

Interchange Justification Report (IJR) Re-Evaluation

Interstate 10 at Antioch Road

Executive Summary

This Interchange Justification Report (IJR) re-evaluation documents the request for a new interchange on Interstate 10 (I-10) at PJ Adams Parkway (referred to as the I-10 at Antioch Road interchange). The Original IJR and Project Development and Environment (PD&E) study were completed by FDOT District Three in August 2019. FDOT District Three initiated the design phase in February 2019 and the right-of-way phase in 2021 following the completion of the IJR and PD&E study. FDOT District Three selected the Design-Build firm for the construction of the interchange in June 2021. The interchange is scheduled for construction in Spring 2022.

The Design-Build team has proposed design modifications to the I-10 at Antioch Road IJR design concept in the original approved IJR. Therefore, a re-evaluation of the IJR is required to demonstrate that the proposed concept performs equal to or better than the Original IJR concept.

As shown in **Figure A**, the proposed interchange is located in Okaloosa County, approximately 2.4 miles west of the interchange with SR 85. PJ Adams Parkway will be extended north to tie into I-10 approximately 0.25 miles east of where Antioch Road bridges over I-10 (FPID 407918-5). The Southwest Crestview Bypass (SW Bypass) is being constructed to tie into the PJ Adams Parkway extension and continue north to US 90 (Okaloosa County project). In addition, Okaloosa County is constructing the East-West Connector which will connect Antioch Road to the SW Bypass and then to Physician's Way near SR 85.

The Original IJR design connects PJ Adams Parkway (south of the interstate) and the SW Bypass (north of the interstate) by raising PJ Adams Parkway over the existing I-10 corridor. The concept proposed by the Design-Build team in the Alternative Technical Concept raises I-10 over PJ Adams Parkway. The Design-Build concept adds approximately 4,600 linear feet of construction along I-10, reduces mechanically stabilized earth (MSE) walls by 130,000 square feet, reduces the maximum height of the MSE walls from 57 feet to 27 feet, and eliminates all double two-tier MSE walls. By raising I-10 over PJ Adams Parkway, this allows the profile of PJ Adams Parkway to be lowered closer to existing ground when compared to the Original IJR design. By lowering the profile of PJ Adams Parkway, the profiles of the ramps are closer to existing ground, reducing the amount of earthwork fill and MSE walls needed to construct the ramps. In short, the revised roadway geometry of the interchange matches the existing topography more closely than the Original IJR design. This results in a lower initial construction cost and reduced long term maintenance costs for FDOT. The elevation changes for the horizontal and vertical geometry of the ramps and mainline were necessary to meet the criteria for design speeds defined in the Request for Proposals, and still fit within the proposed right-of-way shown in the conceptual plans. The interchange in the proposed Design-Build concept remains a tight diamond, consistent with the Original IJR, with signalized ramp terminals. The horizontal alignment for PJ Adams Parkway also remains consistent with the Original concept.

This IJR re-evaluation document serves to provide determination of safety, operational, and engineering (SO&E) acceptability of the modified concept per Federal Highway Administration (FHWA) to advance the project and for inclusion in subsequent National Environmental Policy Act (NEPA) documentation.

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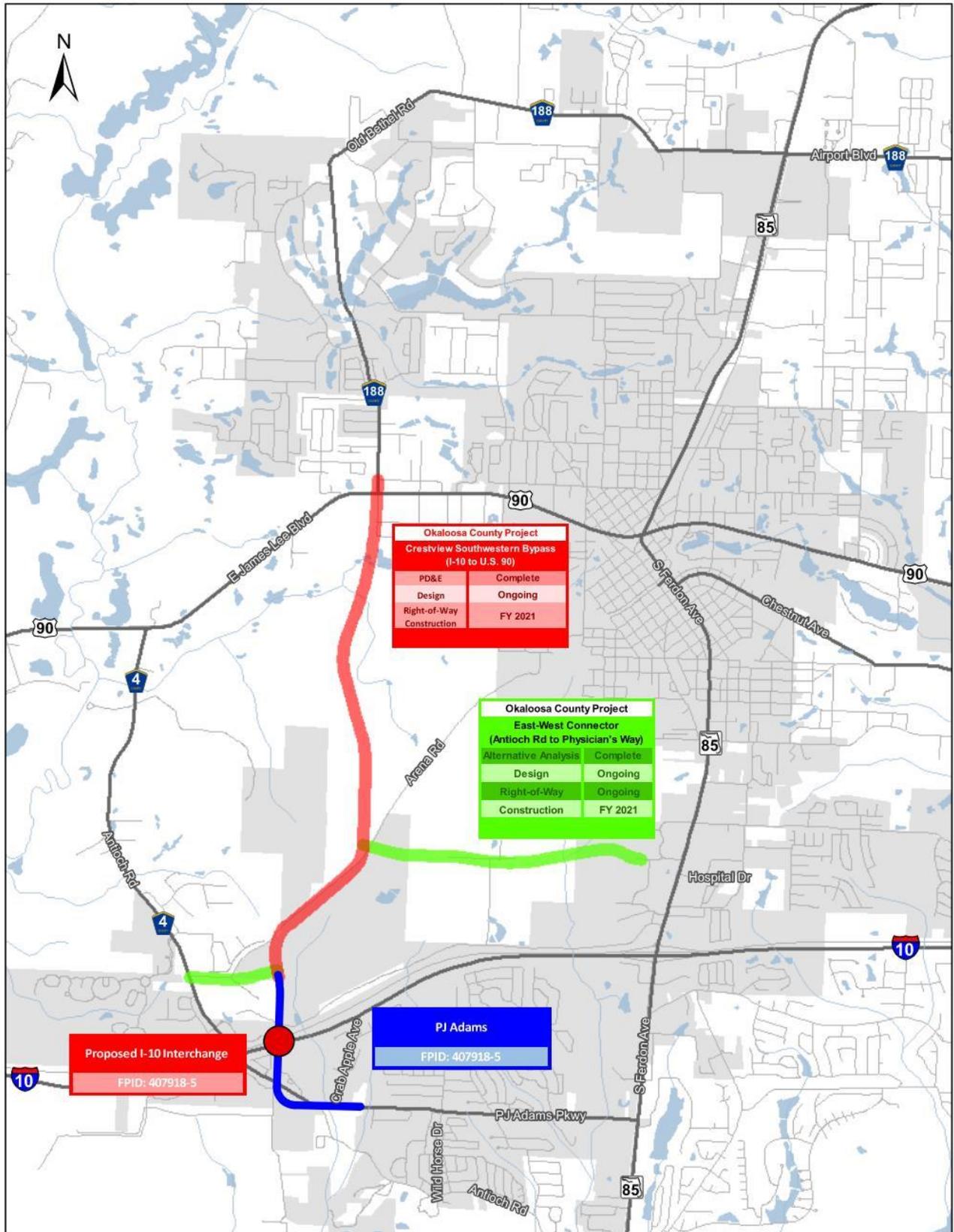


Figure A | Project Location, Southwest Bypass and East-West Connector

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E.1 Purpose and Need

The purpose and need for the project is provided below from the Efficient Transportation Decision Making (ETDM) Summary Report for Project 14237.

Purpose: The purpose of this project is to improve regional mobility and increase local accessibility to the transportation network that supports the planned Crestview Bypass.

Need: The SR 85 corridor carries nearly twice the annual average daily traffic (AADT) of I-10 and provides access between the Alabama state line to the north, and Ft. Walton Beach to the south, which includes Eglin Air Force base and surrounding beach communities. At present, the interchange between I-10 and SR 85 is the one and only access serving the Crestview urban area. The alternate access to I-10 from the proposed new interchange has potential to improve operations within the adjacent network by relieving congestion.

E.2 Re-Evaluation Reasons

There are three primary reasons necessitating the re-evaluation of the IJR. These are listed below.

Reason 1 – Design Change Due to Design-Build Alternative Concept: A design modification to the approved I-10 at Antioch Road interchange concept was proposed during the Design-Build selection process. The Original IJR concept includes PJ Adams Parkway over the existing I-10. The proposed Design-Build concept raises I-10 over PJ Adams Parkway causing changes to ramp lengths and gore points while maintaining the Original IJR geometry and intersection control at the PJ Adams Parkway ramp terminal intersections. This means the re-evaluation shall demonstrate that the proposed Design-Build concept satisfies the MOEs used in the evaluation of the Original IJR concept.

Reason 2 – New Traffic Pattern from Southwest Crestview Bypass and East-West Connector: Since the approval of the Original IJR, Okaloosa County has advanced funding for construction of the SW Bypass and East-West Connector projects (see Figure 1) which will provide connection to north leg of the proposed I-10 at Antioch Road interchange. These projects were not funded for right-of-way and construction at the time of approval of the Original IJR at Antioch Road interchange IJR and PD&E and, thus, not included in the Original IJR evaluation. Completion of these projects are anticipated to bring additional traffic to the subject interchange. As such, an update to the traffic and safety analysis is needed to reflect this background condition change.

Reason 3 – Design Change at I-10 at Antioch Road: The following intersections within the area of influence (AOI) for the Original IJR were modified by Okaloosa County since the approval of the Original IJR. These changes will be evaluated in this re-evaluation, as follows:

- PJ Adams Parkway and Arena Road changed from stop-controlled intersection to a traffic signal as a part of the SW Bypass construction.
- PJ Adams Parkway and Antioch Road changed from roundabout to a traffic signal.

Per the 2020 Interchange Access Request Users Guide (IARUG), the re-evaluation shall show that the Design-Build concept satisfies the FHWA's policy points requirements.

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E.3 Methodology

The traffic and safety analysis methodology for this re-evaluation is consistent with the approved Methodology Letter of Understanding (MLOU) (see **Appendix A**). The AOI includes the proposed interchange at PJ Adams Parkway, the existing interchange at SR 85, the associated ramps, and PJ Adams Parkway. The analysis years are 2024 (Opening Year) and 2044 (Design Year). The analysis tools are Highway Capacity Software (HCS version 6.9) for the freeway and ramps, and Synchro 10 for intersections. The quantitative safety analysis was performed using the Enhanced Interchange Safety Analysis Tool (ISATe) consistent with the Original IJR.

E.4 Alternatives

Consistent with the MLOU, the following three alternatives were evaluated:

- **Alternative 1 - Approved IJR Alternative:** This alternative is same as the Original IJR concept.
- **Alternative 2 - Approved IJR Alternative with SW Bypass and East-West Connector:** Since the approval of the Original IJR, Okaloosa County has advanced funding for construction of the SW Bypass and East-West Connector projects which will provide a connection to north leg of the proposed I-10 at Antioch Road interchange. During the development of the Original IJR, these projects were unfunded and were not considered at the time. Therefore, Alternative 2 is created to evaluate traffic and safety impacts to Alternative 1 due to additional traffic from aforementioned projects. The Original IJR concept was evaluated with Okaloosa County SW Bypass and East-West Connector traffic and design changes made at PJ Adams Parkway and Arena Road and PJ Adams Parkway and CR 4 (Antioch Road) intersections.
- **Alternative 3 - Design Build Alternative with SW Bypass and East-West Connector:** The Design Build concept was evaluated with Okaloosa County SW Bypass and East-West Connector traffic and design changes made at PJ Adams Parkway and Arena Road and PJ Adams Parkway and Antioch Road intersections. Alternative 2 also includes Design Build concept modifications to ramp lengths and merge/diverge distances and they are discussed in Section 3.5.

Per the 2020 FDOT IARUG, the Original IJR concept and the proposed Design-Build concept are required to be analyzed. In order to provide a fair comparison of concepts, the additional traffic from the new SW Bypass and East-West Connector was accounted for in Alternative 2 and 3 to understand the impacts to traffic operations and safety due to the design changes. Alternative 1 was used as a reference because it does not include the SW Bypass and East-West Connector projects which will provide connection to north leg of the proposed I-10 at Antioch Road interchange.

E.5 Compliance with FHWA General Requirements

The FHWA Policy on Access to the Interstate System provides the requirements for the justification and documentation necessary to substantiate any proposed changes in access to the Interstate System. The policy is published under the Federal Register, Volume 74, Number

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43743, dated May 22, 2017. The responses provided herein for each of the two policy statements demonstrate compliance with these requirements and justification for the proposed interchange. The following two FHWA Policy Criteria (effective May 22, 2017) are addressed below:

Policy

It is in the national interest to preserve and enhance the Interstate System to meet the needs of the 21st Century by assuring that it provides the highest level of service in terms of safety and mobility. Full control of access along the interstate mainline and ramps, along with control of access on the crossroad at interchanges, is critical to providing such service. Therefore, FHWA's decision to approve new or revised access points to the Interstate System under Title 23, United States Code (U.S.C.), Section 111, must be supported by substantiated information justifying and documenting that decision. The FHWA's decision to approve a request is dependent on the proposal satisfying and documenting the following requirements.

Policy Point 1: The proposal does not adversely impact operations or safety of the existing freeway.

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)).

Response:

Operational Analysis Findings

A detailed traffic operational analysis was conducted for freeway segments, ramp merge/diverge locations and intersections within the AOI using HCS and Synchro software implementing HCM 2010 methodologies for the opening year (2024), and design year (2044) conditions. Consistent with the approved MLOU and Section 2.5 of this report, Alternative 1, Alternative 2, and Alternative 3 were included in this re-evaluation. Alternative 1 is same as the Original IJR concept. Alternative 2 and 3 are the

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Original IJR concept and Design-Build concept, respectively, with the SW Bypass and East-West Connector projects in place and design changes made at PJ Adams Parkway and Arena Road and PJ Adams Parkway and Antioch Road intersections. The traffic operational analysis was performed for Alternative 2 and Alternative 3. The performance of Alternative 3 was compared against Alternative 2. The following observations provide a brief summary of traffic operational results:

Freeway Segments:

- Since both the Original IJR Concept and the Design Build concept maintain the same number of lanes along freeway and at ramp merge/diverge locations, freeway analysis indicate that Alternative 2 and Alternative 3 are expected to operate at similar conditions with additional traffic from the SW Bypass and East-West Connector projects. I-10 freeway segments are anticipated to operate at LOS B or better in the 2024 and 2044 conditions in Alternatives 1, 2 and 3.

Ramp Junctions:

- The Original IJR indicates that the Alternative 1 expected to operate at LOS B or better in the 2024 and at LOS C or better 2044 conditions.
- Similarly, the Alternative 2 and 3 expected to operate at LOS B or better in the 2024 and at LOS C or better 2044 conditions with additional traffic from the SW Bypass and East-West Connector projects.
- Minor changes in ramp acceleration lane lengths in the Design-Build concept (Alternative 3) will maintain the same LOS as the Original Build concept (Alternative 2) and a minimal change in density with the exception of the I-10 at PJ Adams Parkway EB. The I-10 at PJ Adams Parkway EB is expected to operate at LOS B (with density at 10.6 pcpmpl) in Alternative 3 when compared to Alternative 2 expected to operate at LOS A (with density at 10.0 pcpmpl) in 2024 AM peak hour.

Intersections:

- All intersections are expected to operate at similar conditions in Alternatives 2 and 3.
- All intersections in Alternative 3 are expected to operate at similar or better delay and LOS as the operations in Alternative 1.
- In the opening year, the intersections on PJ Adams Parkway operate at LOS B or better in Alternatives 2 and 3. Similarly, in the design year, the intersections on PJ Adams Parkway operate at LOS D or better.

PJ Adams Parkway Ramp Queue

- The I-10 eastbound and westbound off-ramps at PJ Adams Parkway intersections are expected to operate at similar conditions in Alternatives 2 and 3 and expected to accommodate 95th percentile queues and necessary deceleration distances for exiting traffic in both the Opening Year and Design Year.

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Safety Analysis Findings

A quantitative analysis was completed to provide a comparison between the Alternative 2 and Alternative 3. The quantitative safety analysis was performed using the Enhanced Interchange Safety Analysis Tool (ISATe) consistent with approved MLOU and the Original IJR. The following observations provide a brief summary of safety operational results:

- Similar to Alternative 1, Alternative 2, and Alternative 3 show the majority of predicted crashes are single injury (C) and property damage only crashes.
- The overall facility predictive crash total for the Alternative 3 is expected to be slightly less than the Alternative 2 with additional traffic from the SW Bypass and East-West Connector projects. The difference between the two alternatives is 0.5%, with Alternative 3 experiencing less property damage crashes. Differences in predictive crash totals are due to varying factors such as ramp segment lengths, inside and outside barrier presence, segmentation of the freeway and associated AADTs and ramp terminals.
- Of the overall 1500 crashes expected to occur for Alternative 3 during the 20-year time span, approximately 69% of those crashes are anticipated to occur at the crossroad ramp terminals. The PJ Adams Parkway ramp terminals experienced a small increase in crashes in Alternative 3 compared to Alternative 2 due to design modifications such as the increased median width and its associated effect on protected left-turn operations, as well changes in channelized right turns.
- Associated costs by severity for the overall predictive crash totals for Alternative 3 decreased by 0.9% when comparing to Alternative 2. The number of total fatal crashes are expected to remain unchanged, while suspected injury-related crashes for Alternative 3 showed an anticipated slight decrease.

Conceptual Signing Plan

The signing plans for Design Build Alternative were developed in compliance with FDOT Design Standards and the 2009 Manual of Uniform Traffic Control Devices (MUTCD) and in accordance with 2020 IARUG requirements and is included in **Appendix H**.

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Policy Point 2: A full interchange with all traffic movements at a public road is provided.

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.

Response:

I-10 is a public facility, and the proposed interchange will provide full access for all traffic movements. PJ Adams Parkway will be extended north to tie into I-10 approximately 0.25 miles east of where Antioch Road bridges over I-10. The SW Bypass is being constructed to tie into the PJ Adams Parkway extension and continue north to US 90. The proposed design connects PJ Adams Parkway south of the interstate and the SW Bypass north of the interstate by raising I-10 over PJ Adams Parkway. The interchange in the re-evaluation remains a tight diamond, consistent with the Original IJR and provides full access for all movements.