

## Executive Summary

### INTRODUCTION

The Florida Department of Transportation (FDOT) is conducting a Project Development and Environment (PD&E) Study for SR 90/US 41/SW 8<sup>th</sup> Street/SW 7<sup>th</sup> Street, located in Miami-Dade County, Florida. The limits of the PD&E Study extend along the one-way pair of SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street from SR 9/SW 27<sup>th</sup> Avenue (western limit) to SR 5/US 1/Brickell Avenue (eastern limit). The limits of the project incorporate the existing interchange at I-95 and SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street. As part of the PD&E Study, the FDOT proposes to implement improvements at the I-95 interchange to increase capacity and enhance safety conditions. The proposed improvements result from a FDOT Planning Study for SW 8<sup>th</sup> Street/SW 7<sup>th</sup> Street, which examined conceptual improvements for the one-way pair arterials and corresponding improvements to the I-95 Interchange. **Figure 1.1** depicts the project location.

This Interchange Modification Report (IMR) has been prepared in accordance with the criteria specified in the FDOT's Interchange Access Request User's Guide. The IMR will be processed through the expedited programmatic approval process, as agreed upon in the Programmatic Agreement between the Federal Highway Administration (FHWA), Florida Division and FDOT, dated April 24, 2020. The IMR provides the necessary documentation for review and determination of the safety, operational and engineering acceptability of the I-95 at SW 8<sup>th</sup> Street/SW 7<sup>th</sup> Street Interchange Modification. It will serve as the traffic operations analysis document for the related National Environmental Policy Act (NEPA) study encompassing the interchange and the arterial improvements.

### PURPOSE AND NEED FOR PROJECT

The interchange at I-95 and SR 90/SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street experiences substantial operational deficiencies with extensive queueing and delays at the terminal intersections and neighboring intersections. Currently this terminal intersection operates at level of service (LOS) F during the PM peak with extensive delays and long queues which spillback onto the I-95 mainline. The population growth



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within the City of Miami, along with new developments in the downtown Miami and Brickell areas, will result in a significant increase in surface transportation demand and will worsen operating conditions at the already congested I-95/SW 8<sup>th</sup> Street/SW 7<sup>th</sup> Street Interchange. In addition, the subject interchange and neighboring intersections along SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street have historically experienced abnormally high crash rates. FDOT's crash records indicate that the I-95 terminal intersections have consistently experienced abnormal high crash rates in every year from 2011 through 2015. Queue spillback onto the mainline is a major safety and operational concern. Many fatal crashes have occurred within the project limits, and several of these crashes have involved pedestrians. If no action is taken, these safety and operational concerns will continue.

The purpose of this project is to develop recommendations for the proposed modifications to the SR 9 / I-95 and SR 90 /SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street interchange, as well as along the one-way pair arterials. The proposed project will improve traffic operations at the interchange and study area roadways / intersections by implementing operational and capacity improvements to meet the future travel demand projected as a result of Miami-Dade County population and employment growth. The project will further enhance safety conditions at the interchange, improve multimodal interrelationships, promote economic development by improving connectivity between I-95 and the service arterials, and enhance accommodations for bicycle and pedestrian activities.

### METHODOLOGY

The methodology applied for the I-95 at SR 90/US 41/SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street IMR is documented in the Methodology Letter of Understanding (MLOU), dated April 9, 2020. The MLOU was approved by FDOT District Six and FDOT Central Office, Systems Implementation Office. The MLOU outlines the criteria, assumptions, processes, analyses and documentation requirements for the project. The MLOU was prepared in accordance with the FDOT's Interchange Access Users' Guide. The IMR evaluates operating conditions for an anticipated opening year of 2025 and design year 2045. Estimated future traffic volumes are based on travel demand forecast resulting from the Southeast Florida Regional Planning Model (SERPM) v7. Assessment of traffic operating conditions are based on the HCM 2010 procedures and microsimulation analyses using Vissim models.



**EXISTING (2015) CONDITIONS**

The existing I-95 corridor is a limited access highway and a designated Strategic Intermodal System (SIS) facility. The existing typical section, within the project limits, consists of two to five general use (GU) lanes in the northbound direction and two to four GU lanes in the southbound direction.

SR 90/SW 8<sup>th</sup> Street/SW 7<sup>th</sup> Street is an urban principal arterial, one-way pair. The existing typical section consists of three eastbound lanes (SW 8<sup>th</sup> Street) and three westbound lanes (SW 7<sup>th</sup> Street).

Existing traffic operations at the I-95/SW 8<sup>th</sup> Street/SW 7<sup>th</sup> Street are substandard. The I-95 southbound terminal intersection at SW 7<sup>th</sup> Street and SW 4<sup>th</sup> Avenue is most critical. This intersection operates at LOS F during the PM peak and queues and delays experienced at this intersection spillback to impact traffic operations along I-95 mainline. Safety is a primary concern at the interchange as several intersections in the vicinity have been identified as high crash locations. These include:

- SW 8<sup>th</sup> Street at SW 4<sup>th</sup> Avenue (I-95 SB Terminal) - listed high crash location in 2011 through 2015
- SW 8<sup>th</sup> Street at SW 3<sup>rd</sup> Avenue (I-95 NB Terminal) - listed high crash location in 2011, 2012, 2014 and 2015
- SW 8<sup>th</sup> Street at SW 2<sup>nd</sup> Avenue - listed high crash location in 2011 through 2015
- SW 7<sup>th</sup> Street at SW 2<sup>nd</sup> Avenue - listed high crash location in 2011 through 2015
- SW 7<sup>th</sup> Street at SW 3<sup>rd</sup> Avenue - listed high crash location in 2011 through 2015
- SW 7<sup>th</sup> Street at SW 4<sup>th</sup> Avenue - listed high crash location in 2011 through 2015

Traffic congestion is currently experienced along the mainline segments of I-95, particularly in the NB direction. However, this congestion results from the spillback effect of downstream congestion that occurs outside the project study limits.

**NO BUILD ALTERNATIVE**

The future year No Build Alternative network includes the existing (2015) roadway conditions plus all funded and committed projects within the study corridor per the FDOT 5-Year Work Program. It also incorporates all Cost Feasible Plan projects contained in the Metropolitan Planning Organization's (MPO's) Long Range Transportation Plan (LRTP) that are located outside the immediate project limits. The roadway geometry for the No Build Alternative was determined to be consistent with the geometry for the existing 2015 road network within the project limits.

Travel demand forecast indicate that traffic growth will continue through the design year at a rate of approximately 0.5% along I-95 and approximately 0.80% to 1.35% along SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street. Based on this anticipated traffic growth, congestion will continue to increase at the interchange. By the design year 2045 it is anticipated that the northbound segment of I-95 Mainline (north of SW 8<sup>th</sup> Street on-ramp) will operate at LOS F conditions. In addition, several intersections are expected to operate at LOS F. These include:

- SW 7<sup>th</sup> Street at SW 4<sup>th</sup> Avenue/I-95 SB Off-Ramp (LOS F/F – AM/PM)
- SW 8<sup>th</sup> Street at SW 2<sup>nd</sup> Avenue (LOS F/F – AM/PM peak)
- SW 7<sup>th</sup> Street at SW 2<sup>nd</sup> Avenue (LOS F – PM peak)

Given these forecasted future traffic operating conditions, it was determined that the No Build Alternative will be inadequate to accommodate the future travel demand at the interchange.

**SR 90/SW 8<sup>th</sup> STREET/SW 7<sup>th</sup> STREET BUILD ALTERNATIVES**

The SR 90/SW 8<sup>th</sup> Street/SW 7<sup>th</sup> Street PD&E Study examined two tiers of build alternatives covering the limits of the study network. Alternatives were first considered for the configuration of SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street. Secondly, alternative configurations were considered for the I-95/SR 90 Interchange that would be consistent with the recommended configuration for SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street.



The alternatives analysis for SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street is documented in the associated Preliminary Engineering Report (PER). The alternatives analysis examined multiple configurations and traffic flow patterns for SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street. These are illustrated in **Figures 6.1** through **6.7** in the IMR. They include the following:

- Alternative 1: Two Lanes, Two-Way Alternative (**Figure 6.1**)
- Alternative 2: Two Lanes, Two-Way + Transit Lane (**Figure 6.2**)
- Alternative 2A: Two Lanes, Two-Way + Bicycle Lane (**Figure 6.3**)
- Alternative 3: Two Lane, One-Way (**Figure 6.4**)
- Alternative 3A: Three (3) Lanes - One (1) Way + Shared Parking and Travel Lane (**Figure 6.5**)
- Alternative 4: Three Lane, One-Way (**Figure 6.6**)
- Alternative 5: Reverse Flow (**Figure 6.7**)
- Alternative 6: Shared Parking and Travel Lane and Bike Lanes (**Figure 6.8**)

#### **SR 90/SW 8<sup>th</sup> Street/SW 7<sup>th</sup> Street Recommended Alternative**

Following extensive analyses and coordination with stakeholder agencies and local communities, it was determined that Alternative 4 was the Recommended Alternative for SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street. This alternative retains the existing configuration and one-way traffic flow along SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street. The roadway geometry is similar to existing except for modifications at the I-95 Interchange. The typical section on each facility consists of the following:

- SW 8<sup>th</sup> Street: three eastbound lanes. The typical section on SW 8<sup>th</sup> Street also includes on-street parking on both sides of the roadway.
- SW 7<sup>th</sup> Street: three westbound lanes

#### **I-95 at SR 90/SW 8<sup>th</sup> STREET/SW 7<sup>th</sup> STREET INTERCHANGE BUILD ALTERNATIVES**

Various potential design modifications were considered for the I-95/SR 90 Interchange. The design modifications considered included the following:



- Interchange Alternative B-1 (**Figure 7.1**): New flyover from SB I-95 to EB SW 8<sup>th</sup> Street and new flyover for WB SW 7<sup>th</sup> Street to NB I-95. This alternative was discarded due to inability to meet the minimum vertical alignment criteria for the proposed SB I-95 to EB SW 8<sup>th</sup> Street flyover.
- Interchange Alternative B-2 (**Figure 7.2**): New flyover from WB SW 7<sup>th</sup> Street to NB I-95.
- Interchange Alternative B-3 (**Figure 7.3**): New flyover from SB I-95 to EB SW 8<sup>th</sup> Street. This alternative was discarded due to inability to meet the minimum vertical alignment criteria for the proposed SB I-95 to EB SW 8<sup>th</sup> Street flyover.
- Interchange Alternative B-4 (**Figure 7.4**): Segment of SW 3<sup>rd</sup> Avenue between SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street is modified to include three lanes, one-way southbound.
- Interchange Alternative B-5 (**Figure 7.5**): New flyover from WB SW 7<sup>th</sup> Street to NB I-95. In addition, a new at grade turbo lane is provided for movements from I-95 SB Off-Ramp to EB SW 8<sup>th</sup> Street. This turbo lane allows traffic from SB I-95 to bypass the signals at SW 8<sup>th</sup> Street and SW 4<sup>th</sup> Avenue.
- Interchange Alternative B-6 (**Figure 7.6**): Segment of SW 3<sup>rd</sup> Avenue between SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street is modified to include three lanes, one-way southbound. In addition, a new at grade turbo lane is provided for movements from I-95 SB Off-Ramp to EB SW 8<sup>th</sup> Street. This turbo lane allows traffic from SB I-95 to bypass the signals at SW 8<sup>th</sup> Street and SW 4<sup>th</sup> Avenue.
- Interchange Alternative B-7 (**Figure 7.7**): New flyover from WB SW 7<sup>th</sup> Street to NB I-95. In addition, SW 4<sup>th</sup> Avenue is closed just north of SW 7<sup>th</sup> Street. This street closure allows for modifying the signal timings at the I-95 SB Terminal intersection from 3-phase operation (No Build) to more efficient 2-phase operation (Recommended Alternative).

#### **I-95/SW 8<sup>th</sup> Street/SW 7<sup>th</sup> Street Interchange Recommended Alternative**

The I-95 interchange alternatives were screened in an evaluation matrix considering several performance criteria including: safety, traffic operations, environmental impacts, social impacts, right of way, and construction cost. Based on this evaluation, Alternative B-7 was determined to be the Recommended Alternative. The proposed I-95 Interchange Alternative B-7 incorporates the following.

- New flyover ramp for accommodating movements from westbound SW 7<sup>th</sup> Street to NB I-95. The proposed WB to NB ramp elevates above SW 7<sup>th</sup> Street/SW 3<sup>rd</sup> Avenue Intersection and it introduces a new connection (on-ramp) to NB I-95.

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- Close SW 4<sup>th</sup> Avenue at its intersection with SW 7<sup>th</sup> Street and I-95 Southbound Off-Ramp. The proposed road closure will prohibit all vehicular traffic movements from SW 4<sup>th</sup> Avenue, at the intersection.
- Convert the segment of SW 4<sup>th</sup> Avenue between SW 7<sup>th</sup> Street and SW 6<sup>th</sup> Street from one-way southbound to two-way traffic flow. A turn-around facility is also proposed to facilitate traffic circulation and access within this segment of SW 4<sup>th</sup> Avenue.
- Widen I-95 SB Off-Ramp to provide one additional southbound through lane at the intersection with SW 7<sup>th</sup> Street. This additional through lane will further increase the capacity of the terminal intersection.
- Convert the segment of SW 3<sup>rd</sup> Avenue between SW 7<sup>th</sup> Street and SW 6<sup>th</sup> Street from one-way northbound to two-way traffic flow. This modification will create one northbound through lane and one new southbound through lane within the segment. This traffic flow modification will facilitate the rerouting of traffic for accessing EB SW 8<sup>th</sup> Street and the I-95 NB and SB ramps.
- Modification of signal timings to accommodate changes in intersection geometry and traffic volumes due to rerouting of traffic. Notably, signal operation plans at the following intersections will be modified:
  - SW 4<sup>th</sup> Avenue at Southwest 7<sup>th</sup> Street and I-95 SB Off-Ramp: Signal operation plan will be changed from 3-phase operation to 2-phase operation (serving SW 7<sup>th</sup> Street and I-95 SB Off-Ramp).
  - SW 3<sup>rd</sup> Avenue at SW 7<sup>th</sup> Street: Signal operation plan will be changed from 2-phase operation to 3-phase operation (serving NB SW 3<sup>rd</sup> Avenue, SB SW 3<sup>rd</sup> Avenue and WB SW 7<sup>th</sup> Street).

The proposed closure of SW 4<sup>th</sup> Avenue at SW 7<sup>th</sup> Street is being coordinated with the City of Miami and Miami-Dade County, Department of Transportation and Public Works (DTPW). In accordance with the County's procedures, FDOT District Six submitted a request for the street closure along with a supporting traffic study. At the time of this writing, both the County and City of Miami have indicated their support for the proposed street closure. Other key stakeholders have also offered no objections to the proposed street closure – these include the City's Police, Fire Rescue and Solid Waste departments.



Notwithstanding, per the City of Miami Policy, a formal resolution the street closure will not be issued until the project advances to design and construction is forthcoming.

#### **ASSESSMENT OF RECOMMENDED ALTERNATIVE AND NO BUILD – HCM Analysis**

A comparative assessment was performed for the Recommended Alternative and the No Build Alternative, for future year conditions, based on HCM 2010 analytical procedures. The results from the assessment indicated that the Recommended Alternative performs substantially better than the No Build Alternative for all future year scenarios (2025, 2035 and 2045). Based on the HCM 2010 analysis, under the Recommended Alternative by year 2045, all segments of I-95 will operate at LOS E or better in the NB and SB directions. In comparison, the No Build Alternative will experience LOS F along segments of NB I-95 by year 2045. Furthermore, in the Recommended Alternative, the critical intersection at I-95 SB Off-Ramp and SW 7<sup>th</sup> Street/SW 4<sup>th</sup> Avenue is expected to operate at LOS C (delay 24.2 sec/veh) in the AM and LOS D in PM (delay 47.9 seconds/vehicle). In comparison, under the No Build Alternative, this critical intersection is expected to operate at LOS F (delay 99.0 sec/veh) in the AM peak and LOS F (delay 198.1 sec/veh) in the PM peak.

#### **ASSESSMENT OF RECOMMENDED ALTERNATIVE AND NO BUILD – Microsimulation Analysis**

A detailed assessment of operating conditions for the Build and No Build Alternatives was performed using Vissim microsimulation models. Vissim models were developed for the AM peak period (4 hours) and PM peak period (4 hours) in the design year 2045. The results from the microsimulation analyses indicate that the Recommended Alternative generates overall better operating conditions for all considered MOEs in both the AM and PM peak periods along SR 90 and on I-95. Results for key matrices are as follows:

- **I-95 Travel Times:** The Recommended Alternative improves travel times/operating speeds along SB I-95 by approximately 57% during the AM peak and 14% in the PM peak. Correspondingly, along NB I-95 operating speeds improve by approximately 21% in the AM peak and are similar to No Build during the PM peak.
- **I-95 Throughput Traffic:** In the AM peak period, the Recommended Alternative increases throughput traffic on I-95 mainline by approximately 5% in the NB direction and 54% in the SB direction. In the PM peak period, throughput traffic is increased by approximately 3% in the northbound direction and 10% in the southbound direction.



- SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street Travel times:** The Recommended Alternative improves travel times along WB SW 7<sup>th</sup> Street by approximately 41% during the AM peak and 38% in the PM peak. Correspondingly along eastbound SW 8<sup>th</sup> Street, travel times are improved by approximately 24% in the AM peak. In the PM peak, travel times increase slightly along SW 8<sup>th</sup> Street by approximately 8%. This is due to more traffic being processed in the Recommended Alternative, specifically at the SW 7<sup>th</sup> Street & SW 4<sup>th</sup> Avenue/SB Ramp Terminal which results in more vehicles arriving at downstream intersections along SW 8<sup>th</sup> Street.
- I-95 Off-Ramp Queue Lengths:** Queue lengths on the SB off-ramps are substantially reduced with the Recommended Alternative – reduction in queue length ranges from approximately 7,275 feet (PM peak) to 7,590 feet (AM peak). Queues on the NB Off-Ramp are reduced by approximately 1,515 feet (AM) to 1,750 feet (PM) in comparing the recommended Alternative to the No Build.

Queueing along the I-95 off-ramps is of critical importance to traffic operations and safety along the mainline. Under the No Build Alternative, queue lengths exceed the available storage and impact I-95 mainline throughout the AM and PM peak periods. This condition is alleviated with the Recommended Alternative in the AM peak and PM peak periods.

- Network-wide MOEs:** The Recommended Alternative consistently performs better than the No Build Alternative for all network-wide performance measures – average speed, total delay, latent delay, latent demand, total travel time, vehicle miles traveled and total stops.

## ENVIRONMENTAL CONSIDERATIONS

This IMR is being performed in coordination with a related National Environmental Policy Act (NEPA) study, encompassing the I-95 interchange and SR 90/SW 8<sup>th</sup> Street/SW 7<sup>th</sup> Street Improvements. Results from the NEPA study will be documented in other project related reports. To date, no adverse environmental issues have been identified that would prevent the advancement of the proposed improvements.

## ANTICIPATED DESIGN VARIATIONS AND EXCEPTIONS

No design exceptions or variations are anticipated at this time for implementation of the Recommended Alternative. As the project moves forward through final design and construction, any design variations or exceptions that should arise will be processed through the FDOT and the FHWA for approval.



## SAFETY

Several intersections within the vicinity of the interchange have historically experienced abnormally high crash rates. These include the existing I-95 ramp terminal intersections at SW 8<sup>th</sup> Street and 3<sup>rd</sup> Avenue, the ramp terminal intersection at SW 7<sup>th</sup> Street and SW 4<sup>th</sup> Avenue and the adjacent intersections. The extensive weaving activities at these locations, together with the excessive traffic flows have been identified as contributing factors to the abnormally high crash rates at these locations. The Recommended Alternative offers the following improvements to address safety concerns at the interchange:

- The proposed new on-ramp from SW 7<sup>th</sup> Street to NB I-95 will substantially reduce weaving activity within the vicinity of the interchange. In the existing condition, access to NB I-95 from SW 7<sup>th</sup> Street involves travelling a circuitous route – WB along SW 7<sup>th</sup> Street, SB along SW 4<sup>th</sup> Avenue and EB along SW 8<sup>th</sup> Street to the I-95 NB-On-Ramps. These maneuvers are accomplished across multiple lanes within very short city blocks and this creates a high crash risk condition. The proposed new on-ramp from SW 7<sup>th</sup> Street will alleviate this condition by providing a direct access to NB I-95 for approximately 940/1040 vehicles that make this movement during the AM/PM peak hours (2045 estimates).
- The proposed new I-95 NB on-ramp will reduce conflicting movements at four high crash intersections: SW 8<sup>th</sup> Street at 4<sup>th</sup> Avenue; SW 8<sup>th</sup> Street at 3<sup>rd</sup> Avenue SW 7<sup>th</sup> Street at 3<sup>rd</sup> Avenue and SW 7<sup>th</sup> Street at SW 4<sup>th</sup> Avenue. This reduction in conflicting traffic will correspondingly reduce crashes and in particular right-angle crashes at these intersections.
- The proposed improvements will reduce the risk for queue spillback onto I-95 mainline. Vissim microsimulation analysis demonstrates that with the existing interchange configuration, queues at the I-95 SB off-ramp will exceed the available storage resulting in queue spillbacks onto I-95 mainline during AM and PM peak periods. This condition creates a major safety concern with standing queues on I-95 mainline adjacent to high-speed traffic. This safety concern is mitigated by the Recommended Alternative due to the substantial reduction in the generated queue lengths.

It is estimated that the Recommended Alternative will generate crash reductions of approximately 919 crashes at the arterial intersections, over the design life of the project. The crash reduction translates to crash savings of approximately \$133,586,000 (919 crashes reduced @ \$123,589 per crash) based on FDOT's average crash cost for similar facilities .

### ACCESS MANAGEMENT

The proposed improvements will not adversely impact access to any property within the study area. Accordingly, an access management plan is not required for the proposed improvements.

### MULTIMODAL ACCOMODATIONS

the proposed interchange improvements will enhance safety for pedestrian and bicyclists. Much of the safety enhancements for pedestrians and bicyclists will be realized through their reduced exposure to conflicting automobile and truck traffic, which will result from the proposed new I-95 on-ramp from NW 7<sup>th</sup> Street. This new on-ramp will reduce traffic exposure at four critical intersections:

- SW 8<sup>th</sup> Street at SW 4<sup>th</sup> Avenue
- SW 8<sup>th</sup> Street at SW 3<sup>rd</sup> Avenue
- SW 7<sup>th</sup> Street at SW 4<sup>th</sup> Avenue
- SW 7<sup>th</sup> Street at SW 4<sup>th</sup> Avenue

In addition to the reduced traffic exposure, pedestrians and bicyclists will benefit from upgraded roadway and traffic control facilities such as, updated signing and markings for pedestrians, signal system upgrades, and rehabilitation of facilities for ADA compliance

### JUSTIFICATION FOR PROJECT

The FHWA's Policy on Access to the Interstate System provides the requirements for the justification and documentation necessary to substantiate any proposed changes in access to the Interstate System. The policy is published under the Federal Register, Volume 74, Number 165, which was updated on May 22, 2017. The responses provided in the IMR for both of the policy statements demonstrate compliance with these requirements and justification for the proposed interchange modifications at I-95 and SR 90/SW 8<sup>th</sup> Street/SW 7<sup>th</sup> Street in Miami-Dade County, Florida.

***Policy Requirement No. 1: An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or***

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*on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).*

**Response to Policy Requirement #1:** The operational analysis conducted for the IMR confirmed that the proposed interchange modifications are not expected to have any significant adverse impacts on safety and operations on the interstate facility (I-95). Analyses performed using both the HCM procedure and microsimulation techniques confirm that the Recommended Alternative will improve traffic operations along NB and SB I-95 within the area of influence of the interchange. In addition, traffic operations at the I-95 terminal intersections and adjacent intersections will be improved. The analyses indicate the following operational improvements in the design year (2045) along various segments of the study network:

**NB I-95:** The Recommended Alternative will improve travel times along NB I-95 by approximately 21% in the AM peak hour when compared to the No Build Alternative. In the PM peak hour travel times are approximately the same along NB I-95 in both the No Build and Recommended Alternative. The Recommended Alternative increases throughput traffic along NB I-95 by approximately 5% in the AM peak and 3% in the PM peak. It is noted that considerable traffic congestion occurs downstream along NB I-95, outside the project study area. This congestion, outside the study area, results in substandard operating conditions throughout NB I-95 in both the No Build and Recommended Alternative. The FDOT plans to address this congestion along I-95 in future projects.

**SB I-95:** The Recommended Alternative will improve travel times along SB I-95 by approximately 57% in the AM peak hour and 15% in the PM peak hour, when compared to the No Build Alternative. Furthermore, the Recommended Alternative increases throughput traffic along SB I-95 by approximately 54% in the AM peak and 10% in the PM peak. This dramatic improvement in operations in the southbound direction results from benefits generated by the Recommended Alternative in

alleviating queue spillback from the off-ramp onto the mainline which occurs under the No Build Alternative. This is also a significant safety benefit resulting from the Recommended Alternative.

**SW 8<sup>th</sup> Street Traffic Operations:** The Recommended Alternative will improve travel times along SW 8<sup>th</sup> Street by approximately 24% during the AM peak with a minor increase of 8% during the PM peak period. The proposed new NB on-ramp will substantially reduce conflicting traffic at critical intersections - SW 8<sup>th</sup> Street at SW 4<sup>th</sup> Avenue; and SW 8<sup>th</sup> Street at 3<sup>rd</sup> Avenue (northbound ramp terminal). This reduction in traffic improves safety and operations at the intersections.

**SW 7<sup>th</sup> Street Traffic Operations:** The Recommended Alternative will improve travel times along SW 7<sup>th</sup> Street by approximately 41% during the AM peak period and 38% during the PM peak period. The proposed new NB on-ramp will substantially reduce conflicting traffic at critical intersections - SW 7<sup>th</sup> Street at SW 3<sup>rd</sup> Avenue; and SW 7<sup>th</sup> Street at 4<sup>th</sup> Avenue (southbound ramp terminal). This reduction in traffic improves safety and operations at the intersections.

**Network-wide Performance Measures:** The Recommended Alternative generates significant improvements across all network-wide performance measures. These include: average speed (70%/38% increase in AM/PM peaks); total delay (69%/51% decrease in AM/PM peaks); latent demand (78%/41% decrease in AM/PM peaks); total travel time (35%/24% decrease in AM/PM peak); and total stops (73%/62% decrease in AM/PM peaks).

**Safety Enhancements:** The I-95 ramp terminal intersections at SW 8<sup>th</sup> Street and SW 7<sup>th</sup> Street and the adjacent intersections are high crash locations. The existing circuitous routes, extensive weaving maneuvers and excessive traffic volumes are all contributing causes to the abnormally high crash rates experienced at these intersections. In addition, the I-95 SB Off-ramp experiences extensive queueing during peak periods which often spills-back onto the mainline and creates a high crash risk condition. The No Build Alternative offers no improvements to address these contributing causes, hence the high crash rates will continue if no corrective measures are implemented. The Recommended Alternative addresses these contributing causes by:

- Providing direct access to NB I-95 from SW 7<sup>th</sup> Street (new on-ramp)
- Providing improved access to EB SW 8<sup>th</sup> Street from SB I-95 (simple and more efficient 2-phase signal at terminal intersection)

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- Reducing conflicting traffic at critical intersections
- Mitigating risk of queue spillback onto I-95 mainline by increasing capacity and efficiency of the I-95 SB Off-ramp Terminal Intersection.

The above improvements will substantially improve safety conditions at the arterial intersections. It is estimated that the Recommended Alternative will generate crash reductions of approximately 919 crashes at the arterial intersections, over the design life of the project. This crash reduction translates to crash savings of approximately \$133,586,000 over the design life of the improvements.

The proposed interchange modifications will modify access to/from I-95 and necessitate changes to the current signing at the I-95/SR 90 Interchange. A conceptual signing plan for the interchange modifications is included under **Appendix K**. The signing plan will be fully coordinated with FHWA in advance of construction.

***Policy Requirement No. 2: The proposed access connects to a public road only and will provide for all traffic movements. Less than “full interchanges” may be considered on a case-by-case basis for applications requiring special access, such as managed lanes (e.g., transit or high occupancy vehicle and high occupancy toll lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)). In rare instances where all basic movements are not provided by the proposed design, the report should include a full-interchange option with a comparison of the operational and safety analyses to the partial interchange option. The report should also include the mitigation proposed to compensate for the missing movements, including wayfinding signage, impacts on local intersections, mitigation of driver expectation leading to wrong-way movements on ramps, etc. The report should describe whether future provision of a full interchange is precluded by the proposed design.***

**Response to Policy Requirement #2:** The IMR proposes no new interchanges along I-95. The existing interchange provides access to public roads only. The improvements proposed at the interchange will maintain full access to SR 90/SW 8<sup>th</sup> Street/SW 7<sup>th</sup> Street and accommodate all movements.

The proposed improvements include a new northbound on-ramp from SW 7<sup>th</sup> Street to NB I-95. As discussed under response to Policy Point No. 1, the proposed new on-ramp will have no adverse impacts to traffic operations nor safety along I-95 mainline segments or the arterial segments of the study network.



**CONCEPTUAL FUNDING PLAN**

Construction cost for the proposed improvements is estimated at \$19.7M. According to the FDOT current Five-Year Work Program schedule, the project is a candidate for funding with final design allocations in 2024 and construction funding in 2029. These dates are subject to change as the Work Program is frequently updated and modified as project priorities change.

**RECOMMENDATION**

The information presented in the preceding sections of the IMR demonstrate that the proposed modifications for the interchange of I-95 and SW 8<sup>th</sup> Street/SW 7<sup>th</sup> Street satisfy the requirements for safety, operational and engineering (SO&E) acceptability. The proposed modifications satisfy the FHWA's Policy Points and the improvements will fulfil the purpose and need for the project. Based on these findings, it is recommended that the proposed improvements be advanced for formal approval and implementation.