

SR 8 (I-10) / SR 99 (Beulah Road) Interchange
FPID 433113-1-22-01, 433113-2-22-01, & 433113-3-22-01

EXECUTIVE SUMMARY

The purpose of this report is to document the safety, operational and engineering considerations as required for the approval of a new interchange along SR 8 (I-10) in the vicinity of SR 99 (Beulah Road) in Escambia County, located approximately 2 miles east of the Florida/Alabama state line. This report addresses the purpose and need, alternatives and evaluation of Federal Highway Administration's (FHWA) policy points for approval of access to the interstate system.

Environmental considerations are documented separately as part of the concurrent Project Development and Environment (PD&E) Study identified as Efficient Transportation Decision Making (ETDM) Project #14176 in the Environmental Screening Tool (EST), entitled "Beulah Road (SR 99) at I-10 Interchange Project".

The project location and Area of Influence (AOI) is shown in Figure 1.

Purpose and Need

The primary purpose of the proposed project is to improve regional connectivity and mobility within the greater Escambia County area. Secondary purposes include reducing congestion on adjacent roadways, reducing trip lengths for area commuters, and enhancing emergency evacuation by providing an additional connection to I-10.

The project need is driven by the increasing traffic demand resulting from significant development within the project area (both current and planned), as set forth in future development plans such as the Mid-West Escambia County Optional Sector Plan, Detailed Specific Area Plans, and the Escambia County Comprehensive Plan. As a result of this growth, there is a need to provide connectivity from these new areas of development to the surrounding regional transportation system. Additionally, there is a need to provide an alternative route to reduce travel times and congestion, while also providing route choices for hurricane evacuation within the project AOI.

Applicable Policy and Methodology

This IJR has been developed in accordance with current policy, guidelines, and procedures including the following:

- FHWA "Policy on Access to the Interstate System", May 22, 2017
- FHWA guidelines "Interstate System Access Informational Guide", August 31, 2010
- FDOT Policy 000-525-015: "Approval of New or Modified Access to Limited Access Highways on the State Highway System (SHS)", December 16, 2013
- FDOT Topic 525-030-160: "New or Modified Interchanges", January 19, 2018
- FDOT Procedure No. 525-030-120 "Project Traffic Forecasting", March 8, 2019
- FDOT "Interchange Access Request User's Guide", January 2018
- FDOT Topic 625-000-002: "2020 FDOT Design Manual", 201 Design Controls

Since this IJR is for a new service interchange located outside the Transportation Management Area (TMA), the programmatic approval process will be followed in accordance with FDOT Topic 525-030-160.

A Methodology Letter of Understanding (MLOU) for this IJR was prepared and approved on May 6, 2019.

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A Design Traffic Report was approved and signed February 21, 2019 using the latest version of Northwest Florida Regional Planning Model (NWFRPM), Version 2.1 with base year 2010 and horizon year 2040, as modified to include updated roadway network and land use data for the base year of 2016 and a horizon year of 2045.

The analysis years for this study include Existing Year 2018, Opening Year 2025 and Design Year 2045. The operational analysis for this study was performed using the Highway Capacity Software (HCS 7.4) and Synchro 10.1. The operational analysis utilized the methodologies of the Highway Capacity Manual (HCM) 6th Edition and HCM 2000. Since the project is not anticipated to be constructed in phases, a year 2035 analysis was not conducted.

Build Alternative

The recommended Build Alternative includes widening approximately 3.1 miles of I-10 from 4 to 6 lanes from the Florida/Alabama state line to the FDOT Pensacola Weigh Station, a new interchange along I-10 in the vicinity of the existing SR 99 (Beulah Road), widening approximately 1.4 miles of the existing Beulah Road from 2 to 4 lanes from south of W. Nine Mile Road to Isaacs Lane, realigning the existing Beulah Road to create a T-intersection with a new alignment, and constructing a 0.7-mile section on new alignment from Isaacs Lane through the new interchange and terminating at W. Kingsfield Road.

Planning Consistency

The proposed interchange and related roadway improvements are included in the 2045 Needs Plan and 2045 Cost Feasible Plan elements of the Florida-Alabama Transportation Planning Organization (FATPO) 2045 Long Range Transportation Plan (LRTP) as adopted on October 14, 2020. The proposed interchange is identified as a Strategic Intermodal System (SIS) project with right-of-way and construction funded in fiscal year 2026-2045.

Regional Connectivity & Mobility

As discussed in Section 7.3 Alternatives Comparison, the Build Alternative provides improved regional connectivity and mobility that is driven by the current and planned growth within the greater Escambia County area.

The proposed improvement would provide improved connectivity along an approximately 18-mile stretch of I-10 (from CR 64 in Alabama to W. Nine Mile Road) that is without access to the local roadway network. This improvement will reduce circuitous routing (back-tracking, in some cases) and provide more direct connectivity - both regional and local.

Areas such as the township of Cantonment, FL located north of the proposed project (with an estimated population of 26,000 as of the 2010 census) would be provided with improved access to the interstate system. For instance, a trip from I-10 at the state line to Cantonment would be reduced from 13-miles to 7-miles with the new connection and beltway in place. The Mid-West Escambia County Optional Sector Plan is anticipated to result in an increase of up to 23,500 residential units in this area by 2035. This increase in population, along with the associated growth in employment (such as Navy Federal Credit Union), would greatly influence and increase travel demand on the local area roadway network, estimated at 371,000 additional trips per day. The Navy Federal Credit Union is currently the area's largest employer at 8,200 employees and growing. According to a local news journal published November 7, 2019, the company is ahead of schedule in its effort to reach 10,000 employees by 2026. The existing network and future development of the Escambia County Sector Plan will need to be supported by an interconnected transportation

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system that efficiently links housing with employment and retail centers. The proposed hierarchical transportation system would be anchored by the Beulah/I-10 interchange.

From a systemwide perspective, mobility is also enhanced since average travel speeds would be increased with more vehicles being afforded the opportunity to use the interstate system. As presented in Section 7.3.1, an analysis of No-Build and Build Alternative vehicle-miles traveled (VMT), vehicle-hours traveled (VHT), and overall average travel speeds (VMT/VHT) was conducted using outputs from the regional travel demand model.

The analysis shows an increase in overall VMT and reduced VHT and higher average travel speeds under the build scenario. Increased VMT and reduced VHT and higher average travel speeds are observed as a result of routing opportunities along facilities of higher mobility/safety standards and higher travel speeds offered by the Build Alternative. At the regional-level, a shift in travel demand from US 29 to the Beltway and I-10 is observed resulting in longer trips being made at higher speeds and in less time. At the local level, a shift in travel demand is observed from W. Nine Mile Road to SR 99 (Beulah Road) and the I-10 interstate system under the build scenario. This shift in travel demand is a result of the added interchange providing route choice with higher travel speeds and improved roadway standards along the widened Beulah Road and new interchange access to I-10 under the Build Alternative.

The Build Alternative would align relatively longer-distance trips (such as between northern Escambia County and Pensacola) with a facility (I-10) that is designed for this purpose, thereby supporting facilities with higher mobility and safety standards. Without the Build Alternative, there would be increased use of the existing US 29 corridor to satisfy this travel demand. Recognizing US 29 is an interrupted flow facility, mobility (and safety) are enhanced under the build scenario by providing linkage between I-10 and the Beltway to support regional trips on the interstate system rather than the arterial system.

The shift of regional travel demand from US 29 to I-10 and the Beltway is revealed through the “select link plots” as shown in Appendix J which provide a comparison of the 2045 build and no-build scenarios. The VMT, VHT and average travel speed analysis reveals an increase in VMT associated with the build alternative, largely on the freeway. But again, this is a result of trips sacrificing the shortest distance path to gain a mobility edge (as seen by the VHT savings and average speed increases) by re-routing to I-10 at the Beulah Road interchange. In realigning this market with the I-10 route option, not only are mobility benefits realized, but safety benefits are likely as well (reduced long-distance trips on the surface street system). The increased traffic on I-10 resulting from the build alternative would degrade average speed slightly on the interstate system. However, the slight decrease in travel speed on I-10 is not considered significant and it is noted that the volume-delay functions employed in regional travel demand models do not necessarily mirror congestion-deterioration effects.

In summary it is concluded that through an examination of VMT, VHT and average travel speeds, the new interchange and associated roadway improvements further support the purpose and need in terms of providing regional connectivity, mobility, and safety benefits.

Furthermore, as discussed in Section 5.3 Emergency Evacuation and Response Times, the proposed interchange would offer an additional access point to the interstate system providing critically needed improved access and route choices for emergency evacuation.

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E.1.1 FHWA Policy Point 1

An operational and safety analysis was performed comparing the Build Alternative to the No-Build Alternative with the conclusion that the proposed interchange does not have a significant adverse impact on the safety and operation of the Interstate facility (including mainline lanes, existing and new ramps, and ramp intersections with crossroads) or on the local street network based on both the current and the planned future traffic projections.

Operational Analysis

As discussed in further detail in Section 7.3.2 Operational Analysis, and as summarized in Figure 33 and Figure 34, the I-10 mainline and ramp merge/diverge points function similarly for the No-Build and Build alternatives at opening year 2025 and design year 2045 operating at (or better than) target LOS values.

The Build Alternative would function significantly better than the No-Build Alternative along Beulah Road. In the 2045 No-Build Alternative condition, the entire length of Beulah Road would operate at LOS E/F in the peak direction (from south of W. Nine Mile Road to Muscogee Road), and the intersections along Beulah Road would operate at LOS E/F. In the 2045 Build Alternative condition, all of Beulah Road and its intersecting side streets would meet target LOS goals (except for the segment of Beulah Road south of W. Nine Mile Road that operates at LOS E).

Although the proposed I-10/Beulah interchange would reduce traffic demand along W. Nine Mile Road, operational failures are anticipated to occur at the signalized and unsignalized intersections along W. Nine Mile Road from east of Beulah Road to I-10 in design year 2045 no-build and build conditions. In addition, operational failures are anticipated to occur at the signalized and unsignalized intersection along Pine Forest Road within the AOI in design year 2045 no-build and build conditions. As discussed in Section 2.3 Ongoing Adjacent Capacity Improvement Studies, these outlying capacity deficiencies are being evaluated as part of other PD&E studies.

Safety Analysis

As described in further detail in Section 7.3.3 Safety Analysis, the results of the predictive crash analysis indicate that the Build Alternative would provide enhanced safety when compared to No-Build Alternative. Based on the safety analysis, it is predicted that the total number of crashes from opening year to design year would be reduced by 164, of which 47 are fatal/injury type and 117 are Property Damage Only (PDO) crashes.

While crashes for the new interchange ramps and ramp terminals are predicted to increase as a result of the new conflict points, safety benefits are anticipated along Beulah Road, W. Nine Mile Road, and Pine Forest within the AOI.

A Safety Benefit Cost Analysis was performed utilizing “HSM Crash Distribution for Florida” and “KABCO Crash Costs” as presented in the January 2020 FDOT Design Manual. As shown in Table 47: Benefit Cost Analysis, the total safety benefit for the project over the 20-year analysis period is approximately \$95,000,000.

E.1.2 FHWA Policy Point 2

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

Conclusions

The recommended Build Alternative provides the needed regional connectivity, reduced congestion on adjacent roadways, and enhanced emergency evacuation within the AOI as compared to the No-Build Alternative and meets the criteria of the two FHWA policy points. The Recommended Build Alternative will be incorporated into, and further developed in the PD&E study process.