

# Crash Modification Factors Clearinghouse

## The Search for Safety



2018 Transportation Engineering and Safety  
Conference

Session 2A:  
Highway Safety - The Final Frontier



December 5, 2018

# What is a Crash Modification Factor?

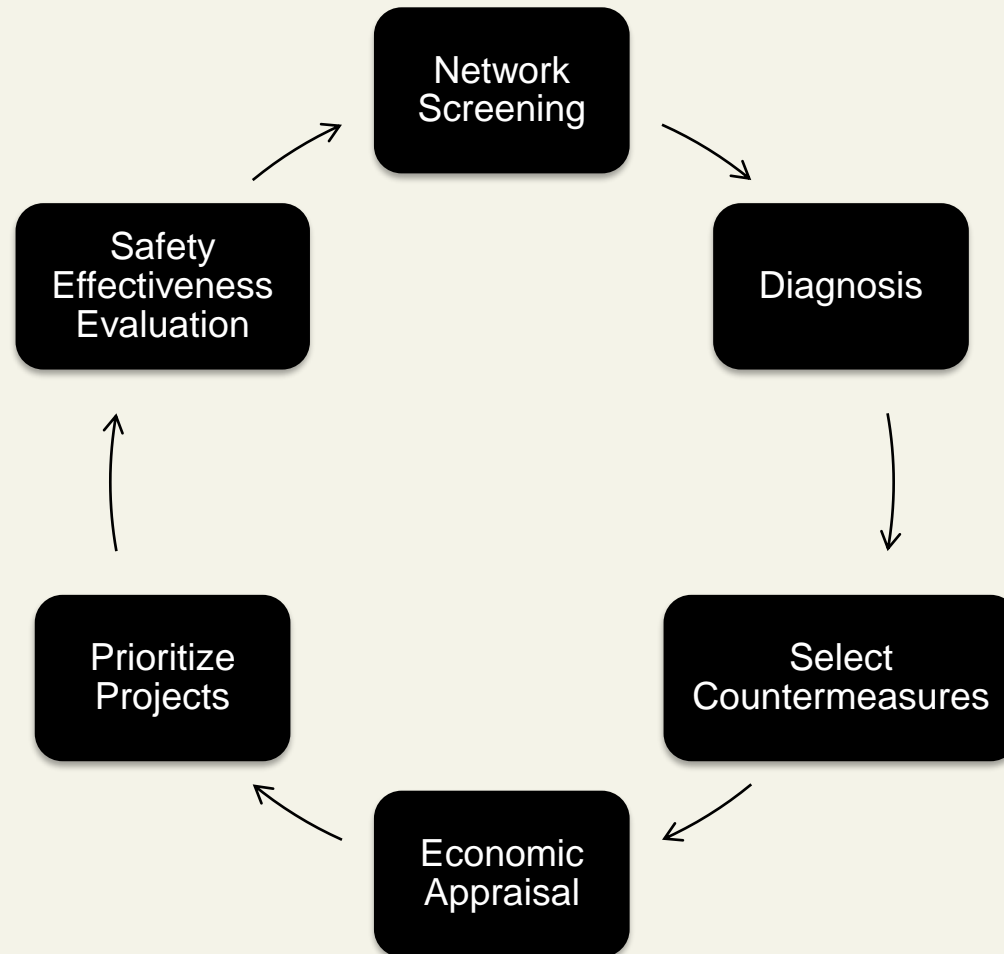
- A CMF is a multiplicative factor used to compute the expected number of crashes after implementing a given countermeasure at a specific site.

Example:

$$\text{CMF} = 0.8$$

(The crashes would be expected to be reduced by 20%)

# How do you use CMFs?



# What is the purpose of the CMF Clearinghouse?

- Provides CMF data
- Educates CMF users
- Facilitates CMF research

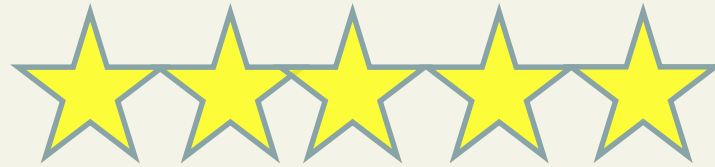
The screenshot shows the CMF Clearinghouse website. At the top left is the logo for the Crash Modification Factors Clearinghouse, featuring a stylized 'C' and 'M' in a square followed by 'F' in a square, with 'CMF' in large letters and 'CRASH MODIFICATION FACTORS CLEARINGHOUSE' below. To the right of the logo is a navigation bar with links: 'Skip to main content | Site Map | Notice | Sign Up for our e-Newsletter | Home'. Below the navigation bar is a secondary navigation bar with links: 'About the CMF Clearinghouse | Using CMFs | Developing CMFs | Additional Resources'. The main content area is divided into two columns. The left column contains a search form with a 'Search for:' label, a text input field containing 'enter search term(s)', an 'in' label, a dropdown menu for 'Countermeasure Name', a 'Need Help?' link, and a 'Search CMFs' button. The right column features a large image of a car driving on a road with a yellow double line, overlaid with the text 'State CMF Lists' and a paragraph: 'See the CMFs that various states have decided to use statewide to improve their consistency of practice.' Below the image is a pagination control with numbers 1, 2, 3, 4, 5. At the bottom of the page, there is a dark blue section with the text: 'A crash modification factor (CMF) is used to compute the expected number of crashes after implementing a countermeasure on a road or intersection. The Crash Modification Factors Clearinghouse provides a searchable online database of CMFs along with guidance and resources on using CMFs in road safety practice. It also provides guidance to researchers on best practices for developing high quality CMFs.' To the right of this text is a 'Recently Added CMFs' section with three entries: 'Install cable median barrier (high tension)' with CMF: 0.76 and CRF: 24; 'Install separated bicycle lane' with CMF: 0.963 and CRF: 3.7; and 'Install intersection conflict warning systems (ICWS) for two-lane at two-lane intersections' with CMF: 0.7 and CRF: 30.

# What's in the Clearinghouse?

- Nearly 7,000 CMFs with star ratings
- Covers almost 1,000 countermeasures
- CMFs obtained from 400+ studies
- CMF information
  - CMF value
  - Collision type and crash severity
  - Roadway type and characteristics
  - Standard errors
  - Star quality rating
  - Study information

# Star Quality Rating

- Structured but subjective process
- Star quality rating criteria (excellent, fair, poor)
  1. Study design
  2. Sample size
  3. Standard error
  4. Potential bias
  5. Data source



# The Search for Safety



[Skip to main content](#) | [Site Map](#) | [Notice](#) | [Sign Up for our e-Newsletter](#) | [Home](#)

[About the CMF Clearinghouse](#) | [Using CMFs](#) | [Developing CMFs](#) | [Additional Resources](#)

Search for:

in

[Need Help?](#)

[Search CMFs](#)

## State CMF Lists

See the CMFs that various states have decided to use statewide to improve their consistency of practice.

1 2 3 4 5

A crash modification factor (CMF) is used to compute the expected number of crashes after implementing a [countermeasure](#) on a road or intersection. The Crash Modification Factors Clearinghouse provides a searchable online database of CMFs along with guidance and resources on [using CMFs](#) in road safety practice. It also provides guidance to researchers on best practices for [developing](#) high quality CMFs.

## Recently Added CMFs

[Install cable median barrier \(high tension\)](#)

CMF: 0.76

CRF: 24

Crash type: Other

Crash severity:

[Install separated bicycle lane](#)

CMF: 0.963

CRF: 3.7

Crash type: All

Crash severity: All

[Install intersection conflict warning systems \(ICWS\) for two-lane at two-lane intersections](#)

CMF: 0.7

CRF: 30

# Live Demo

# FAQs

- How do I select a CMF when major factors are the same?
- How do I apply more than one CMF?



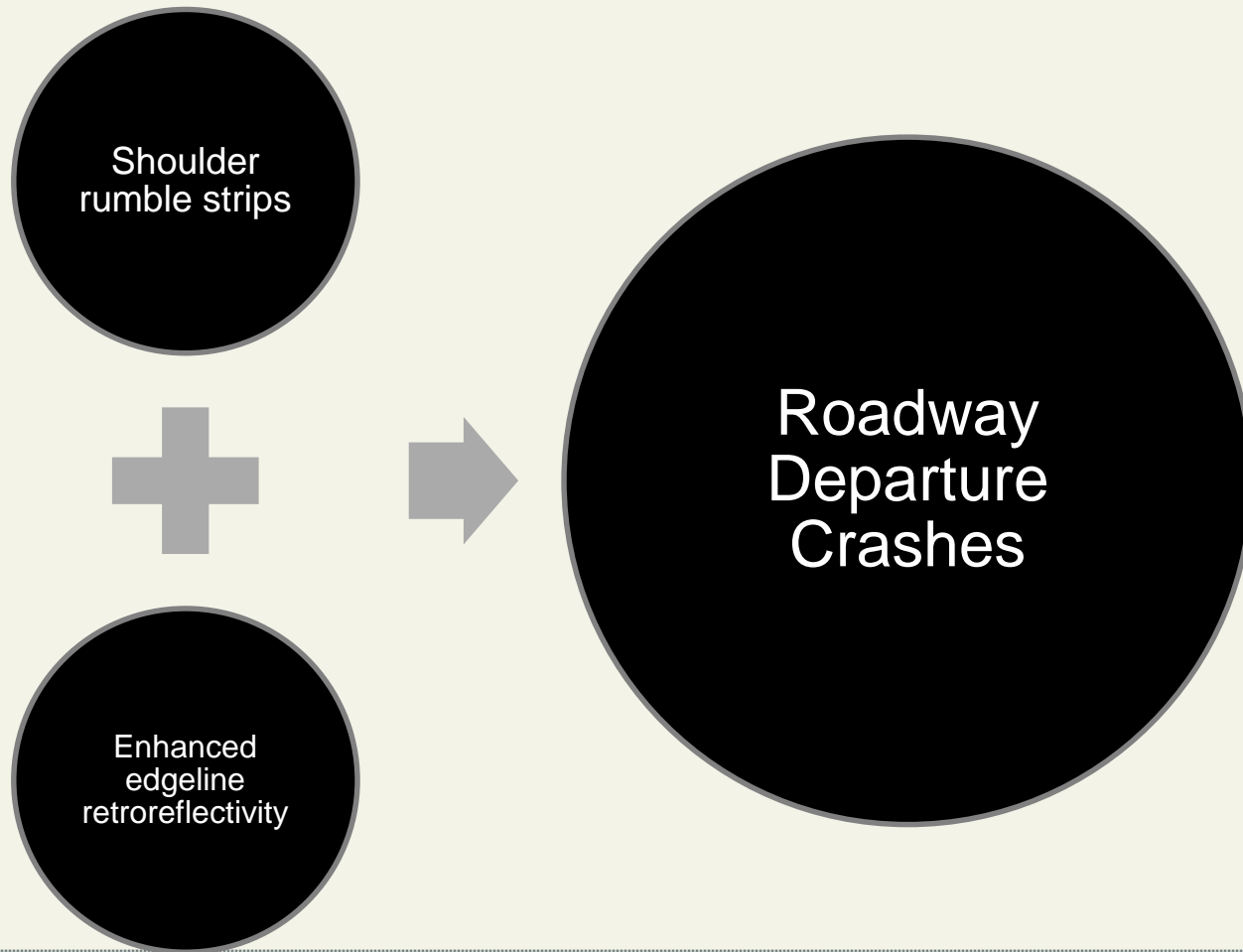
# How do I select a CMF when major factors are the same?

- Star Quality Rating
- Score Details
- Similar Locality
- Traffic Volume Range
- Age of Data
- Original Study Report

# How do I apply more than one CMF?

- Common practice is to multiply CMFs
- Limited understanding of interrelationships
- Likely to overestimate combined effect
- Assumes independence
- Use engineering judgement, especially when more than 3 CMFs are proposed

# Example of Related CMFs (Target same crash type)



# Examples of Independent CMFs (Target different crash types)

Convert left turn phase from permissive to protected

- Angle crashes

Installation of an exclusive right turn lane

- Rear end crashes

# Looking Ahead

- CMF Tune Up: Resources, Methods and Real World Applications
  - Monday, December 17<sup>th</sup> 2:00 -3:30 PM ET
  - Register on CMF CH Website
- Developing Quality CMFs
  - NHI Course 380119
  - Offered in Spring and Fall
- Highway Safety Manual, 2<sup>nd</sup> edition
  - Part D Changes
  - NCHRP 17-72 Review Criteria

# Questions?

Karen Scurry, P.E.

FHWA Office of Safety Programs

karen.scurry@dot.gov

202-897-7168

[www.cmfclearinghouse.org](http://www.cmfclearinghouse.org)