



National Committee on Uniform Traffic Control Devices

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ATTACHMENT NO. 12

Markings No. 2

TECHNICAL COMMITTEE: Markings
TOPIC: Crosswalk Markings Application Criteria
STATUS: Approved by NCUTCD Council, January 2012
ORIGIN OF REQUEST: Author of Research Criteria
AFFECTED PORTIONS OF MUTCD: Section 3B.18

Summary:

The following explains the basis for the changes in this section:

Line No.	Explanation
52-53 (¶ 13)	<ul style="list-style-type: none"> • Remove the speed criteria as it is moved to a stand-alone criterion.
57-58 (¶ 13)	<ul style="list-style-type: none"> • Speed added as a stand-alone criterion and the speed is changed from 40 to 35 mph.

The 2009 MUTCD added new guidance concerning when new marked crosswalks at uncontrolled intersections should not be installed without other measures to improve pedestrian safety. As currently written, additional measures to just a marked crosswalk at an uncontrolled intersection are only recommended guidance when the speed limit is greater than 40 mph.

Much of the new guidance language adopted in the 2009 MUTCD is based on the FHWA report, "Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations." The 2007 NPA language more closely aligned with the research and covers a larger range of crosswalk locations because a speed limit of greater than 40 miles per hour was not a prerequisite to recommending "other measures" on roadways with four or more lanes. The adopted language in the 2009 MUTCD reduced the application of this guidance by adding the speed limit as a prerequisite to the other determination criterion; this was in response to some comments to the NPA being opposed to supplemental measures being recommended for crosswalks on multi-lane roadways.

The existing language in Paragraph 13 below (Paragraph 9 in the 2009 MUTCD) could be interpreted to exclude all multi-lane streets in urban areas with speed limits of 40 mph or below from needing to consider "other measures" in conjunction with a marked crosswalk. The FHWA report focused on roadways with lower speed limits (93% of the sites had speed limits between 25-35 mph) and found that the number of lanes and volume of traffic had significant impacts on pedestrian crash rates, while the speed limit was not significantly related to pedestrian crash frequency.

The revision to the speed limit value from 40 mph to 35 mph was selected to be consistent with the pedestrian signal warrant. It also considers the survivability of pedestrians when hit (a pedestrian hit at 40 mph has an 85% chance of being killed, at 30 mph the likelihood goes down to 45% while at 20 mph the fatality rate is only 5% - UK DOT, Killing Speed and Saving Lives, London 1987).

The proposed changes to this section provide expanded guidance for the practitioner by recommending that other measures be installed in conjunction with marked crosswalks when (A) the multi-lane roadway without a median has an ADT of 12,000 or greater, (B) the multi-lane roadway with a median has an ADT of 15,000 or greater, or (C) the speed limit exceeds 35 mph.

It should be noted that the base text and figures below for Section 3B.18 include the changes adopted by the NCUTCD general council on June 23, 2011 from a previous ballot item.

Recommendation:

Based on this information, the Markings Technical Committee determined that changes shown in the following pages should be made to Section 3B.18, Crosswalk Markings (version approved by Council in June 2011) to better implement the research findings. The change was approved by the NCUTCD Council at the January 2012 meeting.

Recommended Changes to the MUTCD:

The proposed changes to Section 3B.18 are shown in the following pages. The version presented is the language for Section 3B.18 as approved by the Council at the June 2011 meeting with the proposed additions indicated by blue double underline and the proposed ~~deletions~~ indicated by red double strikethrough.

1 **Section 3B.18 Crosswalk Markings**

2
3 Support:

4 01 Crosswalk markings provide guidance for pedestrians who are crossing roadways by
5 defining and delineating paths on approaches to and within signalized intersections, and on
6 approaches to other intersections where traffic stops.

7 02 In conjunction with signs and other measures, crosswalk markings help to alert road users of
8 a designated pedestrian crossing point across roadways at locations that are not controlled by
9 traffic control signals or STOP or YIELD signs.

10 03 At non-intersection locations, crosswalk markings legally establish the crosswalk.

11
12 **Standard:**

13 04 **Crosswalk markings shall be white. When used, lines shall not be less than 6 inches or
14 greater than 24 inches in width.**

15
16 *Support:*

17 05 *Crosswalk markings are classified as basic or high visibility. Basic crosswalk markings
18 consist of two transverse lines. High visibility markings consist of longitudinal lines parallel to
19 traffic flow with or without transverse lines. Figure 3B-19 presents examples of crosswalk
20 markings.*

21
22 Option:

23
24 06 For added visibility, such as locations where pedestrians cross without any other traffic
25 control device, at locations where physical conditions are such that added visibility of the
26 crosswalk is desired, or at places where a pedestrian crosswalk might not be expected, the area of
27 the crosswalk may be marked with a high visibility crosswalk marking pattern.

28 07 When longitudinal lines are used to mark a crosswalk, the transverse crosswalk lines may be
29 omitted.

30 08 Diagonal lines may be used instead of longitudinal lines as a part of a high visibility
31 crosswalk.

32
33 *Guidance:*

34 09 *If two transverse lines are used to mark a crosswalk, the gap between the lines should not be
35 less than 6 feet. If longitudinal lines are used without transverse lines to mark a crosswalk, the
36 crosswalk should be not less than 6 feet wide.*

37 10 *Transverse crosswalk lines, when used on both sides of the crosswalk, should extend across
38 the full width of pavement or to the edge of the intersecting crosswalk to discourage diagonal
39 walking between crosswalks.*

40 11 *At locations controlled by traffic control signals or on approaches controlled by STOP or
41 YIELD signs, crosswalk markings should be installed where engineering judgment indicates they
42 are needed to direct pedestrians to the proper crossing path(s).*

43 12 *Crosswalk markings should not be used indiscriminately. An engineering study should be
44 performed before a marked crosswalk is installed at a location away from a traffic control signal
45 or an approach controlled by a STOP or YIELD sign. The engineering study should consider the
46 number of lanes, the presence of a median, the distance from adjacent signalized intersections,*

47 *the pedestrian volumes and delays, the average daily traffic (ADT), the posted or statutory speed*
48 *limit or 85th-percentile speed, the geometry of the location, the possible consolidation of multiple*
49 *crossing points, the availability of street lighting, and other appropriate factors.*

50 13 *New marked crosswalks alone, without other measures designed to reduce traffic speeds,*
51 *shorten crossing distances, enhance driver awareness of the crossing, and/or provide active*
52 *warning of pedestrian presence, should not be installed across uncontrolled roadways where any*
53 *of the following conditions exist ~~the speed limit exceeds 40 mph and either:~~*

- 54 *A. The roadway has four or more lanes of travel without a raised median or pedestrian*
55 *refuge island and an ADT of 12,000 vehicles per day or greater; or*
- 56 *B. The roadway has four or more lanes of travel with a raised median or pedestrian refuge*
57 *island and an ADT of 15,000 vehicles per day or greater; or*
- 58 *C. The speed limit exceeds 35 mph.*

59
60 Support:

61 14 Chapter 4F contains information on Pedestrian Hybrid Beacons. Section 4L.03 contains
62 information regarding Warning Beacons to provide active warning of a pedestrian's presence.
63 Section 4N.02 contains information regarding In-Roadway Warning Lights at crosswalks.
64 Chapter 7D contains information regarding school crossing supervision.

65
66 *Guidance:*

67 15 *Because non-intersection pedestrian crossings are generally unexpected by the road user,*
68 *warning signs (see Section 2C.50) and high visibility crosswalk markings (such as shown in*
69 *Figure 3B-19) should be installed for marked crosswalks at non-intersection locations.*

70
71 Option:

72 16 A crosswalk marking consisting of two transverse lines may be used at a non-intersection
73 location based on engineering judgment.

74 17 Added visibility may be provided by parking prohibitions.

75
76 *Guidance:*

77 18 *At a non-intersection uncontrolled pedestrian crossing where the speed limit is greater than*
78 *35 mph, the high visibility crosswalk marking, if used, should not be less than 8 feet wide.*

79
80 Support:

81 19 Section 3B.16 contains information regarding placement of stop line markings near
82 crosswalk markings.

83
84 *Guidance:*

85 20 *If used, the longitudinal lines within the continental or ladder markings should be 12 to 24*
86 *inches wide and separated by gaps of 12 to 60 inches. If used, a bar pair should consist of two 8*
87 *to 12 inch stripes separated by 8 to 12 inches to form a bar pair. Bar pairs should be separated*
88 *by gaps of 24 to 60 inches. The design of the lines and gaps should avoid the wheel paths if*
89 *possible, and the gap between the lines should not exceed 2.5 times the width of the longitudinal*
90 *lines or bar pair.*

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93 Option:

94 21 When an exclusive pedestrian phase that permits diagonal crossing of an intersection is
95 provided at a traffic control signal, a marking as shown in Figure 3B-20 may be used for the
96 crosswalk.

97

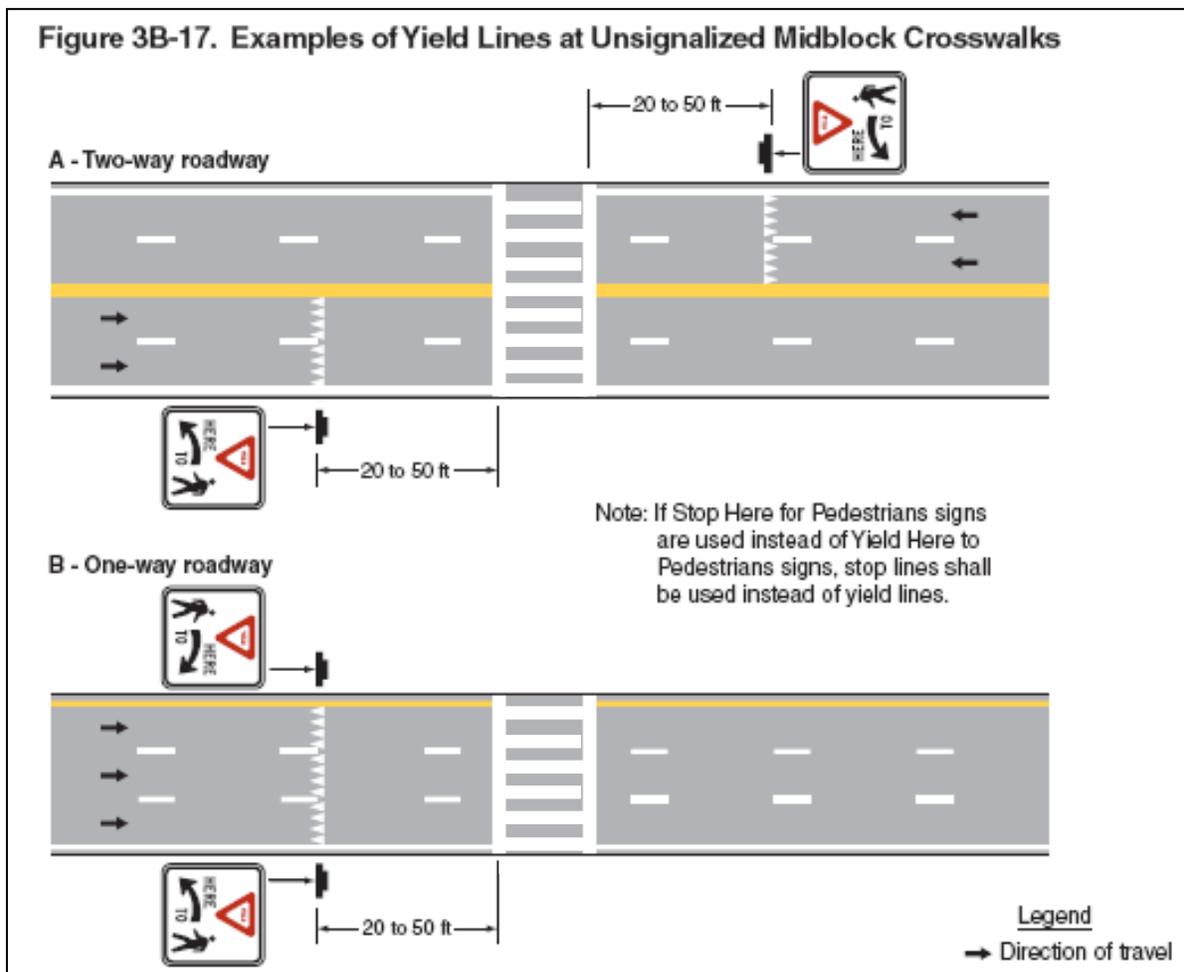
98 *Guidance:*

99 22 *Crosswalk markings should be located so that the curb ramps are within the extension of the*
100 *crosswalk markings.*

101

102 Support:

103 23 Detectable warning surfaces mark boundaries between pedestrian and vehicular ways where
104 there is no raised curb. Detectable warning surfaces are required by 49 CFR, Part 37 and by the
105 Americans with Disabilities Act (ADA) where curb ramps are constructed at the junction of
106 sidewalks and the roadway, for marked and unmarked crosswalks. Detectable warning surfaces
107 contrast visually with adjacent walking surfaces, either light-on-dark, or dark-on-light. The
108 “Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities
109 (ADAAG)” (see Section 1A.11) contains specifications for design and placement of detectable
110 warning surfaces.
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Figure 3B-17. Examples of Yield Lines at Unsignalized Midblock Crosswalks

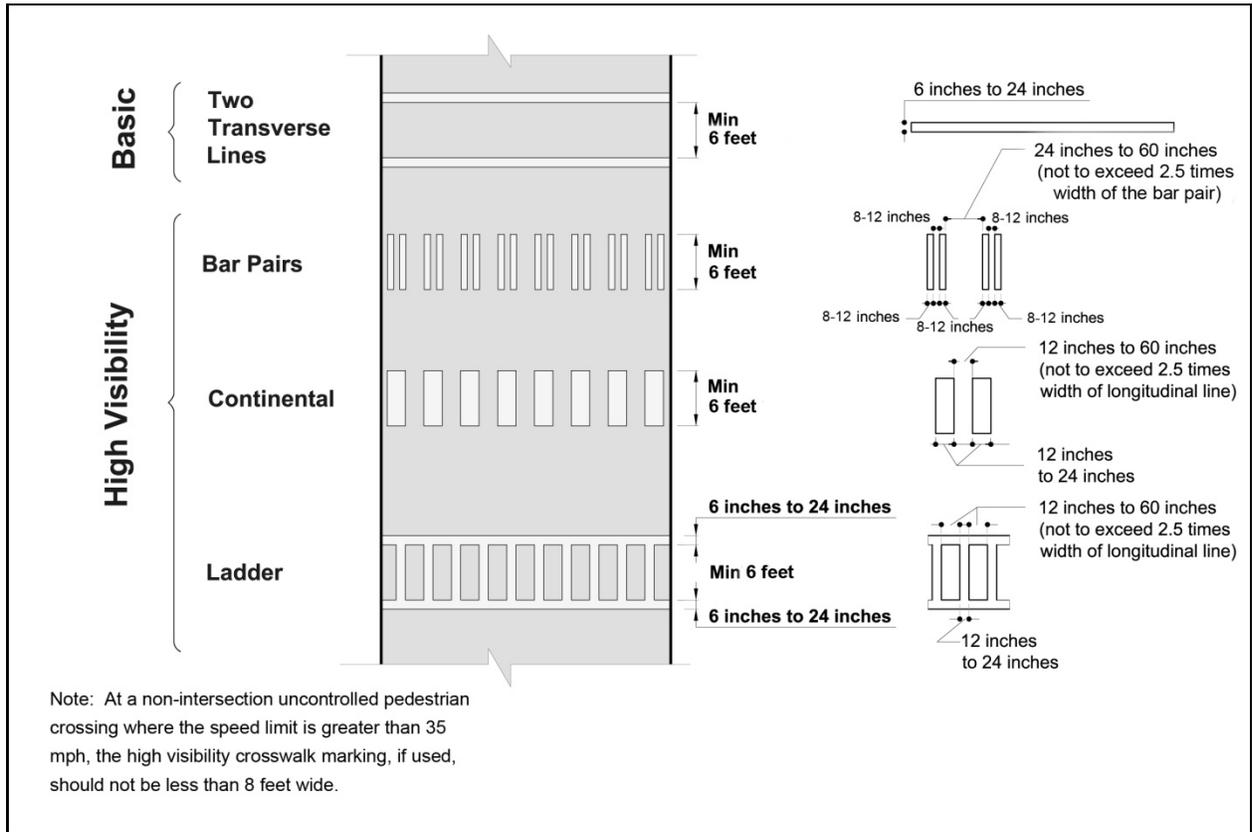


Figure 3B-19. Examples of Crosswalk Markings

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