

study or on engineering judgment. The FHWA received one comment from the NCUTCD suggesting that this statement was redundant. The FHWA agrees with this comment because traffic engineers consider the need for additional warning signs for curves or turns using engineering judgment or studies as part of common practice. The FHWA withdraws this proposal, and deletes this GUIDANCE from this final rule.

The FHWA adds an OPTION statement at the end of the section that provides a method that may be used to determine the need for additional speed reduction warning signs. The FHWA includes these optional criteria for determining the need for additional recommended speed reduction signs to mitigate the high number of run-off-the-road crashes along curves and ramps. Similar to their comments in Section 2C.36 Advisory Exit, Ramp, and Curve Speed Signs (W13-2, W13-3, W13-5), the NCUTCD Regulatory and Warning Sign Technical Committee, Caltrans and the City of Kennewick, Washington, suggested deleting this statement as well as other statements in this section referring to the Curve Speed sign. Those opposed cited their disagreement with the whole concept of the Curve Speed sign and the lack of criteria for its use. The FHWA believes this is a helpful sign to remind drivers of the advisory speed that should be added for optional use. Most curves are very well outlined with delineators or chevron signs. However, because crashes are still occurring, the FHWA believes that this sign could be used to advantage to remind drivers of the recommended reduction in speed as they proceed along the curve or ramp. The FHWA includes this statement, as well as other references to the Curve Speed sign in this final rule.

Additionally, the FHWA adds metric information to Table 2C-5 to show the metric speed value of less than or equal to 50 km/h along with the English unit of less than or equal to 30 mph and shows the metric speed value of greater than 50 km/h along with the English unit of greater than 30 mph. The metric values were inadvertently omitted from the 2000 MUTCD.

60. In Section 2C.07 Combination Horizontal Alignment/Advisory Speed Signs (W1-1a, W1-2a) (titled "Combination Horizontal Alignment/Advisory Speed Sign (W1-9)" in the 2000 MUTCD), the NPA included several proposed revisions to this section and the addition of Figure 2C-2 to provide for enhanced uniformity of application of these types of signs and improved safety on curves and turns. While there were two comments from

the City of Tucson, Arizona, and a private citizen in support of the changes, several commenters from the NCUTCD, the Washington and Wisconsin DOTs, and the Product and Highway Safety Institute expressed concern.

The NCUTCD Regulatory and Warning Sign Technical Committee recommended deleting this section and the associated sign images on Figure 2C-1 because of a lack of consensus in the profession on the proper application of these signs. The NCUTCD offered to review applications and develop a recommendation for future consideration. As a result of the comments received, the FHWA withdraws these proposed revisions and Figure 2C-2. However, in order to distinguish between the combination curve signs, the FHWA retains the revised sign codes of W1-1a and W1-2a instead of W1-9. The FHWA also rennumbers subsequent figures (as numbered in the NPA). After the NCUTCD has reviewed existing applications of this type of signing (which exist in only a few States) and makes further recommendations on application and placement issues, the FHWA may consider changes to this section in a future rulemaking.

61. In Section 2C.10 Chevron Alignment Sign (W1-8), the FHWA adds to the STANDARD statement that a border shall not be used on the Chevron Alignment sign. This change corrects an error in the 2000 MUTCD. The FHWA adopts this change.

The FHWA received one comment from the NCUTCD suggesting that the second OPTION statement be revised to state that multiple Chevron Alignment signs may be used on the far side of a T-intersection to inform drivers of a change of horizontal alignment. The FHWA disagrees because a Two-Direction Large Arrow sign (W1-7) may be used instead. Chevron signs should be limited to use for curves only. Changes to this statement may be appropriate for a future rulemaking.

62. The FHWA adds a new section numbered and titled, "Section 2C.11 Truck Rollover Warning Signs (W1-13)." This section was numbered Section 2C.54 in the NPA. This new section includes OPTION and STANDARD statements on the use of the Truck Rollover warning sign to warn drivers of vehicles with a high center of gravity of a curve or turn having geometric conditions that are prone to cause such vehicles to lose control and overturn. This new section provides for uniform design and application of signs for this purpose, using the Pennsylvania sign design that research found to be

most effective in warning truckers of the condition.<sup>15</sup> The FHWA received four comments from the NCUTCD, ATSSA, the City of Tucson, Arizona, and a private citizen in support of this change, and four comments from the Oregon and Wisconsin DOTs and a private citizen suggesting that the sign design be revised for clarity. As a result, the FHWA adds a SUPPORT statement clarifying that the curved arrow on the sign shows the direction of the roadway curvature, and that the truck tips in the opposite direction. In the NPA, the FHWA proposed two versions of the sign. Several commenters from State DOTs opposed the W1-13a Combination sign, stating that there was too much information on the sign for the motorist to understand. Based on these comments, the FHWA removes the W1-13a Combination sign from this final rule. The FHWA establishes a phase-in target compliance date of 10 years from the effective date of this final rule for existing signs in good condition to minimize any impact on State or local governments.

63. In Section 2C.12 Hill Signs (W7-1, W7-1a, W7-1b) (numbered Section 2C.11 in the NPA), the FHWA adds to the GUIDANCE statement to clarify that on longer grades, the Hill sign with distance (W7-3a) plaque or the combination distance/grade (W7-3b) plaque at periodic intervals of approximately 1.6 km (1 mi) spacing should be considered. This change clarifies that the plaques should not be used alone but should supplement the Hill sign. The FHWA received one comment from the City of Tucson, Arizona, in support of this change, and adopts this change.

64. In Section 2C.13 Truck Escape Ramp Signs (W7-4 Series) (numbered Section 2C.12 in the NPA), the FHWA adds to the STANDARD statement to indicate that at least one of the W7-4 series warning signs shall be used when truck escape ramps are installed. This change clarifies that additional warning signs may be used as conditions warrant. The FHWA received one comment from the City of Tucson, Arizona, in support of this change, and adopts this change. The FHWA also adds an illustration of the regulatory RUNAWAY VEHICLES ONLY (R4-10) sign on Figure 2B-8 (numbered Figure 2B-6 in the NPA) in this final rule.

<sup>15</sup> "Ramp Signing for Trucks," by the Center for Applied Research, Inc., December 20, 1989, a research project conducted for the Federal Highway Administration (FHWA) under contract number DTFH61-88-C-00048, is available from FHWA Turner-Fairbank Highway Research Center, 6300 Georgetown Pike, McLean, Virginia 22101, Web site <http://www.tfhrc.gov>.