

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

Place, Heritage Oaks Boulevard, and Navy Federal Way may be resolved by capacity and traffic signalization improvements to meet the traffic demand from the Navy Federal Credit Union. However, speculation of the exact remedy to be determined by other ongoing studies was intentionally omitted to avoid conflicting commitments. It is also noted that these arterial intersection failures would not affect the operations of the interstate system.

Capacity and interchange improvements are also being evaluated to address the deficiencies along Pine Forest Road in the vicinity of I-10 as part of FPID 437905-1 (I-10 from East of the Alabama State Line to US 29 PD&E and SIMR). Since the FPID 437905-1 study is ongoing with the exact remedy to the intersection failures unknown, potential improvements that may be implemented as part of FPID 437905-1 have been omitted from the analysis to avoid conflicting commitments.

7.3.3 Safety Analysis

Two analysis tools were applied for this study. The HSM spreadsheet tool was used to implement predictive methods on rural 2-lane and rural multilane roadways while the Enhanced Interchange Safety Analysis Tool (ISATe) was used to evaluate freeway and interchange safety. Crash frequencies were adjusted using calibration factors to account for site specific conditions for each facility type. Calibration factors used to adjust safety performance functions (SPFs) for Florida conditions were obtained from the FDOT HSM webpage¹. It is noted that the Empirical Bayes Method (EBM) cannot be applied to new location roadways where no relevant crash history exists and locations where a substantial proportion of the roadway length is proposed to undergo major improvements, hence it was not used for this project. Table 46 (2 pages) shows a comparison of expected crashes for the no-build and build scenarios. The detailed worksheets and output files from the safety analysis are included in Appendix K.

Table 46: No-Build vs. Build Predicted Crashes Over 20 years			
	Total	Fatal and Injury (FI)	Property Damage Only (PDO)
Beulah Road & Intersections			
No-Build	1340.9	467.0	874.0
Build	1036.8	394.6	642.3
Benefit	304.1	72.4	231.7
W. Nine Mile Road & Intersections			
No-Build	1616.3	582.8	1033.6
Build	1452.7	528.2	924.5
Benefit	163.6	54.6	109.1

¹ <http://www.fdot.gov/safety/11A-SafetyEngineering/TransSafEng/HighwaySafetyManual.shtm>

Table 46: No-Build vs. Build Predicted Crashes Over 20 years			
	Total	Fatal and Injury (FI)	Property Damage Only (PDO)
I-10 Mainline			
No-Build	356.8	115.9	240.8
Build	393.1	113.6	279.5
Benefit	-36.3	2.3	-38.7
I-10 & Beulah Road Interchange Ramps			
No-Build	0.0	0.0	0.0
Build	35.3	16.1	19.2
Benefit	-35.3	-16.1	-19.2
I-10 & Beulah Road Interchange Ramp Terminals			
No-Build	0.0	0.0	0.0
Build	274.7	78.9	195.9
Benefit	-274.7	-78.9	-195.9
Pine Forest Road and Intersections			
No Build	711.6	253.9	457.7
Build	669.2	241.2	427.9
Benefit	42.4	12.7	29.8
Overall			
No-Build	4025.6	1419.6	2606.1
Build	3861.8	1372.6	2489.3
Benefit	163.8	47.0	116.8
Predicted crashes for the 20-year analysis period were determined by multiplying mean of the predicted crashes for each of the two analysis years (2025, 2045) by 20.			

The results of the predictive 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 228.7, of which 57.3 are fatal/injury type and 171.4 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 in the build condition, safety benefits are anticipated along Beulah Road, W. Nine Mile Road, and Pine Forest Road as a result of the decrease in AADTs along these arterials as compared to the no-build condition.

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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 below in Table 47, the total safety benefit for the project over the 20-year analysis period is approximately \$95,000,000.

	Fatal (K)	Incapacitating Injury (A)	Non-Incapacitating Injury (B)	Possible Injury (C)	Property Damage Only (PDO)
No-Build	78.5	259.1	527.2	553.9	2606.0
Build	71.5	240.9	503.5	555.9	2489.3
Crash Reduction	7.0	18.2	23.7	-2.1	116.7
Cost Per Crash (\$)	\$10,670,000	\$872,612	\$174,018	\$106,215	\$7,700
Benefit	\$74,262,374.76	\$15,887,961	\$4,118,131	-\$220,670	\$898,266
20 Year Life Cycle Benefit	\$94,946,063				

7.4 Alternative Comparison Summary

As presented in Section 7.3, the Build Alternative would address the project objectives, whereas the No-Build alternative would not. The Build Alternative provides improved regional connectivity and offers the added benefit of reduced congestion on adjacent roadways, enhanced emergency evacuation and response times and improved overall safety.

As described in further detail in section 7.3.1, the Build Alternative would provide the much-needed improved regional connectivity and mobility that is driven by the current and planned growth within the greater Escambia County area.

As discussed in further detail in Section 7.3.2, 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 would operate 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