EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) District Five has prepared an Interchange Operational Analysis Report (IOAR) for the proposed improvements of the I-95 and Fiske Boulevard (SR 519) interchange located in Brevard County, Florida. The findings, operational and safety analysis and the Federal Highway Administration (FHWA) Policy Points discussion are summarized as follows:

Purpose and Need

The purpose of this project is to provide operational benefits at the interchange of I-95 and Fiske Boulevard. The following existing operations have been observed at the interchange intersections:

- Fiske Boulevard at the I-95 Northbound Ramps
    - In the existing PM peak hour, queues have been observed on the I-95 northbound off-ramp.
    - In the existing AM peak hour, queues have been observed on the I-95 northbound off-ramp. In addition, significant delays have been observed for the eastbound left turn movement at the I-95 northbound off-ramp causing this movement to experience failing conditions.
    - While the existing queues do not back onto the I-95 mainline, the delays and queues are anticipated to worsen in the future conditions, which could have an impact on the I-95 mainline operations.
- Fiske Boulevard at the I-95 Southbound Ramps
    - In the existing PM peak hour, the westbound left turn movement (from the southbound off-ramp approach) experiences significant delays.

The proposed improvements are expected to improve operating conditions at both ramp terminals and prevent future adverse impacts to the I-95 mainline. The proposed improvements will improve capacity at the ramp terminals and are expected to provide safety benefits.

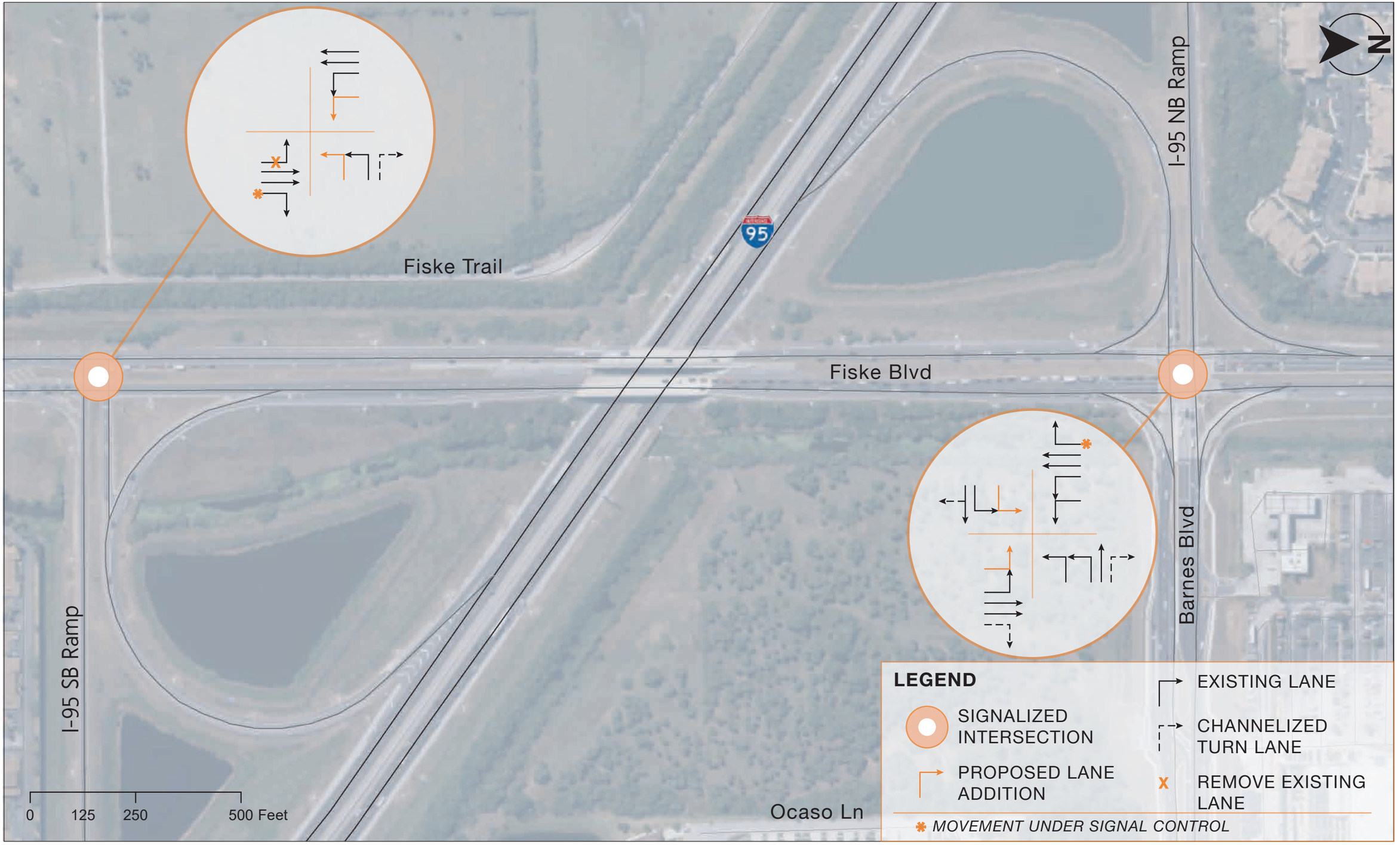
Proposed Improvements

The I-95 and Fiske Boulevard interchange improvement is planned and funded for construction in FY 2021. Design for the improvements is on-going with 90% plans recently released. The construction letting date of the project is currently set for January 2021 with an anticipated

opening year in 2023. The proposed improvements at the two ramp intersections are listed below and illustrated in **Figure E-1**:

- Fiske Boulevard at the I-95 Northbound Ramps
    - Additional northbound left turn lane and the corresponding widening of the I-95 northbound on-ramp to accommodate the dual left turn lanes. The two lane on-ramp merges to one lane before the freeway ramp gore, therefore maintaining existing lanes at the gore point.
    - Extension of storage for the northbound left turn lanes on Fiske Boulevard.
    - Modification of the southbound channelized right turn lane on Fiske Boulevard to remove free flow lane and bring the movement under signal control.
    - Additional eastbound left turn lane on the I-95 northbound off-ramp approach.

- Fiske Boulevard at the I-95 Southbound Ramps
    - Additional southbound left turn lane and the corresponding widening of the I-95 southbound on-ramp to accommodate the dual left turn lanes. The two lane on-ramp merges to one lane at the freeway ramp gore, therefore maintaining existing lanes at the gore point.
    - Removal of the existing northbound U-turn/left turn lane on Fiske Boulevard.
    - Modification of the northbound channelized right turn lane on Fiske Boulevard to remove free flow lane and bring the movement under signal control.
    - Additional westbound left turn lane on the I-95 southbound off-ramp approach.


Fiske Trail
Fiske Blvd
Ocaso Ln
I-95 NB Ramp
I-95 SB Ramp
Barnes Blvd
N
95
0
125
250
500 Feet
LEGEND
SIGNALIZED INTERSECTION
PROPOSED LANE ADDITION
EXISTING LANE
CHANNELIZED TURN LANE
REMOVE EXISTING LANE
* MOVEMENT UNDER SIGNAL CONTROL

FHWA Policy Points

The proposed improvements are consistent with FHWA's Policy Points.

Policy Point 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, and ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis should, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (Title 23, Code of Federal Regulations (CFR), paragraphs 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, should 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 should 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 should 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)).*.

A detailed operational and safety analysis was conducted in this IOAR to address this policy point. The response is provided in two parts, discussion of the operational improvements and safety performance.

Operational Analysis

- Traffic operational analysis was performed for existing year (2019), opening year (2023) and design year (2033).

- Existing Year
    - Congestion, delays, and queuing are experienced at both the ramp intersections in the existing year analysis.

- No-Build Conditions and Build Conditions
  - 2023 and 2033 No-Build analysis indicates traffic conditions will continue to worsen if no improvements are made.
  - 2023 and 2033 Build analysis indicates that, the proposed improvements will improve operations at the I-95 southbound and northbound ramp terminals intersecting Fiske Boulevard and will not have any adverse impacts to the I-95 mainline operations.
  - The overall intersection Level of Service (LOS) and Delay (sec/veh) are expected to improve and meet the LOS target (LOS D) for both the ramp terminal intersections. **Table E-1** summarizes the intersection operational analysis results.
  - Analysis shows a reduction of the 95th percentile queue ensuring there will be no queue spillback onto the I-95 mainline during the design year peak hours. **Table E-2** summarizes the off-ramp queues at both the ramp terminal intersections.

Table E-1 Operational Analysis Results

Intersection	2019 Existing		2023 (No-Build)		2023 (Build)		2033 (No-Build)		2033 (Build)	
	Delay*	LOS	Delay*	LOS	Delay*	LOS	Delay*	LOS	Delay*	LOS
AM Peak Hour										
Fiske Blvd at I-95 NB off-ramp	70.6	E	87.9	F	48.8	D	115.0	F	50.0	D
Fiske Blvd at I-95 SB off-ramp	17.0	B	22.5	C	23.7	C	33.5	C	26.6	C
PM Peak Hour										
Fiske Blvd at I-95 NB off-ramp	81.7	F	92.3	F	48.7	D	102.4	F	52.1	D
Fiske Blvd at I-95 SB off-ramp	31.6	C	36.0	D	26.1	C	45.6	D	31.2	C

Delay is reported in seconds/vehicle.

Table E-2 95th Percentile Queue Length

Intersection	Ramp Length* (ft.)	95th Percentile Queue Length (ft.)				
		2019 Existing	2023 (No-Build)	2023 (Build)	2033 (No-Build)	2033 (Build)
AM Peak Hour						
Fiske Blvd at I-95 NB off-ramp	1,300	800	925	225	1,475	325
Fiske Blvd at I-95 SB off-ramp	1,350	350	450	175	600	225
PM Peak Hour						
Fiske Blvd at I-95 NB off-ramp	1,300	975	1,175	350	1,325	375
Fiske Blvd at I-95 SB off-ramp	1,350	225	325	125	450	175

**Ramp lengths are measured as the distance from the stop bar to the painted nose of the gore*

Safety Performance

- The historical crash analysis indicates no existing safety issues when compared with statewide crash rates. The existing crash rate on Fiske Boulevard is between 1.81 and 3.58 which is lower than the statewide average of 3.64 for a four-lane urban divided roadway.

- Crash Modification Factor (CMF) Clearing House and FHWA sources were reviewed to determine crash modification factors for the proposed improvements. While there are no CMF's that can be applied to quantify the benefits, FDOT's Crash Reduction Factors (CRF) are available for the improvements proposed. The CRF's show a positive effect on safety for the proposed improvements with up to 11% reduction in total crashes.

- Additionally, the FHWA Signalized Intersections Safety Guide cites studies performed at similar intersections with dual left turn lane improvements showing reduction by at least 20% in angle fatal/injury collisions and 29% in fatal/injury rear-end collisions. The literature review also found that dual left-turn lanes with protected-only phasing generally operate with minimal negative safety impacts.

- The analysis shows that the proposed Improvements are projected to reduce the crashes and improve safety in the study area including the I-95 northbound and southbound ramp terminals.

Policy Point 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*

The existing interchange is a partial cloverleaf interchange providing full access to all traffic movements on the connecting crossroad (Fiske Boulevard). The proposed improvement will maintain full access to all traffic movements. The interchange access conditions will remain the same in the Build condition.

The proposed improvements are expected to improve operations and safety along Fiske Boulevard and at the I-95 ramp terminal intersections. Based on the analysis performed in support of this IOAR, the proposed improvements have safety, operational and engineering viability and do not have an adverse impact on the I-95 mainline operations.