



EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) District One is completing an Interchange Operational Analysis Report (IOAR) for the improvement of the Interstate 4 (I-4) interchange at State Road 559 (SR 559) in Polk County. This IOAR has been developed in accordance with FDOT Policy No. 000-525-015: Approval of New or Modified Access to Limited Access Highways on the State Highway System (SHS), the Interchange Access Request User's Guide (2022) and the FDOT's 2019 Project Traffic Forecasting Handbook (Procedure No. 525-030-120).

The I-4 and SR 559 interchange is located in Auburndale, in North-Central Polk County, Florida. The interchange is a diamond configuration with single-lane ramps in all four quadrants and two unsignalized ramp terminal intersections. In this region, I-4 is a six-lane, limited access Strategic Intermodal System (SIS) facility that is classified as an urban principal arterial-interstate west of SR 559 and as a rural principal arterial-interstate east of SR 559. SR 559 is an urban minor arterial that has a four-lane section south of I-4; it becomes a two-lane roadway north of the Interstate. The I-4 westbound exit ramp provides separate left and right turn lanes while the I-4 eastbound exit ramp has one shared left/right lane; both exit ramps are stop-controlled.

FDOT District One has identified operational and safety deficiencies associated with the current interchange traffic control. Operational review of the I-4 Westbound at SR 559 ramp terminal intersection has shown conflicts between northbound left and southbound right turning vehicles entering the I-4 westbound on-ramp and between I-4 westbound off-ramp left and SR 559 north/south through vehicles. The westbound off ramp left turn queues have been observed to extend beyond the existing turn lane, blocking right turn vehicles from entering the right turn lane. The westbound left turn experiences excessive delay during the peak hours and instances of queued vehicles extending back to the I-4 mainline. The eastbound off ramp volumes are similar to the westbound, however the majority of turning movements are right turns. Although right turns are made with less interference than left turns, the eastbound exit ramp is a single lane ramp that flares at SR 559 to provide approximately 30 feet of storage each for left and right turns and a queue of two left turn vehicles blocks right turn access. Additionally, sight distance for eastbound exit ramp vehicles looking north is limited due to the existing concrete barrier wall on the SR 559 bridge. Signalization at both locations has been proposed to alleviate the identified traffic operations and safety deficiencies.

The request for approval of this revised access point, and the analyses and evaluations that were conducted to support this request, satisfy FHWA's two policy point requirements as described in the following section of this executive summary. Therefore, the Build Alternative is recommended for implementation at the I-4 and SR 559 interchange.

**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, 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)).

Satisfaction of FHWA Policy Point 1

The operational analysis documented in this IOAR included the I-4 ramp merge/diverge areas, the I-4 at SR 559 ramp terminal intersections, and the SR 559 arterial. The analysis demonstrates that both of the I-4 ramp terminal intersections at SR 559 are anticipated to experience excessive delays and to operate at LOS F during the design year 2036 under the no-build condition. Moreover, the 95th percentile off-ramp left turn queues are expected to extend beyond the available off-ramp storage as in the existing conditions. The proposed improvement to install a traffic signal at the ramp terminal intersections provides significant benefits to the operations of the interchange by improving delays and managing the queues for the exit ramp left turn movements. In addition, the traffic signal installation has potential safety benefits to address the existing sight distance deficiencies identified at the I-4 Eastbound ramp intersection. The 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, the adjacent interchanges, or on the local street network based on both the current and the planned future traffic projections.

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, 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.

Satisfaction of FHWA Policy Point 2

The existing I-4 and SR 559 interchange is a diamond interchange that connects to a public road (SR 559) and provides for all traffic movements. The recommended I-4 and SR 559 interchange improvements maintain the diamond interchange configuration and continue to provide for all traffic movements to and from SR 559. The proposed access connects to a public road only and will provide for all traffic movements. Therefore, the Build Alternative is recommended for implementation at the I-4 and SR 559 interchange.

Recommendation

It is recommended that the Build Alternative be constructed to improve the safety and operational conditions at the I-4 and SR 559 interchange. It is also recommended that the intersections of SR 559 at the I-4 Eastbound and Westbound ramps and SR 559 and CR 559A (C. Fred Jones Boulevard) be continuously monitored for improvements to ensure that there are no detrimental impacts to the interstate facility. Lastly, it is recommended that the District continues to evaluate ultimate improvements for the I-4 freeway segment in this area as part of the I-4 Master Plan study in order to adequately prioritize improvements necessary to achieve acceptable operations at the interchange.