better
- D
- E
- F

Figure 4-2: No-Build Scenario 2040 LOS

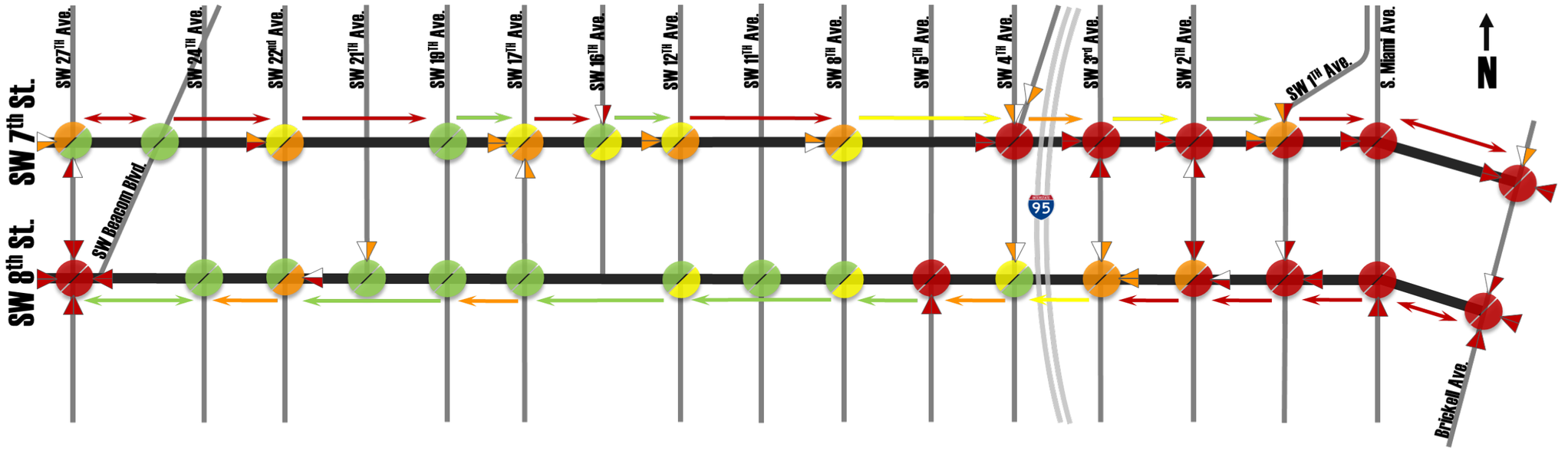


Figure 4-3: Build Scenario 1 (2 Lanes and Transit Alternative 3) 2020 LOS

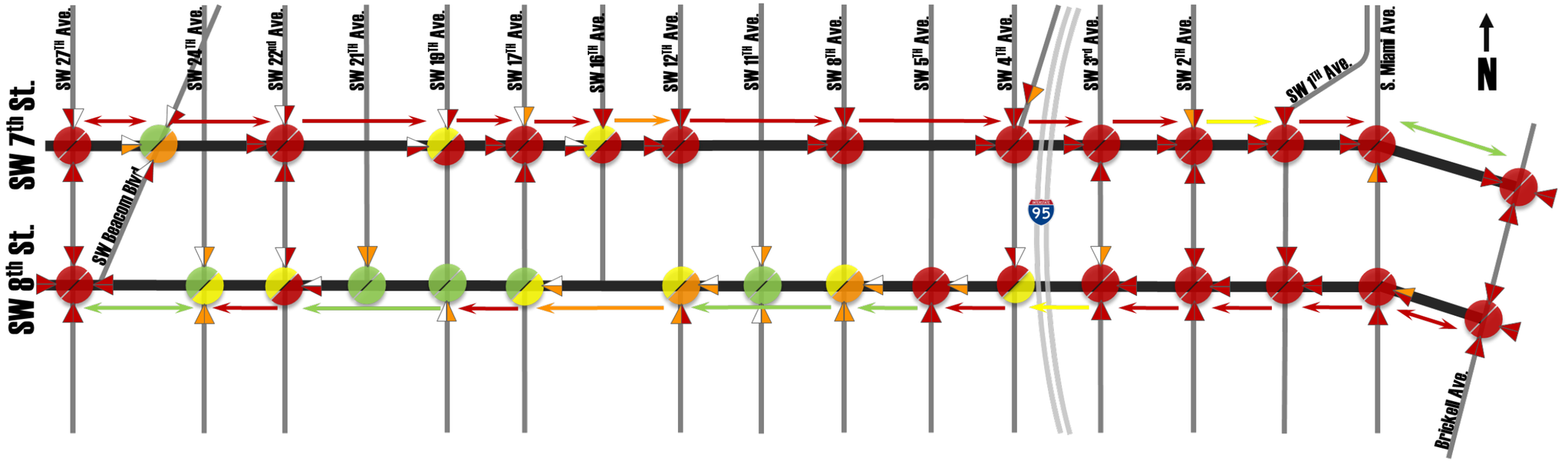


Figure 4-4: Build Scenario 1 (2 Lanes and Transit Alternative 3) 2040 LOS

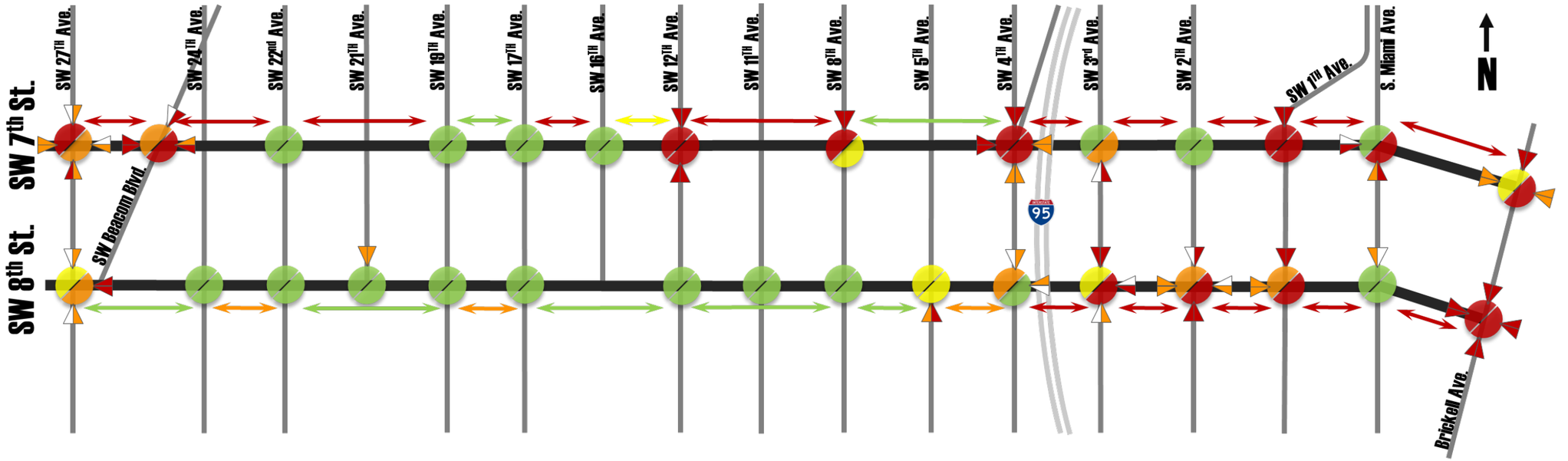
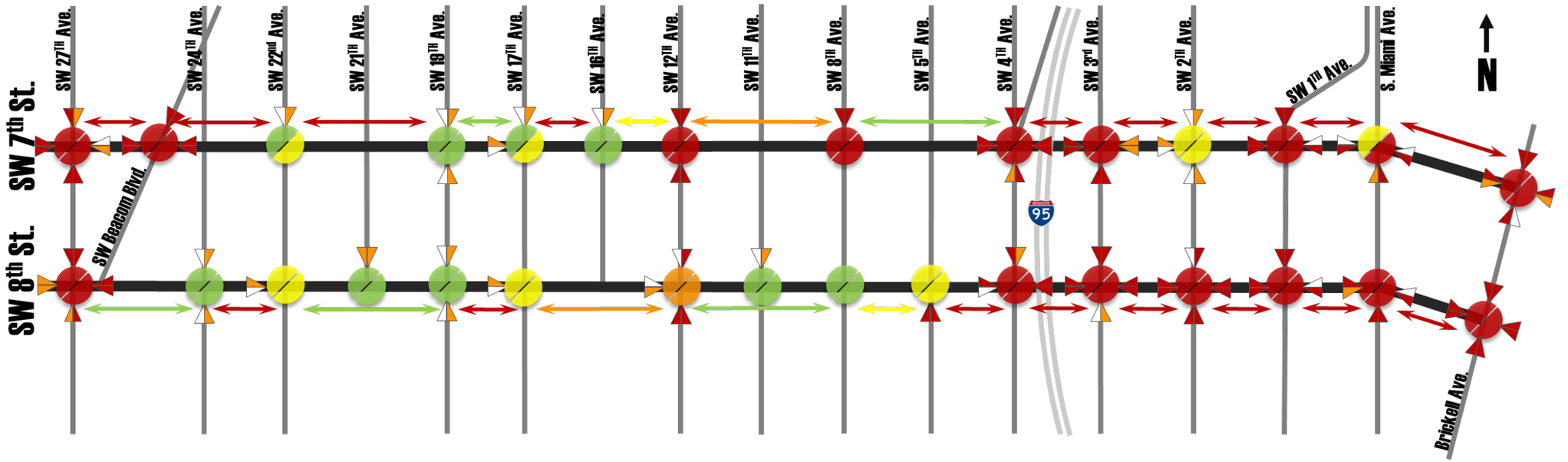


Figure 4-5: Build Scenario 2 (2-Way Alternative 3) 2020 LOS



Level of Service – Build Scenario 2 "2 Way Alternative 3"

2040

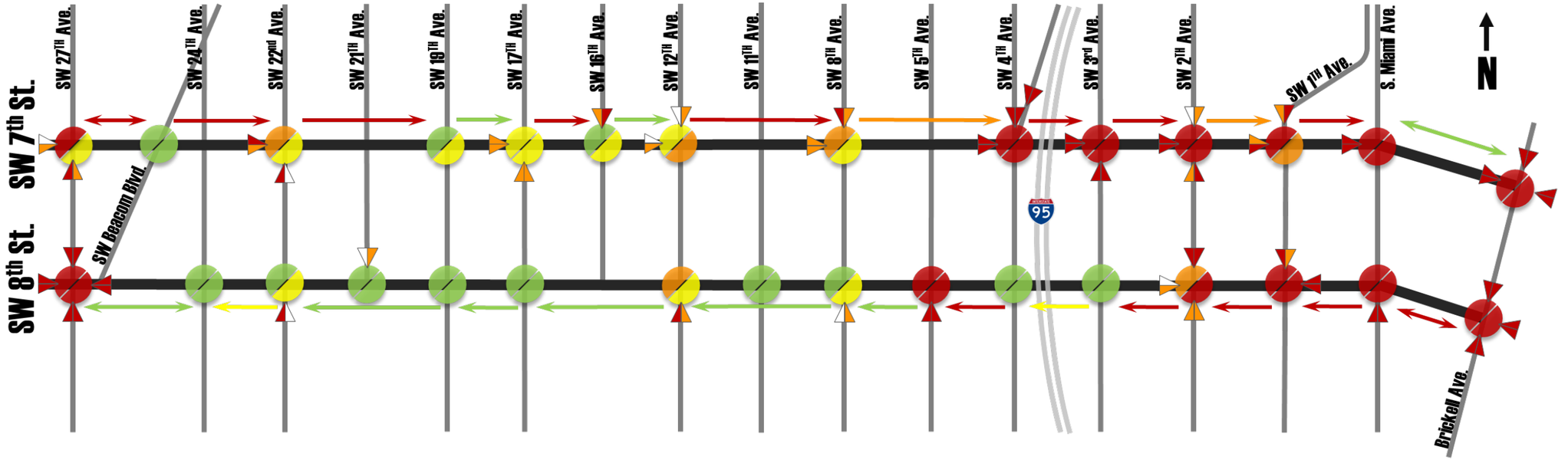
LEGEND:

- Segment LOS
- AM / PM - Approach LOS (Morning and Evening Time Period)
- AM / PM - Intersection LOS (Morning and Evening Time Period)

Level of Service Ranks:

- C or Better
- D
- E
- F

Figure 4-6: Build Scenario 2 (2-Way Alternative 3) 2040 LOS



Level of Service – Build Scenario 3 "3 Lanes, Reversed, Alternative 3"

2020

LEGEND:

- Segment LOS
- Approach LOS (Morning and Evening Time Period)
- Intersection LOS (Morning and Evening Time Period)

Level of Service Ranks:

- C or Better
- D
- E
- F

Figure 4-7: Build Scenario 3 (3 Lanes Reversed Alternative 3) 2020 LOS

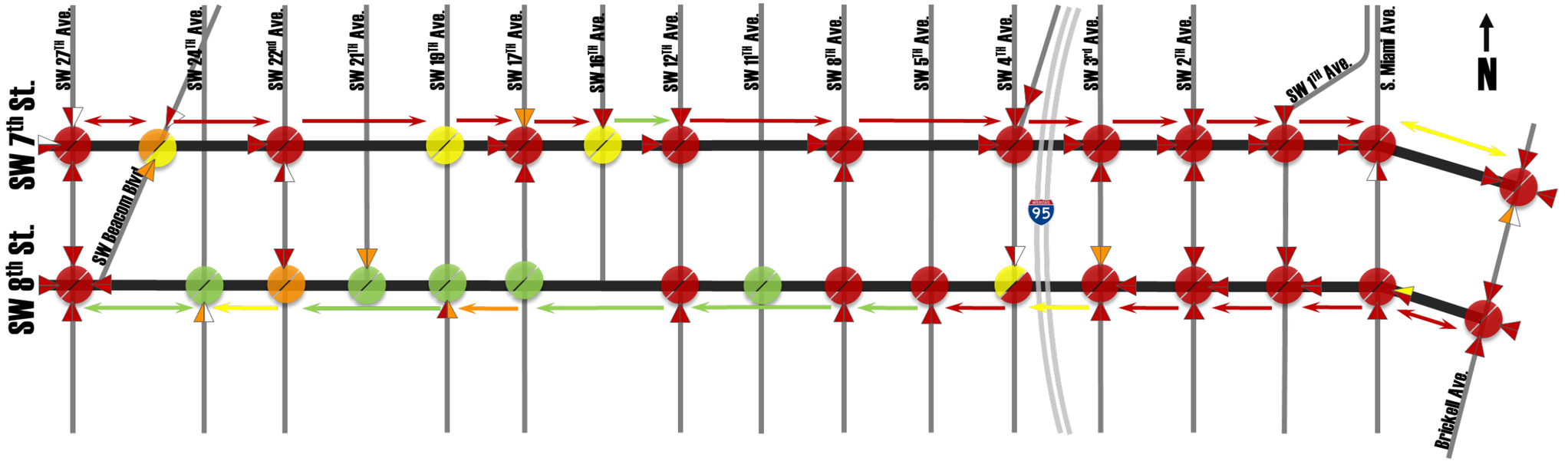


Figure 4-8: Build Scenario 3 (3 Lanes Reversed Alternative 3) 2040 LOS

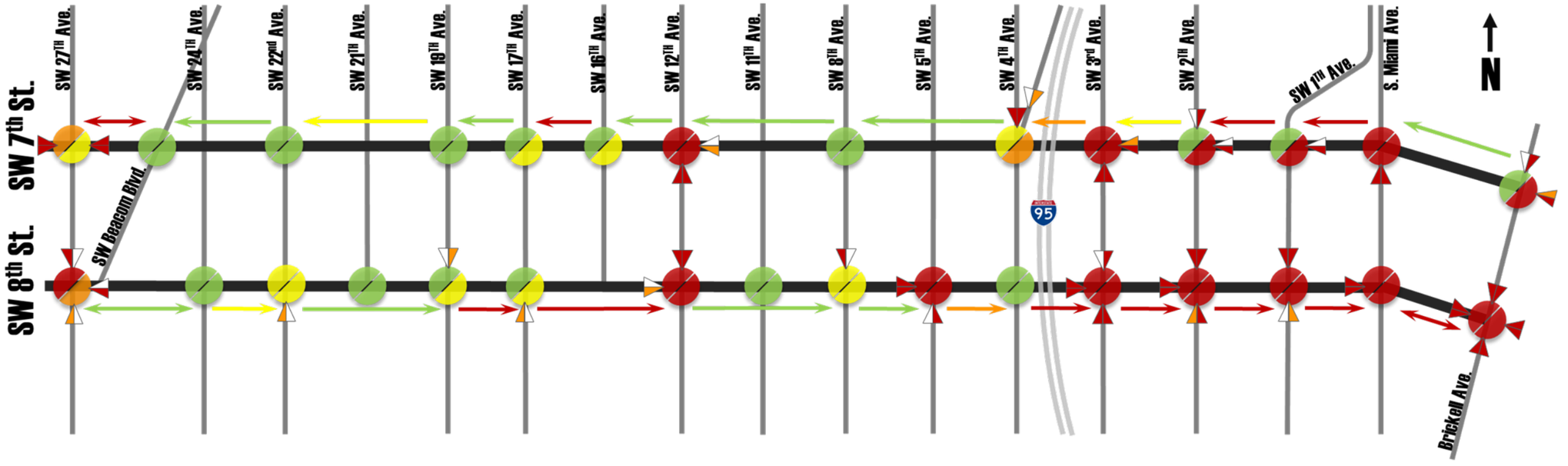
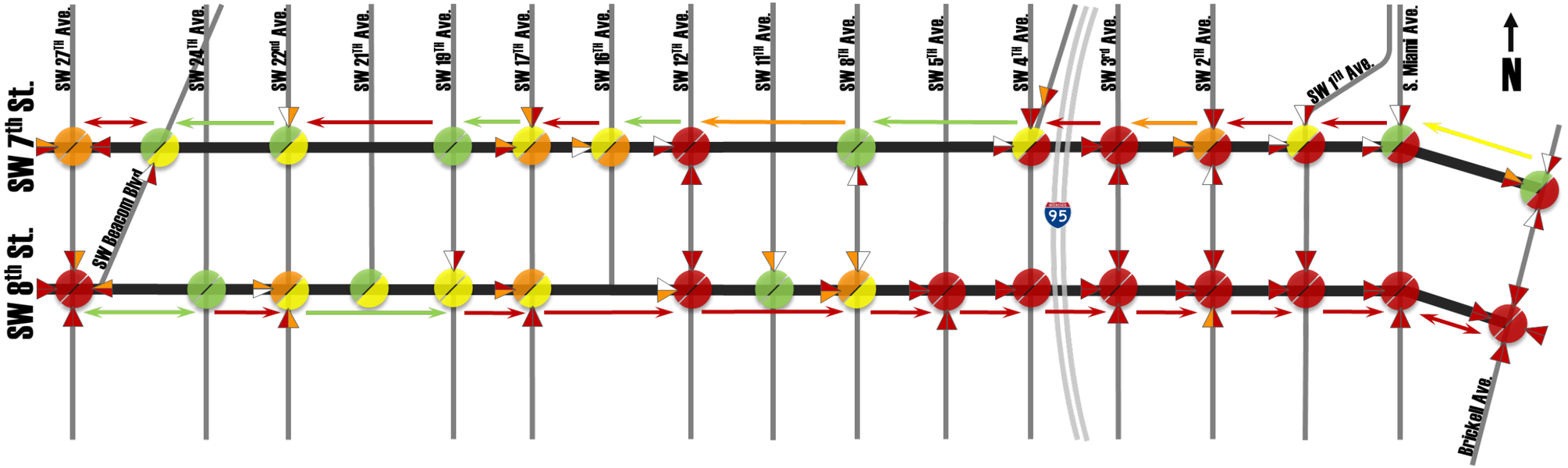


Figure 4-9: Build Scenario 4 (3 Lanes Alternative 4) 2020 LOS



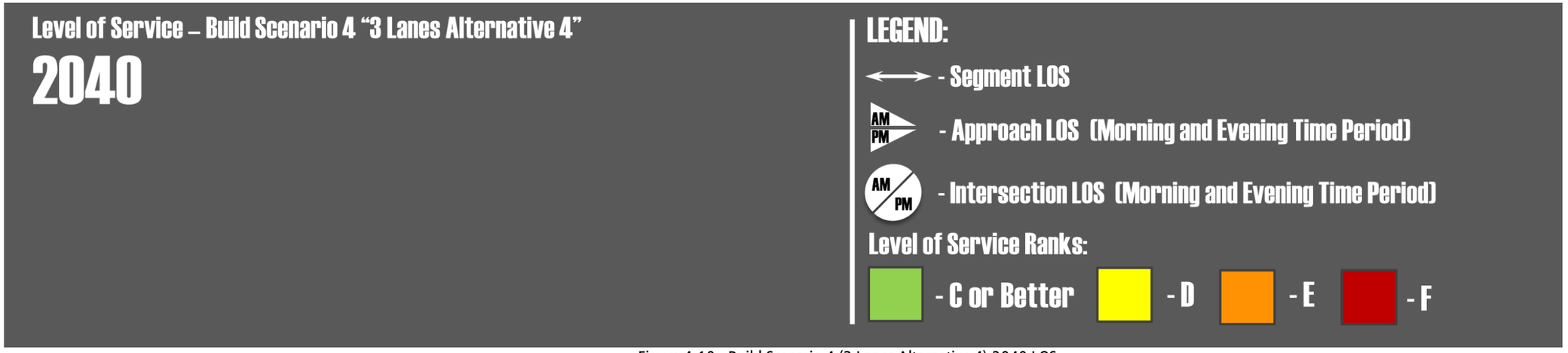


Figure 4-10: Build Scenario 4 (3 Lanes Alternative 4) 2040 LOS

5 Transit Ridership

Proposed MDT Service Plan can be found in Appendix B of this document. Additionally, transit ridership data for each alternative can be found within the tables provided in this section of the document. The Southeast Florida Regional Planning Model version 6.5.4 (SERPM 6.5.4) used in this study is a multi-modal 4-step model. The model performs trip generation at Traffic Analysis Zone (TAZ) level based on input socioeconomic data in the first step. Trip distribution is the next step where the TAZ level trips are distributed as trip interchanges between TAZs. In the mode choice step, the total trips between TAZs out of trip distribution step are split into different modes of travel including highway and transit. Attributes including transit fare, number of transfers, auto operating cost, out of vehicle travel time, in-vehicle travel time are considered in the mode choice model. In the final step, the trips by modes are assigned to the networks. In this step, the model constructs shortest impedance paths between TAZ interchanges for highway and transit modes and assigns the trips to those paths.

Table 5-1 Socioeconomic Growth within 1 mile of Transit Route

Route	2005		2035		2035		
	Household	Employment	Household	Employment	Household	Employment	Average
8	79,497	177,003	118,329	232,145	49%	31%	**40%**
207/208	40,589	130,145	68,479	168,703	69%	30%	**49%**
Route: 15 BRT	48,084	162,149	74,050	216,027	54%	33%	**44%**
Route: 19 BRT	81,701	181,070	121,376	237,257	49%	31%	**40%**

Table 5-2 No-Build Transit Ridership

Route	2005 Base	2035
Route 8	7,598	10,637
Route 207	1,375	2,051
Route 208	1,757	2,523
Total	**10,730**	**15,211**

Notes:
1) 2005 Base ridership obtained from MDT Technical Ridership Report
2) 2035 No-Build ridership obtained by applying socioeconomic growth within 1 mile of transit route

Table 5-3 Build Scenario 1 (Transit Reverse with Alternative 3 at Interchange)

Route	2005 Base	2035
Route 8	4,365	7,669
Route 207	1,501	2,451
Route 208	2,261	3,452
Route: 15 BRT	2,849	4,106
Route: 19 BRT	5,316	10,746
Total	**16,292**	**28,424**

Notes:
1) Alternative ridership estimated by applying factors based on model results to No-Build Estimates

Table 5-4 Build Scenario 2 (Two-Way with Alternative 3 at Interchange)

Route	2005 Base	2035
Route 8	7,630	9,414
Route 207	1,184	2,192
Route 208	1,667	2,029
Total	**10,481**	**13,634**

Notes:
1) Alternative ridership estimated by applying factors based on model results to No-Build Estimates

Table 5-5 Build Scenario 3 (3-lanes Reversible with Alternative 3 at Interchange)

Route	2005 Base	2035
Route 8	7,997	10,223
Route 207	1,175	2,356
Route 208	1,690	2,178
Total	**10,862**	**14,758**

Notes:
1) Alternative ridership estimated by applying factors based on model results to No-Build Estimates

Table 5-6 Build Scenario 4 (3-lanes with Alternative 4 at Interchange)

Route	2005 Base	2035
Route 8	7,594	10,538
Route 207	1,366	2,048
Route 208	1,749	2,530
Total	**10,710**	**15,117**

Notes:
1) Alternative ridership estimated by applying factors based on model results to No-Build Estimates

6 Preliminary Cost Estimates

To determine how economically practical the four (4) analyzed scenarios would be and to provide basis for future study phases, preliminary construction cost estimates were developed based on typical sections groups and I-95 interchange conceptual alternatives. These estimates serve as an aid to preliminarily measure the effectiveness of each screened scenario. It should be noted that since typical sections and concepts are at an early stage of the overall process certain assumptions have been made as well as contingencies to produce the following cost estimates. It is recommended that if any of these scenarios moves forward during the PD&E phase of this project, more detailed cost estimates should be developed for any refined concepts.

3 Lanes Alternative 4 Preliminary Cost Estimate

Construction Costs

	Unit	Unit Cost ($)	Quantity	Cost
New 15 ft. Ramp [1]	MI	$ 1,500,000.00	0.6	$ 900,000.00
New 24 ft. Ramp [2]	MI	$ 2,000,000.00	0.15	$ 300,000.00
2 Lanes plus Shoulder Widening (Urban Interstate) [3]	MI	$ 6,750,000.00	0.17	$ 1,147,500.00
3 Lanes plus Shoulders Reconstruction (Urban Interstate) [4]	MI	$ 6,000,000.00	0.39	$ 2,340,000.00
3 Lane plus Sidewalks Reconstruction (Urban Arterial) [5]	MI	$ 5,000,000.00	7.00	$ 35,000,000.00
Bridge Structure [6]	SF	$ 200.00	292086	$ 58,417,200.00

Subtotal	$ 98,104,700.00
Contingency (25%)	$ 24,526,175.00
Total	**$ 122,630,875.00**

Notes:

Unit costs were obtained from the estimating resources provided on the Department's website:
http://www.dot.state.fl.us/planning/policy/costs/

(1) D3, D5, and D7 Costs Per Mile
(2) D3, D5, and D7 Costs Per Mile
(3) Generic cost per mile for "Widening a 4 Lane Urban Interstate with Closed Median to 6 Lanes Outside ` Mill + Resurface Existing` 10' Shoulders Outside"
(4) New Construction Divided Urban 6 Lane Interstate with 22' Closed Median with Barrier Wall 10' Shoulders Inside + Out
(5) New Construction 3 Lane Undivided Urban Arterial with Center Lane and 4' Bike Lanes
(6) FDOT Bridge Costs

Right-of-Way Costs

Publix Parcel Market Value	$ 10,500,000.00
New Walgreens Parcels Market Value	$ 6,500,000.00
Parcels Across from Publix on South Side of SW 7th Street Market Value	$ 5,500,000.00
Potential Right-of-Way Acquisition Cost	**$ 13,050,000.00**

Notes:

All market values were obtained from the Miami-Dade County Property Appraiser website:
http://www.miamidade.gov/propertysearch/#/
All market values include: land value, building value, and extra feature value.
The assumption is made that 10% of Right-of-Way would be acquired from the existing Publix parcel.

Total Cost Including Potential Right-of-Way Acquisition	**$ 135,680,875.00**

Figure 6-1: Build Scenario 4 (3 Lanes Alternative 4) Preliminary Cost Estimate

3 Lanes Reversed Alternative 3 Preliminary Cost Estimate

Construction Costs

	Unit	Unit Cost ($)	Quantity	Cost
New 15 ft. Ramp [1]	MI	$ 1,500,000.00	0.23	$ 345,000.00
New 24 ft. Ramp [2]	MI	$ 2,000,000.00	0.15	$ 300,000.00
3 Lanes plus Shoulders Reconstruction (Urban Interstate) [3]	MI	$ 6,000,000.00	0.12	$ 720,000.00
3 Lane plus Sidewalks Reconstruction (Urban Arterial) [4]	MI	$ 6,000,000.00	7.0	$ 42,000,000.00
Bridge Structure [5]	SF	$ 200.00	125195	$ 25,039,000.00

Subtotal	$ 68,404,000.00
Contingency (25%)	$ 17,101,000.00
Total	**$ 85,505,000.00**

Notes:

Unit costs were obtained from the estimating resources provided on the Department's website:
http://www.dot.state.fl.us/planning/policy/costs/

(1) D3, D5, and D7 Costs Per Mile

(2) D3, D5, and D7 Costs Per Mile

(3) New Construction Divided Urban 6 Lane Interstate with 22' Closed Median with Barrier Wall 10' Shoulders Inside + Out

(4) New Construction 3 Lane Undivided Urban Arterial with Center Lane and 4' Bike Lanes (The costs obtained from the LRE site was $5 M per mile, however since it is assumed that traffic flow reversal will have access management impacts to most properties adjacent to the corridor, a 20% contingency has been added to this unit cost)

(5) FDOT Bridge Costs

Total Construction Cost	**$ 85,505,000.00**

Figure 6-2: Build Scenario 3 (3 Lanes Reversed Alternative 3) Preliminary Cost Estimate

2 Lanes + Transit Alternative 3 Preliminary Cost Estimate

Construction Costs

	Unit	Unit Cost ($)	Quantity	Cost
New 15 ft. Ramp [1]	MI	$ 1,500,000.00	0.23	$ 345,000.00
New 24 ft. Ramp [2]	MI	$ 2,000,000.00	0.15	$ 300,000.00
3 Lanes plus Shoulders Reconstruction (Urban Interstate) [3]	MI	$ 6,000,000.00	0.12	$ 720,000.00
3 Lane plus Sidewalks Reconstruction (Urban Arterial) [4]	MI	$ 6,000,000.00	7.0	$ 42,000,000.00
Bridge Structure [5]	SF	$ 200.00	125195	$ 25,039,000.00

Subtotal	$ 68,404,000.00
Contingency (25%)	$ 17,101,000.00
Total	**$ 85,505,000.00**

Notes:

Unit costs were obtained from the estimating resources provided on the Department's website:
http://www.dot.state.fl.us/planning/policy/costs/

(1) D3, D5, and D7 Costs Per Mile

(2) D3, D5, and D7 Costs Per Mile

(3) New Construction Divided Urban 6 Lane Interstate with 22' Closed Median with Barrier Wall 10' Shoulders Inside + Out

(4) New Construction 3 Lane Undivided Urban Arterial with Center Lane and 4' Bike Lanes (The costs obtained from the LRE site was $5 M per mile, however since it is assumed that running transit in the opposite direction of the traffic flow will represent the need for extra signal priority equipment, a 20% contingency has been added to this unit cost)

(5) FDOT Bridge Costs

Total Construction Cost	**$ 85,505,000.00**

Figure 6-3: Build Scenario 1 (2 Lanes + Transit Alternative 3) Preliminary Cost Estimate

2 Way Alternative 3 Preliminary Cost Estimate

Construction Costs

	Unit	Unit Cost ($)	Quantity	Cost
New 15 ft. Ramp [1]	MI	$ 1,500,000.00	0.23	$ 345,000.00
New 24 ft. Ramp [2]	MI	$ 2,000,000.00	0.15	$ 300,000.00
3 Lanes plus Shoulders Reconstruction (Urban Interstate) [3]	MI	$ 6,000,000.00	0.12	$ 720,000.00
3 Lane plus Sidewalks Reconstruction (Urban Arterial) [4]	MI	$ 5,500,000.00	7.0	$ 38,500,000.00
Bridge Structure [5]	SF	$ 200.00	125195	$ 25,039,000.00

Subtotal	$ 64,904,000.00
Contingency (25%)	$ 16,226,000.00
Total	**$ 81,130,000.00**

Notes:

Unit costs were obtained from the estimating resources provided on the Department's website:
http://www.dot.state.fl.us/planning/policy/costs/

(1) D3, D5, and D7 Costs Per Mile

(2) D3, D5, and D7 Costs Per Mile

(3) New Construction Divided Urban 6 Lane Interstate with 22' Closed Median with Barrier Wall 10' Shoulders Inside + Out

(4) New Construction 4 Lane Urban Road with 22' Median and 4' Bike Lanes (The generic cost per mile from the LRE site is approximatelly $6.5M, since the 2 way typical section for SW 8th Street presented in this study consist of only 2 lane divided roadways [not provided on the site] the unit cost was reduced by a factor of 15%)

(5) FDOT Bridge Costs

Total Construction Cost	**$ 81,130,000.00**

Figure 6-4: Build Scenario 2 (2 Way Alternative 3) Preliminary Cost Estimate

7 Recommendations

This study recommends the four (4) previously presented scenarios to be further studied during the Project Development & Environment Study (PD&E) for this corridor:

1. Build Scenario 1 (2-Way Alternative 3)
2. Build Scenario 2 (2 Lanes + Transit Alternative 3)
3. Build Scenario 3 (3 Lanes Reversed Alternative3)
4. Build Scenario 4 (3 Lanes Alternative 4)

While not all four (4) scored high based on priorities, their potential extends beyond a quantitative measure of performance. Public outreach revealed their importance for the residents, business owners; and overall connectivity of the region. They all provide a different approach for common transportation problems of the area. The following section presents the opportunities and challenges of the recommended scenarios.

7.1 Build Scenario 1 (2 Lanes + Transit Alternative 3)

Area	Opportunities	Challenges
Community Character	• Potential for TOD's • Potential benefits to business • Alternative 3 (@I-95) less disruptive, minor to none Right-of-Way acquisition	• On-street parking reduction may affect businesses
Safety	• Fewer conflicts for pedestrians when accessing transit stops • Potential traffic calming • Reduces conflict between pedestrians and bicycles.	• Unusual for corridor users if transit run in the opposite direction
Transportation Connectivity	• Potential increase in Transit Ridership • Increase in Transit Frequency • Decrease in Travel Time for Transit Riders • Potential reduction of traveling cost for new riders • More transfer for transit	• Less capacity for automobiles

7.2 Build Scenario 2 (2-Way Alternative 3)

Area	Opportunities	Challenges
Community Character	• Perceived as a better option for some key stakeholders in the community because it may give the corridor the same boulevard feel that it previously had • Alternative 3 (@I-95) less disruptive, minor to none Right-of-Way acquisition	• No on-street parking may affect businesses
Safety	• Provides refuge at pedestrian crossings through a center median • Reduces conflict between pedestrians and bicycles.	• May required access management modifications
Transportation Connectivity	• More access for local trips	• Less capacity may affect transit in mixed traffic • Bus stops will affect operations

7.3 Build Scenario 3 (3 Lanes Reversed Alternative 3)

Area	Opportunities	Challenges
Community Character	• Potential new customers for local businesses from commuters from the Brickell Area • Bicycle lanes provide a complete streets look • Alternative 3 (@I-95) less disruptive, minor to none Right-of-Way acquisition	• On-street parking reduction may affect businesses
Safety	• Reduces conflict between pedestrians and bicycles • Provides a safe environment for leisure and avid bicyclists	• No pedestrian refuge
Transportation Connectivity	• Additional local trips Reduce Reliance on Single-Occupant Vehicle because of bicycle lanes • Reduce Reliance on Single-Occupant Vehicle because of bicycle lanes	• Transit will run in mixed traffic

7.4 Build Scenario 4 (3 Lanes Alternative 4)

Area	Opportunities	Challenges
Community Character	• Provide a complete street feel for the corridor with more modal opportunities • Bicycle lanes provide a complete streets look	• On-street parking reduction may affect businesses
Safety	• Reduces conflict between pedestrians and bicycles • Provides a safe environment for leisure and avid bicyclists	• No pedestrian refuge
Transportation Connectivity	• Additional local trips • Provide direct connection from westbound SW 7th Street to I-95 • Reduce Reliance on Single-Occupant Vehicle because of bicycle lanes	• Transit will run in mixed traffic

Appendix A

Conceptual SR 90 at I-95 Interchange Alternatives

SR 90 and I-95 Interchange
Alternative 1

Please note that this alternative presents potential weaving issues on westbound SW 7th Street to access the proposed ramp for northbound I-95. This will have to be addressed in the PD&E phase if this alternative is further developed.

Please note that this alternative presents potential weaving issues on southbound and northbound I-95 off-ramps at northbound 3rd Avenue

Please note that although this alternative presents a new segment of SW 11th Street to be constructed, further coordination between the City of Miami and developers of a new complex in the vicinity of this intersection (SW 3rd Street and SW 11th Street) should take place

N

1"=200'

SW 6TH ST
SW 7TH ST
SW 8TH ST
SW 9TH ST
SW 10TH ST
SW 11TH ST
SW 12TH ST
SW 15TH RD
SW 5TH AVE
SW 4TH AVE
SW 3RD AVE
SW 2ND AVE

SR 90 and I-95 Interchange
Alternative 2

SR 90 and I-95 Interchange Alternative 3

Please note that this alternative presents potential weaving issues for vehicles on southbound SW 4th Street turning onto eastbound SW 7th Street to access northbound I-95. This will have to be addressed in more detail during the PD&E phase if this alternative is further developed.

N

1"=200'

SW 4TH AVE
SW 3RD AVE
SW 2ND AVE
SW 5TH AVE
SW 6TH ST
SW 7TH ST
SW 8TH ST
SW 9TH ST
SW 10TH ST
SW 11TH ST
SW 12TH ST
SW 15TH RD

SR 90 and I-95 Interchange
Alternative 4

SR 90 and I-95 Interchange "Ultimate" Concept

Appendix B

Miami Dade Transit (MDT) Proposed Plans

SR 90 (SW 7 & 8 Street) Transit Priority Lanes - Proposed Transit Operating Plan