

INTERCHANGE OPERATIONAL ANALYSIS REPORT (IOAR)

I-10 at Ward Basin Road (C.R. 89)
FPID: 222530-5-22-01 and 222530-6-22-01



EXECUTIVE SUMMARY

The purpose of this IOAR is to provide the required documentation for obtaining approval for improvements at the Interstate 10 (I-10)/Ward Basin Road (C.R. 89) interchange in Santa Rosa County. The current interchange is a four-quadrant partial cloverleaf with stop-controlled operation at both ramp terminal intersections. The primary need of the project is to improve future traffic operations at the ramp terminal intersections, thereby improving safety at the interchange.

The primary basis for traffic projection in this IOAR is consistent with the Project Traffic Analysis Report (PTAR) dated May 2020, which incorporates the field traffic counts, Florida Traffic Online (FTO) and the latest version of the Northwest Florida Regional Planning Model (NWFRPM) with base year 2010 and horizon year 2040. The analysis years for the study include Existing Year 2019, Opening Year 2025 and Design Year 2045. The operational analysis for this study was performed using Synchro 10. The delay and level of service (LOS) for the unsignalized intersection analyses were reported based on Highway Capacity Manual (HCM 6th Edition) methodology. The delay and LOS for the signalized intersection analyses were reported based on Synchro 10 methodology.

If no improvements are made, traffic operations within the study area will continue to deteriorate as traffic volumes increase.

Two alternatives were evaluated to address the purpose and needs identified in this IOAR. The alternatives analyzed include:

- No-Build Alternative – This alternative includes the existing configuration plus all programmed improvements with future traffic.
- Build Alternative – This alternative includes signalizing the I-10/Ward Basin Road interchange ramp terminal intersections.

As part of this study, an existing crash analysis was performed. The data obtained from the Signal 4 analytics and FDOT State Safety Office Map-Based Query Tool (SSOGis) shows 4 crashes which

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resulted in 6 injuries for the five-year period (2013-2017). No fatal crashes occurred during the five-year period. The crash rate at the I-10 WB ramp terminal is 0.401 crashes per million entering vehicles, which is higher than the average statewide crash rate for similar facilities. Analysis of the crashes revealed the following notable characteristics:

- Rollover type crashes were the predominant crash type (3 crashes), followed by sideswipe type crashes (1 crash).
- Rollover crashes were concentrated at the I-10 WB ramp terminal intersection.
- High speed vehicles along the curved ramp is a contributing factor of rollover crashes at the I-10 WB on-ramp.

Based on the evaluations of the No-Build and Build Alternatives, the preferred alternative for approval in this study is the Build Alternative.

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), FDOT Procedure No. 525-030-160: New or Modified Interchanges, FDOT Procedure No. 525-030-120: Project Traffic Forecasting, Interchange Access Request User's Guide (IARUG) and the FDOT Project Traffic Forecasting Handbook.

E.1 Compliance with FHWA General Requirements

The following requirements serve as the primary decision criteria used in the approval of interchange operational analysis projects. Responses to each of the two FHWA policy points are provided to show that the proposed improvements at the I-10/Ward Basin Road interchange are viable based on the conceptual 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.

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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 in-depth operational and safety analysis conducted for this IOAR confirmed that the proposed improvements to the existing interchange will not have a significant adverse impact on the operations and safety of the project area. Several performance measures were used to compare the operations of the existing system under No-Build and Build conditions. Key measures included delays, 95th percentile queue lengths and safety under existing and proposed conditions.

From an operational perspective in the Design Year 2045 under the No-Build Alternative, operational deficiencies exist. The left-turn movement on the minor approach at WB ramp terminal intersections will operate at LOS E and F in the AM and PM peak hours, respectively. For the EB ramp terminal intersection the left-turn movement on the EB approach will operate at LOS D in the AM and PM peak hours. These deficiencies are attributed to the high through traffic volume along Ward Basin Road and high left-turn traffic volume exiting the I-10 mainline. The EB right-turn movements at both the ramp terminals will experience queues that are longer than the available storage.

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The Build Alternative for this study performs substantially better than the No-Build Alternative for all future years. When compared to the No-Build Alternative, the proposed improvements provide a reduction in delay at both study intersections. The most significant reduction in delay and improvement in LOS occurs at the I-10 WB On/Off-ramp intersection. The delay for the left-turn movement at the I-10 WB ramp terminal intersection is reduced by 1.4 seconds and 31.0 seconds during the AM and PM peak hours, respectively. Also, the LOS for the left-turn movement at the I-10 WB ramp terminal intersection changes from F to D in the PM peak hour.

The safety analysis performed for this study indicated that a total of four crashes occurred within the project area during the five study years (2013-2017). Three of those crashes that occurred at the I-10 WB on-ramp are rollover crashes. Crashes of these types are typically attributed to reckless driving, where the car is at high speed and the driver fails to control the vehicle.

The proposed improvements under the Build Alternative are anticipated to enhance safety within the project area. A quantitative safety analysis was performed for the study area where improvements are to be implemented. Based on the safety analysis, it is predicted that a total annual crash reduction of 0.227 crashes per year will occur at the ramp terminal intersections.

Overall, the Build Alternative provides significantly better traffic operations and enhanced safety when compared to the No-Build Alternative. All proposed improvements as a part of this project will be constructed within the existing right-of-way.

In conclusion, the comparison of the No-Build and Build Alternatives shows that the proposed improvements provide enhanced operations, thereby enhancing safety.

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, 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

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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 improvements will be applied to the I-10 and Ward Basin Road interchange in Santa Rosa County and no new access is requested. The improvements are proposed to preserve all the existing connections between public roads and preserve existing traffic movements onto and off of I-10. These improvements are designed to meet current standards for federal-aid projects on the interstate system and conform to American Association of State Highway and Transportation Officials (AASHTO) and the FDOT Design Manual.