

CMF Clearinghouse Webinar – December 07, 2022

Practicing What We...Research: How to Apply CMFs in Road Safety Audits, Consider CAVs/Technology, and Understand Recent Federal Research

Audience Questions with CMF Clearinghouse Team Responses

**Some questions have been reworded for clarity.*

Questions for Clearinghouse/CMF Use

Question How can two separate studies find different CMFs for treatments?

Different studies can find different CMFs for the same treatment depending on the treatment scenario. The CMF Clearinghouse doesn't recommend using a specific CMF for a treatment for which multiple CMFs are available. Users are encouraged to use the compare tool and review the CMF details to find the best CMF applicable to their specific use case/application scenario.

Question: When a CMF is greater than one, does that ultimately mean that crash likelihood is increased? If that is the case, is the countermeasure ultimately inadequate in need of obsolescence?

A CMF of greater than one would indicate a likely increase in crashes with the application of the treatment. However, there are many situations in the CMF Clearinghouse, where countermeasures would have multiple CMFs showing both likely increases and decreases in crashes. A CMF of greater than one doesn't necessarily mean that the countermeasure is obsolete, it is just an indication of the crash expectation when the countermeasure is applied under a certain scenario. As mentioned in response to the previous question, users are encouraged to use the compare tool and review the CMF details to find the best CMF applicable to their specific use case/application scenario.

Question: Is there a minimum star rating recommended to use when selecting CMFs for various application scenarios?

The star quality rating indicates the quality or confidence in the results of the study producing the CMF. Various factors go into determining the star rating of a CMF. Further details about star quality ratings can be found at <http://cmfclearinghouse.org/sgr.cfm>.

When selecting a CMF for use, users are encouraged to look at the CMF details in addition to the star ratings to ensure that the CMF that is being selected is appropriate for and applicable to their specific use case. The CMF Clearinghouse does not recommend a minimum star rating when selecting a CMF, rather it provides users with pertinent information to make informed decisions.

Questions for Road Safety Audit Presentation

Question: Have you used any crash cost for the benefit-cost analysis? If used, what is the cost for K/A/B/C/O crashes??

No, we did not apply crash costs for this method. The relative benefit-cost ratio was purely based on a low-to-high benefit score and a low-to-high-cost score. This gave us a relative score that could be used for comparison and prioritization but did not provide a quantitative benefit-cost ratio as a typical B/C analysis outcome. Severity could definitely have an impact on safety impact, but this was a more simplified approach that allowed for direct comparisons using whatever level of data was available.

Question: What specific modules were used in your IHSDM review?

We used the crash prediction module, the design consistency module, the driver vehicle module, and the stopping sight distance piece of the policy review module.

Question: Why was it decided to do the HSM analysis before the RSA? One of the advantages of the RSA can be fewer resource requirements, while the HSM analysis can be resource intensive.

The public agency had dictated that an IHSDM analysis would be used for this RSA. There were several reasons why, but because this was a unique case for an RSA and we had such a large area to cover (about 50 miles in total, with significant distances between the five sites), the additional analysis could help us focus better when completing the field assessment. We also already had survey data for the two sites we used it on, so it did help to reduce the level of effort/resource intensiveness a bit in this specific case. This type of analysis is not necessary or applicable for every (or maybe even most) RSAs, but the additional detail may be helpful in some situations. There is an [FHWA document](#) that provides some case studies of using IHSDM in RSAs that can provide some more information and examples as well.

Question: Do you have an idea of how many/the percentage of RSA countermeasures have an applicable CMF?

For this RSA, it was a little less than 50% of the countermeasures that had an applicable CMF (or range of CMFs). That could vary significantly for different projects depending on what countermeasures are recommended.

Questions for Impacts of CAV Technology Presentation

Question: If you are just guessing, is it reasonable to have results expressed to the thousandth place?

It's a matter of difference in reporting between engineering and statistics. In engineering, we try to provide a number of significant decimals to indicate the precision of a measure. In this case, we set up the reporting from the view of statistical analysis: precision of reporting is set before we ran statistical analysis and reported that way. The analysis then quantifies the

uncertainty of each evaluated scenario. The amount of evidence supporting that any differences are not just random fluctuations is estimated by the reported p-value.

Question: When looking at the potential modifications to countermeasures to improve safety outcomes for CAV, are you also investigating the impact of these modifications on conventional vehicles and road users? This may be important given that CAVs are likely to coexist with conventional vehicles for the foreseeable future.

In our discussions and recommendations, we focused mostly on modifications that could be applied to infrastructure, but vehicle modifications were not off the table. For example, we discussed how widely available cell signals could be leveraged to accelerate a state of broad V2V and V2I connectivity.

Question: Do we really expect people to allow their CAVs to obey the speed limits? People do not obey speed limits themselves. If their automated vehicle is going too slow, I think people will kick it out of automated mode and take over.

The scenario you describe (and many others) was part of our discussions with the panel to provide an assessment of how the presence of various CAV technologies in the mixed fleet would impact the safety performance of the facilities and the countermeasures.

Question: My current vehicle has lane-sensing technology. The cameras that read the pavement markings fail in winter weather conditions and often in rainy conditions. How will any of this ever be addressed without putting high costs on the vehicles? No additional width of pavement markings will help with that.

Technology is ever-changing. Improvements in machine vision will likely be made by the time Level 4 and Level 5 automation are achieved.

Question: For connected vehicle research, are you considering all road types or only freeways?

We assessed each countermeasure in its typical context: for example, rumble strips are applied on rural highways; thus, that was our focus.