



## CMF / CRF Details

CMF ID: 4113

**Improve signal visibility, including signal lens size upgrade, installation of new back-plates, addition of reflective tapes to existing back-plates, and installation of additional signal heads**

**Description: 4-leg intersections with 3 or 4 lanes on each approach and 50 km/h posted speed**

**Prior Condition: Smaller signal lens size, old back-plates, no reflective tapes on existing back-plates, and less number of signal heads**

**Category: Intersection traffic control**

**Study: [Investigating Effect of Collision Aggregation on Safety Evaluations Using Multivariate Linear Intervention Models: Case Study of Signal Head Upgrade Program, El-Basyouny et al., 2012](#)**

Star Quality Rating:



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

### Crash Modification Factor (CMF)

**Value:** 0.867

**Adjusted Standard Error:**

**Unadjusted Standard Error:** 0.052

### Crash Reduction Factor (CRF)

<b>Value:</b>	13.3 (This value indicates a <b>decrease</b> in crashes)
<b>Adjusted Standard Error:</b>	
<b>Unadjusted Standard Error:</b>	5.2

### Applicability

<b>Crash Type:</b>	Nighttime
<b>Crash Severity:</b>	0 (property damage only)
<b>Roadway Types:</b>	Not Specified
<b>Number of Lanes:</b>	3 to 4
<b>Road Division Type:</b>	
<b>Speed Limit:</b>	50 km/h
<b>Area Type:</b>	Urban
<b>Traffic Volume:</b>	
<b>Time of Day:</b>	Night

### *If countermeasure is intersection-based*

<b>Intersection Type:</b>	Roadway/roadway (not interchange related)
<b>Intersection Geometry:</b>	4-leg
<b>Traffic Control:</b>	Signalized
<b>Major Road Traffic Volume:</b>	4637 to 51743 Average Daily Traffic (ADT)
<b>Minor Road Traffic Volume:</b>	134 to 48906 Average Daily Traffic (ADT)

### Development Details

<b>Date Range of Data Used:</b>	1999 to 2004
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<b>Municipality:</b>	British Columbia
<b>State:</b>	
<b>Country:</b>	Canada
<b>Type of Methodology Used:</b>	2
<b>Sample Size Used:</b>	Crashes
<b>Before Sample Size Used:</b>	1348 Crashes
<b>After Sample Size Used:</b>	786 Crashes

<b>Other Details</b>	
<b>Included in Highway Safety Manual?</b>	No
<b>Date Added to Clearinghouse:</b>	Nov-01-2012
<b>Comments:</b>	3 CMF sets are presented: crash severity only, time of day only, severity and time of day. Only disaggregate set (severity and time of day) is reported

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