



# CMF / CRF Details

**CMF ID: 4642**

**Increase vertical grade by 1%**

**Description:**

**Prior Condition: Level roadway (0% grade)**

**Category: Alignment**

**Study: [Prediction of the Expected Safety Performance of Rural Two-Lane Highways, Harwood et al., 2000](#)**

<b>Star Quality Rating:</b>	

<b>Crash Modification Factor (CMF)</b>	
<b>Value:</b>	1.02
<b>Adjusted Standard Error:</b>	
<b>Unadjusted Standard Error:</b>	

<b>Crash Reduction Factor (CRF)</b>	
<b>Value:</b>	-2 (This value indicates an <b>increase</b> in crashes)
<b>Adjusted Standard Error:</b>	
<b>Unadjusted Standard Error:</b>	

## Applicability

**Crash Type:**

All

**Crash Severity:**

All

**Roadway Types:**

Principal Arterial Other

**Number of Lanes:**

2

**Road Division Type:**

**Speed Limit:**

**Area Type:**

Rural

**Traffic Volume:**

**Time of Day:**

*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:**

**Municipality:**

**State:**

**Country:**

**Type of Methodology Used:**

11

<b>Sample Size Used:</b>	
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<b>Other Details</b>	
<b>Included in Highway Safety Manual?</b>	
<b>Date Added to Clearinghouse:</b>	Dec-01-2009
<b>Comments:</b>	HSM 1st Ed, Table 13-28

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