CMF Clearinghouse Webinar 2015

Audience Questions with CMF Clearinghouse Team Responses

Some questions have been reworded for clarity.

Q: I am surprised that the standard error is a criterion for study quality. Does this mean that a study that does not find a significant effect cannot be a good study?

The standard error criterion is not focused on the quality of the study overall, but rather the statistical reliability of a CMF produced from that study. The standard error is influenced by the variability of the data as well as the sample size. It could be that a well-constructed study could still produce CMFs with high standard errors (undesireable) because the sample of available data was very small or perhaps the data itself was simply not adequately reliable (highly variable).

Q: Many of the CMFs provide very little data or simply use vague terms for the different descriptive category. Is there any effort to improve this?

In many aspects, we operate very much as a Clearinghouse, in that we report the data we find in the source document. You might be seeing the effect of situations where the author was vague in what he or she reported in the study document. We can't include details about the study or the CMF if such details were not provided by the author.

Q: In the safety performance functions and CMF discussion, how do we handle a situation where we have both a paved and gravel shoulder on one side of the road?

We assume your road of interest has a paved shoulder adjacent to the travelway and then a gravel shoulder beyond that. We also assume that the safety performance function you're using has an accompanying adjustment factor (also called CMF) for shoulder type. The Highway Safety Manual CMFs in the crash prediction models for rural two-lane and rural multilane roads has a shoulder type for "composite". It is defined under HSM Table 10-10 as a shoulder which is 50% paved and 50% turf. While this is not an exact fit to your scenario, it is the closest match and would represent the best estimate for the CMF to use for shoulder type.

Q: Is there a percentage breakdown of study design star quality ratings in the CMF clearinghouse? How many are 1, 2, 3, 4 ,5? Is there any guidance from FHWA or other on when to use and not use certain star rating quality for CMF? Some states are not allowing 3 star rated or below studies within the federally administered HSIP program even if the study and CMF is a great match for what agencies are trying to do.

To your first question, you can actually see for yourself. Run a blank search on the Clearinghouse. When you get to the results, look at the star rating filter area. The numbers in parentheses next to each star rating level will tell you how many CMFs have that rating.

To your second question, neither FHWA nor the Clearinghouse specifies a minimum star rating that should be required, though many states have their own internal practices and policies related to the star rating.

Q: How to combine multiple CMFs affecting same crash type/severity and etc.? Multiplication does not seem always the best method.

If you are applying two countermeasures which are expected to have independent effects, that is, they will address different crash types, it would be reasonable to estimate their combined effect by multiplying. For example, this could be true for an application of shoulder rumble strips (to decrease run off road crashes) and crosswalk enhancements (to decrease pedestrian crashes) on a segment of road. For example, if a countermeasure has a CMF of 0.5 (presumably for "total crashes"), it means that the countermeasure is expected to decrease the total crashes by half. If it is true that two such countermeasures have independent effects, then one countermeasure would reduce the total crashes by half (0.5), and the second countermeasure would further reduce that by half (0.25).

However, in most situations, countermeasures which are applied together at one location are related in terms of which crash type they address. For instance, an agency might apply post-mounted delineators and wider edgelines together at horizontal curves. Both of these countermeasures are intended to improve the delineation of the curve and prevent run off road crashes. In this case, multiplying their CMFs would not be appropriate. If both countermeasures had a CMF of 0.5 for total crashes, then the first countermeasure could be expected to reduce total crashes by half (0.5), but the effectiveness of the second countermeasure would be much more limited, since the first countermeasure has already reduced the type of crash that the second countermeasure is targeting. Thus, conservatively we can use 0.5 as the final CMF, or we can increase it slightly with the assumption that the second countermeasure will still have some effect. A white paper by Gross and Hamidi (http://www.cmfclearinghouse.org/collateral/Combining_Multiple_CMFs_Final.pdf) provides

further details on when it is appropriate to multiply and when it is appropriate to use another method to estimate the combined effect.

Q: Just wondering whether "Publication Date" should be also added to the star rating criteria or not? Based on my data query (2 months ago) there were CMFs from 1974 to 2014 on the CMF Clearinghouse.

That's a great point. Right now we are not undergoing a revision of the star rating criteria, but this is a good item for future consideration.

Q: Can CMF be directly applied to observed crashes?

Yes, you can apply a CMF to a history of observed crashes (e.g., the past 3 to 5 years of crashes) to estimate the annual crashes you would expect to see after installing the countermeasure. However, this method may give you an unreliable estimate, since the past 3 to 5 years may have been unusually high or low. It would be more common for recent crash history to be abnormally high if the site was identified based on high crash numbers. Thus, it is best to some method of crash prediction such as a safety performance function from the Highway Safety Manual or other source to calculate the annual crash value to which you would apply the CMF. This will give you a more reliable estimate of the annual crashes you would expect after installing the countermeasure.

Q: Is there any CMF database specific for pedestrians? Is there any way to retrieve all countermeasures for pedestrians, instead of initiating the search using a specific countermeasure?

The best way to see all pedestrian-related countermeasures contained in the Clearinghouse is to do a blank search (a search using no search term, just clicking on Submit) and then expand the category for pedestrians.

The following are questions that were directed to Michael McNeill following his presentation:

Q (for Michael McNeill, Ohio DOT): How did Ohio DOT decide the cost of a countermeasure?

McNeill: The cost of the countermeasure is filled in by the applicant that is completing the ECAT Tool. This is because sometimes estimates vary for countermeasures depending on other project variables. Additional items like the annual maintenance, energy costs and salvage value are also entered in conjunction with the service life to understand the entire Benefit/Cost.

Q (for Michael McNeill, Ohio DOT):   Why doesn't ODOT use the Economic Appraisal Tool of Safety Analyst for economic analyses rather than using the GCAT/ECAT tool?

McNeill: ODOT created the ECAT Tool using Part C of the HSM, which is more geared toward site specific analysis (i.e. lane widths/shoulder widths, etc). The economic appraisal tool of Safety Analyst uses Part B of the HSM and does not use the same countermeasures as included in Part C.

Q (for Michael McNeill, Ohio DOT): Does Ohio account for future changes in traffic volume in comuting the B/C ratios in the ECAT tool? If so, is traffic growth/reduction assumed to be linear?

McNeill: Yes. In the project information tab it asks for present ADT and future ADT along with the years. An annual linear growth is then calculated based on the values that are entered.

Traffic Volume Growth Rate Calculation			
	Year	AADT	
Present ADT (PADT)	2016	19,050	veh / day
Future ADT (FADT)	2036	32,330	veh / day
Annual Linear Growth Rate		0.03	

Q (for Michael McNeill, Ohio DOT): IS ECAT a spreadsheet that additional CMFs can be added to?

McNeill: Yes, additional CMFs can be added to the spreadsheet within the CMF tab. They would just be placed at the bottom below the other CMFs.