



# CMF / CRF Details

CMF ID: 2991

**Convert High-Occupancy-Vehicle (HOV) lanes to High-Occupancy-Toll (HOT) lanes**

**Description:** convert a High-Occupancy-Vehicle (HOV) interstate segment into a High-Occupancy-Toll (HOT) segment

**Prior Condition:** High-Occupancy-Vehicle (HOV) interstate segment

**Category:** Roadway

**Study:** [Safety Benefits of Converting HOV lanes to HOT lanes: Case Study of the I-394 MnPass, Cao et al., 2011](#)

Star Quality Rating:	
<input type="text" value="✘ Star"/>	<a href="#">[View score details]</a>

Crash Modification Factor (CMF)	
Value:	1.06
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)	
Value:	-6 (This value indicates an <b>increase</b> in crashes)
Adjusted Standard Error:	
Unadjusted Standard Error:	

**Applicability**

<b>Crash Type:</b>	All
<b>Crash Severity:</b>	B (minor injury)
<b>Roadway Types:</b>	Principal Arterial Interstate
<b>Number of Lanes:</b>	
<b>Road Division Type:</b>	Divided by Median
<b>Speed Limit:</b>	
<b>Area Type:</b>	Urban
<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>	1998 to 2008
<b>Municipality:</b>	Minneapolis-St. Paul
<b>State:</b>	MN
<b>Country:</b>	U.S.A.

<b>Type of Methodology Used:</b>	3
<b>Sample Size Used:</b>	
<b>Before Sample Size Used:</b>	101
<b>After Sample Size Used:</b>	43

<b>Other Details</b>	
<b>Included in Highway Safety Manual?</b>	No
<b>Date Added to Clearinghouse:</b>	Jul-15-2011
<b>Comments:</b>	This CMF was derived from a comparison group study, but the method does not follow Hauer's book. Data on traffic volumes, speed limits, and thru lanes are not provided. The authors only have crash and volume data for every other year.

---

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.*