Crash Modification Factors Clearinghouse

The Search for Safety

2018 Transportation Engineering and Safety Conference

Session 2A: Highway Safety - The Final Frontier

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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:

CMF = 0.8

(The crashes would be expected to be reduced by 20%)
How do you use CMFs?

1. Network Screening
2. Diagnosis
3. Select Countermeasures
4. Economic Appraisal
5. Prioritize Projects
6. Safety Effectiveness Evaluation
What is the purpose of the CMF Clearinghouse?

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

- **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

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**State CMF Lists**

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

- Shoulder rumble strips
- Enhanced edgeline retroreflectivity
- Roadway Departure Crashes
Examples of Independent CMFs (Target different crash types)

- **Angle crashes**
  - Convert left turn phase from permissive to protected

- **Rear end crashes**
  - Installation of an exclusive right turn lane
Looking Ahead

• CMF Tune Up: Resources, Methods and Real World Applications
  – Monday, December 17th 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, 2nd edition
  – Part D Changes
  – NCHRP 17-72 Review Criteria
Questions?

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