

	per 100,000,000 VMT:		
	Fatality	Injury	Property Damage
Base	1.3026	58.6189	212.3306
With Project	0.7586	34.1360	123.6480

	CMF	Applicable Crashes			
Clear Zone	0.78	All	HSM	5 Star	<a href="http://www.cmfclearinghouse.org/detail.cfm?facid=35">http://www.cmfclearinghouse.org/detail.cfm?facid=35</a>
Lane Width	0.86	Proportioned to All	HSM		Calculation
Shldr width/type	0.87	Proportioned to All	HSM		Calculation
Combined CMF	0.58233735				

$$CMF_{2r} = (CMF_{wra} \times CMF_{tra} - 1.0) \times p_{ra} + 1.0$$

AADT is > 2000

$$CMF_{1r} = (CMF_{ra} - 1.0) \times p_{ra} + 1.0$$

Before  
After

SHOULDERS CMF <sub>2r</sub>			CRASHES				LANES CMF <sub>ra</sub>		
CMF <sub>wra</sub>	CMF <sub>tra</sub>	CMF <sub>2r</sub>	Applicable crashes			p <sub>ra</sub>	Total Crashes	CMF <sub>tr</sub>	CMF <sub>ra</sub>
Table 10-9 - Shoulder Width	Table 10-10 Shoulder Type	Equation 10-12	Run off the road (Single Vehicle)	Head On	All Sideswipes			% of Total	Equation 10-11
1.40	1.00	1.70	81	5	23	50%	217	1.15	1.30
0.87	1.06	1.46						1.00	1.00
		0.86						0.87	

**Table 10-8. CMF for Lane Width on Roadway Segments (CMF<sub>ra</sub>)**

Lane Width	AADT (vehicles per day)		
	< 400	400 to 2000	> 2000
9 ft or less	1.05	1.05 + 2.81 × 10 <sup>-4</sup> (AADT - 400)	1.50
10 ft	1.02	1.02 + 1.75 × 10 <sup>-4</sup> (AADT - 400)	1.30
11 ft	1.01	1.01 + 2.5 × 10 <sup>-5</sup> (AADT - 400)	1.05
12 ft or more	1.00	1.00	1.00

Note: The collision types related to lane width to which this CMF applies include single-vehicle run-off-the-road and multiple-vehicle head-on, opposite-direction sideswipe, and same-direction sideswipe crashes.

**Table 10-9. CMF for Shoulder Width on Roadway Segments (CMF<sub>wra</sub>)**

Shoulder Width	AADT (vehicles per day)		
	< 400	400 to 2000	> 2000
0 ft	1.10	1.10 + 2.5 × 10 <sup>-4</sup> (AADT - 400)	1.50
2 ft	1.07	1.07 + 1.43 × 10 <sup>-4</sup> (AADT - 400)	1.30
4 ft	1.02	1.02 + 8.125 × 10 <sup>-5</sup> (AADT - 400)	1.15
6 ft	1.00	1.00	1.00
8 ft or more	0.98	0.98 + 6.875 × 10 <sup>-5</sup> (AADT - 400)	0.87

Note: The collision types related to shoulder width to which this CMF applies include single-vehicle run-off the-road and multiple-vehicle head-on, opposite-direction sideswipe, and same-direction sideswipe crashes.

The base condition for shoulder type is paved. Table 10-10 presents the effects of gravel, turf, and composite shoulders as a function of shoulder width.

**Table 10-10. Crash Modification Factors for Shoulder Types and Shoulder Widths on Roadway Segments (CMF<sub>tra</sub>)**

Shoulder Type	Shoulder Width (ft)						
	0	1	2	3	4	6	8
Paved	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Gravel	1.00	1.00	1.01	1.01	1.01	1.02	1.02
Composite	1.00	1.01	1.02	1.02	1.03	1.04	1.06
Turf	1.00	1.01	1.03	1.04	1.05	1.08	1.11

Note: The values for composite shoulders in this table represent a shoulder for which 50 percent of the shoulder width is paved and 50 percent of the shoulder width is turf.

If the shoulder types for a roadway segment differ, the CMF are determined