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 85th 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
other states, the default speed limit on an unposted road is the statutory maximum; in
our case, 55 MPH for a two lane road. On a curvilinear road, it is quite probable that
most, or even all, curves will have prevailing approach speeds well below 55 MPH.

City of Fort Collins, CO (Joe Olson)

1768-14: Agrees with revision, with modification

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

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

A State DOT and four local DOT’s supported the overall intent of the proposed
new section and associated table, but felt that FHWA should modify the language to
allow the use of engineering judgment rather than require the use of Table 2C-5 and
should clarify that actual prevailing speeds should be used when determining the need
for horizontal alignment warning signs. (Review of the comments found only two local
agencies). To address some of the concerns, the FHWA revises the STANDARD
statement in this final rule to clarify that 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 or 85th percentile speed, whichever is higher, and the
horizontal curve’s advisory speed. This change is consistent with the methodology on
application of posted or statutory speed limit or 85th percentile speed is consistent with
FHWA’s “Program Memorandum on Consideration and Implementation of Proven
Safety Countermeasures, Measure #7, Yellow Change Intervals.” As part of this
change, the FHWA also includes in the STANDARD statement the use of the prevailing
speed in determining the speed differential to the horizontal curve’s advisory speed
along with posted and statutory speed and 85th percentile speed. (No basis is provided
for adding prevailing speed).

RESEARCH:
The research for advisory speed signing to arrive at the new MUTCD provisions
reviewed studies that addressed curve approach speeds, vehicle speed on curves, and
methods to determine an appropriate curve advisory speed. There was some research
on the use of curve 85th percentile speed as a consideration for advisory speeds. It was
the considered expertise of the RWSTC members and NCUTCD that the appropriate
approach was to proceed with the 2009 MUTCD provisions, however, there was never
any intention to define speed differential as the difference between the 85th percentile or prevailing speed and the advisory speed of the curve.

**DISCUSSION**

This revision of the STANDARD statement in the final rulemaking causes a number of problems as follows;

1. The revision of the STANDARD statement in the final rulemaking was made without any opportunity for comment and input from the NCUTCD, Sponsors or other parties and is substantially different than the Advance Rulemaking.

2. The expansion of the definition of speed differential was based on comments by two local jurisdictions, one City and one County, generally concerned with posted or statutory speed limits that are not representative of the roadway speeds that could cause a higher speed differential and increased requirements for signing. Appropriate speed determinations in accordance with Section 2B.13 would resolve this concern. Also, their concerns with inappropriate speed limits can be addressed in their engineering study for the advisory speed determinations if the problem is that much of an issue.

3. Prevailing speed is not defined in the MUTCD and is not an accurately defined engineering speed statistic that can be determined and remain the same through repeated speed studies. It is a very subjective term and could be classified as any speed that may be observed on the approach to the curve.

4. In reading the STANDARD statement, “whichever is higher” pertains to posted, or statutory or 85th percentile speed. This has already raised the question of installing curve signing and advisory speeds above the posted speed limited on the FHWA Webpage, MUTCD Discussion area. The posted or statutory speeds are a legally documented value that is easily determined for the advisory speed studies. The 85 percentile speed is an accurate speed statistic readily determined through speed studies but is only representative of the speed characteristics at the time of the studies and can vary dependent on traffic characteristics, season, and weather. This provision could force the agencies to obtain speed studies as part of the advisory speed studies just to protect the agency from liability. It makes the jurisdiction subject to lawsuits based on speed studies after a crash, changes in speed characteristics or speed studies subsequent to advisory speed determinations.

5. The selection of the FHWA Memorandum on Yellow Change Intervals as a basis for supporting the addition of the 85th percentile in the STANDARD was not a good choice for several reasons. The FHWA Safety Countermeasure Memorandum is a Guidance document compared to the MUTCD mandatory provisions. The FHWA Memo is based on ITE Proposed Recommended Practice that has been in the development stage for 20 years unable to attain acceptance as a Recommended Practice in the profession and therefore, remains as an informational document. And finally, the FHWA Memo states, “If approach speed is not known, the posted speed may be used.” This does not appear to be adequate supporting documentation to use 85th percentile speed as an alternative to posted or statutory speeds for the determination of differential speed.
6. The argument that posted or statutory speed limits may be too high or too low creating an unreasonable speed differential should not impose a correction factor in these advisory speed determinations when the correction should be compliance with MUTCD Section 2B.13.Speed Limit signing. The development of MUTCD provisions has to assume compliance with other requirements in the MUTCD to provide consistency and to establish any credibility for MUTCD provisions.

7. A word search of the 2009 MUTCD finds that the term “prevailing speed” is only used in this one Section of the MUTCD as part of a mandatory STANDARD STATEMENT. The term is also used at two other locations in the MUTCD as part of Guidance statements for Preferential Lane Word and Symbol Markings, Section 3D.01 and Bike Lane Signs and Plaques, Section 9B.04 in the context of using engineering judgment that considers prevailing speed for device placement as carryover text from the 2003 MUTCD. The use of “prevailing speed” in a STANDARD statement is an unprecedented provision in the MUTCD where nebulous criteria and undefined terms are used for the application of mandatory requirements.

8. A word search of the 2009 MUTCD identified 39 locations where “85th percentile speed” appeared in the document. The term appeared six times in STANDARD statements as follows;

   a. Page 21, Definitions
   b. Page 37, Issue to be considered in sign spacing.
   c. Page 110, The issue herewith to define “differential speed”.
   d. Page 352, No Passing Zones, Used as “85th percentile or posted or statutory” but excludes “whichever is higher”.
   e. Page 531 and 577, Defining when minimum sign sizes may be considered.

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

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

184 Delete the following MUTCD provisions as lined through in red;

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

190 Standard:
191 In advance of horizontal curves on freeways, on expressways, and on roadways with
192 more than 1,000 AADT that are functionally classified as arterials or collectors, horizontal
193 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 or 85th-percentile speed,
whichever is higher, or the prevailing speed on the approach to the curve, and the
196 horizontal curve’s advisory speed.

198 VOTE: RWSTC  For: Unanimous
199 Approved

202 VOTE: COUNCIL  For: 36
203 Opposed: 0
204 Abstentions: 1
205 approved January 2011

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