6.5 Build Alternative Safety Analysis

A quantitative analysis was completed to predict the crash frequency and provide a comparison between the No-Build and Build Alternative. The quantitative analysis involves prediction of number of crashes on the freeway facility using tools identified in HSM. The Enhanced Interchange Safety Analysis Tool (ISATe) is a safety analysis tool approved by FDOT to evaluate freeway and interchange safety. The ISATe was developed for inclusion as a Part C predictive method for the HSM. The ISATe predicts crashes by crash location, i.e., mainline freeway segments, ramp segments, and ramp terminals. The methodology also predicts crash severity for each crash type using the KABCO scale (K – fatal crashes; A, B, C – injury crashes of decreasing severity; O – Property Damage Only crashes). Inputs to the tool include both geometric and operational characteristics of roadway and ramp facilities. In this regard, the freeway facility is broken into one or more freeway sections based on the geometric characteristics and ramp junctions. ISATe also accounts for annual average daily traffic (AADT) volumes through user inputs. The measures are then combined as needed to describe the performance of the freeway section, interchange, or facility as a whole.

As part of the I-10/Antioch Road IJR, ISATe was used to estimate crashes on mainline freeway, ramp segments, and ramp terminals. The roadway inventory data including lane width, shoulder width, median width, clear zone, rumble strips, and roadway barriers were obtained from the Roadway Classification Inventory (RCI) and as-built plans. Future traffic projections developed as part of the IJR were included in the analysis.

The study area analyzed consists of I-10 from approximately 0.5 miles west of Antioch Road to approximately 0.5 miles east of SR 85 ramps. All existing and proposed ramps and ramp terminals were included as needed. The segmentation was performed based on the procedure provided in NCHRP 17-45. The study section of I-10 was divided into segments within which the characteristics such as traffic volume and geometry are consistent. For the No-Build Alternative, the I-10 mainline was divided into 14 segments and the interchange ramp segments were divided into 9 segments based on geometric characteristics. For Build Alternative, the I-10 mainline is divided into 18 segments and the ramps are divided into 13 segments.

The opening year (2024) and design year (2044) conditions were analyzed using HSM predictive methods coded in the ISATe tool, to predict the number and severity of crashes expected to occur within the interchange area. Table 28 shows the predicted crashes by severity for the No-Build Alternative during the study period (2024 – 2044) using the ISATe analysis. The majority of predicted crashes are single injury (C) and property damage only crashes.

Table 28 provides a comparison of the ISATe Output between No-Build and the Build Alternative. These results are the predicted crashes during the study period based on a statistical model from the ISATe software. The ISATe inputs and outputs are provided in Appendix H.

Table 28: ISATe Output Comparison

Alternative	Crash Severity					Total	Total Percent Change
	K	A	B	C	PDO		
No-Build	5.1	29.0	162.7	552.9	628.3	1377.9	**N/A**
Build Alternative	4.9	26.3	147.6	490.4	591.5	1260.7	**-8.50%**

Similar to the No-Build Alternative, the Build Alternative shows the majority of predicted crashes are single injury (C) and property damage only crashes. As shown in Table 28, the Build Alternative showed reduction in all crash types during the study period.

Due to the future high volume along SR 85, the ramp terminals in the No-Build condition experience approximately 69% of all the crashes in the study area. While the proposed interchange will naturally introduce crash experience associated with a new connection, the overall number and severity of crashes within the study area are anticipated to decrease with the build condition, resulting in a net positive effect by the proposed project.

6.6 Benefit – Cost Analysis

The Benefit - Cost Analysis is used to analyze the benefit to society the crash reduction has compared to the cost the project has to society. The FDOT documents crash costs by type in the FDOT Design Manual Section 122, Table 122.6.2, FDOT KABCO Crash Costs. Table 29 is the crash cost comparison and savings between No-Build and Build Alternative using FDOT crash cost and the outputs from the ISATe evaluation.

Table 29: Crash Cost Comparison

Alternative	Average Crash Cost by type					Crash Cost over Study Period	Crash Cost Savings
	K	A	B	C	PDO		
No-Build	$53,811,209	$17,367,168	$26,392,511	$55,731,110	$4,774,766	$158,076,765	**N/A**
Build Alternative	$51,915,099	$15,744,875	$23,950,091	$49,430,584	$4,495,712	$145,536,361	**$12,540,403**

As part of the PD&E, more-detailed project costs will be developed and the subject comparison updated to reflect the additional accuracy provided. However, this initial assessment indicates a compelling improvement in crash-related costs with implementation of the proposed interchange. Based on preliminary project cost estimates, the savings identified for either interchange alternative are approaching values that are nearly half of the total anticipated project cost itself.

6.7 Transportation Network Constraints

The I-10 and SR 85 interchange is currently the only access to the Interstate serving the Crestview area. SR 85 within Crestview and its interchange with I-10 experience heavy congestion in existing conditions and do not support widening to serve the increasing volumes anticipated for the area. Figure 30 depicts the constraints of the transportation network as it applies to providing access for the community of Crestview. As shown in Figure 30, in the event of a shutdown on I-10 within this portion of Okaloosa County, detours from I-10 around the SR 85 interchange from either adjacent interchange is around 16 miles from either direction. Depending on the scenario, these diversion routes require travel along the severely congested section of SR 85 within Crestview. The new interchange would significantly reduce the length of these diversion routes, particularly to and from the west, allowing PJ Adams Parkway, Antioch Road, and US 90 to relieve I-10 while eliminating pressure on SR 85 as part of an incident management diversion of traffic from I-10.