



National Committee on Uniform Traffic Control Devices

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Attachment No. 4

Item No.: 17A.RW.04

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,
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**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.

32 **DISCUSSION**

33

34 In Comment 18, Mr. Gerhard writes:

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

37 Option:

38 01 A Truck Rollover Warning (W1-13) sign (see figure 2C-1) may be used to warn
39 drivers of vehicles with a high center of gravity, such as trucks, tankers, and recreational
40 vehicles, of a curve or turn where geometric conditions might contribute to a loss of
41 control and a rollover as determined by an engineering study.

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

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

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

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

57 ***1 Truck Rollover Warning signs (W1-13) shall be used to warn drivers of***
58 ***vehicles with a high center of gravity, such as trucks, tankers, and***
59 ***recreational vehicles, of a curve, loop, or turn, where geometric conditions***
60 ***might contribute to a loss of control and a rollover or roadway departure,***
61 ***as determined by direct observation based upon engineering judgment,***
62 ***crash history at the location, or an engineering study.***

63 ***2 A Truck Rollover sign (W1-13) shall be placed in advance of the hazard***
64 ***area, and immediately prior to the entry to the roll- over hazard area. Such***
65 ***signs shall be accompanied by an Advisory Speed plaque (W13-1P)***
66 ***indicating the recommended speed for vehicles with a higher center of***
67 ***gravity.***

68 ***Provide new “Option” as follows:***

69 **3 A Truck Rollover sign (W1-13) may be placed prior to the advance**
70 **warning placement, and, if used, shall be accompanied by a plaque**
71 **indicating the distance to the hazard area.**

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

76 **Provide new "Support" as follows:**

- 77 **1 Where an engineering study is deemed necessary to determine that**
78 **truck rollover signage is appropriate, established engineering practices**
79 **for determining truck rollover potential of a horizontal curve include:**
80 **A. An accelerometer that provides a direct determination of side friction**
81 **factors**
82 **B. A design speed equation**
83 **C. A traditional ball-bank indicator using 10 degrees of ball-bank**
84 **2 The curved arrow on the Truck Rollover Warning sign shows the**
85 **direction of roadway curvature. The truck tips in the opposite direction.**

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

88 (End of Quote)

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

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

105 Mr. Gerhard's second point is that he does not believe than an engineering study is always
106 needed. Engineering judgment should be sufficient. He believes that "In many, if not most
107 instances, the existence of a truck rollover hazard is obvious."

108 He has a point considering the lack of quantitative values contained in the listing of
109 engineering practices in paragraph 02. What values or combination of factors indicate that a
110 truck rollover problem may exist? Is there any quantitative research relating these rollovers to
111 geometric factors. The only research they we have found is related to driver response to
112 proposed signs. A research report entitled “Methodologies for Determination of Advisory
113 Speeds”_was cited during RWSTC discussions. A portion of this report addresses the truck
114 rollover problem.

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

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

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

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

136 **RECOMMENDATION:**

137 The RWSTC has a number of recommendations.

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

146

147 4. RECOMMENDED MUTCD CHANGES

148

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

156

157 Section 2C.13 Truck Rollover ~~Warning~~ Sign (W1-13)

158 Option:

159 01 A Truck Rollover ~~Warning~~ (W1-13) sign (see Figure 2C-1) may be used to warn drivers of
160 vehicles with a high center of gravity, such as trucks, tankers, and recreational vehicles, of a
161 curve or turn where geometric conditions might contribute to a loss of control and a rollover as
162 determined by ~~an~~ engineering ~~study~~ judgment.

163 Support:

164 02 Among the established engineering practices that are appropriate for the determination of the
165 truck rollover potential of a horizontal curve are the following:

166 A. An accelerometer that provides a direct determination of side friction factors

167 B. A design speed equation

168 C. A traditional ball-bank indicator using 10 degrees of ball-bank

169 **Standard:**

170 03 **If a Truck Rollover ~~Warning~~ (W1-13) sign is used, it shall be accompanied by an**
171 **Advisory Speed (W13-1P) plaque indicating the recommended speed for vehicles with a**
172 **higher center of gravity.**

173 Option:

174 04 The Truck Rollover ~~Warning~~ sign may be displayed as a static sign, as a static sign
175 supplemented by a flashing warning beacon, or as a changeable message sign activated by the
176 detection of an approaching vehicle with a high center of gravity that is traveling in excess of the
177 recommended speed for the condition.

178 04a An additional Truck Rollover sign may be placed in advance of the initial Truck Rollover
179 sign.

180 Guidance:

181 04b The location of the additional Truck Rollover sign should be determined by engineering
182 judgment.

183 Standard

184 04a If an additional Truck Rollover sign is used, it shall be accompanied by an advisory
185 speed plaque and either by a distance plaque or a RAMP plaque.

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187 Support:

188 05 The curved arrow on the Truck Rollover ~~Warning~~ sign shows the direction of roadway
189 curvature. The truck tips in the opposite direction.

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Figure 2C-12

Add:



C: NCUTCD/June 2017, 17A.RW.04 Truck Rollover Signs, Section 2C.13 approved by Council 6-30-17