



## CMF / CRF Details

CMF ID: 10190

Change unpaved shoulder width from X to Y (in meters)

Description: Change unpaved shoulder width from X meters to Y meters

Prior Condition: Unpaved shoulder width of X meters, where X is greater than or equal to 0.9 meters

Category: Shoulder treatments

Study: [The influence of shoulder characteristics on the safety level of two-lane roads: A case-study, Gitelman et al., 2019](#)

Star Quality Rating:

Stars

[\[View score details\]](#)

### Crash Modification Factor (CMF)

Value:

$$CMF = e^{[-0.343*(Y-X)]}$$

**Y = proposed average unpaved shoulder width, in meters**

**X = existing average unpaved shoulder width, in meters**

Adjusted  
Standard  
Error:

Unadjusted  
Standard  
Error:

### Crash Reduction Factor (CRF)

Value:

$$CRF = 100 * (1 - e^{[-0.343*(Y-X)])}$$

**Y = proposed average unpaved shoulder width, in meters**

**X = existing average unpaved shoulder width, in meters**

<b>Adjusted Standard Error:</b>	
<b>Unadjusted Standard Error:</b>	

### Applicability

<b>Crash Type:</b>	All
<b>Crash Severity:</b>	K (fatal),A (serious injury)
<b>Roadway Types:</b>	Not specified
<b>Number of Lanes:</b>	2
<b>Road Division Type:</b>	Undivided
<b>Speed Limit:</b>	
<b>Area Type:</b>	Rural
<b>Traffic Volume:</b>	
<b>Time of Day:</b>	All

### *If countermeasure is intersection-based*

<b>Intersection Type:</b>	
<b>Intersection Geometry:</b>	
<b>Traffic Control:</b>	
<b>Major Road Traffic Volume:</b>	
<b>Minor Road Traffic Volume:</b>	

### Development Details

<b>Date Range of Data Used:</b>	2008 to 2010
<b>Municipality:</b>	
<b>State:</b>	
<b>Country:</b>	Israel
<b>Type of Methodology Used:</b>	5
<b>Sample Size Used:</b>	

## Other Details

<b>Included in Highway Safety Manual?</b>	No
<b>Date Added to Clearinghouse:</b>	Dec-07-2019
<b>Comments:</b>	This applies when both the existing (X) and proposed (Y) unpaved shoulder width are greater than or equal to 0.9 meters.

---

This site is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center

*The information contained in the Crash Modification Factors (CMF) Clearinghouse is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The U.S. Government assumes no liability for the use of the information contained in the CMF Clearinghouse. The information contained in the CMF Clearinghouse does not constitute a standard, specification, or regulation, nor is it a substitute for sound engineering judgment.*