

6.0 Future Safety Analysis

6.1 Quantitative Safety Analysis

The Highway Safety Manual procedures and historic crash data were used to quantitatively analyze the safety impacts of the No-Build and Build Alternatives. The quantitative safety analysis for the proposed Build Alternative conditions of converting a diamond interchange to a Diverging Diamond Interchange (DDI) follows the Countermeasure Crash Modification Factors (CMF) methodology and demonstrates the impact to the facility's safety within the AOI. The quantitative safety analysis complies with the guidelines of the FDOT Interchange Access Request User's Guide Safety Analysis Guidance in determining the estimated change in the expected number of crashes due to the proposed modifications of the project.

The Countermeasure CMF methodology utilizes CMFs to compute the expected number of crashes after implementing a selected countermeasure. CMFs were selected from the FHWA Crash Modification Factors Clearinghouse (www.cmfclearinghouse.org). The selected CMFs for the I-75/Gibsonton Interchange have a higher star rating than the minimum requirement of three stars to provide a greater level of confidence when estimating the safety performance by determining the reduction of crashes and the annual cost of the crash reduction. The CMF criteria for the selected Diverging Diamond Interchange countermeasure and reducible crash details are summarized in **Table 6.1**.

Table 6.1: Crash Reduction Factor Application

Location	Improvement	CRF ID ¹	Stars	CRF	Crash Types Impacted	Severity	Number of Reducible Crashes	Total Reduced Crashes	Crash Reduction Per Year
Ramp Terminals and Ramps	Diverging Diamond Interchange	10761	4	14.2%	All Types	All	113	16	3.2

¹ CRF Source: <https://www.cmfclearinghouse.org/>

Using procedures from the Highway Safety Manual (HSM), all collisions associated with the ramp terminals and ramps are expected to be reduced by up to 14.2 percent and provide a 3.2 crash reduction per year. The CMF Details are presented in **Appendix M**.

6.2 Qualitative Safety Analysis

While the conversion of a Diamond Interchange into a Diverging Diamond interchange was able to be quantified for us in the estimation of crash reduction for the project, some improvements lack research to provide CRFs but still provide safety improvements that require examination. The three most notable improvements with no associated CRF are the impacts of the construction of a new two-lane westbound to northbound on-ramp, modification of the existing I-75 single lane northbound off-ramp to a two-lane off ramp, and the modification of the existing I-75 single lane southbound off-ramp to a two-lane off ramp.

The northbound on-ramp, northbound off-ramp, and the southbound off-ramp experienced low crash frequencies under the existing conditions. The most common crash type being overturn/rollover crashes occurring under dark conditions. Additionally, the northbound on-ramp during the AM peak hour and the southbound off-ramp during the PM peak hour are nearing capacity limits affecting flow and driving behaviors. Under the Build Alternative, additional lighting will improve roadway conditions and the additional lane at each ramp is anticipated to improve AM and PM peak hours improving flow and safety through the interchange.