

## 8.5 Safety

A quantitative safety analysis was also performed to determine if the study alternative addressed the existing safety concerns. The safety analysis performed follows the guidelines in the 2018 IARUG. The safety analysis was performed using Crash Modification Factors (CMFs) from the CMF Clearinghouse funding by FHWA.

**Table 8-7**, presented below, shows the reduction in crashes based on the Build Alternative for SR 16 from CR 208 to the I-95 at SR 16 northbound ramp terminal intersection. These crash frequencies were then used to determine the safety impact of the proposed improvements. Of the proposed improvements, widening SR 16 from four to six lanes and converting a yield signal control to signalized control have known CMFs. The safety benefits of some other improvements must be looked at qualitatively. For example, the type of operational improvement being implemented at the SR 16 at Toms Road intersection cannot be analyzed using the HSM and the FHWA Clearinghouse. The elimination of left turn movements at this intersection is expected to improve safety and reduce rear-end and angle crashes. Also, the U-turns provided at the ramp terminal intersections cannot be analyzed using HSM and the FHWA Clearinghouse, but the elimination of left turns improves operations and is expected to reduce the sideswipe crashes.

The CMFs used to quantify the benefits of the project include:

- Clearinghouse CMF 7924: Increase from 4 lanes to 6 lanes = 0.85
- Clearinghouse CMF 2554: Convert from yield signal control to signalized control = 0.64.

It should be noted that CMF 2554 is implemented at the ramp terminals only and applied to the off-ramps' right turn crashes only.

By implementing the proposed modifications, a total crash reduction of 10.13 crashes a year is expected. The CMF Clearinghouse summary reports are provided in **Appendix H**.

Table 8-7: Reduced Crashes Based on the Build Alternative

Location	Existing Number of Crashes	Crash Frequency (crashes/year)	CMF	Reduction in Crashes Annually
SR 16 - Toms Road to CR 208	28	5.6	0.85	0.84
SR 16 at CR 208	33	6.6	0.85	0.99
SR 16 at I-95 SB Ramp Terminal	32	6.4	0.85	0.96
SR 16 at I-95 NB Ramp Terminal	31	6.2	0.85	0.93
SR 16 at I-95 SB Ramp Terminal Right Turns	41	8.2	0.64	2.95
SR 16 at I-95 NB Ramp Terminal Right Turns	48	9.6	0.64	3.46
Total	213	42.6		10.13

## 8.6 Alternatives Comparison

The No-Build Alternative and the Build Alternative were compared and a summary is provided in the sections below.

### 8.6.1 Operational Comparison

This section compares the mainline, merge/diverge and intersections traffic operational performance of the No-Build and Build Alternatives.

The No-Build Alternative intersections of SR 16 at Toms Road, I-95 Southbound On/Off-Ramps and I-95 Northbound On/Off-Ramps do not operate at an acceptable LOS and individual movements operate at LOS F. The traffic operations at these intersections improve with the implementation of the Build Alternative and will operate at LOS C or better.

### 8.6.2 Cost Estimation

A cost estimation was performed for Build Alternative. The Build Alternative cost estimates are shown in **Table 8-8**. The total project cost for the Build Alternative is \$9,139,519.76. The FDOT Long Range Estimating (LRE) is provided in **Appendix I**.