



National Committee on Uniform Traffic Control Devices

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ATTACHMENT NO. 3
Item No.: 16B-RW-02

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

TECHNICAL COMMITTEE: Regulatory & Warning Signs
ITEM NUMBER: 16B-RW-02
TOPIC: In-Street Pedestrian Signs Gateway Installation
ORIGIN OF REQUEST: RW Task Force: Tom Heydel (chair), Joanne Conrad, Randy McCourt, Ross Oyen.
Michigan FHWA Request to Experiment Study- Ron Van Houten and Mark Bott
AFFECTED SECTIONS OF MUTCD: Sections 2B.12

DEVELOPMENT HISTORY: task force: 4-23-16, revised 4-24-16, revised 4-26-16, revised following sponsor comments 12-17-16, revised 12-27-16, updated 1-2-17

- Approved by Technical Committee: 06/08/2016
- Approved by RWSTC Technical committee following sponsor comments: 01/04/2017
- Approved by NCUTCD Council: 01/06/2017

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:

Section 2B.12, In-Street and Overhead Pedestrian Crossing Signs (R1-6, R1-6a, R1-9 and R1-9a) are permitted in the roadway at the crosswalk location on the centerline, on a lane line, or on a median island. Placement of the sign in the gutter pan commonly was done with a portable application of the R1-5 with a heavy rubber base, allowing space for drainage between the base and the curb.

Michigan DOT requested experimental approval in 2014 in accordance with Section 1A.10 of the MUTCD to evaluate the installation technique of installing the R1-6 sign in the bottom of the curb which sometimes is referred to as the gutter pan (in some parts of the country) and also another trial of installing the sign on the curb top using the same 4 foot maximum height above the permanent surface to top of sign as shown in Section 2B.12 (paragraph 13). FHWA

31 approved the request to experiment on May 22, 2014 by letter from Mark R. Kehrli, Director,
32 Office of Transportation Operations, FHWA. Dr. Ron Van Houten, Western Michigan
33 University carried out study in 2015. Application of the R1-6 or R1-6a in this manner provides a
34 gateway impression to the driver and has resulted in reduced speeds approaching the crossing.
35 The curb top installation is also very useful in northern climates where snow removal does not
36 allow for installing the in-street pedestrian sign during the winter months. By allowing both the
37 top of curb and median installation allows for leaving the in-street pedestrian sign in the
38 “gateway” configuration over the winter months.
39 A 6 month status report was presented to RWSTC in January 2016 for consideration to revise the
40 MUTCD language to allow for the gutter pan installation or top of curb mounted application for
41 the R1-6 or R1-6a signs.

42
43 **DISCUSSION**

44 Evaluation of the R1-6 Signs as a Gateway Treatment to Improve Yielding to Pedestrians is
45 recapped by the Ron Van Houten report. Below is an excerpt from their 6 month status report in
46 December 2015.

47
48 Introduction:

49 One of the goals of the MDOT research project is to determine a robust method of installing the
50 Gateway R1-6 crosswalk installation that can survive over time with minimum maintenance
51 effort. One way to improve the survival of the signs used to develop the edge of the Gateway is
52 to place these signs in the gutter pan. However, this can lead to drainage issues, can impede
53 sweeping the roadway and can be an obstacle for bicyclist. Placement on the top of the curb
54 would overcome these potential problems.

55 Figure 1 shows a gateway location in the City of San Antonio, TX. As can be seen the Gateway
56 was not complete because there was a drain in the gutter pan area. A curb top placement at this
57 location would have the best solution.



58
59 **Figure 1. An incomplete gateway that resulted from a combination of narrow lane width**
60 **and drainage issues.**

61
62 We have evaluated the R1-6 sign at one of the original research locations, Rose St. at Academy
63 in Kalamazoo. The results obtained at this site are presented in Table 1. Placement of a gateway

64 with edge side R1-6 signs placed on the curb top is associated with 72% of drivers yielding to
 65 pedestrians vs. 79% yielding with gateway configuration with edge signs in the gutter pan. The
 66 baseline yielding prior to addition of signs was only 7% at this site. This small difference in
 67 yielding between curb top and gutter pan placement is offset by sign survival and maintenance
 68 issues. This result was repeated replicated at this site and is significant at the .01 confidence
 69 level. This site was not selected for permanent installation because of planned construction at
 70 this to the roadway. Three new locations were selected in the City of Ann Arbor. Data have
 71 been collected in Ann Arbor and are shown in Table 1. These data show that on average edge
 72 signs improve yielding behavior to 70-90%+ and that curb top placement is only 10% less
 73 effective than gutter pan placement but far superior to the baseline condition. A Gateway that
 74 does not include an edge sign (sign in middle only) produces yielding at the 50% to 60% levels.
 75 Figure 2 shows a photo with curb top placement at Huron. In all cases we used the city post on
 76 the lane line.



77
 78 Figure 2. The Gateway condition at Huron with the signs placed on top of the curbs.
 79

80 Figures 3, 4 and 5 shows the average percent of drivers yielding during each measurement
 81 session (20 crossings) at each crosswalk. These data show that yielding behavior was relatively
 82 consistent at each site and that results did not vary when gutter pan placement was first treatment
 83 or curb top placement condition was introduced first. The stability of the effect over multiple
 84 replications provides evidence that the differences in driver yielding behavior were a result of the
 85 two different edge sign treatment conditions.

Location	Baseline	Gutter Pan Placement	Curb Top Placement	Gateway with out Edge Signs
Huron Midblock	62	97	92	
Midblock 7 th Street	15	70	54	
Nixon at Bluett	40	93	86	68
Rose at Academy	6	82	72	52
Mean	31	86	76	60

86 **Table 1. The percent of drivers yielding right-of-way to pedestrians during the baseline,**
 87 **gutter pan placement and curb to placement conditions. Gateway without Edge signs just**
 88 **had signs on the yellow line or at the refuge island.**

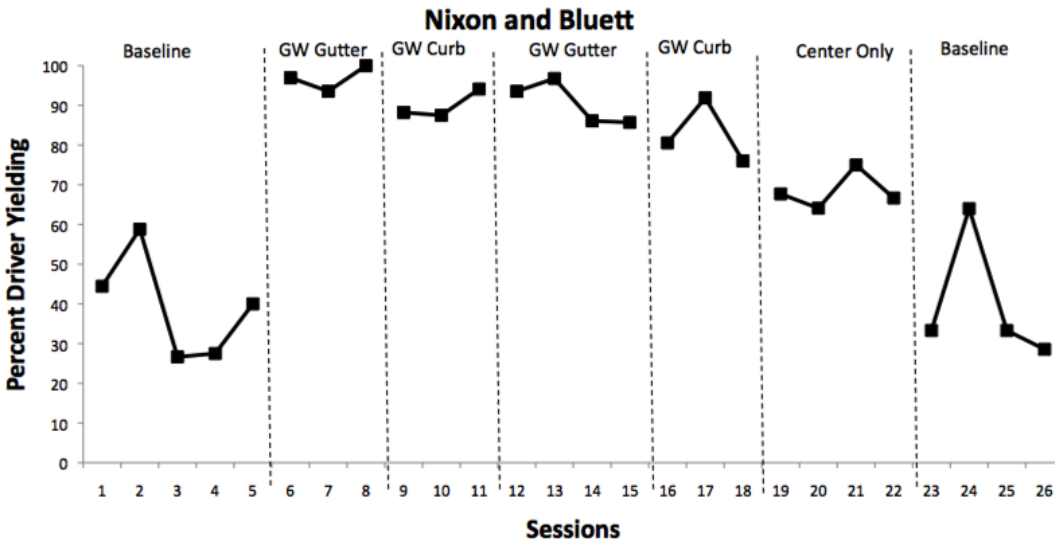
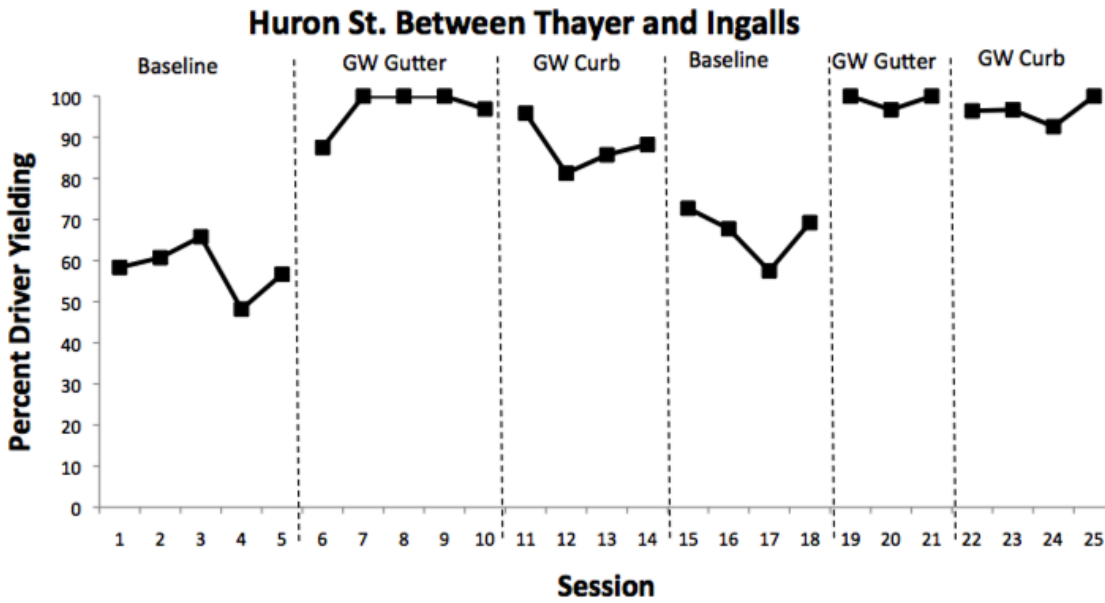


Figure 3.

Percent of drivers yielding right-of-way during each condition of the experiment (note: GW = Gateway)

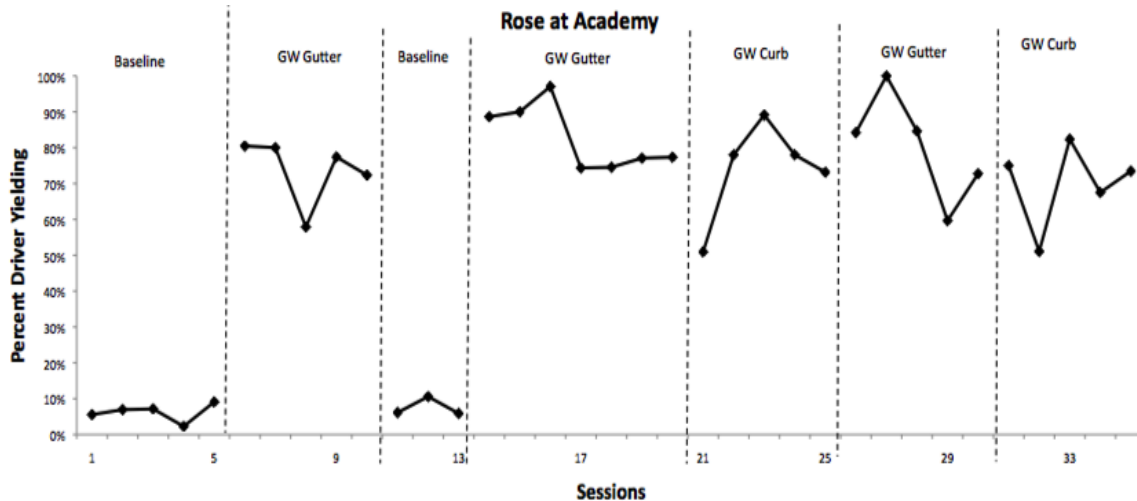
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Figure

4. Percent of drives yielding right-of-way during each condition of the experiment

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95



96 **Figure 5. The percent of drivers yielding right-of-way during condition of the experiment.**

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98
99 Permanent signs were installed in September and were removed for winter operations in
100 November. Data over the first two months show that yielding remains high at each of the Ann
101 Arbor locations. The signs will be reinstalled in the spring of 2016. Preliminary evidence shows
102 that curb top mounted signs have not been struck while some placed in the gutter pan area have
103 been struck.

104
105 **RECOMMENDED MUTCD CHANGES**

106
107 The following present the proposed changes to the current MUTCD within the context of the
108 current MUTCD language. Proposed additions to the MUTCD are shown in blue underline and
109 proposed deletions from the MUTCD are shown in ~~red strikethrough~~. Changes previously
110 approved by NCUTCD Council (but not yet adopted by FHWA) are shown in green double
111 underline for additions and ~~green double strikethrough~~ for deletions. In some cases, background
112 comments may be provided with the MUTCD text. These comments are indicated by
113 highlighted light blue in brackets.

114
115 **PART 2. SIGNS**

116
117 **CHAPTER 2B. REGULATORY SIGNS, BARRICADES, AND GATES**

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119 **Section 2B.12 In-Street and Overhead Pedestrian Crossing Signs (R1-6, R1-6a, R1-9, and**
120 **R1-9a)**

121 Option:

122 01 The In-Street Pedestrian Crossing (R1-6 or R1-6a) sign (see Figure 2B-2) or the Overhead
123 Pedestrian Crossing (R1-9 or R1-9a) sign (see Figure 2B-2) may be used to remind road users of
124 laws regarding right-of-way at an unsignalized pedestrian crosswalk. The legend STATE LAW
125 may be displayed at the top of the R1-6, R1-6a, R1-9, and R1-9a signs, if applicable. On the R1-
126 6 and R1-6a signs, the legends STOP or YIELD may be used instead of the appropriate STOP
127 sign or YIELD sign symbol.

128 02 Highway agencies may develop and apply criteria for determining the applicability of In-
129 Street Pedestrian Crossing signs.

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131

132 **Standard:**

133 03 **If used, the In-Street Pedestrian Crossing sign shall be placed at one or more of the**
134 **following locations at or near the crosswalk:**

135 a. In the roadway on the center line

136 b. In the roadway on a lane line

137 c. On a median island

138 d. In either (but not both) the bottom of curb which is level with the roadway or on
139 top of the curb

140

141 ~~in the roadway at the crosswalk location on the center line, on a lane line, or on a median~~
142 ~~island. The In-Street Pedestrian Crossing sign shall not be post-mounted on the left-hand~~
143 ~~or right-hand side of the roadway.~~

144 04 **If used, the Overhead Pedestrian Crossing sign shall be placed over the roadway at the**
145 **crosswalk location.**

146 05 **An In-Street or Overhead Pedestrian Crossing sign shall not be placed in advance of the**
147 **crosswalk to educate road users about the State law prior to reaching the crosswalk, nor**
148 **shall it be installed as an educational display that is not near any crosswalk.**

149 *Guidance:*

150 06 *If an island (see Chapter 3I) is available, the In-Street Pedestrian Crossing sign, if used,*
151 *should be placed on the island.*

152 *Option:*

153 07 *If a Pedestrian Crossing (W11-2) warning sign is used in combination with an In-Street or an*
154 *Overhead Pedestrian Crossing sign, the W11-2 sign with a diagonal downward pointing arrow*
155 *(W16-7P) plaque may be post-mounted on the right-hand side of the roadway at the crosswalk*
156 *location.*

157 07a In-Street Pedestrian Crossing signs may be mounted back to back for median or centerline of
158 an undivided roadway applications.

159 **Standard:**

160 08 **The In-Street Pedestrian Crossing sign and the Overhead Pedestrian Crossing sign shall**
161 **not be used at signalized locations.**

162 09 **The STOP FOR legend shall only be used in States where the State law specifically**
163 **requires that a driver must stop for a pedestrian in a crosswalk.**

164 10 **The In-Street Pedestrian Crossing sign shall have a black legend (except for the red**
165 **STOP or YIELD sign symbols) and border on a white background, surrounded by an outer**
166 **yellow or fluorescent yellow-green background area (see Figure 2B-2). The Overhead**
167 **Pedestrian Crossing sign shall have a black legend and border on a yellow or fluorescent**
168 **yellow-green background at the top of the sign and a black legend and border on a white**
169 **background at the bottom of the sign (see Figure 2B-2).**

170 11 **Unless the In-Street Pedestrian Crossing sign is placed on a physical island, the sign**
171 **support shall be designed to bend over and then bounce back to its normal vertical position**
172 **when struck by a vehicle.**

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175 Support:

176 12 The Provisions of Section 2A.18 concerning mounting height are not applicable for the In-
177 Street Pedestrian Crossing sign. [See Section 2A.21 for sign mounting methods.](#)

178 **Standard:**

179 13 **The top of an In-Street Pedestrian Crossing sign shall be a maximum of 4 feet above the**
180 **pavement surface. The top of an In-Street Pedestrian Crossing sign placed in an island [or](#)**
181 **[on top of a curb](#) shall be a maximum of 4 feet above the island [or top of curb.](#)**

182 Option:

183 14 The In-Street Pedestrian Crossing sign may be used seasonably to prevent damage in winter
184 because of plowing operations, and may be removed at night if the pedestrian activity at night is
185 minimal.

186 15 In-Street Pedestrian Crossing signs, Overhead Pedestrian Crossing signs, and Yield Here To
187 (Stop Here For) Pedestrians signs may be used together at the same crosswalk.

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C:\NCUTCD\June 2016\Heydel\16B-RW-02 in-street pedestrian signs Gateway Treatment APPROVED BY COUNCIL 1-6-17