

## CMF / CRF Details

CMF ID: 10204

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:



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

### Crash Modification Factor (CMF)

Value:

$$CMF = e^{[-0.211*(Y-2.25)-0.463*(X-2.25)]}$$

**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:

$$CRF = 100 * (1 - e^{[-0.211*(Y-2.25)-0.463*(X-2.25)]})$$

**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>	

<b>Applicability</b>	
<b>Crash Type:</b>	All
<b>Crash Severity:</b>	K (fatal),A (serious injury),B (minor injury),C (possible 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
<i>If countermeasure is intersection-based</i>	
<b>Intersection Type:</b>	
<b>Intersection Geometry:</b>	
<b>Traffic Control:</b>	
<b>Major Road Traffic Volume:</b>	
<b>Minor Road Traffic Volume:</b>	

<b>Development Details</b>	
<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>	Case-control
<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 the existing unpaved shoulder width (X) is greater than or equal to 0.9 meters and the proposed unpaved shoulder width (Y) is less than 0.9 meters.

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