

Executive Summary

The purpose of this Interchange Operational Analysis Report (IOAR) is to provide the required technical documentation for obtaining the Federal Highway Administration (FHWA) determination of safety, operational and engineering acceptability for the implementation of traffic signals at the stop controlled State Road 79 (SR 79) at Interstate 10 (I-10) interchange. The project limits extend from one mile east and west of the interchange on I-10 and half a mile north and south of the interchange on SR 79.

SR 79, a four lane north/south facility within the study area, is an Emerging Strategic Intermodal System (SIS) corridor as well as a designated hurricane evacuation route. The ramp terminal intersections will not be able to accommodate future traffic if operational improvements are not implemented at the interchange. Traffic conditions are expected to operate below the level of service (LOS) target C in the opening and design years of the No-Build Alternative. Implementation of traffic signals at the SR 79/I-10 interchange is anticipated to provide an acceptable level of service at both intersections and reduce intersection delay.

The primary basis for traffic projections in this IOAR is Version 1.4 of the adopted Northwest Florida Regional Planning Model (NWRPMP) which has a base year of 2006 and a cost feasible year of 2035. The analysis years for the study include Existing Year 2015, Opening Year 2025, and Design Year 2045. The operational analysis for this study is performed primarily using capacity analysis software (Synchro and HCS).

Two primary alternatives will be evaluated in this IOAR for future conditions: a No-Build Alternative and a Build Alternative. The Build Alternative proposes signaling the two ramp terminals.

The Design Year 2045 operational analysis results show that the Build Alternative is expected to provide significantly better traffic operations within the SR 79/I-10 study area compared to the No-Build. During the 2045 AM and PM peak, the No-Build Alternative exhibits operational failure (LOS F) at the eastbound ramp terminal. The current stop controlled ramp movement cannot accommodate the future Design Year demand. During both peak hours, the implementation of a signal at the stop controlled ramp junctions provided by the Build Alternative is expected to alleviate the operational issues at the SR 79/I-10 interchange and provide an overall intersection LOS of B or better at both ramp terminals.

In terms of safety, the proposed Build Alternative treatment will improve operations at the intersections and assist in reducing right angle crashes, which are the predominate type of crash along the SR 79 facility in the ramp terminal intersection influence area (a radius of 250 feet). Moreover, the Highway Safety Manual (HSM) analysis of the ramp terminals resulted in an annual reduction in crashes of 73% (0.58 crashes) for the Build Alternative.

In conclusion, the Build Alternative showed significant operational improvements over the No-Build in the Design Year 2045. Based on the safety and traffic operations benefits of the Build Alternative, it is considered the preferred alternative for the SR 79 at I-10 IOAR.

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 Strategic Highway System (SHS), FDOT Procedure No. 525-030-160: New or Modified Interchanges, Interchange Access Request User's Guide and the FDOT Project 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 approval of interchange access requests. 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 The request does not have a significant adverse impact on the safety and operation of the freeway system

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 should, 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, 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)).

The Build Alternative is expected to reduce the observed crashes at the intersection influence area by 73% with the installation of a traffic signal at the ramp terminals of the SR 79 at I-10 interchange. The intersection influence area is considered to be a 250 foot radius around each ramp terminal intersection. This signal implementation will reduce both right angle and left turn crashes since both are attributed to failure to stop at an intersection in the event of an opposing vehicle. From 2011-2015, four crashes were located within the intersection areas of influence with right angle crashes being the most common type of crash accounting for 75% of total crashes. The intersection areas of influence also had 1 left turn crash accounting for 25% of total crashes. The Build Alternative is expected to provide safety enhancements over the No-Build, which is upheld by the results of the HSM-based safety analysis.

The Design Year 2045 operational analysis results show that the Build Alternative provides significantly better traffic operations within the SR 79/I-10 study area compared to the No-Build. During the 2045 AM and PM peak, the No-Build Alternative exhibits operational failure (LOS F) at the eastbound ramp terminal. The current stop controlled ramp movement cannot accommodate the future Design Year demand. During both peak hours, the implementation of a signal at the stop controlled ramp junctions provided by the Build Alternative is expected to alleviate the operational

issues at the SR 79/I-10 interchange and provide overall intersection LOS of B or better at both ramp terminals.

The Build Alternative is expected to improve the safety and operations of the SR 79 at I-10 interchange in both the Opening Year 2025 and Design Year 2045.

E.1.2 The proposed access connects to a public road only and will provide for all traffic movements

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, HOVs, HOT 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 proposed operational improvements will maintain current access for all traffic movements for the project interchange. The current diamond interchange configuration will be maintained while the control for the ramp terminal intersections will be changed from stop control to signalized control.