NCUTCD Proposal for Changes to the Manual on Uniform Traffic Control Devices

TECHNICAL COMMITTEE: Regulatory/Warning Signs Technical Committee
ITEM NUMBER: 17A.RW.04
TOPIC: Section 2C.13, Truck Rollover Signs
ORIGIN OF REQUEST: Gerard Gerhard letters of June 23, 2014 and November 2, 2015

TASK FORCE: Dan Paddick (Chair), Tom Heydel, Andy Ramish, Erin Kissner, Herman Hill, Jason Kennedy, Doug Bartlett, Bruce Ibarguen, Jim Pline, Rober Weber, Paul Carlson

AFFECTED SECTIONS OF MUTCD: Section 2C.13 Truck Rollover Signs, Section 1A.11, Figure 2C.12

DEVELOPMENT HISTORY: Task Force: 4-26-16, revised 1-5-17, revised 6-7-17, revised 6-28-17
- Approved by Technical Committee: 01/05/2017
- Approved by Technical Committee following sponsor comments: 06/28/2017
- Approved by NCUTCD Council: 06/30/2017

This is a proposal for recommended changes to the MUTCD that has been approved by the NCUTCD Council. This proposal does not represent a revision of the MUTCD and does not constitute official MUTCD standards, guidance, or options. It will be submitted to FHWA for consideration for inclusion in a future MUTCD revision. The MUTCD can be revised only through the federal rulemaking process.

SUMMARY

On June 23, 2014, Mr. Gerard Gerhard of Lexington, Kentucky wrote to the Director of Office of Transportation Operations of the Federal Highway Administration (FHWA). The letter had 22 numbered sections recommending changes to the Manual on Uniform Traffic Control Devices (MUTCD). He followed this up with a November 2, 2015 letter to Mr. William Lambert, Chair of the Regulatory and Warning Sign Technical Committee (RWSTC) of the National Committee on Uniform Traffic Control Devices (NCUTCD). This letter contained two more comments recommending changes.

The FHWA had transmitted the original letter to the NCUTCD for consideration. The NCUTCD assigned the overview of these letters to the RWSTC because the majority of the issues related to Regulatory and Warning Signs.
DISCUSSION

In Comment 18, Mr. Gerhard writes:

“As of this writing, Paragraph 01 of Section 2C.13 of the 2009 MUTCD provides, regarding the Truck Rollover Warning Sign (W1-13):

Option:

01 A Truck Rollover Warning (W1-13) sign (see figure 2C-1) may be used to warn drivers of vehicles with a high center of gravity, such as trucks, tankers, and recreational vehicles, of a curve or turn where geometric conditions might contribute to a loss of control and a rollover as determined by an engineering study.

Where a truck rollover hazard exists, why should national policy indicate that a warning of such hazard “may” (rather than “shall”) be used? Why should warning of a truck rollover hazard be an “Option”? Further, requiring an “engineering study” in every case as a condition precedent to application of truck rollover warning signage might unnecessarily delay placement of warning signage to the detriment of the safety of highway users. An engineer exercising reasonable engineering judgment should, in many, if not most instances, be able to discern the existence of a truck rollover hazard without the need of an engineering study. In many if not most instances, the existence of a truck rollover hazard is obvious.

Accordingly, I recommend the following changes to Section 2C.13 of the 2009 MUTCD:

SECTION 2C.13, TRUCK ROLLOVER WARNING SIGN (W1-13), SHOULD BE AMENDED AS FOLLOWS:

Delete “Option,” Paragraph 01 of Section 2C.13 (2009 MUTCD). Provide new “Standard” as follows:

1 Truck Rollover Warning signs (W1-13) shall be used to warn drivers of vehicles with a high center of gravity, such as trucks, tankers, and recreational vehicles, of a curve, loop, or turn, where geometric conditions might contribute to a loss of control and a rollover or roadway departure, as determined by direct observation based upon engineering judgment, crash history at the location, or an engineering study.

2 A Truck Rollover sign (W1-13) shall be placed in advance of the hazard area, and immediately prior to the entry to the roll-over hazard area. Such signs shall be accompanied by an Advisory Speed plaque (W13-1P) indicating the recommended speed for vehicles with a higher center of gravity.

Provide new “Option” as follows:
A Truck Rollover sign (W1-13) may be placed prior to the advance warning placement, and, if used, shall be accompanied by a plaque indicating the distance to the hazard area.

Truck Rollover signs may be displayed as a static sign, as a static sign supplemented by flashing warning beacons, or as a changeable message sign activated by the detection of an approaching vehicle with a high center of gravity.

Provide new “Support” as follows:

1. Where an engineering study is deemed necessary to determine that truck rollover signage is appropriate, established engineering practices for determining truck rollover potential of a horizontal curve include:
   A. An accelerometer that provides a direct determination of side friction factors
   B. A design speed equation
   C. A traditional ball-bank indicator using 10 degrees of ball-bank

2. The curved arrow on the Truck Rollover Warning sign shows the direction of roadway curvature. The truck tips in the opposite direction.

Make other changes to Section 2C.13 to conform with the above recommended text.

(End of Quote)

Mr. Gerhard suggests a number of changes to this Section. Taking them in order, the first is that Mr. Gerhard takes exception with the existing wording of the section that makes the use of the sign an option. He believes that the use of this sign should be required whenever a truck rollover hazard might exist. Couple of questions here:

- Should we approach this issue as an “Option”. Shouldn’t we be saying that the sign “Shall” or “Should” be used when there is a documented history of truck rollover accidents. We could then say that it might also be used when the roadway conditions indicate that a truck rollover hazard might exist. The consensus of RWSTC was that the sign remain as an Option.
- Do we have any indication or research that indicates which specific conditions or set of conditions contribute to or indicate that a truck rollover hazard exists?
- In the absence of specific research or a strong consensus on these conditions, it is probably best to take a “general” approach. If we have a pattern of truck rollover accidents we “should” or “shall” use the sign. If we don’t have a pattern of accidents, but the conditions are such that engineering judgment indicates that there is the potential for a truck rollover problem, then we may use the sign. The consensus of RWSTC was that the sign remain as an Option and that any attempt to quantify an accident related criteria be avoided.

Mr. Gerhard’s second point is that he does not believe than an engineering study is always needed. Engineering judgment should be sufficient. He believes that “In many, if not most instances, the existence of a truck rollover hazard is obvious.”
He has a point considering the lack of quantitative values contained in the listing of engineering practices in paragraph 02. What values or combination of factors indicate that a truck rollover problem may exist? Is there any quantitative research relating these rollovers to geometric factors. The only research they we have found is related to driver response to proposed signs. A research report entitled “Methodologies for Determination of Advisory Speeds” was cited during RWSTC discussions. A portion of this report addresses the truck rollover problem.

His third point relates to the placement of the sign. The first sentence of the second paragraph of his newly proposed standard (line 84) states that the sign “shall be placed in advance of the hazard area, and immediately prior to the entry to the roll-over hazard area.” The placement of the sign, like all warning signs is covered by Section 2C.05 and Table 2C-4. The phrase that he proposes is basically redundant with Section 2C.05 and Table 2C-4. For consistency and uniformity, if we use this statement in this Section for this sign, we should probably include it in the workup of every sign. It is not more important to use it for this sign than any other sign.

His fourth point is proposing a new “Option” statement (line 90) allowing the use of an advance Truck Rollover sign that shall be accompanied by a plaque indicating the distance to the hazard area. He has included a “Standard” within the “Option” statement. If used, this statement will have to be split into an “Option” statement and a “Standard” statement.

There are situations where it is appropriate to use more than one sign approaching a roadway condition. The W7-4 Truck Escape Ramp sign is one that also relates to trucks. Due to the seriousness of these rollovers and the difference between truck operational characteristics and those of most vehicles, this is probably one situation where we should allow the optional use of an additional advance warning sign. This “Optional” sign should include a plaque with the recommended speed, a plaque indicating the distance to the hazard and if appropriate, a plaque that the hazard is at a ramp.

His fifth point is a revision of the two “Support” statements into a single “Support” statement with two paragraphs. The change to the first paragraph is an adjustment to account for allowing engineering judgment being used instead of an engineering study.

**RECOMMENDATION:**

The RWSTC has a number of recommendations.

1. The consensus of RWSTC was that the sign remain as an Option and that any attempt to quantify an accident related criteria be avoided.
2. Modify the “Option” in paragraph 01 to be based on engineering judgment.
3. Add an “Option” statement allowing the use of a second Truck Rollover sign well in advance of the potential rollover location to allow more time for truck drivers to adjust to the situation. Supplement this “Option” statement with a “Standard” statement requiring the sign be supplemented with either a distance plaque and an advisory speed plaque or by a RAMP plaque and an advisory speed plaque. Add a RAMP plaque to Figure 2C-12.
4. RECOMMENDED MUTCD CHANGES

The following present the proposed changes to the current MUTCD within the context of the current MUTCD language. Proposed additions to the MUTCD are shown in blue underline and proposed deletions from the MUTCD are shown in red strikethrough. Changes previously approved by NCUTCD Council (but not yet adopted by FHWA) are shown in green double underline for additions and green double strikethrough for deletions. In some cases, background comments may be provided with the MUTCD text. These comments are indicated by [highlighted light blue in brackets].

Section 2C.13 Truck Rollover Warning Sign (W1-13)
Option: 01 A Truck Rollover Warning (W1-13) sign (see Figure 2C-1) may be used to warn drivers of vehicles with a high center of gravity, such as trucks, tankers, and recreational vehicles, of a curve or turn where geometric conditions might contribute to a loss of control and a rollover as determined by an engineering study judgment.

Support: 02 Among the established engineering practices that are appropriate for the determination of the truck rollover potential of a horizontal curve are the following:
A. An accelerometer that provides a direct determination of side friction factors
B. A design speed equation
C. A traditional ball-bank indicator using 10 degrees of ball-bank

Standard: 03 If a Truck Rollover Warning (W1-13) sign is used, it shall be accompanied by an Advisory Speed (W13-1P) plaque indicating the recommended speed for vehicles with a higher center of gravity.
Option: 04 The Truck Rollover Warning sign may be displayed as a static sign, as a static sign supplemented by a flashing warning beacon, or as a changeable message sign activated by the detection of an approaching vehicle with a high center of gravity that is traveling in excess of the recommended speed for the condition.
04a An additional Truck Rollover sign may be placed in advance of the initial Truck Rollover sign.

Guidance: 04b The location of the additional Truck Rollover sign should be determined by engineering judgment.
Standard 04a If an additional Truck Rollover sign is used, it shall be accompanied by an advisory speed plaque and either by a distance plaque or a RAMP plaque.

Support: 05 The curved arrow on the Truck Rollover Warning sign shows the direction of roadway curvature. The truck tips in the opposite direction.
Add: **RAMP**