

8.5 Safety

A predicted quantitative safety analysis was also performed to determine if the study alternative addressed the existing safety concern. The safety analysis performed follows the guidelines developed in the 2018 IARUG. The safety analysis also follows the HSM Part C safety methodology.

The Empirical Bayes Method was used to determine the expected crash frequency for the study segments where the proposed improvements are being recommended.

Table 8-7, presented below, shows the expected crashes based on the No-Build Alternative compared to the Build Alternative. These crash frequencies were then used to determine the safety impact of the proposed improvements. Of the proposed improvements, converting a loop ramp to a short ramp and providing signals at the ramp terminals have known crash modification factors (CMF). The safety benefits of all other improvements must be looked at only in a qualitative manner.

The CMFs for this analysis were determined using the CMF Clearinghouse funded by FHWA. The two CMFs used to quantify the benefits of the project include:

- Clearinghouse CMF 480: Provide short ramp instead of directional loop ramp = 0.700
- Clearinghouse CMF 5525: Install a traffic signal = 0.656

By implementing the proposed modifications, a total expected crash reduction of 1.98 fatal/injury crashes a year and 2.95 PDO crashes a year. The future safety analysis is provided in **Appendix H**.

Table 8-7: No-Build vs. Build Expected Crashes

	No-Build Expected Crash Frequency		CMF	Build Expected Crash Frequency		Reduction in Crashes	
	FI	PDO		FI	PDO	FI	PDO
Freeway Segment (8th to MLK)	2.29	3.70		2.29	3.70	0.00	0.00
Freeway Segment (I-95 S of I-95 SB Off to MLK EB)	0.89	1.75		0.89	1.75	0.00	0.00
Freeway Segment (I-95 SB On and Off-Ramp (weave section))	1.20	2.78	0.700	0.84	1.94	0.36	0.83
Freeway Segment (I-95 S of I-95 SB Off to MLK WB)	2.46	8.73		2.46	8.73	0.00	0.00
Freeway Segment (MLK to Golfair)	3.85	8.37		3.85	8.37	0.00	0.00
NB Diverge to WB MLK	0.84	3.28		0.84	3.28	0.00	0.00
SB Merge from MLK EB	0.33	1.10		0.33	1.10	0.00	0.00
SB Merge to 8th Street	0.30	0.83		0.30	0.83	0.00	0.00
SB Ramp Terminal	1.42	1.55	0.656	0.93	1.01	0.49	0.53
NB Ramp Terminal	3.28	4.62	0.656	2.15	3.03	1.13	1.59
Total	16.86	36.71		14.88	33.76	1.98	2.95

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, weaving and intersections traffic operational performance of the No-Build and Build Alternatives.

The results of the 2045 No-Build Alternative operational analysis show that I-95 Southbound weave segment between MLK Westbound to I-95 Southbound On-Ramp and I-95 Southbound to MLK Eastbound Off-Ramp operates at failing LOS F in the AM peak hour. With the elimination of the MLK Westbound to I-95 Southbound On-Ramp, all the I-95 freeway segments will operate at acceptable LOS.

The No-Build Alternative has all the ramp movements as free flow movements. The Build Alternative recommends providing signalized intersections at both MLK/I-95 Southbound and Northbound On-Ramp intersections. The new signalized intersections are due to the elimination of the loop ramp and the high left turn volumes using the On-Ramp. Under the No-Build Alternative the eastbound left turn volume will exceed capacity in year 2045. Under the Build Alternative, dual