

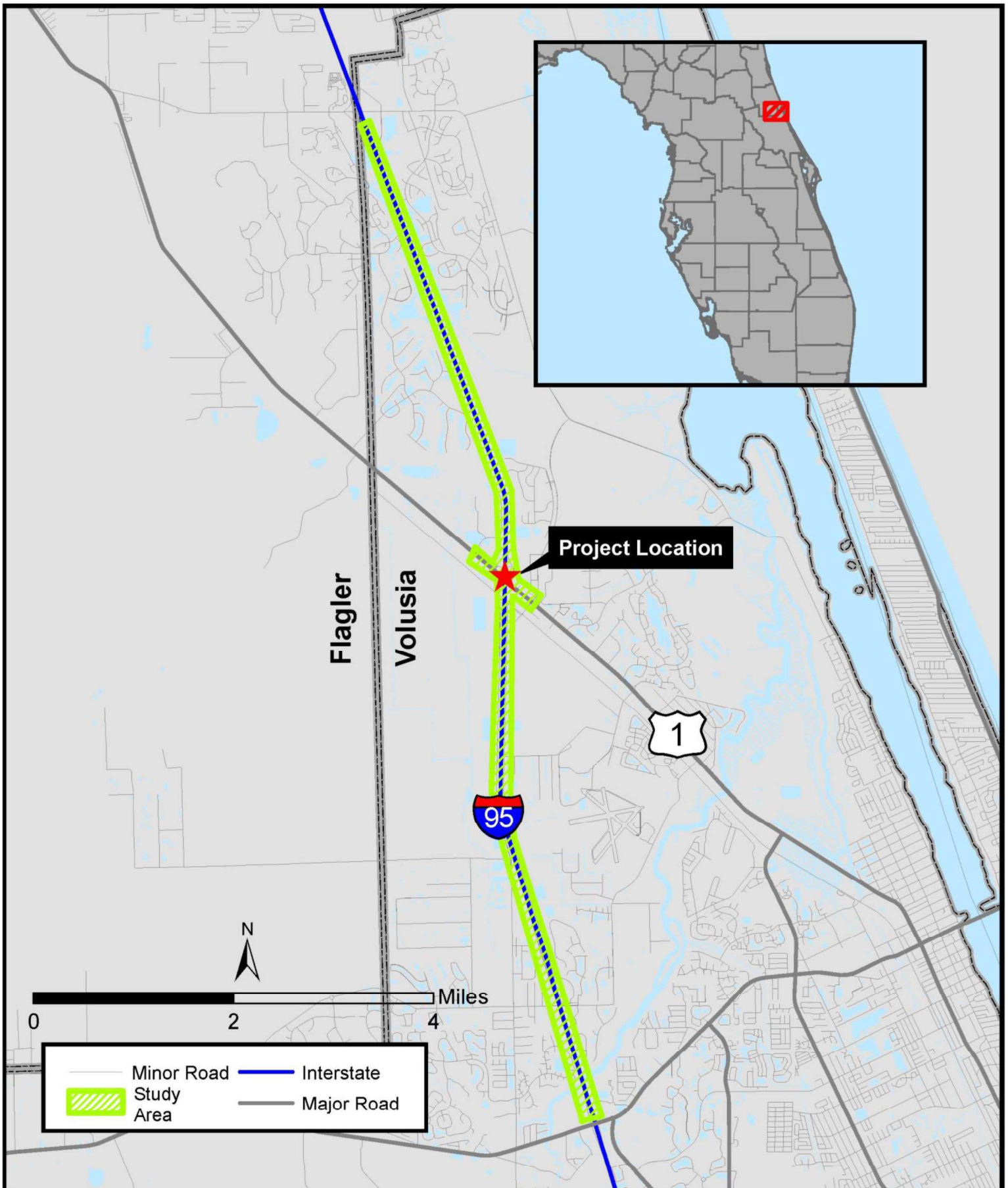
Executive Summary

The Florida Department of Transportation (FDOT) District Five has prepared an Interchange Modification Report (IMR) for the proposed interchange reconfiguration at I-95 and US 1 interchange from a partial cloverleaf interchange to a Diverging Diamond Interchange (DDI), and other arterial improvements.

The purpose of this IMR is to document the potential safety and operational impacts of the proposed interchange, typical section, and arterial modifications being proposed as part of the I-95 and US 1 interchange modification project. The findings of the operational and safety analysis and the FHWA Policy Point discussion are summarized within.

E.1 Background

I-95 and US-1 interchange is located in Volusia County and falls within the boundaries of the City of Ormond Beach. The study limits extend along I-95 from the south side of the Old Dixie Hwy. interchange to the north side of the SR 40 interchange. Along I-95, the adjacent interchanges of Old Dixie Hwy. and SR 40 are 4.9 miles to the north and 5.6 miles to the south, respectively. Along US 1 the limits extend from Broadway Ave., east of the interchange, to Destination Daytona Ln. west of the interchange. **Figure 1** shows displays the Area of Influence.



Project Development and Environment (PD&E) Studies
I-95 Interchange at SR 5 (US 1)
Interchange Modification Report

Area of
Influence
(AOI)

Figure 1

E. 2 Purpose and Need

The purpose and need of the Project Development & Environment (PD&E) study is provided below, from the March 23, 2020 ETDM Summary Report for this IMR, Project 1442.

Purpose

The purpose for improving the interchange on Interstate 95 at US 1 is to enhance operational and safety needs. Interchange improvements will reduce congestion and better serve regional trips.

Need

The need for the project is based on safety, transportation demand, and economic development.

Safety

Between 2012-2016, there were 797 crashes, with 20 fatalities at the interchange. Currently, the interchange is a partial cloverleaf with loop ramps in the northwest and northeast quadrants. The existing loop ramps have extremely tight and inconsistent radii, necessitating a low design speed. The low design speed causes issues northbound when diverging from the interstate to exit, and southbound when merging onto the interstate. The historic rollover and off-road crashes on the loop ramps are consistent with the design issues associated with the existing interchange configuration.

Transportation Demand

In the existing condition, the Annual Average Daily Traffic (AADT) on the southbound ramp is approximately 6,700 daily trips. The AADT on the northbound ramps is approximately 7,400 daily trips. Currently, the I-95 mainline, ramps, and northbound ramp intersection appear to operate at acceptable level of service (LOS); however, in the no-build condition the interchange the ramp terminal intersections will fail by the 2045 design year.

Economic Development

This interchange is located in a strategic area of Volusia County and provides access to a major regional tourist destination. Destination Daytona is one of the major destinations for year-round and special events related to Biketoberfest, Bike Week, Daytona International Speedway events and other outdoor entertainment activities. Additionally, there are planned mixed-use developments adjacent to the interchange which will place increased demands on the transportation network along the US 1 corridor and on the interchange. There is a total of 4,870,000 square feet of non-residential land uses and 2,950 residential dwelling units in the Ormond Crossings Master Development Plan.

E. 3 Methodology

The traffic methodology for this analysis is consistent with the approved Methodology Letter of Understanding (MLOU) included in **Appendix A**. The area of Influence (AOI) includes the two existing interchanges at SR 40/ Granada Blvd., Old Dixie Hwy., and includes the proposed US 1 interchange. The analysis years are Existing 2021, Opening Year 2030, and Design Year 2050. Synchro 11 and HCS 7 were used to conduct detailed operational analysis for the freeway, interchange, and intersections. HCM 2000 was used for all intersection analysis for consistency. Future year analysis required its use due to shared turn lane geometry.

E. 4 Alternatives

Following the approved MLOU, the following alternatives were considered in this IMR:

- No Build
- Build Alternative
 - Diverging Dimond Interchange

The Design Year 2050 operational analysis results show the Build Alternative provides improved traffic operations within the study area compared to the No-Build in the design year. The DDI Alternative not only improves traffic operations within the project limits through the Design Year, it also enhances safety by reducing the number of vehicle to vehicle and pedestrian to vehicle conflict points through the interchange. For these reasons the DDI Alternative is the preferred alternative.

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 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 Modification Report (IMR) in support of the I-95 at US 1 PD&E Study in Volusia County, Florida. The following two FHWA Policy Criteria 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, the Federal Highway Administration's (FHWA) 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:

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)).

Response

Operational Analysis

This IMR consists of a planned modification to the I-95 and US 1 interchange. A traffic operational analysis for the Existing 2021, Opening Year 2030, and Design Year 2050 conditions was performed to assess the impacts of the Build Alternative within the area of influence (AOI). Detailed analyses were performed for the mainline, ramps, intersections, and crossroad.

Some of the measures of effectiveness used to compare the operations of the Existing and Build Conditions were speed, level of service, intersection delays, and 95th queues. Based on the operational analysis conducted for the IMR, the following high-level operational analysis observations were made. Detailed results are provided in Future Traffic Operational Analysis section of this report.

- The 2050 No Build Alternative could not accommodate future traffic demand under existing geometry at the arterial level. LOS E or worse is expected at all intersections along US 1 during AM and PM peaks.
- Build Alternative intersections operates at LOS D or better during both opening and design year.
- The proposed Build Alternative provides operational benefits along US 1 as well as enhanced safety through the interchange.

Safety Analysis

A historic crash data and safety analysis was completed for this project and includes an existing conditions safety analysis to review the crash history, and a quantitative safety analysis using the Highway Safety Manual (HSM) predictive method to analyzed future conditions. The Enhanced Interchange Safety Analysis Tool (ISATe) and HSM Urban and Suburban Arterials Spreadsheet Tool were used for the predictive analysis to assess future conditions.

The predictive method analysis results show an overall decrease in freeway, ramp and crossroad ramp terminals in the Build Alternative compared to the No-Build Alternative.

DDIs have been proven to reduce crashes and crash severity. It is anticipated the I-95 and US 1 interchange modification to a DDI will reduce the total number of crashes, the number of fatalities, and potentially reduce wrong-way maneuver crashes through the I-95 and US 1 interchange area from a qualitative perspective.

Conceptual Signing Plan

Conceptual signing plans were developed and are included in **Appendix I**.

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.

Response

I-95 is a public facility and all interchanges within the area of influence provide full access. The interchange improvements will impact the I-95 and US 1 interchange. Improvements along US 1 are also being proposed to improve traffic flow and enhance safety. The proposed improvements at the interchange will continue to provide full access.