



CMF / CRF Details

CMF ID: 4845

Change in average vertical curve grade from X to Y (% grade)

Description: Change in average vertical curve grade on rural two-lane highways from X to Y (% grade)

Prior Condition: average vertical curve grade of X (% grade)

Category: Alignment

Study: [Efficacies of roadway safety improvements across functional subclasses of rural two-lane highways, Labi, 2011](#)

Star Quality Rating:

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

Crash Modification Factor (CMF)

Value:

$$CMF = e^{(0.1100(Y-X))}$$

Adjusted Standard Error:

Unadjusted Standard Error:

Crash Reduction Factor (CRF)

Value:

$$CRF = 100 \times (1 - e^{(0.1100(Y-X))})$$

Adjusted
Standard
Error:

**Unadjusted
Standard
Error:**

Applicability

Crash Type:

All

Crash Severity:

O (property damage only)

Roadway Types:

Major Collector

Number of Lanes:

2

Road Division Type:

Undivided

Speed Limit:

Area Type:

Rural

Traffic Volume:

Time of Day:

All

If countermeasure is intersection-based

Intersection Type:

Intersection Geometry:

Traffic Control:

Major Road Traffic Volume:

Minor Road Traffic Volume:

Development Details

Date Range of Data Used:

1997 to 2000

Municipality:

State:

IN

Country:

Type of Methodology Used:

7

Sample Size Used:	2160 Site-years
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Other Details

Included in Highway Safety Manual?	No
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Date Added to Clearinghouse:	May-01-2013
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Comments:	There is no indication of statistical significance in the paper. As such, the star rating does not reflect the level of significance. Also, there is no indication of sample size in terms of number of crashes. The star rating reflects a moderate sample based on the number of site-years.
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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

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