6.3.3 Build Alternative Safety Analysis

As discussed in Section 3 of this IOAR, a large proportion of the crashes experienced within the study area were associated with congested traffic operational conditions. The improvements proposed for the SR 111/Cassat Avenue at SR 8/I-10 interchange study area increase capacity along the mainline and at the interchange to enhance traffic flow and reduce congestion related crashes.

The Build Alternative will adequately address the predominant crash types observed within the study area and will reduce them significantly. Crash Reduction Analysis System Hub (CRASH) provided by the FDOT Safety Office summarizes anticipated Crash Reduction Factors (CRF) for specific roadway improvements based on the benefit-cost (B/C) analysis (provided in Appendix I). A summary of anticipated CRFs is provided in Table 6.14.

Table 6.14 Build Alternative Crash Reduction Factors

Improvement	Crash Reduction Factor (percent)							
	Fatal	Injury	PDO*	Rear-End	Angle	Left-Turn	Sideswipe	Total**
Add turn lane(s) & pavement resurfacing	3	47	21	49	20	53	-15	35
Modify intersection at signalized intersection	-24	13	0	7	10	28	3	6
Modify signal timing and phasing	0	30	-1	-22	31	66	-17	14
Total	20	68	20	42	50	88	-31	47

*Property Damage Only

** $CRF = CRF_1 + (1-CRF_1)CRF_2 + (1-CRF_1)(1-CRF_2)CRF_3 + \ldots$

The Build Alternative may reduce rear-end crashes by approximately 42 percent, angle crashes by approximately 50 percent, and left-turn crashes by approximately 88 percent. Sideswipe crashes are anticipated to increase by approximately 31 percent.

6.4 No-Build Alternative, TSM&O Alternative, and Build Alternative Comparison

The SR 111/Cassat Avenue at SR 8/I-10 interchange No-Build, TSM&O, and Build Alternatives' Synchro operational analyses have been quantitatively compared in Table 6.15 for the Opening Year (2025) and Design Year (2045). The study's intersections' anticipated delays per vehicle were summed for the AM and PM peak hours for these scenarios and are compared to each other.

When compared to the No-Build Alternative, the TSM&O Alternative provides approximately 30 percent and 37 percent reduction in the corridor delay (minutes per vehicle) by Design Year (2045) for the AM and PM peak hours, respectively, but the Build Alternative provides a 37 percent and 49 percent reduction in corridor delays (minutes per vehicle) by Design Year (2045) for the AM and PM peak hours, respectively.

Table 6.15 Alternatives Operational Analysis Comparison

		No-Build	TSM&O	Build
2025	Total Delay Per Vehicle (seconds) (AM +PM Peaks)	419.4	295.5	265.2
	Total Delay Per Vehicle (minutes) (AM +PM Peaks)	7.0	4.9	4.4
	Reduction in Delay from No-Build	-	**30%**	**37%**
2045	Total Delay Per Vehicle (seconds) (AM +PM Peaks)	924.1	584.9	472.9
	Total Delay Per Vehicle (minutes) (AM +PM Peaks)	15.4	9.7	7.9
	Reduction in Delay from No-Build	-	**37%**	**49%**