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 Alternatives. 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 – PDO 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-75/CR 514 IJR, ISATe was used to estimate crashes on mainline freeway, ramp segments, and ramp terminals. The section of I-75 within the study area is being widened to a six-lane cross-section, as such, existing crash patterns do not represent the future conditions and were not included as part of the analysis. The roadway inventory data including lane width, shoulder width, median width, clear zone, rumble strips, and roadway barriers were obtained from the roadway design plans. Future traffic projections developed as part of the IJR were included in the analysis.

The segmentation was performed based on the procedure provided in NCHRP 17-45. The study section of I-75 was divided into segments within which the characteristics such as traffic volume and geometry are consistent. For the No Build Alternative, the I-75 mainline was divided into 16 segments and the interchange ramp segments were divided into 16 segments based on geometric characteristics. Similarly, for the Build Alternative, the I-75 mainline was divided into 20 segments and the interchange ramps were divided into 23 segments. The opening year (Year 2025) and Design Year (Year 2045) 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 6-13 shows the predicted annual crashes by severity for the No Build Alternative using the ISATe analysis. The majority of predicted crashes are single injury (C) and property damage only

crashes. These results are the predicted crashes for a specific yearly time period based on a statistical model from the ISATe software.

Table 6-13: No Build Alternative ISATe Outputs

Alternative	Analysis Year	Crash Severity					Total
		K	A	B	C	PDO	
No Build	2025	0.8	3.0	15.6	32.1	112.4	163.9
	2045	1.2	4.6	24.3	51.3	171.5	253.0

Table 6-14 shows the predicted annual crashes by severity for the Build Alternative using the ISATe analysis. The proposed Build Alternative is a par-clo interchange for I-75 at CR 514.

Table 6-14: Build Alternative ISATe Outputs

Alternative	Analysis Year	Crash Severity					Total
		K	A	B	C	PDO	
Build	2025	0.9	2.9	15.4	32.1	118.9	170.2
	2045	1.3	4.3	23.5	50.0	183.3	262.4

Similar to the No Build Alternative, majority of predicted crashes are single injury (C) and property damage only crashes. As shown in **Table 6-14,** Build Alternative showed reduction in injury type crashes in both the opening and design years. The property damage only crashes are high in the Build Alternative.

As traffic volumes increase by Year 2045, crashes on I-75 and at the interchanges can be expected to increase. As previously stated, Pioneer Trail will be built to current design standards. This means that merges and diverges will have appropriate acceleration and deceleration lanes and sight distance will be substantial.