

**RESCINDED
JANUARY 2024**
This Recommended
Change to the MUTCD
was rescinded by the
NCUTCD Council on
January 12, 2024.



National Committee on Uniform Traffic Control Devices

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**Attachment No. 8
Item No.: 19B-SIG-02**

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NCUTCD Approved Changes to the Manual on Uniform Traffic Control Devices

TECHNICAL COMMITTEE:

Signals Technical Committee

ITEM NUMBER:

19B-SIG-02

TOPIC:

Alternatives to Traffic Control Signals

ORIGIN OF REQUEST:

Signals Technical Committee

AFFECTED SECTIONS OF MUTCD:

Section ~~4B.04~~ 4B.05 Alternatives to Traffic Control Signals
and Section 4C.01 Studies and Factors for Justifying Traffic
Control Signals

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DEVELOPMENT HISTORY

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- Approved by Technical Committee: 06/19/2019
- Approved by NCUTCD Council: 01/10/2020

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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 by the FHWA through the federal rulemaking process.

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SUMMARY

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This proposal would add language to an Option statement with information about roundabouts to Section 4B.05 and add a Guidance statement to Section 4C.01 to emphasize consideration of alternatives to traffic control signals listed in Section 4B.05 before installing a traffic control signal.

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DISCUSSION

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The Signals Technical Committee (STC) explored ways to emphasize the consideration of roundabouts as an alternative to a traffic control signal. Two of the STC task forces worked together to develop proposed additional text for Section 4B.0605 to specifically note that a roundabout is an alternative to a traffic control signal and to add a Guidance statement to 4C.01 to emphasize consideration of alternatives to traffic control signals specified in 4B.05 before installing a traffic control signal.

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RECOMMENDED MUTCD CHANGES

Following present the proposed changes to the current MUTCD within the context of the MUTCD language. Proposed additions to the MUTCD are shown in blue underline and proposed deletions from the MUTCD are shown in ~~red strikethrough~~. Changes previously approved by NCUTCD Council (but not yet adopted by FHWA) are shown in green double underline for additions and ~~green double strikethrough~~ for deletions. In some cases, background comments may be provided with the MUTCD text. These comments are indicated by [black font in brackets highlighted light blue].

PART 4. HIGHWAY TRAFFIC SIGNALS CHAPTER 4B TRAFFIC CONTROL SIGNALS - GENERAL

Section ~~4B.04~~ 4B.05 Alternatives to Traffic Control Signals

Guidance:

01 *Since vehicular delay and the frequency of some types of crashes are sometimes greater under traffic signal control than under STOP sign control, consideration should be given to providing alternatives to traffic control signals even if one or more of the signal warrants has been satisfied.*

Option:

- 02 These alternatives may include, but are not limited to, the following:
 - A. Installing signs along the major street to warn road users approaching the intersection;
 - B. Relocating the stop line(s) and making other changes to improve the sight distance at the intersection;
 - C. Installing measures designed to reduce speeds on the approaches;
 - D. Installing a flashing beacon at the intersection to supplement STOP sign control;
 - E. Installing flashing beacons on warning signs in advance of a STOP sign controlled intersection on major- and/or minor-street approaches;
 - F. Adding one or more lanes on a minor-street approach to reduce the number of vehicles per lane on the approach;
 - G. Revising the geometrics at the intersection to channelize vehicular movements and reduce the time required for a vehicle to complete a movement, which could also assist pedestrians;
 - H. Revising the geometrics at the intersection to add pedestrian median refuge islands and/or curb extensions;
 - I. Installing roadway lighting if a disproportionate number of crashes occur at night;
 - J. Restricting one or more turning movements, perhaps on a time-of-day basis, if alternate routes are available;
 - K. If the warrant is satisfied, installing multi-way STOP sign control;
 - L. Installing a pedestrian hybrid beacon (see Chapter 4F) or In-Roadway Warning Lights (see Chapter 4N) if pedestrian safety is the major concern;
 - M. Installing a roundabout to reduce vehicular conflicts; and
 - N. Employing other alternatives, depending on conditions at the intersection.
- 02a Support: Where installation of a roundabout as an alternative to a traffic control signal is in close proximity to a grade crossing, refer to Section 8C.12 for additional information.

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CHAPTER 4C. TRAFFIC CONTROL SIGNAL NEEDS STUDIES

4C.01 Studies and Factors for Justifying Traffic Control Signals

Standard:

80 01 Except for temporary traffic control signals (see Section 4D.10), before a traffic control
81 signal is installed at a particular location, an engineering study of traffic conditions,
82 pedestrian characteristics, and physical characteristics of the location shall be performed
83 and placed in the agency's files. The engineering study shall clearly indicate the reason(s)
84 that a traffic control signal was determined whether installation of a traffic control
85 signal is to be justified at a particular the location.

86 02 The investigation of the need for a traffic control signal shall include an analysis of
87 factors related to the existing operation and safety at the study location and the potential to
88 improve these conditions, and the applicable factors contained in the following traffic
89 signal warrants:

90 Warrant 1, Eight-Hour Vehicular Volume

91 Warrant 2, Four-Hour Vehicular Volume

92 Warrant 3, Peak Hour

93 Warrant 4, Pedestrian Volume

94 Warrant 5, School Crossing

95 Warrant 6, Coordinated Signal System

96 Warrant 7, Crash Experience

97 Warrant 8, Roadway Network

98 Warrant 9, Intersection Near a Grade Crossing

99 03 The satisfaction of a traffic signal warrant or warrants shall not in itself require the
100 installation of a traffic control signal.

101 Support:

102 04 Sections 8C.09 and 8C.10 contain information regarding the use of traffic control signals
103 instead of gates and/or flashing-light signals at highway-rail grade crossings and highway-light
104 rail transit grade crossings, respectively.

105 *Guidance:*

106 04a When considering the installation of a traffic control signal, alternatives to traffic control
107 signals, including those listed in Section 4B.05, should also be considered.

108 05 A traffic control signal should not be installed unless one or more of the factors described in
109 this Chapter are met.

110 06 A traffic control signal should not be installed unless an engineering study indicates that
111 installing a traffic control signal will improve the overall safety and/or operation of the
112 intersection.

113 07 A traffic control signal should not be installed if it will seriously disrupt progressive traffic
114 flow.

115 08 The study should consider the effects of the right-turn vehicles from the minor-street
116 approaches. Engineering judgment should be used to determine what, if any, portion of the
117 right-turn traffic is subtracted from the minor-street traffic count when evaluating the count
118 against the signal warrants listed in Paragraph 2.

119 09 Engineering judgment should also be used in applying various traffic signal warrants to
120 cases where approaches consist of one lane plus one left-turn or right-turn lane. The site-
121 specific traffic characteristics should dictate whether an approach is considered as one lane or

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126 *approach. The approach should be considered two lanes if approximately half of the traffic on*
127 *the approach turns left and the left-turn lane is of sufficient length to accommodate all left-turn*
128 *vehicles.*

129 10 *Similar engineering judgment and rationale should be applied to a street approach with one*
130 *through/left-turn lane plus a right-turn lane. In this case, the degree of conflict of minor-street*
131 *right-turn traffic with traffic on the major street should be considered. Thus, right-turn traffic*
132 *should not be included in the minor-street volume if the movement enters the major street with*
133 *minimal conflict. The approach should be evaluated as a one-lane approach with only the traffic*
134 *volume in the through/left-turn lane considered.*

135 11 *At a location that is under development or construction and where it is not possible to obtain*
136 *a traffic count that would represent future traffic conditions, hourly volumes should be estimated*
137 *as part of an engineering study for comparison with traffic signal warrants. Except for locations*
138 *where the engineering study uses the satisfaction of Warrant 8 to justify a signal, a traffic*
139 *control signal installed under projected conditions should have an engineering study done within*
140 *1 year of putting the signal into stop-and-go operation to determine if the signal is justified. If*
141 *not justified, the signal should be taken out of stop-and-go operation or removed.*

142 Option:

143 12 *For signal warrant analysis, a location with a wide median, even if the median width is*
144 *greater than 30 feet, ~~should~~ may be ~~considered~~ analyzed as one intersection or as two*
145 *intersections based on engineering judgment.*

146 Option:

147 13 *At an intersection with a high volume of left-turn traffic from the major street, the signal*
148 *warrant analysis may be performed in a manner that considers the higher of the major-street left-*
149 *turn volumes as the “minor-street” volume and the corresponding single direction of opposing*
150 *traffic on the major street as the “major-street” volume.*

151 14 *For signal warrants requiring conditions to be present for a certain number of hours in order*
152 *to be satisfied, any four ~~sequential~~ consecutive 15-minute periods may be considered as 1 hour if*
153 *the separate 1-hour periods used in the warrant analysis do not overlap each other and both the*
154 *major-street volume and the minor-street volume are for the same specific one-hour periods.*

155 15 *For signal warrant analysis, bicyclists may be counted as either vehicles or pedestrians.*

156 Support:

157 16 *When performing a signal warrant analysis, bicyclists riding in the street with other vehicular*
158 *traffic are usually counted as vehicles and bicyclists who are clearly using pedestrian facilities*
159 *are usually counted as pedestrians.*

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Engineering study data may include the following:

The number of vehicles entering the intersection in each hour from each approach during 12 hours of an average day. It is desirable that the hours selected contain the greatest percentage of the 24-hour traffic volume.

- B. Vehicular volumes for each traffic movement from each approach, classified by vehicle type (heavy trucks, passenger cars and light trucks, public-transit vehicles, and, in some locations, bicycles), during each 15-minute period of the 2 hours in the morning and 2 hours in the afternoon during which total traffic entering the intersection is greatest.
- C. Pedestrian volume counts on each crosswalk during the same periods as the vehicular counts in Item B and during hours of highest pedestrian volume. Where young, elderly, and/or persons with physical or visual disabilities need special consideration, the pedestrians and their crossing times may be classified by general observation.
- D. Information about nearby facilities and activity centers that serve the young, elderly, and/or persons with disabilities, including requests from persons with disabilities for accessible crossing improvements at the location under study. These persons might not be adequately reflected in the pedestrian volume count if the absence of a signal restrains their mobility.
- E. The posted or statutory speed limit or the 85th-percentile speed on the uncontrolled approaches to the location.
- F. A condition diagram showing details of the physical layout, including such features as intersection geometrics, channelization, grades, sight-distance restrictions, transit stops and routes, parking conditions, pavement markings, roadway lighting, driveways, nearby railroad crossings, distance to nearest traffic control signals, utility poles and fixtures, and adjacent land use.
- G. A collision diagram showing crash experience by type, location, direction of movement, severity, weather, time of day, date, and day of week for at least 1 year.

18 The following data, which are desirable for a more precise understanding of the operation of the intersection, may be obtained during the periods described in Item B of Paragraph 17:

- A. Vehicle-hours of stopped time delay determined separately for each approach.
- B. The number and distribution of acceptable gaps in vehicular traffic on the major street for entrance from the minor street.
- C. The posted or statutory speed limit or the 85th-percentile speed on controlled approaches at a point near to the intersection but unaffected by the control.
- D. Pedestrian delay time for at least two 30-minute peak pedestrian delay periods of an average weekday or like periods of a Saturday or Sunday.
- E. Queue length on stop-controlled approaches.