

**ATTACHMENT NO. 8**

**RW No. 7, January 19, 2011**

**TECHNICAL COMMITTEE:** Regulatory & Warning Signs following sponsor comments

**TOPIC:** Speed Differential for Horizontal Alignment Sign Selection, Table 2C-5

**STATUS/DATE OF ACTION:**

**TC Drafts:** 03/05/2010, 03/18/2010

**TC Approval:** 06/30/2010

**Transmitted to Sponsors:** 10/28/2010

**TC Approval date following sponsor comments:** 1-19-11

**Council Approval:** 01-20-11

**ORIGIN OF REQUEST:** James Pline

**AFFECTED SECTIONS OF MUTCD:** Section 2C.07 (02)

**SUMMARY:**

The NCUTCD recommended that Standard Statement read as follows;

**In advance of horizontal curves on freeways, on expressways, and on roadways with more than 1,000 AADT that are functionally classified as arterial or collectors, horizontal alignment warning signs shall be used in accordance with Table 2C-5 based on the speed differential between the roadway's posted or statutory speed limit and the horizontal curve's advisory speed.**

And the Standard Statement appeared this way in the Notice of Proposed Rulemaking.

The Final rule was modified by FHWA to add the following as shown in red;

**“speed differential between the roadway's posted or statutory speed limit or 85<sup>th</sup> percentile speed, whichever is higher, or the prevailing speed on the approach to the curve, and the horizontal curve's advisory speed.**

This addition to the Standard was based on the comments of the following agencies;

Mendocino County, CA (Stephen Ford)

1758-1: Agrees with revision, with modification

Page 672, Line 5: As written, the standard in Section 2C.06 would result in the excessive signing of curves and turns because speed reductions are referenced to the posted or statutory speed limit. Neither of these should be factors in determining the need for such signing. At a horizontal curve, the critical differential is between the prevailing approach speed and the advisory speed. In California, and presumably most

47 other states, the default speed limit on an unposted road is the statutory maximum; in  
48 our case, 55 MPH for a two lane road. On a curvilinear road, it is quite probable that  
49 most, or even all, curves will have prevailing approach speeds well below 55 MPH.

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51 City of Fort Collins, CO (Joe Olson)  
52 1768-14: Agrees with revision, with modification

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54 Page 672, Line 5: In the standard change "roadway's posted or statutory speed limit" to  
55 "roadway's posted or statutory speed limit or 85<sup>th</sup> percentile speed whichever is higher"  
56 to be consistent with other sections (Section 3B.10 for example) and because  
57 consideration of the actual prevailing speeds on a road is critical to ensuring a safe  
58 roadway. Highway agencies will sometimes post speed limits near horizontal curves at  
59 or near the advisory speed of the curve (due to fear of liability?) and then not post  
60 horizontal alignment signs or an appropriate advisory speed. This is counterproductive  
61 to safety. Clarification that the actual prevailing speeds should be used when  
62 determining the need for horizontal alignment signs would help ensure the proper  
63 signage and advisory speeds are placed thereby enhancing safety.

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65 The Final Rulemaking, Federal Register, Vol. 74, No. 240, 12/16/2009, Item 116, had  
66 the following comments relative to this addition to the Standard Statement;

67 A State DOT and four local DOT's supported the overall intent of the proposed  
68 new section and associated table, but felt that FHWA should modify the language to  
69 allow the use of engineering judgment rather than require the use of Table 2C-5 and  
70 should clarify that actual prevailing speeds should be used when determining the need  
71 for horizontal alignment warning signs. (*Review of the comments found only two local*  
72 *agencies*). To address some of the concerns, the FHWA revises the STANDARD  
73 statement in this final rule to clarify that alignment warning signs shall be used in  
74 accordance with Table 2C-5 based on the speed differential between the roadway's  
75 posted or statutory speed limit or 85<sup>th</sup> percentile speed, whichever is higher, and the  
76 horizontal curve's advisory speed. This change is consistent with the methodology on  
77 application of posted or statutory speed limit or 85<sup>th</sup> percentile speed is consistent with  
78 FHWA's "Program Memorandum on Consideration and Implementation of Proven  
79 Safety Countermeasures, Measure #7, Yellow Change Intervals." As part of this  
80 change, the FHWA also includes in the STANDARD statement the use of the prevailing  
81 speed in determining the speed differential to the horizontal curve's advisory speed  
82 along with posted and statutory speed and 85<sup>th</sup> percentile speed. (*No basis is provided*  
83 *for adding prevailing speed*).

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85 **RESEARCH:**

86 The research for advisory speed signing to arrive at the new MUTCD provisions  
87 reviewed studies that addressed curve approach speeds, vehicle speed on curves, and  
88 methods to determine an appropriate curve advisory speed. There was some research  
89 on the use of curve 85<sup>th</sup> percentile speed as a consideration for advisory speeds. It was  
90 the considered expertise of the RWSTC members and NCUTCD that the appropriate  
91 approach was to proceed with the 2009 MUTCD provisions, however, there was never

92 any intention to define speed differential as the difference between the 85<sup>th</sup> percentile or  
93 prevailing speed and the advisory speed of the curve..

## 94 **DISCUSSION**

95 This revision of the STANDARD statement in the final rulemaking causes a  
96 number of problems as follows;  
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- 100 1. The revision of the **STANDARD** statement in the final rulemaking was made without  
101 any opportunity for comment and input from the NCUTCD, Sponsors or other parties  
102 and is substantially different than the Advance Rulemaking.
- 103 2. The expansion of the definition of speed differential was based on comments by two  
104 local jurisdictions, one City and one County, generally concerned with posted or  
105 statutory speed limits that are not representative of the roadway speeds that could  
106 cause a higher speed differential and increased requirements for signing.  
107 Appropriate speed determinations in accordance with Section 2B.13 would resolve  
108 this concern. Also, their concerns with inappropriate speed limits can be addressed  
109 in their engineering study for the advisory speed determinations if the problem is that  
110 much of an issue.
- 111 3. Prevailing speed is not defined in the MUTCD and is not an accurately defined  
112 engineering speed statistic that can be determined and remain the same through  
113 repeated speed studies. It is a very subjective term and could be classified as any  
114 speed that may be observed on the approach to the curve.
- 115 4. In reading the STANDARD statement, “whichever is higher” pertains to posted, or  
116 statutory or 85<sup>th</sup> percentile speed. This has already raised the question of installing  
117 curve signing and advisory speeds above the posted speed limited on the FHWA  
118 Webpage, MUTCD Discussion area. The posted or statutory speeds are a legally  
119 documented value that is easily determined for the advisory speed studies. The 85  
120 percentile speed is an accurate speed statistic readily determined through speed  
121 studies but is only representative of the speed characteristics at the time of the  
122 studies and can vary dependent on traffic characteristics, season, and weather. This  
123 provision could force the agencies to obtain speed studies as part of the advisory  
124 speed studies just to protect the agency from liability. It makes the jurisdiction  
125 subject to lawsuits based on speed studies after a crash, changes in speed  
126 characteristics or speed studies subsequent to advisory speed determinations.
- 127 5. The selection of the FHWA Memorandum on Yellow Change Intervals as a basis for  
128 supporting the addition of the 85<sup>th</sup> percentile in the STANDARD was not a good  
129 choice for several reasons. The FHWA Safety Countermeasure Memorandum is a  
130 Guidance document compared to the MUTCD mandatory provisions. The FHWA  
131 Memo is based on ITE Proposed Recommended Practice that has been in the  
132 development stage for 20 years unable to attain acceptance as a Recommended  
133 Practice in the profession and therefore, remains as an informational document. And  
134 finally, the FHWA Memo states, “If approach speed is not known, the posted speed  
135 may be used.” This does not appear to be adequate supporting documentation to  
136 use 85<sup>th</sup> percentile speed as an alternative to posted or statutory speeds for the  
137 determination of differential speed.

- 138 6. The argument that posted or statutory speed limits may be too high or too low  
139 creating an unreasonable speed differential should not impose a correction factor in  
140 these advisory speed determinations when the correction should be compliance with  
141 MUTCD Section 2B.13.Speed Limit signing. The development of MUTCD provisions  
142 has to assume compliance with other requirements in the MUTCD to provide  
143 consistency and to establish any credibility for MUTCD provisions.
- 144 7. A word search of the 2009 MUTCD finds that the term “prevailing speed” is only  
145 used in this one Section of the MUTCD as part of a mandatory STANDARD  
146 STATEMENT. The term is also used at two other locations in the MUTCD as part of  
147 Guidance statements for Preferential Lane Word and Symbol Markings, Section  
148 3D.01 and Bike Lane Signs and Plaques, Section 9B.04 in the context of using  
149 engineering judgment that considers prevailing speed for device placement as  
150 carryover text from the 2003 MUTCD. The use of “prevailing speed” in a  
151 STANDARD statement is an unprecedented provision in the MUTCD where  
152 nebulous criteria and undefined terms are used for the application of mandatory  
153 requirements.
- 154 8. A word search of the 2009 MUTCD identified 39 locations where “85<sup>th</sup> percentile  
155 speed” appeared in the document. The term appeared six times in STANDARD  
156 statements as follows;
- 157 a. Page 21, Definitions
  - 158 b. Page 37, Issue to be considered in sign spacing.
  - 159 c. Page 110, The issue herewith to define “differential speed”.
  - 160 d. Page 352, No Passing Zones, Used as “85<sup>th</sup> percentile or posted or  
161 statutory” but excludes “whichever is higher”.
  - 162 e. Page 531 and 577, Defining when minimum sign sizes may be  
163 considered.

164 The other 33 uses are guidance, option, support and footnotes in Figures that do  
165 not impose a mandatory requirement. The closest similar usage is for the “No  
166 Passing Zones” on page 352. This usage with “posted or statutory speeds” for  
167 the determination of speed differential is not in general usage and represents  
168 movement towards engineering practices that do not have confidence in speed  
169 zoning procedures that are also part of the same engineering field of practice.

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- 171 9. Section 2C.08 (06) Advisory Speed Plaques requires as a Standard, “**The**  
172 **advisory speed shall be determined by an engineering study that follows**  
173 **established engineering practice.**” Neither “prevailing speed” nor “85<sup>th</sup>  
174 percentile speed” are mentioned or addressed in the established engineering  
175 practice for determining advisory speed. Therefore, the addition of either of these  
176 terms to the determination of advisory speeds is arbitrary, not in conformance  
177 with engineering practice and not in compliance with Section 2C.08 MUTCD.
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184 **RECOMMENDED MUTCD PROVISIONS/ REVISIONS**

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186 **Delete the following MUTCD provisions as lined through in red;**

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188 **Section 2C.06 Horizontal Alignment Warning Signs, page 110**

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190 **Standard:**

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**VOTE: RWSTC For: Unanimous**

**Approved**

**VOTE: COUNCIL For: 36**

**Opposed: 0**

**Abstentions: 1**

**approved January 2011**

**C: ncutcd\january 2011\RW # 7 agenda item IV.7 speed differential 1-19-11, 1-20-11 approved by council**