



EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) is conducting this Interchange Justification Report (IJR) Reevaluation for the proposed construction of a new interchange along Interstate 95 (I-95) at Pioneer Trail (County Road (CR) 4118) near milepost (MP) 19.032 in Volusia County. The proposed interchange is located between two existing interchanges along the Interstate: I-95 and State Road (SR) 44 (Lytle Avenue) at MP 16.287 and I-95 and SR 421 (Dunlawton Avenue) at MP 23.300. A project location map is provided in **Figure 1**. This project is being developed concurrently with the I-95 Interchange at Pioneer Trail Project Development and Environment (PD&E) Study.

The Interchange Access Request (IAR) approval process is a two-step process that requires: (1) determination of Safety, Operational & Engineering (SO&E) acceptability and (2) the approval of the National Environmental Policy Act (NEPA) document. The determination of Engineering and Operational Acceptability for the original IAR for this project was granted by the Federal Highway Administration (FHWA) in May 2017. The current PD&E phase of the project constitutes the NEPA documentation and approval process. As part of the current PD&E Study, a Project Traffic Analysis Report (PTAR) was prepared to update the previously approved *I-95 at Pioneer Trail Interchange Justification Report (IJR, April 2017)* and to provide additional traffic analysis in support of project-level environmental analyses. This IJR Reevaluation is required due to proposed changes in the originally approved IAR design concept.

This IJR Reevaluation conforms to FDOT Systems Implementation Office (SIO) procedure Topic Nos. 525-030-160-I and 000-525-015-h and follows guidelines provided in the FDOT Interchange Access Request User's Guide (IARUG, January 2018). The approved 2017 IJR determined that the future conditions without the interchange (No Build) will not meet the Purpose and Need for this project. Thus, the approved 2017 IJR evaluated two build alternatives: Diamond Interchange and Partial Cloverleaf Interchange (with southbound to eastbound loop ramp). The partial cloverleaf interchange was recommended as the preferred alternative to be carried forward for further study during PD&E. The PD&E study introduced a third concept, Partial Cloverleaf 2 (Double-Loop Ramps), which resulted in the preferred alternative to be recommended for approval. The PD&E preferred alternative is a complete interchange that allows full access but differs from the 2017 IJR concept by eliminating the diagonal exit ramp in the southeast quadrant. Instead it provides a second loop ramp in the northeast quadrant for the I-95 northbound exiting movements onto Pioneer Trail. In the PD&E preferred alternative, both the northeast guadrant and southwest quadrant loop ramps have parallel-type single-lane exits from I-95 with a design speed of 30 miles per hour (mph). The PD&E preferred alternative was considered due to its minimal impact on right of way requirements, drainage design and involvement with contamination sites in the southeast quadrant. Since this current IAR request proposes this PD&E preferred design concept which is different from the previously approved 2017 IAR, the approved 2017 IAR preferred design concept will serve as the baseline condition and be used as the basis of comparison with the current IJR Reevaluation's proposed design concept (Build). The IARUG guidelines state that the new concept must perform equal to or better than the original IAR approved concept.

The proposed I-95 Interchange at Pioneer Trail is located within the Palm Coast-Daytona Beach-Port Orange Transportation Management Area (TMA). A Programmatic Agreement (PA) between FHWA Florida Division and FDOT was executed on April 24, 2020 allowing for a more expedited IAR review and approval process. However, since the proposed new service interchange is within a TMA, it is not included in the PA and therefore, requires full review and approval by the FHWA Florida Division Office with concurrence by FHWA headquarters.



IJR Reevaluation

October 2020





The requirements set forth by FHWA's "Access to the Interstate System" policy were developed to describe the justification and documentation required to demonstrate the need and viability of a project, and to facilitate decision-making with regard to proposed changes in access to the Interstate System. The original policy was published in the Federal Register on October 22, 1990 (55 FR 42670) and modified on February 11, 1998 (63 FR 7045) and August 27, 2009 (74 FR 43743). The August 2009 policy which outlined eight policy requirements was replaced on May 22, 2017 with two policy points that focus on technical feasibility of the proposed access change to support SO&E acceptability. Social, economic, environmental and planning considerations which constituted the remainder of the 2009 policy points are addressed in detail in the NEPA documents and will be summarized herein. This IJR Reevaluation addresses the following two FHWA policy points (*eff. May 22, 2017*) in terms of safety, operational and engineering acceptability:

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)).

FHWA Policy Point 1 – Summary Findings

The purpose of the proposed interchange at I-95 and Pioneer is to relieve traffic congestion at the two adjacent interchanges north and south of the project, I-95 at State Road 421/Dunlawton Avenue and I-95 at State Road 44/Lytle Avenue. The future planned developments in the vicinity of Pioneer Trail include large increases in density of both population and employment in this area of the corridor including three Developments of Regional Impact (Farmton, Restoration and Pavilion at Port Orange), thus the project also aims to support economic development associated with existing and approved developments. The new interchange will provide a more direct access to these developments and relieve the congestion at the adjacent existing interchanges.

The original IJR approved in 2017 and the Project Traffic Analysis Report (PTAR, June 2019) prepared during the concurrent PD&E phase have documented that the Build condition with the proposed interchange is not expected to adversely impact safety and operations. Based on the findings in this IJR Reevaluation, under the Build scenario in design year 2045, all freeway segments and all of the merge and diverge ramp segments are anticipated to operate at Level of Service (LOS) B or LOS C during both AM and PM peak hours. The ramp diverge analysis of the two build alternatives shows that the Partial Cloverleaf 2 exit ramp has a lower density of 20.1 passenger cars/mile/lane (pc/mi/ln) compared to Partial Cloverleaf 1 (23.3 pc/mi/ln) for the AM peak hour and 16.0 pc/mi/ln compared to 19.1 pc/mi/ln for the PM peak hour, a reduction of 14% and 16% in the northbound





ramp influence area during the AM and PM peak hours, respectively. Additionally, all of the study intersections are projected to operate at or better than the target levels of service established for State and County Roadways except for two intersections along SR 421 (Williamson Boulevard and Yorktowne Boulevard). Although these intersections along SR 421 are anticipated to operate below the target LOS for the projected future demand, provision of a new access connection at Pioneer Trail would provide needed relief and benefits by reducing overall traffic demand, with anticipated decrease in intersection delays over a no build scenario as was already demonstrated in the previously approved IJR. The results of the operational analysis of the proposed ramp terminals at the future Pioneer Trail interchange showed a cumulative 24% reduction in combined AM/PM total delay for Partial Cloverleaf 2 (63.9 seconds/vehicle (sec/veh)) compared to Partial Cloverleaf 1 (84.0 sec/veh).

The findings of the predictive safety analysis indicate that overall there is not a significant difference in the estimated total number of predicted crashes between the Partial Cloverleaf 1 and Partial Cloverleaf 2 alternatives (a difference of approximately one percent during the 20-year period). Additionally, the crossroad ramp terminal crashes in the Partial Cloverleaf 2 alternative (1144.7 crashes) are less than those predicted for Partial Cloverleaf 1 (1156.7 crashes). Under Partial Cloverleaf 2, the northbound ramp terminal is a type B2, three-leg configuration which has an increased distance from the adjacent southbound ramp terminal (approximately 300 feet further to the east along the crossroad). Furthermore, there is not a significant difference in the average annual crash frequency with an estimated 171.0 crashes per year for Partial Cloverleaf 1 and an estimated 173.5 crashes per year for Partial Cloverleaf 2. Additionally, the difference in annual total crashes between the two alternatives decline from 2.5 crashes in opening year 2025 to 2.1 crashes in design year 2045. Based on this safety evaluation, the difference in total crashes and the estimated average crash frequency between the two Build alternatives during the study period is approximately one percent. Thus, it is anticipated that the Partial Cloverleaf 2 with Double loop ramps Build alternative will not have a significant adverse impact on the overall safety and operation of the Interstate facility for the planned future traffic projections when compared to the Partial Cloverleaf 1 with Single Loop Ramp Build alternative.

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.

FHWA Policy Point 2 – Summary Findings

The proposed new interchange with I-95 provides full access to a public roadway and serves all traffic movements. The preferred build alternative is a partial cloverleaf with loop ramps in the southwest and northeast quadrants. The southwest quadrant loop ramp provides access to eastbound Pioneer Trail from I-95 Southbound, eliminating the need for a left turn movement from the northwest quadrant outer-connector diagonal ramp. The northeast quadrant loop ramp is for I-95 northbound traffic exiting to Pioneer Trail eastbound and westbound.





Provision of the loop ramp in the northeast quadrant reduces impacts to the southeast quadrant of the interchange substantially. Diagonal outer-connector ramps are also provided in the northeast and southwest quadrants for entry onto I-95 northbound and I-95 southbound, respectively. All proposed ramp connections are parallel type, single lane ramp connections to/ from the Interstate. The northeast quadrant exit loop ramp is widened at the ramp terminal intersection to provide for separate left and right turn movements. Similarly, the diagonal entry ramps are two lanes beginning at the ramp terminals and tapering to one lane as they connect to the freeway. The proposed improvements also include widening Pioneer Trail in the vicinity of the new interchange.