

Executive Summary

The purpose of this Systems Interchange Modification Report (SIMR) re-evaluation is to provide the required technical documentation for obtaining Federal Highway Administration (FHWA) approval of a re-evaluation of the approved July 2021 I-95 from International Golf Parkway (IGP) to Atlantic Boulevard Systems Interchange Modification Report (SIMR) Re-evaluation. The only interchange being re-evaluated in this study is the First Coast Expressway (FCE) interchange with I-95 and, therefore, will be the primary focus of this SIMR Re-evaluation.

The primary reason for this re-evaluation is due to a design modification to the approved I-95 at FCE interchange concept. Per the 2020 Interchange Access Request User's Guide (IARUG), the re-evaluation shall show that the revised concept satisfies the safety, operational and engineering (SO&E) acceptability requirements and FHWA's policy points. This means the re-evaluation shall demonstrate that the proposed concept satisfies the measures of effectiveness (MOEs) used in the evaluation of the approved 2021 SIMR Re-evaluation concept.

This re-evaluation proposes one design change. The design change is for the northbound access ramps at the I-95 and FCE interchange. Two alternatives have been evaluated in this SIMR for future conditions – 2021 SIMR Concept and FCE SIMR Concept. Each of these alternatives is described below.

Alternative 1 – 2021 SIMR Concept: This alternative is the same as the approved July 2021 SIMR Re-evaluation concept. At the FCE interchange, the northbound access ramps to/from I-95 and FCE are located on the left side of the I-95 mainline.

Alternative 2 – FCE SIMR Concept: This SIMR Re-evaluation is the same as the approved 2021 SIMR Re-evaluation concept except for the design change at the FCE interchange. At the FCE interchange, the proposed design change relocates the FCE northbound access ramps from the left side of the I-95 mainline to the right side of the I-95 mainline. There are no other modifications to the previously approved July 2021 SIMR Concept.

The Methodology Letter of Understanding (MLOU) was prepared in February 2022. The primary basis for traffic projections in this SIMR is Version 2 of the adopted Northeast Regional Planning Model (NERPM) Activity-Based Model (ABM) which has a base year of 2010 and a cost feasible year of 2040. The analysis year for this study is Design Year 2045. The operational analysis for this study is performed using microsimulation (Vissim). The traffic development, operational analysis procedures and MOEs are consistent with the previously approved July 2021 SIMR Re-evaluation.

The purpose of this re-evaluation is to ensure the proposed modifications to the FCE interchange do not adversely impact the operations or safety of I-95 and surrounding interchanges. In addition, typical driver expectations place ramps on the right side of the roadway.

The Design Year 2045 operational analysis results also show that the FCE SIMR Concept performs similar to the 2021 SIMR Concept within the I-95 study area. During the 2045 AM peak hour, the FCE SIMR Concept alternative shows a similar average speed and total travel time. The FCE SIMR Concept does show a slight reduction in delay of 2%. During the PM peak, similar operations to the AM peak are experienced.

In terms of safety, the FCE SIMR Concept is expected to reduce crashes due to the northbound access ramps modifications at the FCE interchange, hence providing safer travel conditions. The FCE SIMR Concept provides an overall 16% decrease in annual predicted crashes.

In conclusion, the FCE SIMR Concept showed similar operational conditions and improved safety conditions over the 2021 SIMR Concept in the Design Year 2045. Based on the safety and traffic operational analyses performed, the FCE SIMR Concept is considered the preferred alternative for this SIMR.

This SIMR has been developed in accordance with Florida Department of Transportation (FDOT) Policy No. 000-525-015: Approval of New or Modified Access to Limited Access Highways on the State Highway System (SHS), FDOT Procedure No. 525-030-160: New or Modified Interchanges, 2020 Interchange Access Request User's Guide (IARUG) and the 2019 FDOT Traffic Forecasting Handbook (Procedure No. 525-030-120).

E.1 Compliance with FHWA General Requirements

The following requirements serve as the primary decision criteria used in the approval of interchange modification projects. Responses to the FHWA policy points are provided to show that the proposed project is viable based on the analysis performed to date.

E.1.1 FHWA 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, ramp intersections with crossroad) or 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)).

An in-depth operational and safety analysis was conducted to study the operational and safety benefits offered by the proposed modifications at the FCE interchange. Consistent with the approved MLOU, the approved

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concept from the July 2021 SIMR Re-evaluation was compared with the new FCE SIMR Concept. The FCE SIMR Concept recommends the northbound access ramps at the FCE interchange be relocated from the left side of the I-95 mainline to the right side. The operational analysis was performed using Vissim microsimulation for the Design Year 2045. Several performance measures were used to compare the traffic operations and safety. Key measures include:

- Peak hour link-level freeway mainline segments
 - Travel speed
 - Simulated (throughput) volume
 - Density
- Peak period link-level density heat maps for the freeway mainline segments
- Network-Wide Performance
 - Average speed
 - Total delay
 - Latent delay
 - Latent demand
 - Total travel time
 - Total stops
 - Vehicles Arrived
- Safety
 - Predicted reduction in crashes

The Design Year 2045 operational analysis results show that the FCE SIMR Concept will operate at similar conditions compared to the 2021 SIMR Concept. For both alternatives within the area of influence, I-95 will operate at nearly free-flow speed. In addition to operational analysis, safety analysis has been performed to compare the two alternatives. A predictive safety analysis was performed using Highway Safety Manual (HSM) methodologies. Based on this analysis, the FCE SIMR Concept is expected to reduce crashes by 22% annually along the I-95 mainline at the northbound off ramp to FCE and 20% annually at the northbound on ramp from FCE. Overall, crashes within the study area are expected to reduce by 16% annually compared to the 2021 SIMR Concept.

In summary, the proposed modifications will provide similar operations along I-95 and safety benefits to the study corridor (I-95) at the FCE interchange.

E.1.2 FHWA 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 for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards for federal-aid projects on the interstate system (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.

I-95 is a public facility and all interchanges within the study area provide full access and will continue to do so with the FCE SIMR Concept. The FCE SIMR Concept will maintain and provide interchange access catering to all traffic movements to/from existing interchanges within the study limits.

The proposed improvements under the FCE SIMR Concept were designed to meet current standards for federal-aid projects on the interstate system and conform to the American Association of State Highway and Transportation Officials (AASHTO) and the FDOT Design Manual (FDM). Various border width variations are expected between MP 0.977-6.138. These variations are justified because the project will still be able to accommodate proposed signing, lighting, drainage features, guardrail, fencing, clear zone and construction and maintenance despite having substandard border width.