

NORTH DAKOTA LOCAL GOVERNMENT ROADS SIGNING REFERENCE

(As extracted from MUTCD 2009 with revisions dated May 2012)



Produced collaboratively by NDLTAP and SDLTAP in cooperation with North Dakota and South Dakota Departments of Transportation and FHWA North Dakota and South Dakota Divisions

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2012 Edition

ND LOCAL GOVERNMENT ROADS SIGNING REFERENCE MANUAL

FORWARD

This publication is being provided as a service to North Dakota rural local government agencies. It was developed to assist in handling basic signing situations with updated information from the 2009 Manual on Uniform Traffic Control Devices (MUTCD) as adopted by the North Dakota Department of Transportation (NDDOT).

This publication is made up primarily of excerpts taken from sections or parts of the Manual on Uniform Traffic Control Devices, 2009 Edition, (MUTCD 2009), which establishes minimum standards for signing on all streets and highways in the United States. Any reference to “Manual” in this publication is referring to the MUTCD 2009 including revisions 1 and 2 dated May 2012, unless otherwise noted. The information in this publication is not intended to be all inclusive of information from the MUTCD but rather is intended to provide information for basic, simple signing decisions only. It is recommended that additional reference be made to the actual MUTCD or from professionals knowledgeable in this field if the situation is not clear or appears complicated. Also included in this publication is a section titled Part 5– Traffic Control Devices for Low-Volume Roads of the MUTCD which applies to roads with less than 400 ADT (pages 114-133 in this publication). A copy of the entire MUTCD 2009 can be found on the internet at http://mutcd.fhwa.dot.gov/pdfs/2009/pdf_index.

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INTRODUCTION

ADOPTION OF 2009 MANUAL OF TRAFFIC CONTROL DEVICES IN NORTH DAKOTA

North Dakota law provides for the adoption of the MUTCD as stated below:

NDCC 39-13-06. Authority to adopt manual on uniform traffic-control devices. The director shall adopt a manual and specifications for a uniform system of traffic-control devices consistent with the provisions of law, for use upon all highways and streets in this state. Such uniform system must correlate with and so far as possible conform to the system set forth in the most recent edition of the manual promulgated as a national standard by the federal highway administrator.

The North Dakota Department of Transportation has adopted the 2009 MUTCD with supplemental language that corresponds with FHWA's May, 2012, revisions 1 and 2.

The Standard, Guidance, Option, and Support material described in this edition of the MUTCD provide the transportation professional with the information needed to make appropriate decisions regarding the use of traffic control devices on streets, highways, bikeways, and private roads open to public travel (see definition in Section 1A.13).

Throughout this Manual the headings Standard, Guidance, Option, and Support are used to classify the nature of the text that follows. Figures and tables, including the notes contained therein, supplement the text and might constitute a Standard, Guidance, Option, or Support. The user needs to refer to the appropriate text to classify the nature of the figure, table, or note contained therein.

Standard:

When used in this Manual, the text headings of Standard, Guidance, Option, and Support shall be as defined in Paragraph 1 of Section 1A.13.

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Support:

Throughout this Manual all dimensions and distances are provided in English units.

(NOTE: When reference is made to “Manual” in this document, it refers to the Federal Manual on Uniform Traffic Control Devices [MUTCD].)

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CHAPTER 1A. GENERAL

Section 1A.01 Purpose of Traffic Control Devices

Support:

The purpose of traffic control devices, as well as the principals for their use, is to promote highway safety and efficiency by providing for the orderly movement of all road users on streets, highways, bikeways, and private roads open to public travel throughout the Nation.

Traffic control devices notify road users of regulations and provide warning and guidance needed for the uniform and efficient operation of all elements of the traffic stream in a manner intended to minimize the occurrences of crashes.

Standard:

Traffic control devices or their supports shall not bear any advertising message or any other message that is not related to traffic control.

Support:

Tourist-oriented directional signs and Specific Service signs are not considered advertising; rather, they are classified as motorist service signs.

Section 1A.02 Principles of Traffic Control Devices

Support:

This Manual contains the basic principles that govern the design and use of traffic control devices for all streets, highways, bikeways, and private roads open to public travel (see definition in Section 1A.13) regardless of type or class or the public agency, official, or owner having jurisdiction. This Manual's text specifies the restriction on the use of a device if it is intended for limited application or for a specific system. It is important that these principles be given primary consideration in the selection and application of each device.

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Guidance:

To be effective, a traffic control device should meet five basic requirements:

- A. Fulfill a need;*
- B. Command attention;*
- C. Convey a clear, simple meaning;*
- D. Command respect from road users; and*
- E. Give adequate time for proper response.*

Design, placement, operation, maintenance, and uniformity are aspects that should be carefully considered in order to maximize the ability of a traffic control device to meet the five requirements listed in the previous paragraph. Vehicle speed should be carefully considered as an element that governs the design, operation, placement, and location of various traffic control devices.

Support:

The definition of the word “speed” varies depending on its use. The definitions of specific speed terms are contained in Section 1A.13.

Guidance:

The actions required of road users to obey regulatory devices should be specified by State statute, or in cases not covered by State statute, by local ordinance or resolution. Such statutes, ordinances, and resolutions should be consistent with the “Uniform Vehicle Code” (see Section 1A.11).

The proper use of traffic control devices should provide the reasonable and prudent road user with the information necessary to efficiently and lawfully use the streets, highways, pedestrian facilities, and bikeways.

Support:

Uniformity of the meaning of traffic control devices is vital to their effectiveness. The meanings ascribed to devices in this Manual are in general accord with the publications mentioned in Section 1A.11.

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Section 1A.03 Design of Traffic Control Devices

Guidance:

Devices should be designed so that features such as size, shape, color, composition, lighting or retroreflection, and contrast are combined to draw attention to the devices; that size, shape, color, and simplicity of message combine to produce a clear meaning; that legibility and size combine with placement to permit adequate time for response; and that uniformity, size, legibility, and reasonableness of the message combine to command respect.

Aspects of a device's standard design should be modified only if there is a demonstrated need.

Support:

An example of modifying a device's design would be to modify the Combination Horizontal Alignment/Intersection (W1-10) sign to show intersecting side roads on both sides rather than on just one side of the major road within the curve.

Option:

With the exception of symbols and colors, minor modifications in the specific design elements of a device may be made provided the essential appearance characteristics are preserved.

Section 1A.04 Placement and Operation of Traffic Control Devices

Guidance:

Placement of a traffic control device should be within the road user's view so that adequate visibility is provided. To aid in conveying the proper meaning, the traffic control device should be appropriately positioned with respect to the location, object, or situation to which it applies. The location and legibility of the traffic control device should be such that a road user has adequate time to make the proper response in both day and night conditions.

Traffic control devices should be placed and operated in a uniform and consistent manner.

Unnecessary traffic control devices should be removed. The fact that a device is in good physical condition should not be a basis for deferring needed removal or change.

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Section 1A.05 Maintenance of Traffic Control Devices

Guidance:

Functional maintenance of traffic control devices should be used to determine if certain devices need to be changed to meet current traffic conditions.

Physical maintenance of traffic control devices should be performed to retain the legibility and visibility of the device, and to retain the proper functioning of the device.

Support:

Clean, legible, properly mounted devices in good working condition command the respect of road users.

Section 1A.06 Uniformity of Traffic Control Devices

Support:

Uniformity of devices simplifies the task of the road user because it aids in recognition and understanding, thereby reducing perception/reaction time. Uniformity assists road users, law enforcement officers, and traffic courts by giving everyone the same interpretation. Uniformity assists public highway officials through efficiency in manufacture, installation, maintenance, and administration. Uniformity means treating similar situations in a similar way. The use of uniform traffic control devices does not, in itself, constitute uniformity. A standard device used where it is not appropriate is as objectionable as a non-standard device; in fact, this might be worse, because such misuse might result in disrespect at those locations where the device is needed and appropriate.

Section 1A.07 Responsibility for Traffic Control Devices

Standard:

The responsibility for the design, placement, operation, maintenance, and uniformity of traffic control devices shall rest with the public agency or the official having jurisdiction, or, in the case of private roads open to public travel, with the private owner or private official having jurisdiction. 23 CFR 655.603 adopts the MUTCD as the national standard for all traffic control

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devices installed on any street, highway, bikeway, or private road open to public travel (see definition in Section 1A.13). When a State or other Federal agency manual or supplement is required, that manual or supplement shall be in substantial conformance with the National MUTCD.

23 CFR 655.603 also states that traffic control devices on all streets, highways, bikeways, and private roads open to public travel in each State shall be in substantial conformance with standards issued or endorsed by the Federal Highway Administrator.

Support:

The Introduction of this Manual contains information regarding the meaning of substantial conformance and the applicability of the MUTCD to private roads open to public travel.

All States have officially adopted the National MUTCD either in its entirety, with supplemental provisions, or as a separate published document.

Guidance:

These individual State manuals or supplements should be reviewed for specific provisions relating to that State.

(NOTE: North Dakota has adopted the 2009 MUTCD with supplemental language that corresponds with language included in FHWA revisions 1 and 2 adopted in May, 2012)

Section 1A.08 Authority for Placement of Traffic Control Devices

Standard:

Traffic control devices, advertisements, announcements, and other signs or messages within the highway right-of-way shall be placed only as authorized by a public authority or the official having jurisdiction, or, in the case of private roads open to public travel, by the private owner or private official having jurisdiction, for the purpose of regulating, warning, or guiding traffic.

When the public agency or the official having jurisdiction over a street or highway or, in the case of private roads open to public travel, the private owner or private official

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having jurisdiction, has granted proper authority, others such as contractors and public utility companies shall be permitted to install temporary traffic control devices in temporary traffic control zones. Such traffic control devices shall conform with the Standards of this Manual.

All regulatory traffic control devices shall be supported by laws, ordinances, or regulations.

Support:

Provisions of this Manual are based upon the concept that effective traffic control depends upon both appropriate application of the devices and reasonable enforcement of the regulations.

Although some highway design features, such as curbs, median barriers, guardrails, speed humps or tables, and textured pavement, have a significant impact on traffic operations and safety, they are not considered to be traffic control devices and provisions regarding their design and use are generally not included in this Manual.

Certain types of signs and other devices that do not have any traffic control purpose are sometimes placed within the highway right-of-way by or with the permission of the public agency or the official having jurisdiction over the street or highway. Most of these signs and other devices are not intended for use by road users in general, and their message is only important to individuals who have been instructed in their meanings. These signs and other devices are not considered to be traffic control devices and provisions regarding their design and use are not included in this Manual. Among these signs and other devices are the following:

- A. Devices whose purpose is to assist highway maintenance personnel. Examples include markers to guide snowplow operators, devices that identify culvert and drop inlet locations, and devices that precisely identify highway locations for maintenance or mowing purposes.
- B. Devices whose purpose is to assist fire or law enforcement personnel. Examples include markers that identify fire hydrant locations, signs that identify fire or water district boundaries, speed measurement pavement markings, small indicator lights to assist in enforcement of red light violations, and photo enforcement systems.

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- C. Devices whose purpose is to assist utility company personnel and highway contractors, such as markers that identify underground utility locations.
- D. Signs posting local non-traffic ordinances.
- E. Signs giving civic organization meeting information.

Standard:

Signs and other devices that do not have any traffic control purpose that are placed within the highway right-of-way shall not be located where they will interfere with, or detract from, traffic control devices.

Guidance:

Any unauthorized traffic control device or other sign or message placed on the highway right-of-way by a private organization or individual constitutes a public nuisance and should be removed. All unofficial or non-essential traffic control devices, signs, or messages should be removed.

Section 1A.09 Engineering Study and Engineering Judgment

Support:

Definitions of an engineering study and engineering judgment are contained in Section 1A.13.

Standard:

This Manual describes the application of traffic control devices, but shall not be a legal requirement for their installation.

Guidance:

The decision to use a particular device at a particular location should be made on the basis of either an engineering study or the application of engineering judgment. Thus, while this Manual provides Standards, Guidance, and Options for design and application of traffic control devices, this Manual should not be considered a substitute for engineering judgment. Engineering judgment should be exercised in the selection and application of traffic control devices, as well as in the location and design of the roads and streets that the devices complement. (Revision 1)

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Early in the process of location and design of roads and streets, engineers should coordinate such location and design with the design and placement of the traffic control devices to be used with such roads and streets.

Jurisdictions with responsibility for traffic control that do not have engineers on their staffs should seek engineering assistance from others, such as the State transportation agency, their county, a nearby large city, or a traffic engineering consultant.

Support:

As part of the Federal-aid Program, each State is required to have a Local Technology Assistance Program (LTAP) and to provide technical assistance to local highway agencies. Requisite technical training in the application of the principles of the MUTCD is available from the State's Local Technology Assistance Program for needed engineering guidance and assistance.

(NOTE: NDLTAP

515 ½ East Broadway, Suite 101

Bismarck, North Dakota 58501

www.ndltap.org

701-328-9855)

Section 1A.13 Definitions of Headings, Words, and Phrases in this Manual

Standard:

When used in this Manual, the text headings of Standard, Guidance, Option, and Support shall be defined as follows:

- A. **Standard**—a statement of required, mandatory, or specifically prohibitive practice regarding a traffic control device. All Standard statements are labeled, and the text appears in bold type. The verb “shall” is typically used. The verbs “should” and “may” are not used in Standard statements. Standard statements are sometimes modified by Options.
- B. **Guidance**—a statement of recommended, but not mandatory, practice in typical situations, with deviations allowed if engineering judgment or

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engineering study indicates the deviation to be appropriate. All Guidance statements are labeled, and the text appears in unbold type. The verb “should” is typically used. The verbs “shall” and “may” are not used in Guidance statements. Guidance statements are sometimes modified by Options.

- C. **Option**—a statement of practice that is a permissive condition and carries no requirement or recommendation. Option statements sometime contain allowable modifications to a Standard or Guidance statement. All Option statements are labeled, and the text appears in unbold type. The verb “may” is typically used. The verbs “shall” and “should” are not used in Option statements.
- D. **Support**—an informational statement that does not convey any degree of mandate, recommendation, authorization, prohibition, or enforceable condition. Support statements are labeled, and the text appears in unbold type. The verbs “shall,” “should,” and “may” are not used in Support statements.

Unless otherwise defined in this Section, or in other Parts of this Manual, words or phrases shall have the meaning(s) as defined in the most recent editions of the “Uniform Vehicle Code,” “AASHTO Transportation Glossary (Highway Definitions),” and other publications mentioned in Section 1A.11.

The following words and phrases, when used in this Manual, shall have the following meanings: (Refer to MUTCD Section 1A.13 for additional definitions)

64. Engineering Judgment—the evaluation of available pertinent information, and the application of appropriate principles, provisions, and practices as contained in this Manual and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device. Engineering judgment shall be exercised by an engineer, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the

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engineer. Documentation of engineering judgment is not required.

65. Engineering Study—the comprehensive analysis and evaluation of available pertinent information, and the application of appropriate principles, provisions, and practices as contained in this Manual and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device. An engineering study shall be performed by an engineer, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. An engineering study shall be documented.

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CHAPTER 2A. GENERAL

Section 2A.01 Function and Purpose of Signs

Support:

This Manual contains Standards, Guidance, and Options for the signing of all types of highways, and private roads open to public travel. The functions of signs are to provide regulations, warnings, and guidance information for road users. Words, symbols, and arrows are used to convey the messages. Signs are not typically used to confirm rules of the road.

Detailed sign requirements are located in the following Chapters of Part 2: (**Refer to MUTCD for Chapters 2D – 2N**)

- Chapter 2B – Regulatory Signs, Barricades, and Gates
- Chapter 2C – Warning Signs and Object Markers
- Chapter 2D – Guide Signs for Conventional Roads
- Chapter 2E – Guide Signs for Freeways and Expressways
- Chapter 2F – Toll Road Signs
- Chapter 2G – Preferential and Managed Lane Signs
- Chapter 2H – General Information Signs
- Chapter 2I – General Service Signs
- Chapter 2J – Specific Service (Logo) Signs
- Chapter 2K – Tourist-Oriented Directional Signs
- Chapter 2L – Changeable Message Signs
- Chapter 2M – Recreational and Cultural Interest Area Signs
- Chapter 2N – Emergency Management Signs

Standard:

Because the requirements and standards for signs depend on the particular type of highway upon which they are to be used, the definitions for freeway, expressway, conventional road, and special purpose road given in Section 1A.13 shall apply in Part 2.

(NOTE: Excerpts that follow are from Section 1A.13 and Section 5A.01)

41. Conventional Road—a street or highway other than a low-volume road (as defined in Section 5A.01), expressway, or freeway.

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213. Special Purpose Road—a low-volume, low-speed road that serves recreational areas or resource development activities.

Some roadways may qualify as low-volume roads which are addressed in Part 5 – Traffic Control Devices for Low-Volume Roads in the MUTCD 2009 Section 5A.01.

Standard:

A low-volume road shall be defined for this Part of the Manual as follows:

- A. A low-volume road shall be a facility lying outside of built-up areas of cities, towns, and communities, and it shall have a traffic volume of less than 400 AADT.**
- B. A low-volume road shall not be a freeway, an expressway, an interchange ramp, a freeway service road, a road on a designated State highway system, or a residential street in a neighborhood. In terms of highway classification, it shall be a variation of a conventional road or a special purpose road as defined in Section 1A.13.**
- C. A low-volume road shall be classified as either paved or unpaved.**

Support:

Low-volume roads typically include agricultural, recreational, resource management and development such as mining and logging and grazing, and local roads in rural areas.

Guidance:

The needs of unfamiliar road users for occasional, recreational, and commercial transportation purposes should be considered.

Support:

At some locations on low-volume roads, the use of traffic control devices might be needed to provide the road user limited, but essential, information regarding regulation, guidance, and warning. Other Parts of this Manual contain provisions applicable to all low-volume roads; however, Part 5 specifically supplements and

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references the provisions for traffic control devices commonly used on low-volume roads.

Section 2A.03 Standardization of Application

Support:

It is recognized that urban traffic conditions differ from those in rural environments, and in many instances signs are applied and located differently. Where pertinent and practical, this Manual sets forth separate recommendations for urban and rural conditions.

Guidance:

Signs should be used only where justified by engineering judgment or studies, as provided in Section 1A.09.

Results from traffic engineering studies of physical and traffic factors should indicate the locations where signs are deemed necessary or desirable.

Roadway geometric design and sign application should be coordinated so that signing can be effectively placed to give the road user any necessary regulatory, warning, guidance, and other information.

Standard:

Each standard sign shall be displayed only for the specific purpose as prescribed in this Manual. Determination of the particular signs to be applied to a specific condition shall be made in accordance with the provisions set forth in Part 2. Before any new highway, private road open to public travel (see definition in Section 1A.13), detour, or temporary route is opened to public travel, all necessary signs shall be in place. Signs required by road conditions or restrictions shall be removed when those conditions cease to exist or the restrictions are withdrawn.

Section 2A.04 Excessive Use of Signs

Guidance:

Regulatory and warning signs should be used conservatively because these signs, if used to excess, tend to lose their effectiveness. If used, route signs and directional guide signs should be used

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frequently because their use promotes efficient operations by keeping road users informed of their location.

Section 2A.05 Classification of Signs

Standard:

Signs shall be defined by their function as follows:

- A. Regulatory signs give notice of traffic laws or regulations.**
- B. Warning signs give notice of a situation that might not be readily apparent.**
- C. Guide signs show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information.**

Support:

Object markers are defined in Section 2C.63.

Section 2A.06 Design of Signs

Support:

The basic requirements of a sign are that it be legible to those for whom it is intended and that it be understandable in time to permit a proper response. Desirable attributes include:

- A. High visibility by day and night; and**
- B. High legibility (adequately sized letters, symbols, or arrows, and a short legend for quick comprehension by a road user approaching a sign).**

Standardized colors and shapes are specified so that the several classes of traffic signs can be promptly recognized. Simplicity and uniformity in design, position, and application are important.

Standard:

The term legend shall include all word messages and symbol and arrow designs that are intended to convey specific meanings.

Uniformity in design shall include shape, color, dimensions, legends, borders, and illumination or retroreflectivity.

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Standardization of these designs does not preclude further improvement by minor changes in the proportion or orientation of symbols, width of borders, or layout of word messages, but all shapes and colors shall be as indicated.

All symbols shall be unmistakably similar to, or mirror images of, the adopted symbol signs, all of which are shown in the “Standard Highway Signs and Markings” book (see Section 1A.11). Symbols and colors shall not be modified unless otherwise provided in this Manual. All symbols and colors for signs not shown in the “Standard Highway Signs and Markings” book shall follow the procedures for experimentation and change described in Section 1A.10.

Option:

Although the standard design of symbol signs cannot be modified, the orientation of the symbol may be changed to better reflect the direction of travel, if appropriate.

Standard:

Where a standard word message is applicable, the wording shall be as provided in this Manual.

In situations where word messages are required other than those provided in this Manual, the signs shall be of the same shape and color as standard signs of the same functional type.

Option:

State and local highway agencies may develop special word message signs in situations where roadway conditions make it necessary to provide road users with additional regulatory, warning, or guidance information, such as when road users need to be notified of special regulations or warned about a situation that might not be readily apparent. Unlike colors that have not been assigned or symbols that have not been approved for signs, new word message signs may be used without the need for experimentation.

Standard:

Except as provided in the Option below and except for the Carpool Information (D12-2) sign (see Section 2I.11), Internet addresses and e-mail addresses, including domain names and uniform resource locators (URL), shall not be displayed on any

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sign, supplemental plaque, sign panel (including logo sign panels on Specific Service signs), or changeable message sign.

Guidance:

Unless otherwise provided in this Manual for a specific sign, and except as provided in the Option below, telephone numbers of more than four characters should not be displayed on any sign, supplemental plaque, sign panel (including logo sign panels on specific service signs), or changeable message sign.

Option:

Internet addresses, e-mail addresses, or telephone numbers with more than four characters may be displayed on signs, supplemental plaques, sign panels, and changeable message signs that are intended for viewing only by pedestrians, bicyclists, occupants of parked vehicles, or drivers of vehicles on low-speed roadways where engineering judgment indicates that an area is available for drivers to stop out of the traffic flow to read the message.

Standard:

Pictographs (see definition in Section 1A.13) shall not be displayed on signs except as specifically provided in this Manual. Pictographs shall be simple, dignified, and devoid of any advertising. When used to represent a political jurisdiction (such as a State, county, or municipal corporation) the pictograph shall be the official designation adopted by the jurisdiction. When used to represent a college or university, the pictograph shall be the official seal adopted by the institution. Pictorial representations of university or college programs shall not be permitted to be displayed on a sign.

Section 2A.07 Retroreflectivity and Illumination

Standard:

Regulatory, warning, and guide signs and object markers shall be retroreflective (see Section 2A.08) or illuminated to show the same shape and similar color by both day and night, unless otherwise provided in the text discussion in this Manual for a particular sign or group of signs.

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The requirements for sign illumination shall not be considered to be satisfied by street or highway lighting.

Section 2A.08 Maintaining Minimum Retroreflectivity

Support:

Retroreflectivity is one of several factors associated with maintaining nighttime sign visibility (see Section 2A.22).

Standard:

Public agencies or officials having jurisdiction shall use an assessment or management method that is designed to maintain sign retroreflectivity at or above the minimum levels in Table 2A-3 (Refer to MUTCD).

Support:

Compliance with the Standard in Paragraph 2 is achieved by having a method in place and using the method to maintain the minimum levels established in Table 2A-3.

Provided that an assessment or management method is being used, an agency or official having jurisdiction would be in compliance with the Standard in Paragraph 2 even if there are some individual signs that do not meet the minimum retroreflectivity levels at a particular point in time.

(NOTE: Refer to Section 2A.07 and Section 2A.08 of the MUTCD for more specific information on retroreflectivity requirements or contact the North Dakota LTAP Office at 1-701-328-9855, or the NDDOT at 701-328-2513).

Section 2A.09 Shapes

Standard:

Particular shapes, as shown in Table 2A-4, shall be used exclusively for specific signs or series of signs, unless otherwise provided in the text discussion in this Manual for a particular sign or class of signs.

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Table 2A-4. Use of Sign Shapes

| Shape | Signs |
|---|--|
| Octagon | Stop* |
| Equilateral Triangle (1 point down) | Yield* |
| Circle | Grade Crossing Advance Warning* |
| Pennant Shape/Isosceles Triangle (longer axis horizontal) | No Passing* |
| Pentagon (pointed up) | School Advance Warning Sign (squared bottom corners)* County Route Sign (tapered bottom corners)* |
| Crossbuck (two rectangles in an "X" configuration) | Grade Crossing* |
| Diamond | Warning Series |
| Rectangle (including square) | Regulatory Series Guide Series** Warning Series |
| Trapezoid | Recreational and Cultural Interest Area Series National Forest Route Sign |

* This sign shall be exclusively the shape shown.

** Guide series includes general service, specific service, tourist-oriented directional, general information, recreational and cultural interest area, and emergency management signs.

Section 2A.10 Sign Colors

Standard:

The colors to be used on standard signs and their specific use on these signs shall be as provided in the applicable Sections of this Manual. The color coordinates and values shall be as described in 23 CFR, Part 655, Subpart F, Appendix.

Support:

As a quick reference, common uses of sign colors are shown in Table 2A-5. Color schemes on specific signs are shown in the illustrations located in each appropriate Chapter.

Option:

The approved fluorescent version of the standard red, yellow, green, or orange color may be used as an alternative to the corresponding standard color.

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Table 2A-5. Common Uses of Sign Colors

| Type of Sign | Legend | | | | | | | | Background | | | | | | | | | | |
|-----------------------------|--------|-------|------|-------|--------|--------|--------------------------|------------------|------------|------|-------|-------|---------|------|-------|---------|--------|--------------------------|------------------|
| | Black | Green | Red | White | Yellow | Orange | Fluorescent Yellow-Green | Fluorescent Pink | Black | Blue | Brown | Green | Orange* | Red† | White | Yellow‡ | Purple | Fluorescent Yellow-Green | Fluorescent Pink |
| Regulatory | X | | X | X | | | | | X | | | | | X | X | | | | |
| Prohibitive | | | X | X | | | | | | | | | | X | X | | | | |
| Permissive | | X | | | | | | | | | | | | | X | | | | |
| Warning | X | | | | | | | | | | | | | | | X | | | |
| Pedestrian | X | | | | | | | | | | | | | | | X | | X | |
| Bicycle | X | | | | | | | | | | | | | | | X | | X | |
| Guide | | | | X | | | | | | | X | | | | | | | | |
| Interstate Route | | | | X | | | | | | X | | | | X | | | | | |
| State Route | X | | | | | | | | | | | | | | X | | | | |
| U.S. Route | X | | | | | | | | | | | | | | X | | | | |
| County Route | | | | | X | | | | | X | | | | | | | | | |
| Forest Route | | | | X | | | | | | | X | | | | | | | | |
| Street Name | | | | X | | | | | | | | X | | | | | | | |
| Destination | | | | X | | | | | | | | X | | | | | | | |
| Reference Location | | | | X | | | | | | | | X | | | | | | | |
| Information | | | | X | | | | | | X | | X | | | | | | | |
| Evacuation Route | | | | X | | | | | | X | | | | | | | | | |
| Road User Service | | | | X | | | | | | X | | | | | | | | | |
| Recreational | | | | X | | | | | | | X | X | | | | | | | |
| Temporary Traffic Control | X | | | | | | | | | | | | X | | | | | | |
| Incident Management | X | | | | | | | | | | | | X | | | | | | X |
| School | X | | | | | | | | | | | | | | | | | X | |
| ETC-Account Only | X | | | | | | | | | | | | | | | | X**** | | |
| Changeable Message Signs | | | | | | | | | | | | | | | | | | | |
| Regulatory | | | X*** | X | | | | | | X | | | | | | | | | |
| Warning | | | | | X | | | | | X | | | | | | | | | |
| Temporary Traffic Control | | | | X | X | | | | | X | | | | | | | | | |
| Guide | | | | X | | | | | | X | | X** | | | | | | | |
| Motorist Services | | | | X | | | | | | X | X** | | | | | | | | |
| Incident Management | | | | X | | | X | | | X | X | | | | | | | | |
| School, Pedestrian, Bicycle | | | | X | | X | | | | X | | | | | | | | | |

* Fluorescent versions of these background colors may also be used.
 ** These alternative background colors would be provided by blue or green lighted pixels such that the entire CMS would be lighted, not just the legend.
 *** Red is used only for the circle and slash or other red elements of a similar static regulatory sign.
 **** The use of the color purple on signs is restricted per the provisions of Paragraph 1 of Section 2F.03.

Section 2A.11 Dimensions

Support:

The “Standard Highway Signs and Markings” book (see Section 1A.11) prescribes design details for up to five different sizes depending on the type of traffic facility, including bikeways. Smaller sizes are designed to be used on bikeways and some other off-road applications. Larger sizes are designed for use on freeways and expressways, and can also be used to enhance road user safety and convenience on other facilities, especially on multi-lane divided highways and on undivided highways having five or more lanes of

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traffic and/or high speeds. The intermediate sizes are designed to be used on other highway types.

Standard:

The sign dimensions prescribed in the sign size tables in the various Parts and Chapters of the Manual and in the “Standard Highway Signs and Markings” book (see Section 1A.11) shall be used unless engineering judgment determines that other sizes are appropriate. Except as provided in the following Option statement, where engineering judgment determines that sizes smaller than the prescribed dimensions are appropriate for use, the sign dimensions shall not be less than the minimum dimensions specified. The sizes shown in the Minimum columns that are smaller than the sizes shown in the Conventional Road columns in the various sign size tables shall only be used on low-speed roadways, alleys, and private roads open to public travel where the reduced legend size would be adequate for the regulation or warning or where physical conditions preclude the use of larger sizes.

Option:

For alleys with restrictive physical conditions and vehicle usage that limits installation of the minimum size sign (or the Conventional Road size sign if no Minimum size is shown), both the sign height and the sign width may be decreased by up to 6 inches.

Guidance:

The sizes shown in the Freeway and Expressway columns in the various sign size tables should be used on freeways and expressways, and for other higher-speed applications based upon engineering judgment, to provide larger signs for increased visibility and recognition.

The sizes shown in the Oversized columns in the various sign size tables should be used for those special applications where speed, volume, or other factors result in conditions where increased emphasis, improved recognition, or increased legibility is needed, as determined by engineering judgment or study.

Increases above the prescribed sizes should be used where greater legibility or emphasis is needed. If signs larger than the

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prescribed sizes are used, the overall sign dimensions should be increased in 6-inch increments.

Standard:

Where engineering judgment determines that sizes that are different than the prescribed dimensions are appropriate for use, standard shapes and colors shall be used and standard proportions shall be retained as much as practical.

Guidance:

When supplemental plaques are installed with larger sized signs, a corresponding increase in the size of the plaque and its legend should also be made. The resulting plaque size should be approximately in the same relative proportion to the larger sized sign as the conventional sized plaque is to the conventional sized sign.

Section 2A.12 Symbols

Standard:

Symbol designs shall in all cases be unmistakably similar to those shown in this Manual and in the “Standard Highway Signs and Markings” book (see Section 1A.11).

Support:

Sometimes a change from word messages to symbols requires significant time for public education and transition. Therefore, this Manual sometimes includes the practice of using educational plaques to accompany new symbol signs.

Guidance:

New warning or regulatory symbol signs not readily recognizable by the public should be accompanied by an educational plaque.

Option:

Educational plaques may be left in place as long as they are in serviceable condition.

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Guidance:

Although most standard symbols are oriented facing left, mirror images of these symbols should be used where the reverse orientation might better convey to road users a direction of movement.

Section 2A.13 Word Messages

Standard:

Accept as provided in Section 2A.06, all words shall use standard wording and letters as shown in this Manual and in the “Standard Highway Signs and Markings” book (See Section 1A.11).

Guidance:

Word messages should be as brief as possible and the lettering should be large enough to provide the necessary legibility distance. A minimum ratio of 1 inch of letter height per 30 feet of legibility distance should be used.

Abbreviations (see Section 1A.15) should be kept to a minimum.

Word messages should not contain periods, apostrophes, question marks, ampersands, or other punctuation or characters that are not letters, numerals, or hyphens unless necessary to avoid confusion.

The solidus (slanted line or forward slash) is intended to be used for fractions only and should not be used separate words on the same line of legend. Instead, a hyphen should be used for this purpose, such as “TRUCKS-BUSES”.

Section 2A.14 Sign Borders

Standard:

Unless otherwise provided, each sign illustrated in this Manual shall have a border of the same color as the legend, at or just inside the edge.

The corners of all sign borders shall be rounded, except for STOP signs.

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Section 2A.15 Enhanced Conspicuity for Standard Signs

Option:

Based upon engineering judgment, where the improvement of the conspicuity of a standard regulatory, warning, or guide sign is desired, any of the following methods may be used, as appropriate, to enhance the sign's conspicuity (see Figure 2A-1):

- A. Increasing the size of a standard regulatory, warning, or guide sign.
- B. Doubling-up of a standard regulatory, warning, or guide sign by adding a second identical sign on the lefthand side of the roadway.
- C. Adding a solid yellow or fluorescent yellow rectangular "header panel" above a standard regulatory sign, with the width of the panel corresponding to the width of the standard regulatory sign. A legend of "NOTICE," "STATE LAW," or other appropriate text may be added in black letters within the header panel for a period of time determined by engineering judgment.
- D. Adding a NEW plaque (see Section 2C.62) above a new standard regulatory or warning sign, for a period of time determined by engineering judgment, to call attention to the new sign.
- E. Adding one or more red or orange flags (cloth or retroreflective sheeting) above a standard regulatory or warning sign, with the flags oriented so as to be at 45 degrees to the vertical.
- F. Adding a solid yellow, a solid fluorescent yellow, or a diagonally striped black and yellow (or black and fluorescent yellow) strip of retroreflective sheeting at least 3 inches wide around the perimeter of a standard warning sign. This may be accomplished by affixing the standard warning sign on a background that is 6 inches larger than the size of the standard warning sign.
- G. Adding a warning beacon (see Section 4L.03) to a standard regulatory (other than a STOP or a Speed Limit sign), warning, or guide sign.
- H. Adding a speed limit sign beacon (see Section 4L.04) to a standard Speed Limit sign.

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- I. Adding a stop beacon (see Section 4L.05) to a STOP sign.
- J. Adding light emitting diode (LED) units within the symbol or legend of a sign or border of a standard regulatory, warning, or guide sign, as provided in Section 2A.07.
- K. Adding a strip of retroreflective material to the sign support in compliance with the provisions of Section 2A.21.
- L. Using other methods that are specifically allowed for certain signs as described elsewhere in this Manual.

Support:

Sign conspicuity improvements can also be achieved by removing non-essential and illegal signs from the right-of-way (see Section 1A.08), and by relocating signs to provide better spacing.

Figure 2A-1. Examples of Enhanced Conspicuity for Signs

A – W16-15P plaque above a regulatory or warning sign if the regulation or condition is new



B – Red or orange flags above a regulatory, warning, or guide sign



C – W16-18P plaque above a regulatory sign



D – Solid yellow, solid fluorescent yellow, or diagonally striped black and yellow (or black and fluorescent yellow) strip of retroreflective sheeting around a warning sign



E – Vertical retroreflective strip on sign support



F – Supplemental beacon



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Section 2A.16 Standardization of Location

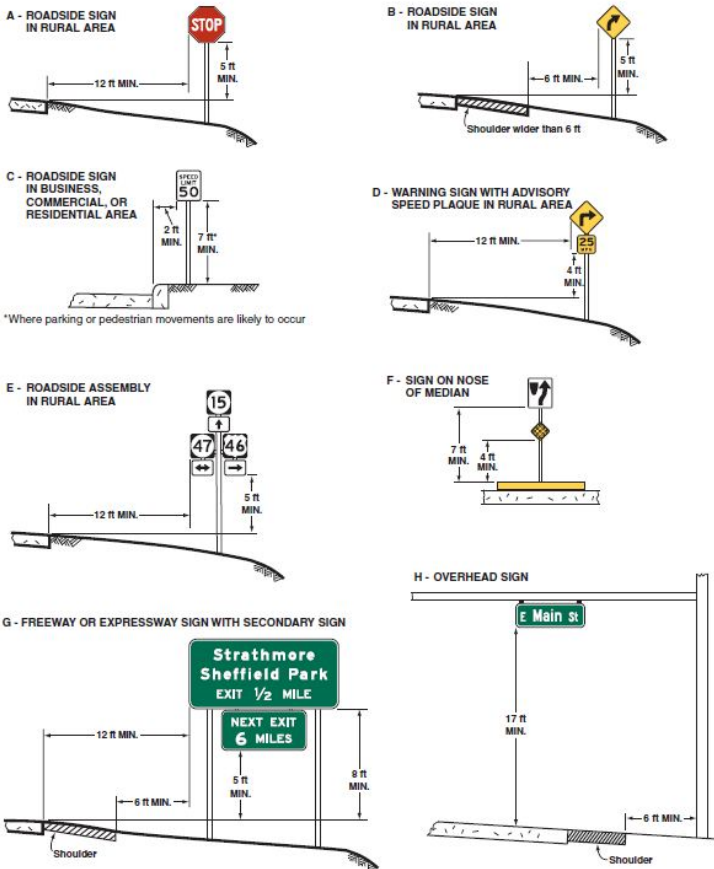
Support:

Standardization of position cannot always be attained in practice. Examples of heights and lateral locations of signs for typical installations are illustrated in Figure 2A-2, and examples of locations for some typical signs at intersections are illustrated in Figures 2A-3 and 2A-4.

Examples of advance signing on an intersection approach are illustrated in Figure 2A-4. Chapters 2B, 2C, and 2D contain provisions regarding the application of regulatory, warning, and guide signs, respectively.

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Figure 2A-2. Examples of Heights and Lateral Locations of Sign Installations



*Where parking or pedestrian movements are likely to occur

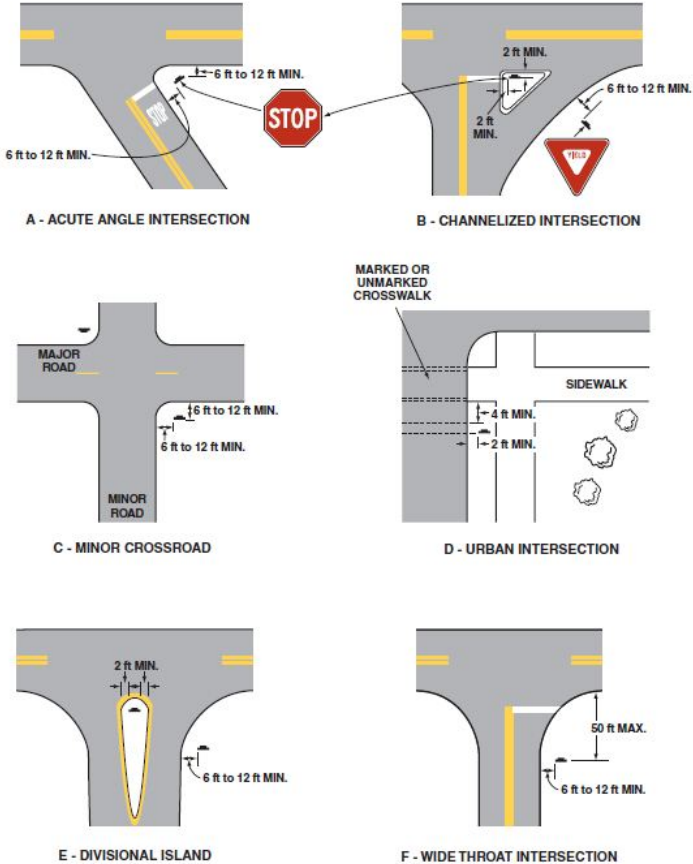
Note:
See Section 2A.19 for reduced lateral offset distances that may be used in areas where lateral offsets are limited, and in business, commercial, or residential areas where sidewalk width is limited or where existing poles are close to the curb.

Standard:

Signs requiring separate decisions by the road user shall be spaced sufficiently far apart for the appropriate decisions to be made. One of the factors considered when determining the appropriate spacing shall be the posted or 85th-percentile speed.

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Figure 2A-3. Examples of Locations for Some Typical Signs at Intersections



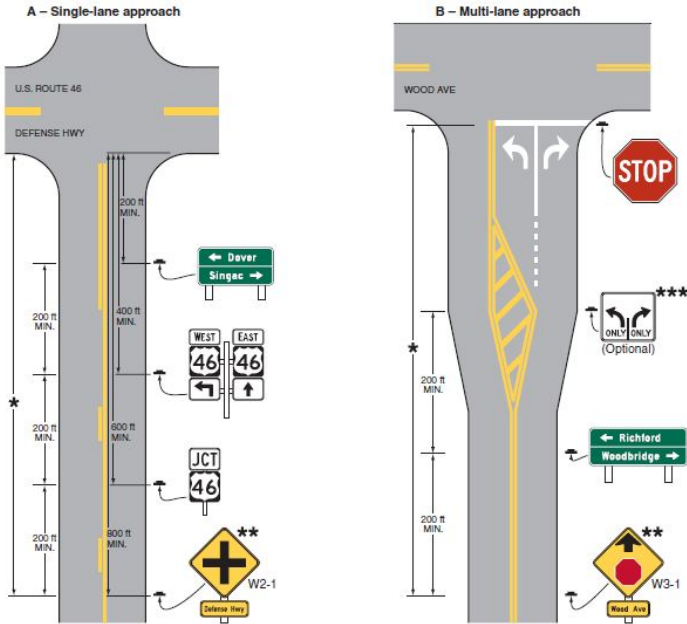
Note: Lateral offset is a minimum of 6 feet measured from the edge of the shoulder, or 12 feet measured from the edge of the traveled way. See Section 2A.19 for lower minimums that may be used in urban areas, or where lateral offset space is limited.

Guidance:

Signs should be located on the right-hand side of the roadway where they are easily recognized and understood by road users. Signs in other locations should be considered only as supplementary to signs in the normal locations, except as otherwise provided in this Manual.

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Figure 2A-4. Relative Locations of Regulatory, Warning, and Guide Signs on an Intersection Approach



Note: See Chapter 2D for information on guide signs and Part 3 for information on pavement markings

- ★ See Table 2C-4 for the recommended minimum distance
- ★★ See Section 2C.46 for the application of the W2-1 sign and Section 2C.36 for the application of the W3-1 sign
- ★★★ See Section 2B.22 for the application of Intersection Lane Control signs

Signs should be individually installed on separate posts or mountings except where:

- A. One sign supplements another;*
- B. Route or directional signs are grouped to clarify information to motorists;*
- C. Regulatory signs that do not conflict with each other are grouped, such as turn prohibition signs posted with one way signs or a parking regulation sign posted with a speed limit sign; or*
- D. Street name signs are posted with a stop or yield sign.*

Signs should be located so that they:

- A. Are outside the clear zone unless placed on a breakaway or yielding support (see Section 2A.19),*
- B. Optimize nighttime visibility,*

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- C. *Minimize the effects of mud splatter and debris,*
- D. *Do not obscure each other, Do not obscure the sight distance to approaching vehicles on the major street for drivers who are stopped on minor street approaches, and*
- E. *Are not hidden from view.*

Guidance:

With the increase in traffic volumes and the desire to provide road users regulatory, warning, and guidance information, an order of priority for sign installation should be established.

Support:

An order of priority is especially critical where space is limited for sign installation and there is a demand for several different types of signs. Overloading road users with too much information is not desirable.

Guidance:

Because regulatory and warning information is more critical to the road user than guidance information, regulatory and warning signing whose location is critical should be displayed rather than guide signing in cases where conflicts occur. Community wayfinding and acknowledgment guide signs should have a lower priority as to placement than other guide signs. Information of a less critical nature should be moved to less critical locations or omitted.

Option:

Under some circumstances, such as on curves to the right, signs may be placed on median islands or on the left-hand side of the road. A supplementary sign located on the left-hand side of the roadway may be used on a multi-lane road where traffic in a lane to the right might obstruct the view to the right.

Section 2A.18 Mounting Height

Standard:

The provisions of this Section shall apply unless specifically stated otherwise for a particular sign or object marker elsewhere in this Manual.

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Support:

The mounting height requirements for object markers are provided in Chapter 2C.

Standard:

The minimum height, measured vertically from the bottom of the sign to the elevation of the near edge of the pavement, of signs installed at the side of the road in rural areas shall be 5 feet (see Figure 2A-2).

The minimum height, measured vertically from the bottom of the sign to the top of the curb, or in the absence of curb, measured vertically from the bottom of the sign to the elevation of the near edge of the traveled way, of signs installed at the side of the road in business, commercial, or residential areas where parking or pedestrian movements are likely to occur, or where the view of the sign might be obstructed, shall be 7 feet (see Figure 2A-2).

Option:

The height to the bottom of a secondary sign mounted below another sign may be 1 foot less than the height specified in the Standard statement listed above.

Standard:

The minimum height, measured vertically from the bottom of the sign to the sidewalk, of signs installed above sidewalks shall be 7 feet.

If the bottom of a secondary sign that is mounted below another sign is mounted lower than 7 feet above a pedestrian sidewalk or pathway (see Section 6D.02), the secondary sign shall not project more than 4 inches into the pedestrian facility.

Option:

Signs that are placed 30 feet or more from the edge of the traveled way may be installed with a minimum height of 5 feet, measured vertically from the bottom of the sign to the elevation of the near edge of the pavement.

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Support:

Figure 2A-2 illustrates some examples of the mounting height requirements contained in this Section.

Section 2A.19 Lateral Offset

Standard:

Post-mounted sign and object marker supports shall be crashworthy (breakaway, yielding, or shielded with a longitudinal barrier or crash cushion) if within the clear zone.

Guidance:

For post-mounted signs, the minimum lateral offset should be 12 feet from the edge of the traveled way. If a shoulder wider than 6 feet exists, the minimum lateral offset for post-mounted signs should be 6 feet from the edge of the shoulder.

Support:

The minimum lateral offset requirements for object markers are provided in Chapter 2C.

Guidance:

All supports should be located as far as practical from the edge of the shoulder. Advantage should be taken to place signs behind existing roadside barriers, on over-crossing structures, or other locations that minimize the exposure of the traffic to sign supports.

Option:

Where permitted, signs may be placed on existing supports used for other purposes, such as highway traffic signal supports, highway lighting supports, and utility poles.

Standard:

If signs are placed on existing supports, they shall meet other placement criteria contained in this Manual.

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Option:

On conventional roads in areas where it is impractical to locate a sign with the lateral offset prescribed by this Section, a lateral offset of at least 2 feet may be used.

A lateral offset of at least 1 foot from the face of the curb may be used in business, commercial or residential areas where sidewalk width is limited or where existing poles are close to the curb.

Guidance:

Overhead sign supports and post-mounted sign and object marker supports should not intrude into usable width of a sidewalk or other pedestrian facility.

Support:

Figures 2A-2 and 2A-3 illustrate some examples of the lateral offset requirements contained in this Section.

Section 2A.20 Orientation

Guidance:

Unless otherwise provided in this Manual, signs should be vertically mounted at right angles to the direction of, and facing, the traffic that they are intended to serve.

Where mirror reflection from the sign face is encountered to such a degree as to reduce legibility, the sign should be turned slightly away from the road. Signs that are placed 30 feet or more from the pavement edge should be turned toward the road. On curved alignments, the angle of placement should be determined by the direction of approaching traffic rather than by the roadway edge at the point where the sign is located.

Option:

On grades, sign faces may be tilted forward or back from the vertical position to improve the viewing angle.

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Section 2A.21 Posts and Mountings

Option:

Where engineering judgment indicates a need to draw attention to the sign during nighttime conditions, a strip of retroreflective material may be used on regulatory and warning sign supports.

Standard:

If a strip of retroreflective material is used on the sign support, it shall be at least 2 inches in width, it shall be placed for the full length of the support from the sign to within 2 feet above the edge of the roadway, and its color shall match the background color of the sign, except that the color of the strip for the YIELD and DO NOT ENTER signs shall be red.

Section 2A.22 Maintenance

Guidance:

Maintenance activities should consider proper position, cleanliness, legibility, and daytime and nighttime visibility (see Section 2A.09). Damaged or deteriorated signs, gates, or object markers should be replaced.

To assure adequate maintenance, a schedule for inspecting (both day and night), cleaning, and replacing signs, gates, and object markers should be established. Employees of highway, law enforcement, and other public agencies whose duties require that they travel on the roadways should be encouraged to report any damaged, deteriorated, or obscured signs, gates, or object markers at the first opportunity.

Steps should be taken to see that weeds, trees, shrubbery, and construction, maintenance, and utility materials and equipment do not obscure the face of any sign or object.

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CHAPTER 2B. REGULATORY SIGNS, BARRICADES, AND GATES

Section 2B.01 Application of Regulatory Signs

Standard:

Regulatory signs shall be used to inform road users of selected traffic laws or regulations and indicate the applicability of the legal requirements.

Regulatory signs shall be installed at or near where the regulations apply. The signs shall clearly indicate the requirements imposed by the regulations and shall be designed and installed to provide adequate visibility and legibility in order to obtain compliance.

Regulatory signs shall be retroreflective or illuminated (see Section 2A.07) to show the same shape and similar color by both day and night, unless specifically stated otherwise in the text discussion for a particular sign or group of signs.

The requirements for sign illumination shall not be considered to be satisfied by street or highway lighting.

Support:

Section 1A.09 contains information regarding the assistance that is available to jurisdictions that do not have engineers on their staffs who are trained and/or experienced in traffic control devices.

Section 2B.02 Design of Regulatory Signs

Standard:

Regulatory signs shall be rectangular unless specifically designated otherwise. Regulatory signs shall be designed in accordance with the sizes, shapes, colors, and legends contained in the “Standard Highway Signs and Markings” book (see Section 1A.11).

Option:

Regulatory word message signs other than those classified and specified in this Manual and the “Standard Highways Signs and Markings” book (see Section 1A.11) may be developed to aid the enforcement of other laws or regulations.

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Except for symbols on regulatory signs, minor modifications may be made to the design provided that the essential appearance characteristics are met.

Support:

The use of educational plaques to supplement symbol signs is described in Section 2A.12.

Guidance:

Changeable message signs displaying a regulatory message incorporating a prohibitory message that includes a red circle and slash on a static sign should display a red symbol that approximates the same red circle and slash as closely as possible.

Section 2B.03 Size of Regulatory Signs

Standard:

Except as provided in Section 2A.11, the sizes for regulatory signs shall be as shown in Table 2B-1.

Support:

Section 2A.11 contains information regarding the applicability of the various columns in Table 2B-1.

Standard:

A minimum size of 36 x 36 inches shall be used for STOP signs that face multi-lane approaches.

Where side roads intersect a multi-lane street or highway that has a speed limit of 45 mph or higher, the minimum size of the STOP signs facing the side road approaches, even if the side road only has one approach lane, shall be 36 x 36 inches.

Where side roads intersect a multi-lane street or highway that has a speed limit of 40 MPH or lower, the minimum size of the STOP signs facing the side road approaches shall be as shown in the Single Lane or Multi-lane columns of Table 2B-1 based on the number of approach lanes on the side street approach.

Table 2B-1. Regulatory Sign and Plaque Sizes

| Sign or Plaque | Sign Designation | Section | Conventional Road (Single Lane) | Minimum | Oversized |
|----------------|------------------|---------|---------------------------------|---------|-----------|
|----------------|------------------|---------|---------------------------------|---------|-----------|

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| Sign or Plaque | Sign Designation | Section | Conventional Road (Single Lane) | Minimum | Oversized |
|-------------------------------------|------------------|---------|--|-----------------|-----------|
| Stop | R1-1 | 2B.05 | 30" x 30" 36" x 36" (multi-lane) | 30" x 30" | 48" x 48" |
| Yield | R1-2 | 2B.08 | 36" x 36" x 36" | 30" x 30" x 30" | ----- |
| All Way | R1-3P | 2B.05 | 18" x 6" | ----- | 30" x 12" |
| Speed Limit | R2-1 | 2B.13 | 24" x 30" | 18" x 24" | 30" x 36" |
| Truck Speed Limit (plaque) | R2-2P | 2B.14 | 24" x 24" | ----- | 36" x 36" |
| Do Not Pass | R4-1 | 2B.28 | 24" x 30" | 18" x 24" | 36" x 48" |
| Pass With Care | R4-2 | 2B.29 | 24" x 30" | 18" x 24" | 36" x 48" |
| No Parking (symbol) | R8-3 | 2B.46 | 24" x 24" | 12" x 12" | 36" x 36" |
| No Parking | R8-3a | 2B.46 | 24" x 30" | 18" x 24" | 36" x 36" |
| Road Closed | R11-2 | 2B.58 | 48" x 30" | ----- | ----- |
| Road Closed – Local Traffic Only | R11-3a, 3b, 4 | 2B.58 | 60" x 30" | ----- | ----- |
| Weight Limit | R12-1, 2 | 2B.59 | 24" x 30" | ----- | 36" x 48" |
| Weight Limit | R12-3 | 2B.59 | 24" x 36" | ----- | ----- |
| Weight Limit | R12-4 | 2B.59 | 36" x 24" | ----- | ----- |
| Weight Limit | R12-5 | 2B.59 | 24" x 36" | ----- | ----- |
| Truck Route | R14-1 | 2B.61 | 24" x 18" | ----- | ----- |
| No Trucks | R5-2, 2a | 2B.39 | 24" x 24" | ----- | 36" x 36" |
| Roundabout Directional (2 chevrons) | R6-4 | 2B.43 | 30" x 24" | ----- | ----- |
| Roundabout Directional (3 chevrons) | R6-4a | 2B.43 | 48" x 24" | ----- | ----- |
| Roundabout Directional (4 chevrons) | R6-4b | 2B.43 | 60" x 24" | ----- | ----- |
| Roundabout Circulation | R6-5P | 2B.44 | 30" x 30" | ----- | ----- |

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| Sign or Plaque | Sign Designation | Section | Conventional Road (Single Lane) | Minimum | Oversized |
|----------------|------------------|---------|---------------------------------|---------|-----------|
| (plaque) | | | | | |

Section 2B.04 Right-of-Way at Intersections

Support:

State or local laws written in accordance with the “Uniform Vehicle Code” (see Section 1A.11) establish the right-of-way rule at intersections having no regulatory traffic control signs such that the driver of a vehicle approaching an intersection must yield the right-of-way to any vehicle or pedestrian already in the intersection. When two vehicles approach an intersection from different streets or highways at approximately the same time, the right-of-way rule requires the driver of the vehicle on the left to yield the right-of-way to the vehicle on the right. The right-of-way can be modified at through streets or highways by placing YIELD (R1-2) signs (see Sections 2B.08 and 2B.09) or STOP (R1-1) signs (see Sections 2B.05 through 2B.07) on one or more approaches.

Guidance:

Engineering judgment should be used to establish intersection control. The following factors should be considered:

- A. *Vehicular, bicycle, and pedestrian traffic volumes on all approaches;*
- B. *Number and angle of approaches;*
- C. *Approach speeds;*
- D. *Sight distance available on each approach; and*
- E. *Reported crash experience.*

YIELD or STOP signs should be used at an intersection if one or more of the following conditions exist:

- A. *An intersection of a less important road with a main road where application of the normal right-of-way rule would not be expected to provide reasonable compliance with the law;*
- B. *A street entering a designated through highway or street; and/or*
- C. *An unsignalized intersection in a signalized area.*

In addition, the use of YIELD or STOP signs should be considered at the intersection of two minor streets or local roads

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where the intersection has more than three approaches and where one or more of the following conditions exist:

- A. *The combined vehicular, bicycle, and pedestrian volume entering the intersection from all approaches averages more than 2,000 units per day;*
- B. *The ability to see conflicting traffic on an approach is not sufficient to allow a road user to stop or yield in compliance with the normal right-of-way rule if such stopping or yielding is necessary; and/or*
- C. *Crash records indicate that five or more crashes that involve the failure to yield the right-of-way at the intersection under the normal right-of-way rule have been reported within a 3-year period, or that three or more such crashes have been reported within a 2-year period.*

YIELD or STOP signs should not be used for speed control.

Support:

Section 2B.07 contains provisions regarding the application of multi-way STOP control at an intersection.

Guidance:

Once the decision has been made to control an intersection, the decision regarding the appropriate roadway to control should be based on engineering judgment. In most cases, the roadway carrying the lowest volume of traffic should be controlled.

A YIELD or STOP sign should not be installed on the higher volume roadway unless justified by an engineering study.

Support:

The following are considerations that might influence the decision regarding the appropriate roadway upon which to install a YIELD or STOP sign where two roadways with relatively equal volumes and/or characteristics intersect:

Controlling the direction that conflicts the most with established pedestrian crossing activity or school walking routes;

- A. Controlling the direction that has obscured vision, dips, or bumps that already require drivers to use lower operating speeds; and
- B. Controlling the direction that has the best sight distance from a controlled position to observe conflicting traffic.

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Standard:

Because the potential for conflicting commands could create driver confusion, **YIELD** or **STOP** signs shall not be used in conjunction with any traffic control signal operation, except in the following cases:

- A. If the signal indication for an approach is a flashing red at all times;
- B. If a minor street or driveway is located within or adjacent to the area controlled by the traffic control signal, but does not require separate traffic signal control because an extremely low potential for conflict exists; or
- C. If a channelized turn lane is separated from the adjacent travel lanes by an island and the channelized turn lane is not controlled by a traffic control signal.

Except as provided in Section 2B.09, **STOP** signs and **YIELD** signs shall not be installed on different approaches to the same unsignalized intersection if those approaches conflict with or oppose each other.

Portable or part-time **STOP** or **YIELD** signs shall not be used except for emergency and temporary traffic control zone purposes.

A portable or part-time (folding) **STOP** sign that is manually placed into view and manually removed from view shall not be used during a power outage to control a signalized approach unless the maintaining agency establishes that the signal indication that will first be displayed to that approach upon restoration of power is a flashing red signal indication and that the portable **STOP** sign will be manually removed from view prior to stop-and-go operation of the traffic control signal.

Option:

A portable or part-time (folding) **STOP** sign that is electrically or mechanically operated such that it only displays the **STOP** message during a power outage and ceases to display the **STOP** message upon restoration of power may be used during a power outage to control a signalized approach.

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Support:

Section 9B.03 contains provisions regarding the assignment of priority at a shared-use path/roadway intersection.

Section 2B.05 STOP Sign (R1-1) and ALL WAY Plaque (R1-3P)

Standard:

When it is determined that a full stop is always required on an approach to an intersection, a STOP (R1-1) sign (see Figure 2B-1) shall be used.

The STOP sign shall be an octagon with a white legend and border on a red background.

Secondary legends shall not be used on STOP sign faces.

At intersections where all approaches are controlled by STOP signs (see Section 2B.07), an ALL WAY supplemental plaque (R1-3P) shall be mounted below each STOP sign. The ALL WAY plaque (see Figure 2B-1) shall have a white legend and border on a red background.

The ALL WAY plaque shall only be used if all intersection approaches are controlled by STOP signs.

Supplemental plaques with legends such as 2-WAY, 3-WAY, 4-WAY, or other numbers of ways shall not be used with STOP signs.

Support:

The use of the CROSS TRAFFIC DOES NOT STOP (W4-4P) plaque (and other plaques with variations of this word message) is described in Section 2C.59 (**Refer to MUTCD**).

Guidance:

Plaques with the appropriate alternative messages of TRAFFIC FROM LEFT (RIGHT) DOES NOT STOP (W4-4aP) or ONCOMING TRAFFIC DOES NOT STOP (W4-4bP) should be used at intersections where STOP signs control all but one approach to the intersection, unless the only non-stopped approach is from a one-way street.

Option:

An EXCEPT RIGHT TURN (R1-10P) plaque (see Figure 2B-1) may be mounted below the STOP sign if an engineering study

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determines that a special combination of geometry and traffic volumes is present that makes it possible for right-turning traffic on the approach to be permitted to enter the intersection without stopping.

Figure 2B-1. STOP and YIELD Signs and Plaques



Section 2B.06 STOP Sign Applications

Guidance:

At intersections where a full stop is not necessary at all times, consideration should first be given to using less restrictive measures such as YIELD signs (see Sections 2B.08 and 2B.09).

The use of STOP signs on the minor-street approaches should be considered if engineering judgment indicates that a stop is always required because of one or more of the following conditions:

- A. The vehicular traffic volumes on the through street or highway exceed 6,000 vehicles per day;*
- B. A restricted view exists that requires road users to stop in order to adequately observe conflicting traffic on the through street or highway; and/or*
- C. Crash records indicate that three or more crashes that are susceptible to correction by the installation of a STOP sign have been reported within a 12-month period, or that five or more such crashes have been reported within a 2-year period. Such crashes include right-angle collisions involving road users on the minor-street approach failing to yield the right-of-way to traffic on the through street or highway.*

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Section 2B.08 YIELD Sign (R1-2)

Standard:

The **YIELD (R1-2) sign** (see Figure 2B-1) shall be a downward-pointing equilateral triangle with a wide red border and the legend **YIELD** in red on a white background.

Support:

The YIELD sign assigns right-of-way to traffic on certain approaches to an intersection. Vehicles controlled by a YIELD sign need to slow down to a speed that is reasonable for the existing conditions or stop when necessary to avoid interfering with conflicting traffic.

Section 2B.09 YIELD Sign Applications

Option:

YIELD signs may be installed:

- A. On the approaches to a through street or highway where conditions are such that a full stop is not always required.
- B. At the second crossroad of a divided highway, where the median width at the intersection is 30 feet or greater. In this case, a STOP or YIELD sign may be installed at the entrance to the first roadway of a divided highway, and a YIELD sign may be installed at the entrance to the second roadway.
- C. For a channelized turn lane that is separated from the adjacent travel lanes by an island, even if the adjacent lanes at the intersection are controlled by a highway traffic control signal or by a STOP sign.
- D. At an intersection where a special problem exists and where engineering judgment indicates the problem to be susceptible to correction by the use of the YIELD sign.
- E. Facing the entering roadway for a merge-type movement if engineering judgment indicates that control is needed because acceleration geometry and/or sight distance is not adequate for merging traffic operation.

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Standard:

A **YIELD (R1-2)** sign shall be used to assign right-of-way at the entrance to a roundabout. **YIELD** signs at roundabouts shall be used to control the approach roadways and shall not be used to control the circulatory roadway.

Other than for all of the approaches to a roundabout, **YIELD** signs shall not be placed on all of the approaches to an intersection.

Section 2B.10 STOP Sign or YIELD Sign Placement

Standard:

The **STOP** or **YIELD** sign shall be installed on the near side of the intersection on the right-hand side of the approach to which it applies. When the **STOP** or **YIELD** sign is installed at this required location and the sign visibility is restricted, a **Stop Ahead** sign (see Section 2C.36) shall be installed in advance of the **STOP** sign or a **Yield Ahead** sign (see Section 2C.36) shall be installed in advance of the **YIELD** sign.

The **STOP** or **YIELD** sign shall be located as close as practical to the intersection it regulates, while optimizing its visibility to the road user it is intended to regulate.

STOP signs and **YIELD** signs shall not be mounted on the same post.

No items other than inventory stickers, sign installation dates, and bar codes shall be affixed to the fronts of **STOP** or **YIELD** signs, and the placement of these items shall be in the border of the sign.

No items other than official traffic control signs, inventory stickers, sign installation dates, anti-vandalism stickers, and bar codes shall be mounted on the backs of **STOP** or **YIELD** signs.

No items other than retroreflective strips (see Section 2A.21) or official traffic control signs shall be mounted on the fronts or backs of **STOP** or **YIELD** signs supports.

Guidance:

STOP or YIELD signs should not be placed farther than 50 feet from the edge of the pavement of the intersected roadway (see Drawing F in Figure 2A-3).

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A sign that is mounted back-to-back with a STOP or YIELD sign should stay within the edges of the STOP or YIELD sign. If necessary, the size of the STOP or YIELD sign should be increased so that any other sign installed back-to-back with a STOP or YIELD sign remains within the edges of the STOP or YIELD sign.

Option:

Where drivers proceeding straight ahead must yield to traffic approaching from the opposite direction, such as at a one-lane bridge, a TO ONCOMING TRAFFIC (R1-2aP) plaque may be mounted below the YIELD sign.

Support:

Figure 2A-3 shows examples of some typical placements of STOP signs and YIELD signs.

Section 2A.16 contains additional information about separate and combined mounting of other signs with STOP or YIELD signs.

Guidance:

Stop lines that are used to supplement a STOP sign should be located as described in Section 3B.16. Yield lines that are used to supplement a YIELD sign should be located as described in Section 3B.16.

Where there is a marked crosswalk at the intersection, the STOP sign should be installed in advance of the crosswalk line nearest to the approaching traffic.

Except at roundabouts, where there is a marked crosswalk at the intersection, the YIELD sign should be installed in advance of the crosswalk line nearest to the approaching traffic.

Where two roads intersect at an acute angle, the STOP or YIELD sign should be positioned at an angle, or shielded, so that the legend is out of view of traffic to which it does not apply.

If a raised splitter island is available on the left-hand side of a multi-lane roundabout approach, an additional YIELD sign should be placed on the left-hand side of the approach.

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Option:

If a raised splitter island is available on the left-hand side of a single lane roundabout approach, an additional YIELD sign may be placed on the left-hand side of the approach.

At wide-throat intersections or where two or more approach lanes of traffic exist on the signed approach, observance of the right-of-way control may be improved by the installation of an additional STOP or YIELD sign on the left-hand side of the road and/or the use of a stop or yield line. At channelized intersections or at divided roadways separated by a median, the additional STOP or YIELD sign may be placed on a channelizing island or in the median. An additional STOP or YIELD sign may also be placed overhead facing the approach at the intersection to improve observance of the right-of-way control.

Standard:

More than one STOP sign or more than one YIELD sign shall not be placed on the same support facing in the same direction.

Section 2B.13 Speed Limit Sign (R2-1)

Standard:

Speed zones (other than statutory speed limits) shall only be established on the basis of an engineering study that has been performed in accordance with traffic engineering practices. The engineering study shall include an analysis of the current speed distribution of free-flowing vehicles.

The Speed Limit (R2-1) sign (see Figure 2B-3) shall display the limit established by law, ordinance, regulation, or as adopted by the authorized agency based on the engineering study. The speed limits displayed shall be in multiples of 5 mph.

Speed Limit (R2-1) signs, indicating speed limits for which posting is required by law, shall be located at the points of change from one speed limit to another.

At the downstream end of the section to which a speed limit applies, a Speed Limit sign showing the next speed limit shall be installed. Additional Speed Limit signs shall be installed beyond major intersections and at other locations where it is

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necessary to remind road users of the speed limit that is applicable.

Speed Limit signs indicating the statutory speed limits shall be installed at entrances to the State and, where appropriate, at jurisdictional boundaries in urban areas.

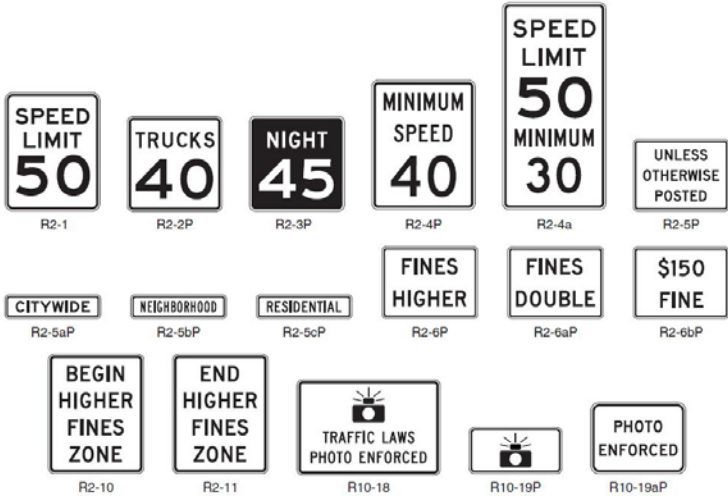
Support:

In general, the maximum speed limits applicable to rural and urban roads are established:

- A. Statutorily – a maximum speed limit applicable to a particular class of road, such as freeways or city streets, that is established by State law; or
- B. As altered speed zones – based on engineering studies.

State statutory limits might restrict the maximum speed limit that can be established on a particular road, notwithstanding what an engineering study might indicate.

Figure 2B-3. Speed Limit and Photo Enforcement Signs and Plaques



Option:

If a jurisdiction has a policy of installing Speed Limit signs in accordance with statutory requirements only on the streets that enter a city, neighborhood, or residential area to indicate the speed limit that is applicable to the entire city, neighborhood, or residential

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area unless otherwise posted, a CITYWIDE (R2-5aP), NEIGHBORHOOD (R2-5bP), or RESIDENTIAL (R2-5cP) plaque may be mounted above the Speed Limit sign and an UNLESS OTHERWISE POSTED (R2-5P) plaque may be mounted below the Speed Limit sign (see Figure 2B-3).

Guidance:

A Reduced Speed Limit Ahead (W3-5 or W3-5a) sign should be used to inform road users of a reduced speed zone where the speed limit is being reduced by more than 10 mph, or where engineering judgment indicates the need for advance notice to comply with the posted speed limit ahead.

Guidance:

An advisory speed plaque (see Section 2C.08) mounted below a warning sign should be used to warn road users of an advisory speed for a roadway condition. A Speed Limit sign should not be used for this situation.

Option:

Other factors that may be considered when establishing or reevaluating speed limits are the following:

- A. Road characteristics, shoulder condition, grade, alignment, and sight distance;
- B. The pace;
- C. Roadside development and environment;
- D. Parking practices and pedestrian activity; and
- E. Reported crash experience for at least a 12-month period.

Section 2B.14 Truck Speed Limit Plaque (R2-2P)

Standard:

Where a special speed limit applies to trucks or other vehicles, the legend TRUCKS XX or such similar legend shall be displayed below the legend Speed Limit XX on the same sign or on a separate R2-2P plaque (see Figure 2B-3) below the standard legend.

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Section 2B.25 BEGIN and END Plaques (R3-9cP, R3-9dP)

Option:

The BEGIN (R3-9cP) or END (R3-9dP) plaque may be used to supplement a regulatory sign to inform road users of the location where a regulatory condition begins or ends.

Standard:

If used, the BEGIN or END plaque shall be mounted directly above a regulatory sign.



R3-9cP



R3-9dP

Section 2B.28 Do Not Pass Sign (R4-1)

Option:

The Do Not Pass (R4-1) sign may be used in addition to pavement markings (see Section 3B.02) to emphasize the restriction on passing. The Do Not Pass sign may be used at the beginning of, and at intervals within, a zone through which sight distance is restricted or where other conditions make overtaking and passing inappropriate.

If signing is needed on the left-hand side of the roadway for additional emphasis, NO PASSING ZONE (W14-3) signs may be used (see Section 2C.45).

Support:

Standards for determining the location and extent of no-passing zone pavement markings are set forth in Section 3B.02.



R4-1

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Section 2B.29 PASS WITH CARE Sign (R4-2)

Guidance:

The PASS WITH CARE (R4-2) sign should be installed at the downstream end of a no-passing zone if a Do Not Pass sign has been installed at the upstream end of the zone.



R4-2

Section 2B.43 Roundabout Directional Arrow Signs (R6-4, R6-4a, and R6-4b)

Guidance:

Where the central island of a roundabout allows for the installation of signs, Roundabout Directional Arrow (R6-4 series) signs (see Figure 2B-20) should be used in the central island to direct traffic counter-clockwise around the central island, except as provided in the following Option.

Option:

Where the central island of a roundabout allows for the installation of signs, ONE WAY signs may be used instead of or in addition to Roundabout Directional Arrow (R6-4 series) signs (see Section 2B.43) to direct traffic counter-clockwise around the central island.

Standard:

The R6-4 sign shall be a horizontal rectangle with two black chevron symbols pointing to the right on a white background. The R6-4a sign shall be a horizontal rectangle with three black chevron symbols pointing to the right on a white background. The R6-4b sign shall be a horizontal rectangle with four black chevron symbols pointing to the right on a white background. No border shall be used on the Roundabout Directional Arrow signs.

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Roundabout Directional Arrow signs shall be used only at roundabouts and other circular intersections.

Guidance:

When used on the central island of a roundabout, the mounting height of a Roundabout Directional Arrow sign should be at least 4 feet, measured vertically from the bottom of the sign to the elevation of the near edge of the traveled way.

Option:

More than one Roundabout Directional Arrow sign and/or R6-4a or R6-4b signs may be used facing high-speed approaches, facing approaches with limited visibility, or in other circumstances as determined by engineering judgment where increased sign visibility would be appropriate.

Section 2B.44 Roundabout Circulation Plaque (R6-5P)

Guidance:

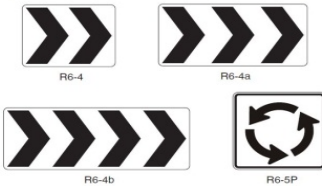
Where the central island of a roundabout does not provide a reasonable place to install a sign, Roundabout Circulation (R6-5P) plaques (see Figure 2B-20) should be placed below the YIELD signs on each approach.

Option:

At roundabouts where Roundabout Directional Arrow signs and/or ONE WAY signs have been installed in the central island, Roundabout Circulation plaques may be placed below the YIELD signs on approaches to roundabouts to supplement the central island signs.

The Roundabout Circulation plaque may be used at any type of circular intersection.

Figure 2B-20. Roundabout Signs and Plaques



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Section 2B.45 Examples of Roundabout Signing

Support:

Figures 2B-21 through 2B-23 (**Refer to MUTCD**) illustrate examples of regulatory and warning signing for roundabouts of various configurations.

Section 2D.38 (**Refer to MUTCD**) contains information regarding guide signing at roundabouts and Chapter 3C (**Refer to MUTCD**) contains information regarding pavement markings at roundabouts.

Section 2B.46 Parking, Standing, and Stopping Signs (R7 and R8 Series)

Support:

Signs governing the parking, stopping, and standing of vehicles cover a wide variety of regulations, and only general guidance can be provided here. The word “standing” when used on the R7 and R8 series of signs refers to the practice of a driver keeping the vehicle in a stationary position while continuing to occupy the vehicle. Typical examples of parking, stopping, and standing signs and plaques are as follows:

1. NO PARKING ANY TIME (R7-1);
18. EMERGENCY SNOW ROUTE NO
PARKING IF OVER XX INCHES (R7-203);
19. NO PARKING ON PAVEMENT (R8-1);
20. NO PARKING EXCEPT ON SHOULDER
(R8-2);
21. No Parking (R8-3, R8-3a);
23. ON PAVEMENT (R8-3cP);
24. ON BRIDGE (R8-3dP);
25. ON TRACKS (R8-3eP);
26. EXCEPT ON SHOULDER (R8-3fP);
29. EMERGENCY PARKING ONLY (R8-4);
30. NO STOPPING ON PAVEMENT (R8-5);
31. NO STOPPING EXCEPT ON SHOULDER (R8-6); and
32. EMERGENCY STOPPING ONLY (R8-7).

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Figure 2B-24 Parking and Standing Signs and Plaques (R7 Series) and Figure 2B-25 Parking and Stopping Signs and Plaques (R8 Series)



Section 2B.47 Design of Parking, Standing, and Stopping Signs

Support:

Discussions of parking signs and parking regulations in this Section apply not only to parking, but also to standing and stopping.

Standard:

The legend on parking signs shall state applicable regulations. Parking signs shall comply with the standards of shape, color, and location.

Where parking is prohibited at all times or at specific times, the basic design for parking signs shall have a red legend and border on a white background (Parking Prohibition signs), except that the R8-4 and R8-7 signs and the alternate design for the R7-201aP plaque shall have a black legend and border on a white background, and the R8-3 sign shall have a black legend and border and a red circle and slash on a white background.

Where only limited-time parking or parking in a particular manner are permitted, the signs shall have a green

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legend and border on a white background (Permissive Parking signs).

Guidance:

Parking signs should display the following information from top to bottom of the sign, in the order listed:

- A. The restriction or prohibition;*
- B. The times of the day that it is applicable, if not at all hours; and*
- C. The days of the week that it is applicable, if not every day.*

If the parking restriction applies to a limited area or zone, the limits of the restriction should be shown by arrows or supplemental plaques. If arrows are used and if the sign is at the end of a parking zone, there should be a single-headed arrow pointing in the direction that the regulation is in effect. If the sign is at an intermediate point in a zone, there should be a double-headed arrow pointing both ways. When a single sign is used at the transition point between two parking zones, it should display a right and left arrow pointing in the direction that the respective restrictions apply.

Where special parking restrictions are imposed during heavy snowfall, Emergency Snow Route (R7-203) signs should be installed. The legend will vary according to the regulations, but the signs should be vertical rectangles, having a white background with the upper part of the plate a red background.

Standard:

Where parking spaces that are reserved for persons with disabilities are designated to accommodate wheelchair vans, a VAN ACCESSIBLE (R7-8P) plaque shall be mounted below the R7-8 sign. The R7-8 sign shall have a green legend and border and a white wheelchair symbol on a blue square, all on a white background. The R7-8P plaque shall have a green legend and border on a white background.

Option:

To minimize the number of parking signs, blanket regulations that apply to a given district may, if legal, be posted at district boundary lines.

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As an alternate to the use of arrows to show designated restriction zones, word messages such as BEGIN, END, HERE TO CORNER, HERE TO ALLEY, THIS SIDE OF SIGN, or BETWEEN SIGNS may be used.

Where parking is prohibited during certain hours and time-limited parking or parking in a particular manner is permitted during certain other time periods, the red Parking Prohibition and green Permissive Parking signs may be designed as follows:

- A. Two 12 x 18-inch parking signs may be used with the red Parking Prohibition sign installed above or to the left of the green Permissive Parking sign; or
- B. The red Parking Prohibition sign and the green Permissive Parking sign may be combined to form an R7-200 sign on a single 24 x 18-inch sign, or an R7-200a sign on a single 12 x 30-inch sign.

At the transition point between two parking zones, a single sign or two signs mounted side by side may be used.

The words NO PARKING may be used as an alternative to the No Parking symbol. The supplemental educational plaque, NO PARKING, with a red legend and border on a white background, may be used above signs incorporating the No Parking symbol.

Alternate designs for the R7-107 sign may be developed such as the R7-107a sign. Alternate designs may include, on a single sign, a transit logo, an approved bus symbol, a parking prohibition, the words BUS STOP, and an arrow. The preferred bus symbol color is black, but other dark colors may be used. Additionally, the transit logo may be displayed on the bus face in the appropriate colors instead of placing the logo separately. The reverse side of the sign may contain bus routing information.

To make the parking regulations more effective and to improve public relations by giving a definite warning, a TOW-AWAY ZONE (R7-201P) plaque may be appended to, or incorporated in, any parking prohibition sign. The Tow-Away Zone (R7-201aP) symbol plaque may be used instead of the R7-201P word message plaque. The R7-201aP plaque may have either a black or red legend and border on a white background.

Option:

In rural areas the legends NO PARKING ON PAVEMENT (R8-1) or NO STOPPING ON PAVEMENT (R8-5) are generally

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suitable and may be used. If a roadway has paved shoulders, the NO PARKING EXCEPT ON SHOULDER sign (R8-2) or the NO STOPPING EXCEPT ON SHOULDER sign (R8-6) may be used as these signs would be less likely to cause confusion. The R8-3 symbol sign or the word message NO PARKING (R8-3a) sign may be used to prohibit any parking along a given highway. Word message supplemental plaques may be mounted below the R8-3 or R8-3a sign. These word message supplemental plaques may include legends such as ON PAVEMENT (R8-3cP), ON BRIDGE (R8-3dP), ON TRACKS (R8-3eP), and EXCEPT ON SHOULDERS (R8-3fP).

Colors that are in compliance with the provisions of Section 2A.10 may be used for color coding of parking time limits.

Guidance:

If colors are used for color coding of parking time limits, the colors green, red, and black should be the only colors that are used.

Section 2B.48 Placement of Parking, Stopping, and Standing Signs

Guidance:

When signs with arrows are used to indicate the extent of the restricted zones, the signs should be set at an angle of not less than 30 degrees or more than 45 degrees with the line of traffic flow in order to be visible to approaching traffic.

Spacing of signs should be based on legibility and sign orientation.

If the zone is unusually long, signs showing a double arrow should be used at intermediate points within the zone.

Standard:

If the signs are mounted at an angle of 90 degrees to the curb line, two signs shall be mounted back to back at the transition point between two parking zones, each with an appended THIS SIDE OF SIGN (R7-202P) supplemental plaque.

Guidance:

If the signs are mounted at an angle of 90 degrees to the curb line, signs without any arrows or appended plaques should be used at intermediate points within a parking zone, facing in the

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direction of approaching traffic. Otherwise the standards of placement should be the same as for signs using directional arrows.

Section 2B.49 Emergency Restriction Signs (R8-4, R8-7)

Option:

The EMERGENCY PARKING ONLY (R8-4) sign or the EMERGENCY STOPPING ONLY (R8-7) sign may be used to discourage or prohibit shoulder parking, particularly where scenic or other attractions create a tendency for road users to stop temporarily.

Standard:

Emergency Restriction signs shall be rectangular and shall have a red or black legend and border on a white background.

Section 2B.58 ROAD CLOSED Sign (R11-2) and LOCAL TRAFFIC ONLY Signs (R11-3 Series, R11-4)

Guidance:

The ROAD CLOSED (R11-2) sign should be installed where roads have been closed to all traffic (except authorized vehicles).

ROAD CLOSED—LOCAL TRAFFIC ONLY (R11-3) or ROAD CLOSED TO THRU TRAFFIC (R11-4) signs should be used where through traffic is not permitted, or for a closure some distance beyond the sign, but where the highway is open for local traffic up to the point of closure.

Standard:

The Road Closed (R11-2, R11-3 series, and R11-4) signs shall be designed as horizontal rectangles. These signs shall be preceded by the applicable Advance Road Closed warning sign with the secondary legend AHEAD and, if applicable, an Advance Detour warning sign (see Section 6F.19) (Refer to MUTCD).

Option:

An intersecting street name or a well-known destination may be substituted for the XX MILES AHEAD legend in urban areas.

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The word message BRIDGE OUT may be substituted for the ROAD CLOSED legend where applicable.



Section 2B.59 Weight Limit Signs (R12-1 through R12-3)

Option:

The Weight Limit (R12-1) sign carrying the legend WEIGHT LIMIT XX TONS may be used to indicate vehicle weight restrictions including load.

Where the restriction applies to axle weight rather than gross load, the legend may be AXLE WEIGHT LIMIT XX TONS or AXLE WEIGHT LIMIT XX LBS (R12-2).

To restrict trucks of certain sizes by reference to empty weight in residential areas, the legend may be NO TRUCKS OVER XX TONS EMPTY WT or NO TRUCKS OVER XX LBS EMPTY WT (R12-3).

Standard:

If used, the Weight Limit sign shall be located in advance of the applicable section of highway or structure.

Guidance:

If used, the Weight Limit sign with an advisory distance ahead legend should be placed at approach road intersections or other points where prohibited vehicles can detour or turn around.



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Section 2B.61 TRUCK ROUTE Sign (R14-1)

Guidance:

The TRUCK ROUTE (R14-1) sign should be used to mark a route that has been designated to allow truck traffic.

Option:

On a numbered highway, the TRUCK (M4-4) auxiliary sign may be used (see Section 2D.20) (**Refer to MUTCD**).



R14-1

Section 2B.62 Hazardous Material Signs (R14-2, R14-3)

Option:

The Hazardous Material Route (R14-2) sign may be used to identify routes that have been designated by proper authority for vehicles transporting hazardous material.

On routes where the transporting of hazardous material is prohibited, the Hazardous Material Prohibition (R14-3) sign may be used.

Guidance:

If used, the Hazardous Material Prohibition sign should be installed on a street or roadway at a point where vehicles transporting hazardous material have the opportunity to take an alternate route.



R14-2



R14-3

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Section 2B.67 Barricades

Options:

Barricades may be used to mark any of the following conditions:

- A. A roadway ends,
- B. A ramp or lane closed for operational purposes, or
- C. The permanent or semi-permanent closure or termination of a roadway.

Standard:

When used to warn and alert road users of the terminus of a roadway in other than temporary traffic control zones, barricades shall meet the design criteria of Section 6F.68 for a Type 3 Barricade, except that the colors of the stripes shall be retroreflective white and retroreflective red.

Option:

An end-of-roadway marker or markers may be used as described in Section 2C.66.

Guidance:

Appropriate advance warning signs (see Chapter 2C) should be used.

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CHAPTER 2C. WARNING SIGNS AND OBJECT MARKERS

Section 2C.01 Function of Warning Signs

Support:

Warning signs call attention to unexpected conditions on or adjacent to a highway, street, or private roads open to public travel and to situations that might not be readily apparent to road users. Warning signs alert road users to conditions that might call for a reduction of speed or an action in the interest of safety and efficient traffic operations.

Section 2C.02 Application of Warning Signs

Standard:

The use of warning signs shall be based on an engineering study or on engineering judgment.

Guidance:

The use of warning signs should be kept to a minimum as the unnecessary use of warning signs tends to breed disrespect for all signs. In situations where the condition or activity is seasonal or temporary, the warning sign should be removed or covered when the condition or activity does not exist.

Section 2C.03 Design of Warning Signs

Standard:

Except as provided in Paragraph 2 or unless specifically designated otherwise, all warning signs shall be diamond-shaped (square with one diagonal vertical) with a black legend and border on a yellow background. Warning signs shall be designed in accordance with the sizes, shapes, colors, and legends contained in the “Standard Highway Signs and Markings” book.

Option:

A warning sign that is larger than the size shown in the Oversized column in Table 2C-2 for that particular sign may be diamond-shaped or may be rectangular or square in shape.

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Except for symbols on warning signs, minor modifications may be made to the design provided that the essential appearance characteristics are met. Modifications may be made to the symbols shown on combined horizontal alignment/intersection signs (see Section 2C.11) and intersection warning signs (see Section 2C.46) in order to approximate the geometric configuration of the intersecting roadway(s).

Word message warning signs other than those provided in this Manual may be developed and installed by State and local highway agencies.

Warning signs regarding conditions associated with pedestrians, bicyclists, and playgrounds may have a black legend and border on a yellow or fluorescent yellow-green background.

Standard:

Warning signs regarding conditions associated with school buses and schools and their related supplemental plaques shall have a black legend and border on a fluorescent yellow-green background.

Section 2C.04 Size of Warning Signs

Standard:

Except as provided in Section 2A.11, the sizes for warning signs shall be as shown in Table 2C-2.

Standard:

Except as provided in the following Option, the minimum size for all diamond-shaped warning signs facing traffic on a multi-lane conventional road where the posted speed limit is higher than 35 mph shall be 36 x 36 inches.

The minimum size for supplemental warning plaques that are not included in Table 2C-2 shall be as shown in Table 2C-3.

Option:

If a diamond-shaped warning sign is placed on the left-hand side of a multi-lane roadway to supplement the installation of the same warning sign on the right-hand side of the roadway, the

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minimum size identified in the Single Lane column in Table 2C-2 may be used.

Signs and plaques larger than those shown in Tables 2C-2 and 2C-3 may be used.

Table 2C-2. Warning Sign and Plaque Sizes

| Sign or Plaque | Sign Designation | Section | Conventional Road (Single Lane) | Minimum | Oversized |
|---|--------------------------------|---------|---------------------------------|------------|-----------|
| Horizontal Alignment | W1-1, 2, 3, 4, 5 | 2C.07 | 30" x 30"* | ----- | 48" x 48" |
| Combination Horizontal Alignment / Advisory Speed | W1-1a, 2a | 2C.10 | 36" x 36" | ----- | 48" x 48" |
| One Direction Large Arrow | W1-6 | 2C.12 | 48" x 24" | ----- | 60" x 30" |
| Two Direction Large Arrow | W1-7 | 2C.47 | 48" x 24" | ----- | 60" x 30" |
| Chevron Alignment | W1-8 | 2C.09 | 18" x 24" | ----- | 24" x 30" |
| Combination Horizontal Alignment / Intersection | W1-10, 10a, 10b, 10c, 10d, 10e | 2C.11 | 36" x 36" | ----- | ----- |
| Hairpin Curve | W1-11 | 2C.07 | 30" x 30" | ----- | 48" x 48" |
| Truck Rollover | W1-13 | 2C.13 | 36" x 36" | ----- | 36" x 36" |
| Intersection Warning | W2-1, 2, 3, 4, 5, 6, 7, 8 | 2C.46 | 30" x 30" | 24" x 24" | 48" x 48" |
| Advanced Traffic Control | W3-1, 2, 3 | 2C.36 | 30" x 30" | 30" x 30" | ----- |
| Be Prepared to Stop | W3-4 | 2C.36 | 36" x 36" | 30" x 30" | ----- |
| Reduced Speed Limit Ahead | W3-5 | 2C.38 | 36" x 36" | ----- | ----- |
| XX MPH Speed Zone Ahead | W3-5a | 2C.38 | 36" x 36" | ----- | ----- |
| Lane Ends | W4-2 | 2C.42 | 36" x 36" | 30" x 30"* | ----- |
| Cross Traffic Does Not Stop (plaque) | W4-4P | 2C.59 | 24" x 12" | ----- | 48" x 24" |
| Traffic From Left (Right) Does Not Stop (plaque) | W4-4aP | 2C.59 | 24" x 12" | ----- | 48" x 24" |
| Oncoming Traffic Does Not Stop (plaque) | W4-4bP | 2C.59 | 24" x 12" | ----- | 48" x 24" |
| Road Narrows | W5-1 | 2C.19 | 36" x 36" | 30" x 30"* | ----- |

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| Sign or Plaque | Sign Designation | Section | Conventional Road (Single Lane) | Minimum | Oversized |
|--------------------------------|------------------|---------|---------------------------------|------------|-----------|
| Narrow Bridge | W5-2 | 2C.20 | 36" x 36" | 30" x 30"* | ----- |
| One Lane Bridge | W5-3 | 2C.21 | 36" x 36" | 30" x 30"* | ----- |
| Two-Way Traffic | W6-3 | 2C.44 | 36" x 36" | ----- | ----- |
| Hill | W7-1 | 2C.16 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| Hill with Grade | W7-1a | 2C.16 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| Use Low Gear (plaque) | W7-2P | 2C.57 | 24" x 18" | ----- | ----- |
| Trucks Use Lower Gear (plaque) | W7-2bP | 2C.57 | 24" x 18" | ----- | ----- |
| XX% Grade (plaque) | W7-3P | 2C.57 | 24" x 18" | ----- | ----- |
| Next XX Miles (plaque) | W7-3aP | 2C.55 | 24" x 18" | ----- | ----- |
| XX% Grade, XX Miles (plaque) | W7-3bP | 2C.57 | 24" x 18" | ----- | ----- |
| Hill Blocks View | W7-6 | 2C.18 | 30" x 30"* | ----- | 48" x 48" |
| Bump or Dip | W8-1, 2 | 2C.28 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| Pavement Ends | W8-3 | 2C.30 | 36" x 36" | 30" x 30"* | ----- |
| Soft Shoulder | W8-4 | 2C.31 | 36" x 36" | 24" x 24"* | 48" x 48" |
| Slippery When Wet | W8-5 | 2C.32 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| Road Condition (plaques) | W8-5P, 5bP, 5cP | 2C.32 | 24" x 18" | ----- | 36" x 30" |
| Ice | W8-5aP | 2C.32 | 24" x 12" | ----- | ----- |
| Truck Crossing | W8-6 | 2C.49 | 36" x 36" | 24" x 24"* | 48" x 48" |
| Loose Gravel | W8-7 | 2C.32 | 36" x 36" | 24" x 24"* | 48" x 48" |
| Rough Road | W8-8 | 2C.32 | 36" x 36" | 24" x 24"* | 48" x 48" |
| Low Shoulder | W8-9 | 2C.31 | 36" x 36" | 24" x 24"* | 48" x 48" |
| Uneven Lanes | W8-11 | 2C.32 | 36" x 36" | ----- | 48" x 48" |
| No Center Line | W8-12 | 2C.34 | 36" x 36" | ----- | ----- |

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| Sign or Plaque | Sign Designation | Section | Conventional Road (Single Lane) | Minimum | Oversized |
|---------------------------------|--------------------------------------|---------|---------------------------------|------------|-----------|
| Bridge Ices Before Road | W8-13 | 2C.32 | 36" x 36" | 24" x 24"* | 48" x 48" |
| Shoulder Drop-Off (plaque) | W8-17P | 2C.31 | 24" x 18" | ----- | 36" x 30" |
| Road May Flood | W8-18 | 2C.35 | 36" x 36" | 24" x 24"* | 48" x 48" |
| No Shoulder | W8-23 | 2C.31 | 36" x 36" | 24" x 24"* | 48" x 48" |
| Shoulder Ends | W8-25 | 2C.31 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| Left (Right) Lane Ends | W9-1 | 2C.42 | 36" x 36" | 30" x 30"* | 48" x 48" |
| Lane Ends Merge Left (Right) | W9-2 | 2C.42 | 36" x 36" | 30" x 30"* | 48" x 48" |
| Bicycle | W11-1 | 2C.49 | 30" x 30" | 24" x 24"* | 48" x 48" |
| Pedestrian | W11-2 | 2C.50 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| Large Animals | W11-3, 4, 16, 17, 18, 19, 20, 21, 22 | 2C.50 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| Farm Vehicle | W11-5, 5a | 2C.49 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| Snowmobile | W11-6 | 2C.50 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| Equestrian | W11-7 | 2C.50 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| Emergency Vehicle | W11-8 | 2C.49 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| Handicapped | W11-9 | 2C.50 | 30" x 30"* | ----- | 48" x 48" |
| Truck | W11-10 | 2C.49 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| Golf Cart | W11-11 | 2C.49 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| Emergency Signal Ahead (plaque) | W11-1P | 2C.49 | 36" x 30" | ----- | ----- |
| Horse-Drawn Vehicle | W11-14 | 2C.49 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| Low Clearance (with arrows) | W12-2 | 2C.27 | 36" x 36" | 30" x 30"* | ----- |
| Low Clearance | W12-2a | 2C.27 | 78" x 24" | ----- | ----- |
| Advisory Speed (plaque) | W13-1P | 2C.08 | 18" x 18" | ----- | 30" x 30" |

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| Sign or Plaque | Sign Designation | Section | Conventional Road (Single Lane) | Minimum | Oversized |
|-----------------------------|------------------|---------|---------------------------------|-----------------|-----------------|
| Dead End, No Outlet | W14-1, 2 | 2C.26 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| No Passing Zone (pennant) | W14-3 | 2C.45 | 48" x 48" x 36" | 40" x 40" x 30" | 64" x 64" x 48" |
| Playground | W15-1 | 2C.51 | 30" x 30"* | 24" x 24"* | 48" x 48" |
| XX Feet | W16-2P | 2C.55 | 24" x 18" | ----- | 30" x 24" |
| XX Ft | W16-2aP | 2C.55 | 24" x 12" | ----- | 30" x 18" |
| XX Miles (2-line plaque) | W16-3P | 2C.55 | 30" x 24" | ----- | ----- |
| XX Miles (1-line plaque) | W16-3aP | 2C.55 | 30" x 12" | ----- | ----- |
| Next XX Feet (plaque) | W16-4P | 2C.55 | 30" x 24" | ----- | ----- |
| Supplemental Arrow (plaque) | W16-5P, 6P | 2C.56 | 24" x 18" | ----- | ----- |
| Ahead | W16-9P | 2C.50 | 24" x 12" | ----- | ----- |
| Traffic Circle (plaque) | W16-12P | 2C.46 | 24" x 18" | ----- | ----- |
| When Flashing (plaque) | W16-13P | 2C.50 | 24" x 18" | ----- | ----- |
| Roundabout (plaque) | W16-17P | 2C.46 | 24" x 12" | ----- | ----- |

* The minimum size required for diamond-shaped warning signs facing traffic on multi-lane conventional roads shall be 36 x 36 per Section 2C.04.

- Notes: 1. Larger signs may be used when appropriate.
2. Dimensions in inches are shown as width x height.

Table 2C-3. Minimum Size of Supplemental Warning Plaques

| Size of Warning Sign | Size of Supplemental Plaque | | | |
|----------------------|-----------------------------|-----------|-----------|-----------|
| | Rectangular | | | Square |
| | 1 Line | 2 Lines | Arrow | |
| 24" x 24" | 24" x 12" | 24" x 18" | 24" x 12" | 18" x 18" |
| 30" x 30" | | | | |
| 36" x 36" | 30" x 18" | 30" x 24" | 30" x 18" | 24" x 24" |

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| Size of Warning Sign | Size of Supplemental Plaque | | | Square |
|-------------------------|-----------------------------|---------|-------|--------|
| | Rectangular | | | |
| | 1 Line | 2 Lines | Arrow | |
| 48" x 48" | | | | |

- Notes: 1. Larger supplemental plaques may be used when appropriate.
 2. Dimensions in inches are shown as width x height.

Section 2C.05 Placement of Warning Signs

Support:

For information on placement of warning signs, see Sections 2A.16 to 2A.21.

The time needed for detection, recognition, decision, and reaction is called the Perception-Response Time (PRT). Table 2C-4 is provided as an aid for determining warning sign location. The distances shown in Table 2C-4 can be adjusted for roadway features, other signing, and to improve visibility.

Table 2C-4. Guidelines for Advance Placement of Warning Signs

| Posted or 85 th - Percentile Speed | Advance Placement Distance ¹ (in feet) | | | | | | | | |
|--|--|--|------------------|------------------|------------------|------------------|------------------|-----------------|-----------------|
| | Condition A: Speed reduction and lane changing in heavy traffic ² | Condition B: Deceleration to the listed advisory speed (mph) for the condition. | | | | | | | |
| | | 0 ³ | 10 ⁴ | 20 ⁴ | 30 ⁴ | 40 ⁴ | 50 ⁴ | 60 ⁴ | 70 ⁴ |
| 20 mph | 225 | 100 ⁶ | N/A ⁵ | ---- | ---- | ---- | ---- | ---- | ---- |
| 25 mph | 325 | 100 ⁶ | N/A ⁵ | N/A ⁵ | ---- | ---- | ---- | ---- | ---- |
| 30 mph | 460 | 100 ⁶ | N/A ⁵ | N/A ⁵ | ---- | ---- | ---- | ---- | ---- |
| 35 mph | 565 | 100 ⁶ | N/A ⁵ | N/A ⁵ | N/A ⁵ | ---- | ---- | ---- | ---- |
| 40 mph | 670 | 125 | 100 | 100 ⁶ | N/A ⁵ | ---- | ---- | ---- | ---- |
| 45 mph | 775 | 175 | 125 | 100 ⁶ | 100 ⁶ | N/A ⁵ | ---- | ---- | ---- |
| 50 mph | 885 | 250 | 200 | 175 | 125 | 100 ⁶ | ---- | ---- | ---- |
| 55 mph | 990 | 325 | 275 | 225 | 200 | 125 | N/A ⁵ | ---- | ---- |
| 60 mph | 1,100 | 400 | 350 | 325 | 275 | 200 | 100 ⁶ | ---- | ---- |
| 65 mph | 1,200 | 475 | 450 | 400 | 350 | 275 | 200 | ---- | ---- |
| 70 mph | 1,250 | 550 | 525 | 500 | 450 | 375 | 275 | ---- | ---- |
| 75 mph | 1,350 | 650 | 625 | 600 | 550 | 475 | ---- | ---- | ---- |

1. The distances are adjusted for a sign legibility distance of 180 feet for Condition A. The distances for Condition B have been adjusted for a sign legibility distance of 250 feet, which is appropriate for an alignment warning symbol sign. For Conditions A and B, warning signs with less than 6-inch legend or more than four words, a minimum of

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100 feet should be added to the advance placement distance to provide adequate legibility of the warning sign.

2. Typical conditions are locations where the road user must use extra time to adjust speed and change lanes in heavy traffic because of a complex driving situation. Typical signs are Merge and Right Lane Ends. The distances are determined by providing the driver a PRT of 14.0 to 14.5 seconds for vehicle maneuvers (2005 AASHTO Policy, Exhibit 3-3, Decision Sight Distance, Avoidance Maneuver E) minus the legibility distance of 180 feet for the appropriate sign.

3. Typical condition is the warning of a potential stop situation. Typical signs are Stop Ahead, Yield Ahead, Signal Ahead, and Intersection Warning signs. The distances are based on the 2005 AASHTO Policy, Exhibit 3-1, Stopping Sight Distance, providing a PRT of 2.5 seconds, a deceleration rate of 11.2 feet/second², minus the sign legibility distance of 180 feet.

4. Typical conditions are locations where the road user must decrease speed to maneuver through the warned condition. Typical signs are Turn, Curve, Reverse Turn, or Reverse Curve. The distance is determined by providing a 2.5 second PRT, a vehicle deceleration rate of 10 feet/second², minus the sign legibility distance of 250 feet.

5. No suggested distances are provided for these speeds, as the placement location is dependent on site conditions and other signing. An alignment warning sign may be placed anywhere from the point of curvature up to 100 feet in advance of the curve. However, the alignment warning sign should be installed in advance of the curve and at least 100 feet from any other signs.

6. The minimum advance placement distance is listed as 100 feet to provide adequate spacing between signs.

Guidance:

Warning signs should be placed so that they provide an adequate PRT. The distances contained in Table 2C-4 are for guidance purposes and should be applied with engineering judgment. Warning signs should not be placed too far in advance of the condition, such that drivers might tend to forget the warning because of other driving distractions, especially in urban areas.

Minimum spacing between warning signs with different messages should be based on the estimated PRT for driver comprehension of and reaction to the second sign.

The effectiveness of the placement of warning signs should be periodically evaluated under both day and night conditions.

Option:

Warning signs that advise road users about conditions that are not related to a specific location, such as Deer Crossing or SOFT SHOULDER, may be installed in an appropriate location, based on engineering judgment, since they are not covered in Table 2C-4.

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Section 2C.06 Horizontal Alignment Warning Signs

Support:

A variety of horizontal alignment warning signs can be used to advise motorists of a change in the roadway alignment. The design and application of horizontal alignment warning signs to meet those requirements are addressed in Sections 2C.06 through 2C.15.

Standard:

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

Option:

Horizontal Alignment Warning signs may also be used on other roadways or on arterial and collector roadways with less than 1,000 AADT based on engineering judgment.

Table 2C-5. Horizontal Alignment Sign Selection

| Type of Horizontal Alignment Sign | Difference Between Speed Limit and Advisory Speed | | | | |
|---|---|-------------|-------------|----------|----------------|
| | 5 mph | 10 mph | 15 mph | 20 mph | 25 mph or more |
| Turn (W1-1), Curve (W1-2), Reverse Turn (W1-3), Reverse Curve (W1-4), Winding Road (W1-5), and Combination Horizontal Alignment/Intersection (W10-1) (see Section 2C.07 to determine which sign to use) | Recommended | Required | Required | Required | Required |
| Advisory Speed Plaque (W13-1P) | Recommended | Required | Required | Required | Required |
| Chevrons (W1-8) and/or One Direction Large Arrow (W1-6) | Optional | Recommended | Required | Required | Required |
| Exit Speed (W13-2) and Ramp Speed (W13-3) on exit ramp | Optional | Optional | Recommended | Required | Required |

Note: Required means that the sign and/or plaque shall be used, recommended means that the sign and/or plaque should be used, and optional means that the sign and/or plaque may be used.

See Section 2C.06 for roadways with less than 1,000 ADT.

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Figure 2C-1. Horizontal Alignment Signs and Plaques



Note: Turn arrows and reverse turn arrows may be substituted for the curve arrows and reverse curve arrows on the W1-10 series signs where appropriate.

Section 2C.07 Horizontal Alignment Signs (W1-1 through W1-5, W1-11)

Standard:

If Table 2C-5 indicates that a horizontal alignment sign (see Figure 2C-1) is required, recommended, or allowed, the sign installed in advance of the curve shall be a Curve (W1-2) sign unless a different sign is recommended or allowed by the provisions of this Section.

A Turn (W1-1) sign shall be used instead of a Curve sign in advance of curves that have advisory speeds of 30 mph or less (see Figure 2C-2).

Guidance:

Where there are two changes in roadway alignment in opposite directions that are separated by a tangent distance of less than 600 feet, the Reverse Turn (W1-3) sign should be used instead of multiple Turn (W1-1) signs and the Reverse Curve (W1-4) sign should be used instead of multiple Curve (W1-2) signs.

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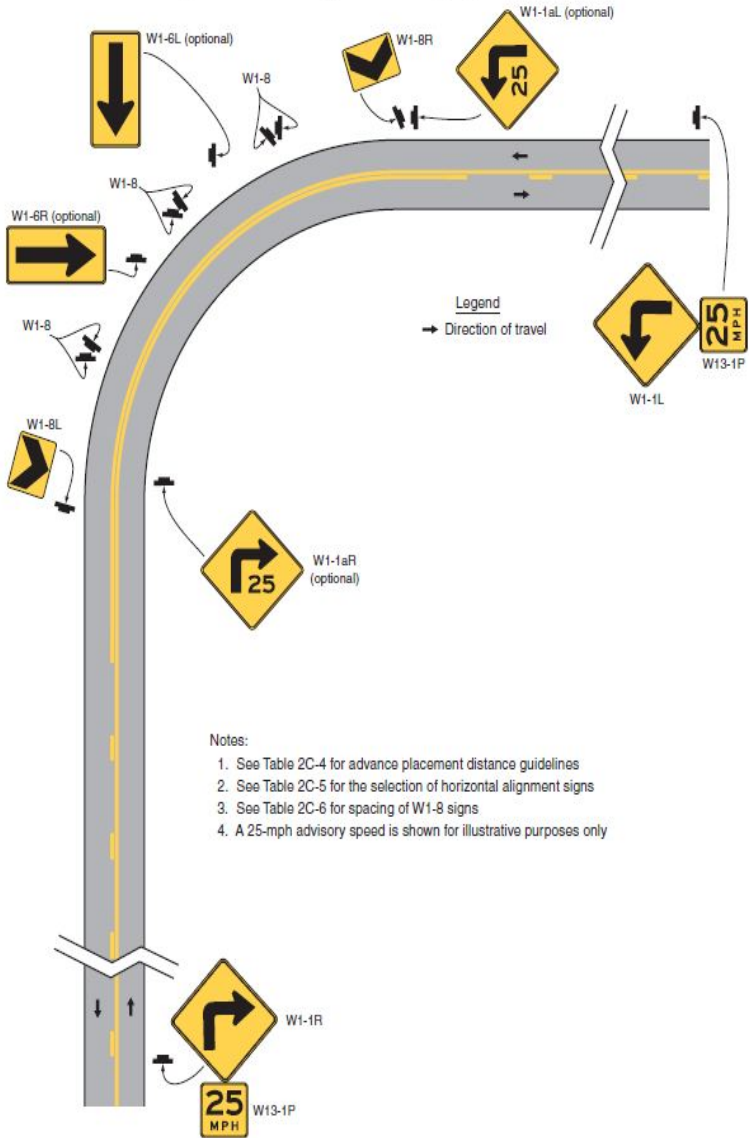
Option:

A Winding Road (W1-5) sign may be used instead of multiple Turn (W1-1) or Curve (W1-2) signs where there are three or more changes in roadway alignment each separated by a tangent distance of less than 600 feet.

A NEXT XX MILES (W7-3aP) supplemental distance plaque (see Section 2C.55) (**Refer to MUTCD**) may be installed below the Winding Road sign where continuous roadway curves exist for a specific distance.

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Figure 2C-2. Example of Warning Signs for a Turn



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Section 2C.08 Advisory Speed Plaque (W13-1P)

Option:

The Advisory Speed (W13-1P) plaque (see Figure 2C-1) may be used to supplement any warning sign to indicate the advisory speed for a condition.

Standard:

The use of the Advisory Speed plaque for horizontal curves shall be in accordance with the information shown in Table 2C-5. The Advisory Speed plaque shall also be used where an engineering study indicates a need to advise road users of the advisory speed for other roadway conditions.

If used, the Advisory Speed plaque shall carry the message XX MPH. The speed displayed shall be a multiple of 5 mph.

Except in emergencies or when the condition is temporary, an Advisory Speed plaque shall not be installed until the advisory speed has been determined by an engineering study.

The Advisory Speed plaque shall only be used to supplement a warning sign and shall not be installed as a separate sign installation.

The advisory speed shall be determined by an engineering study that follows established engineering practices.

Support:

Among the established engineering practices that are appropriate for the determination of the recommended advisory speed for a horizontal curve are the following:

- A. An accelerometer that provides a direct determination of side friction factors
- B. A design speed equation
- C. A traditional ball-bank indicator using the following criteria:
 - 1. 16 degrees of ball-bank for speeds of 20 mph or less.
 - 2. 14 degrees of ball-bank for speeds of 25 to 30 mph.
 - 3. 12 degrees of ball-bank for speeds of 35 mph and Higher.

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The 16, 14, and 12 degrees of ball-bank criteria are comparable to the current AASHTO horizontal curve design guidance. Research has shown that drivers often exceed existing posted advisory curve speeds by 7 to 10 mph.

Guidance:

The advisory speed should be determined based on free-flowing traffic conditions.

Because changes in conditions, such as roadway geometrics, surface characteristics, or sight distance, might affect the advisory speed, each location should be evaluated periodically or when conditions change.

Section 2C.09 Chevron Alignment Sign (W1-8)

Standard:

The use of the Chevron Alignment (W1-8) sign (see Figures 2C-1 and 2C-2) to provide additional emphasis and guidance for a change in horizontal alignment shall be in accordance with the information shown in Table 2C-5.

Option:

When used, Chevron Alignment signs may be used instead of or in addition to standard delineators.

Standard:

The Chevron Alignment sign shall be a vertical rectangle. No border shall be used on the Chevron Alignment sign.

If used, Chevron Alignment signs shall be installed on the outside of a turn or curve, in line with and at approximately a right angle to approaching traffic. Chevron Alignment signs shall be installed at a minimum height of 4 feet, measured vertically from the bottom of the sign to the elevation of the near edge of the traveled way.

Guidance:

The approximate spacing of Chevron Alignment signs on the turn or curve measured from the point of curvature (PC) should be as shown in Table 2C-6.

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If used, Chevron Alignment signs should be visible for a sufficient distance to provide the road user with adequate time to react to the change in alignment.

Table 2C-6. Typical Spacing of Chevron Alignment Signs on Horizontal Curves

| Advisory Speed | Curve Radius | Sign Spacing |
|------------------|----------------------|--------------|
| 15 mph or less | Less than 200 feet | 40 feet |
| 20 to 30 mph | 200 to 400 feet | 80 feet |
| 35 to 45 mph | 401 to 700 feet | 120 feet |
| 50 to 60 mph | 701 to 1,250 feet | 160 feet |
| More than 60 mph | More than 1,250 feet | 200 feet |

Note: The relationship between the curve radius and the advisory speed shown in this table should not be used to determine the advisory speed.

Standard:

Chevron Alignment signs shall not be placed on the far side of a T-intersection facing traffic on the stem approach to warn drivers that a through movement is not physically possible, as this is the function of a Two-Direction (or One-Direction) Large Arrow sign.

Chevron Alignment signs shall not be used to mark obstructions within or adjacent to the roadway, including the beginning of guardrails or barriers, as this is the function of an object marker (see Section 2C.63).

Section 2C.10 Combination Horizontal Alignment/Advisory Speed Signs (W1-1a, W1-2a)

Option:

The Turn (W1-1) sign or the Curve (W1-2) sign may be combined with the Advisory Speed (W13-1P) plaque (see Section 2C.08) to create a combination Turn/Advisory Speed (W1-1a) sign or combination Curve/Advisory Speed (W1-2a) sign (see Figure 2C-1).

The combination Horizontal Alignment/Advisory Speed sign may be used to supplement the advance Horizontal Alignment

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warning sign and Advisory Speed plaque based upon an engineering study.

Standard:

If used, the combination Horizontal Alignment/Advisory Speed sign shall not be used alone and shall not be used as a substitute for a Horizontal Alignment warning sign and Advisory Speed plaque at the advance warning location. The combination Horizontal Alignment/Advisory Speed sign shall only be used as a supplement to the advance Horizontal Alignment warning sign. If used, the combination Horizontal Alignment/Advisory Speed sign shall be installed at the beginning of the turn or curve.

Guidance:

The advisory speed displayed on the combination Horizontal Alignment/Advisory Speed sign should be based on the advisory speed for the horizontal curve using recommended engineering practices (see Section 2C.08).

Section 2C.11 Combination Horizontal Alignment/Intersection Signs (W1-10 Series)

Option:

The Turn (W1-1) sign or the Curve (W1-2) sign may be combined with the Cross Road (W2-1) sign or the Side Road (W2-2 or W2-3) sign to create a combination Horizontal Alignment/Intersection (W1-10 series) sign (see Figure 2C-1) that depicts the condition where an intersection occurs within or immediately adjacent to a turn or curve.

Guidance:

Elements of the combination Horizontal Alignment/Intersection sign related to horizontal alignment should comply with the provisions of Section 2C.07, and elements related to intersection configuration should comply with the provisions of Section 2C.46. The symbol design should approximate the configuration of the intersecting roadway(s). No more than one Cross Road or two Side Road symbols should be displayed on any one combination Horizontal Alignment/Intersection sign.

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Standard:

The use of the combination Horizontal Alignment/Intersection sign shall be in accordance with the appropriate Turn or Curve sign information shown in Table 2C-5.

Section 2C.12 One-Direction Large Arrow Sign (W1-6)

Option:

A One-Direction Large Arrow (W1-6) sign (see Figure 2C-1) may be used either as a supplement or alternative to Chevron Alignment signs in order to delineate a change in horizontal alignment (see Figure 2C-2).

A One-Direction Large Arrow (W1-6) sign may be used to supplement a Turn or Reverse Turn sign (see Figure 2C-2) to emphasize the abrupt curvature.

Standard:

The One-Direction Large Arrow sign shall be a horizontal rectangle with an arrow pointing to the left or right.

The use of the One-Direction Large Arrow sign shall be in accordance with the information shown in Table 2C-5.

If used, the One-Direction Large Arrow sign shall be installed on the outside of a turn or curve in line with and at approximately a right angle to approaching traffic.

The One-Direction Large Arrow sign shall not be used where there is no alignment change in the direction of travel, such as at the beginnings and ends of medians or at center piers.

The One-Direction Large Arrow sign directing traffic to the right shall not be used in the central island of a roundabout.

Guidance:

If used, the One-Direction Large Arrow sign should be visible for a sufficient distance to provide the road user with adequate time to react to the change in alignment.

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Section 2C.16 Hill Signs (W7-1, W7-1a)

Guidance:

The Hill (W7-1) sign (see Figure 2C-4) should be used in advance of a downgrade where the length, percent of grade, horizontal curvature, and/or other physical features require special precautions on the part of road users.

The Hill sign and supplemental grade (W7-3P) plaque (see Section 2C.57)(Refer to MUTCD) used in combination, or the W7-1a sign used alone, should be installed in advance of downgrades for the following conditions:

- A. 5% grade that is more than 3,000 feet in length,*
- B. 6% grade that is more than 2,000 feet in length,*
- C. 7% grade that is more than 1,000 feet in length,*
- D. 8% grade that is more than 750 feet in length, or*
- E. 9% grade that is more than 500 feet in length.*

These signs should also be installed for steeper grades or where crash experience and field observations indicate a need.

Supplemental plaques (see Section 2C.57)(Refer to MUTCD) and larger signs should be used for emphasis or where special hill characteristics exist. On longer grades, the use of the Hill sign with a distance (W7-3aP) plaque or the combination distance/grade (W7-3bP) plaque at periodic intervals of approximately 1-mile spacing should be considered.

Standard:

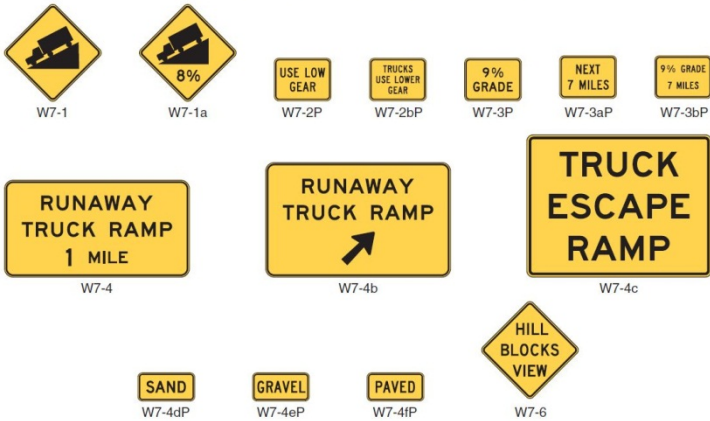
If the percent grade is displayed on a supplemental plaque, the plaque shall be placed below the Hill (W7-1) sign.

Option:

A USE LOW GEAR (W7-2P) or TRUCKS USE LOWER GEAR (W7-2bP) supplemental plaque (see Figure 2C-4) may be used to indicate a situation where downshifting as well as braking might be advisable.

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Figure 2C-4. Vertical Grade Signs and Plaques



Section 2C.18 HILL BLOCKS VIEW Sign (W7-6)

Option:

A HILL BLOCKS VIEW (W7-6) sign (see Figure 2C-4) may be used in advance of a crest vertical curve to advise road users to reduce speed as they approach and traverse the hill as only limited stopping sight distance is available.

Guidance:

When a HILL BLOCKS VIEW sign is used, it should be supplemented by an Advisory Speed (W13-1P) plaque indicating the recommended speed for traveling over the hillcrest based on available stopping sight distance.

Section 2C.19 ROAD NARROWS Sign (W5-1)



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Guidance:

Except as provided in paragraph 2, a ROAD NARROWS (W5-1) sign should be used in advance of a transition on two-lane roads where the pavement width is reduced abruptly to a width such that vehicles traveling in opposite directions cannot simultaneously travel through the narrow portion of the roadway without reducing speed.

Option:

The ROAD NARROWS (W5-1) sign may be omitted on low-volume local streets that have speed limits of 30 mph or less.

Additional emphasis may be provided by the use of object markers and delineators (see Section 2B.63 through 2B.65 and Chapter 3F) (**Refer to MUTCD**). The Advisory Sign (W13-1P) plaque (see Section 2C.08) may be used to indicate the recommended speed.

Section 2C.20 NARROW BRIDGE Sign (W5-2)



W5-2

Guidance:

A NARROW BRIDGE (W5-2) sign should be used in advance of any bridge or culvert having a two-way roadway clearance width of 16 to 18 feet, or any bridge or culvert having a roadway clearance less than the width of the approach travel lanes.

Additional emphasis should be provided by the use of object markers, delineators, and/or pavement markings.

Option:

A NARROW BRIDGE sign may be used in advance of a bridge or culvert on which the approach shoulders are narrowed or eliminated.

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Section 2C.21 ONE LANE BRIDGE Sign (W5-3)



W5-3

Guidance:

A ONE LANE BRIDGE (W5-3) sign should be used on two-way roadways in advance of any bridge or culvert:

- A. Having a clear roadway width of less than 16 feet, or*
- B. Having a clear roadway width of less than 18 feet when commercial vehicles constitute a high proportion of the traffic, or*
- C. Having a clear roadway width of 18 feet or less where the sight distance is limited on the approach to the structure.*

Additional emphasis should be provided by the use of object markers, delineators, and/or pavement markings.

Section 2C.26 DEAD END/NO OUTLET Signs (W14-1, W14-1a, W14-2, W14-2a)

Option:

The DEAD END (W14-1) sign may be used at the entrance of a single road or street that terminates in a dead end or cul-de-sac. The NO OUTLET (W14-2) sign may be used at the entrance of a road or road network from which there are no other exit.

Standard:

The DEAD END (W14-1a) and NO OUTLET (W14-2a) Signs shall be horizontal rectangles with an arrow pointing to the left or right.

When the W14-1 or W14-2 sign is used, the sign shall be posted as near as practical to the entry point or at a sufficient advance distance to permit the road used to avoid the dead end or no outlet condition by turning at the nearest intersecting street.

The DEAD END (W14-1a) or NO OUTLET (W14-2a) shall not be used instead of the W14-1 or W14-2 signs where traffic can proceed straight through the intersection into the dead end street or no outlet area.

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W14-1



W14-1a



W14-2



W14-2a

Section 2C.28 BUMP and DIP Signs (W8-1, W8-2)



W8-1



W8-2

Guidance:

BUMP (W8-1) and DIP (W8-2) signs should be used to give warning of a sharp rise or depression in the profile of the road.

Option:

These signs may be supplemented with an Advisory Speed plaque (see Section 2C.08).

Standard:

The DIP sign shall not be used at a short stretch of depressed alignment that might momentarily hide a vehicle.

Guidance:

A short stretch of depressed alignment that might momentarily hide a vehicle should be treated as a no-passing zone when center line striping is provided on a two-lane or three-lane road (see Section 3B.02) (Refer to MUTCD).

Section 2C.30 PAVEMENT ENDS Sign (W8-3)



W8-3

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Guidance:

A PAVEMENT ENDS (W8-3) word message sign should be used where a paved surface changes to either a gravel treated surface or an earth road surface.

Option:

An Advisory Speed plaque (see Section 2C.08) may be used when the change in roadway condition requires a reduced speed.

Section 2C.31 Shoulder Signs (W8-4, W8-9, W8-17, W8-23, and W8-25)

Option:

The SOFT SHOULDER (W8-4) sign may be used to warn of a soft shoulder condition.

The LOW SHOULDER (W8-9) sign may be used to warn of a shoulder condition where there is an elevation difference of less than 3 inches between the shoulder and the travel lane.

Guidance:

The Shoulder Drop Off (W8-17) sign should be used where an unprotected shoulder drop-off, adjacent to the travel lane, exceeds 3 inches in depth for a significant continuous length along the roadway, based on engineering judgment.

Option:

A SHOULDER DROP-OFF (W8-17P) supplemental plaque may be mounted below the W8-17 sign.

The NO SHOULDER (W8-23) sign may be used to warn road users that a shoulder does exist along a portion of the roadway.

The SHOULDER ENDS (W8-25) sign may be used to warn road users that a shoulder is ending.

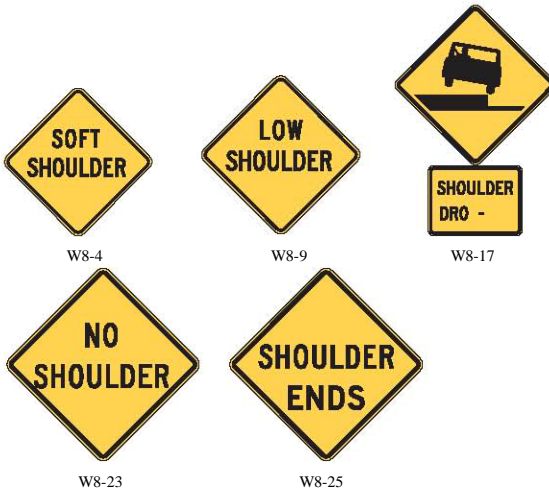
Standard:

When used, shoulder signs shall be placed in advance of the condition (see Table 2C-4).

Guidance:

Additional shoulder signs should be placed at appropriate intervals along the road where the condition continually exists.

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Section 2C.32 Surface Condition Signs (W8-5, W8-7, W8-8, W8-11, W8-13, and W8-14)

Option:

The Slippery When Wet (W8-5) sign may be used to warn of unexpected slippery conditions. Supplemental plaques with legends such as ICE, WHEN WET, STEEL DECK, or EXCESS OIL may be used with the W8-5 sign to indicate the reason that the slippery conditions might be present.

The LOOSE GRAVEL (W8-7) sign may be used to warn of loose gravel on the roadway surface.

The ROUGH ROAD (W8-8) sign may be used to warn of a rough roadway surface.

An UNEVEN LANES (W8-11) sign may be used to warn of a difference in elevation between travel lanes.

The BRIDGE ICES BEFORE ROAD (W8-13) sign may be used in advance of bridges to advise bridge users of winter weather conditions. The BRIDGE ICES BEFORE ROAD sign may be removed or covered during seasons of the year when its message is not relevant.

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The FALLEN ROCKS (W8-14) sign may be used in advance of an area that is adjacent to a hillside, mountain, or cliff where rocks frequently fall onto the roadway.

Guidance:

When used, Surface Condition signs should be placed in advance of the beginning of the affected section (see Table 2C-4), and additional signs should be placed at appropriate intervals along the road where the condition exists.



W8-5



W8-7



W8-8



W8-11



W8-13



W8-14

Section 2C.34 NO CENTER LINE Sign (W8-12)



W8-12

Option:

The NO CENTER LINE (W8-12) sign may be used to warn of a roadway without center line pavement markings.

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Section 2C.35 Weather Condition Signs (W8-18, W8-19)



Option:

The ROAD MAY FLOOD (W8-18) sign may be used to warn road users that a section of roadway is subject to frequent flooding. A Depth Gauge (W8-19) sign may also be installed within a roadway section that frequently floods.

Standard:

If used, the Depth Gauge sign shall be in addition to the ROAD MAY FLOOD sign and shall indicate the depth of the water at the deepest point on the roadway.

Section 2C.36 Advance Traffic Control Signs (W3-1, W3-2, W3-3, W3-4)



Standard:

The Advance Traffic Control symbol signs include the Stop Ahead (W3-1), Yield Ahead (W3-2), and Signal Ahead (W3-3) signs. These signs shall be installed on an approach to a primary traffic control device that is not visible for a sufficient distance to permit the road user to respond to the device (see Table 2C-4).

Support:

Figure 2A-4 shows the typical placement of an Advance Traffic Control sign.

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Option:

An Advance Traffic Control sign may be used for additional emphasis of the primary traffic control device, even when the visibility distance to the device is satisfactory.

A warning beacon may be used with an Advance Traffic Control sign.

A BE PREPARED TO STOP (W3-4) sign may be used to warn of stopped traffic caused by a traffic control signal or in advance of a section of roadway that regularly experiences traffic congestion.

Standard:

When a BE PREPARED TO STOP sign is used in advance of a traffic control signal, it shall be used in addition to a Signal Ahead sign and shall be placed downstream from the Signal Ahead (W3-3) sign.

Option:

The BE PREPARED TO STOP sign may be supplemented with a warning beacon (see Section 4L.03)(Refer to MUTCD).

Section 2C.38 Reduced Speed Limit Ahead Signs (W3-5, W3-5a)

Guidance:

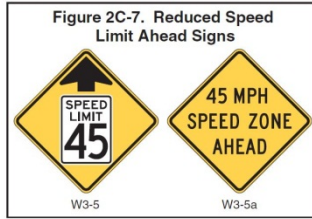
A Reduced Speed Limit Ahead (W3-5 or W3-5a) sign (see Figure 2C-7) should be used to inform road users of a reduced speed zone where the speed limit is being reduced by more than 10 mph, or where engineering judgment indicates the need for advance notice to comply with the posted speed limit ahead.

Standard:

If used, Reduced Speed Limit Ahead signs shall be followed by a Speed Limit (R2-1) sign installed at the beginning of the zone where the speed limit applies.

The speed limit displayed on the Reduced Speed Limit Ahead sign shall be identical to the speed limit displayed on the subsequent Speed Limit sign.

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Section 2C.45 NO PASSING ZONE Sign (W14-3)



W14-3

Standard:

The **NO PASSING ZONE (W14-3)** sign shall be a pennant-shaped isosceles triangle with its longer axis horizontal and pointing to the right. When used, the **NO PASSING ZONE** sign shall be installed on the left side of the roadway at the beginning of no-passing zones identified by pavement markings or **DO NOT PASS** signs or both (see Sections 2B.28 and 3B.02)(Refer to MUTCD).

Section 2C.46 Intersection Warning Signs (W2-1 through W2-8)

Option:

A Cross Road (W2-1) symbol, Side Road (W2-2 or W2-3) symbol, T-Symbol (W2-4), or Y-Symbol (W2-5) sign (see Figure 2C-9) may be used in advance of an intersection to indicate the presence of an intersection and the possibility of turning or entering traffic.

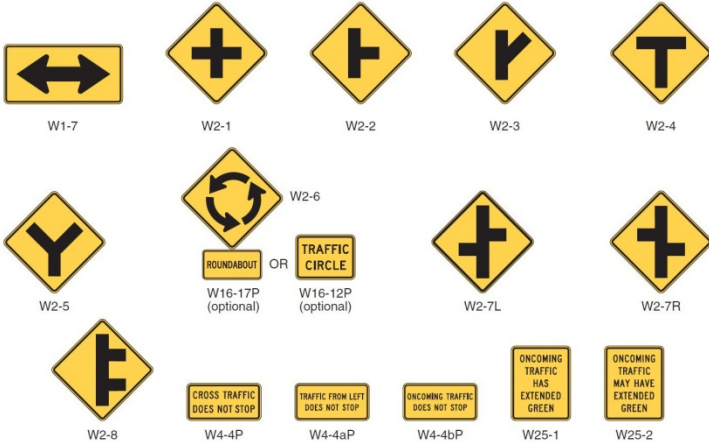
The Circular Intersection (W2-6) symbol sign (see Figure 2C-9) may be installed in advance of a circular intersection.

Guidance:

If an approach to a roundabout has a statutory or posted speed limit of 40 mph or higher, the Circular Intersection (W2-6) symbol sign should be installed in advance of the circular intersection.

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Figure 2C-9. Intersection Warning Signs and Plaques



Option:

An educational plaque (see Figure 2C-9) with a legend such as ROUNDABOUT (W16-17P) or TRAFFIC CIRCLE (W16-12P) may be mounted below a Circular Intersection symbol sign.

The relative importance of the intersecting roadways may be shown by different widths of lines in the symbol.

An advance street name plaque (see Section 2C.58) (**Refer to MUTCD**) may be installed above or below an Intersection Warning sign.

Guidance:

The Intersection Warning sign should illustrate and depict the general configuration of the intersecting roadway, such as cross road, side road, T-intersection, or Y-intersection.

Intersection Warning signs, other than the Circular Intersection (W2-6) symbol sign and the T-intersection (W2-4) symbol sign should not be used on approaches controlled by STOP signs, YIELD signs, or signals.

If an Intersection Warning sign is used where the side roads are not opposite of each other, the Offset Side Roads (W2-7) symbol sign (see Figure 2C-9) should be used instead of the Cross Road symbol sign.

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If an Intersection Warning sign is used where two closely-spaced side roads are on the same side of the highway, the Double Side Roads (W2-8) symbol sign (see Figure 2C-9) should be used instead of the Side Road symbol sign.

No more than two side road symbols should be displayed on the same side of the highway on a W2-7 or W2-8 symbol sign, and no more than three side road symbols should be displayed on a W2-7 or W2-8 symbol sign.

Support:

Figure 2A-4 shows the typical placement of an Intersection Warning sign.

Section 2C.47 Two-Direction Large Arrow Sign (W1-7)

Standard:

The Two-Direction Large Arrow (W1-7) sign (see Figure 2C-9) shall be a horizontal rectangle.

If used, it shall be installed on the far side of a T-intersection in line with, and at approximately a right angle to, traffic approaching from the stem of the T-intersection.

The Two-Direction Large Arrow sign shall not be used where there is no change in the direction of travel such as at the beginnings and ends of medians or at center piers.

The Two-Direction Large Arrow sign directing traffic to the left and right shall not be used in the central island of a roundabout.

Guidance:

The Two-Direction Large Arrow sign should be visible for a sufficient distance to provide the road user with adequate time to react to the intersection configuration.

Section 2C.49 Vehicular Traffic Warning Signs (W8-6, W11-1, W11-5, W11-5a, W11-8, W11-10, W11-11, W11-12P, W11-14, W11-15, and W11-15a)

Option:

Vehicular Traffic Warning (W8-6, W11-1, W11-5, W11-5a, W11-8, W11-10, W11-11, W11-12P, W11-14, W11-15, and W11-

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15a) signs (see Figure 2C-10) may be used to alert road users to locations where unexpected entries into the roadway by trucks, bicyclists, farm vehicles, emergency vehicles, golf carts, horse-drawn vehicles, or other vehicles might occur. The TRUCK CROSSING (W8-6) word message sign may be used as an alternate to the Truck Crossing (W11-10) symbol sign.

Figure 2C-10. Vehicular Traffic Warning Signs and Plaques



* A fluorescent yellow-green background color may be used for this sign or plaque.

Support:

These locations might be relatively confined or might occur randomly over a segment of roadway.

Guidance:

Vehicular Traffic Warning signs should be used only at locations where the road user's sight distance is restricted, or the condition, activity, or entering traffic would be unexpected.

If the condition or activity is seasonal or temporary, the Vehicular Traffic Warning sign should be removed or covered when the condition or activity does not exist.

Option:

The combined Bicycle/Pedestrian (W11-15) sign may be used where both bicyclists and pedestrians might be crossing the roadway, such as at an intersection with a shared-use path. A TRAIL X-ING (W11-15P) supplemental plaque (see Figure 2C-10) may be mounted below the W11-15 sign. The TRAIL CROSSING (W11-15a) sign may be used to warn of shared-use path crossings where pedestrians, bicyclists, and other user groups might be crossing the roadway.

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The W11-1, W11-15, and W11-15a signs and their related supplemental plaques may have a fluorescent yellow-green background with a black legend and border.

Supplemental plaques (see Section 2C.53) (**Refer to MUTCD**) with legends such as AHEAD, XX FEET, NEXT XX MILES, or SHARE THE ROAD may be mounted below Vehicular Traffic Warning signs to provide advance notice to road users of unexpected entries.

Guidance:

If used in advance of a pedestrian and bicycle crossing, a W11-15 or W11-15a sign should be supplemented with an AHEAD or XX FEET plaque to inform road users that they are approaching a point where crossing activity might occur.

Standard:

If a post-mounted W11-1, W11-11, W11-15, or W11-15a sign is placed at the location of the crossing point where golf carts, pedestrians, bicyclists, or other shared-use path users might be crossing the roadway, a diagonal downward pointing arrow (W16-7P) plaque shall be mounted below the sign. If the W11-1, W11-11, W11-15, or W11-15a sign is mounted overhead, the W16-7P supplemental plaque shall not be used.

Option:

The crossing location identified by a W11-1, W11-11, W11-15, or W11-15a sign may be defined with crosswalk markings (see Section 3B.18) (**Refer to MUTCD**).

Standard:

The Emergency Vehicle (W11-8) sign (see Figure 2C-10) with the EMERGENCY SIGNAL AHEAD (W11-12P) supplemental plaque (see Figure 2C-10) shall be placed in advance of all emergency-vehicle traffic control signals (see Chapter 4G) (Refer to MUTCD).

Option:

The Emergency Vehicle (W11-8) sign, or a word message sign indicating the type of emergency vehicle (such as rescue squad),

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may be used in advance of the emergency-vehicle station when no emergency-vehicle traffic control signal is present.

A Warning Beacon (see Section 4L.03) (**Refer to MUTCD**) may be used with any Vehicular Traffic Warning sign to indicate specific periods when the condition or activity is present or is likely to be present, or to provide enhanced sign conspicuity.

A supplemental WHEN FLASHING (W16-13P) plaque may be used with any Vehicular Traffic Warning sign that is supplemented with a Warning Beacon to indicate specific periods when the condition or activity is present or is likely to be present.

Section 2C.50 Non-Vehicular Warning Signs (W11-2, W11-3, W11-4, W11-6, W11-7, W11-9, and W11-16 through W11-22)

Option:

Non-Vehicular Warning (W11-2, W11-3, W11-4, W11-6, W11-7, W11-9, and W11-16 through W11-22) signs (see Figure 2C-11) may be used to alert road users in advance of locations where unexpected entries into the roadway might occur or where shared use of the roadway by pedestrians, animals, or equestrians might occur.

Figure 2C-11. Non-Vehicular Warning Signs



★ A fluorescent yellow-green background color may be used for this sign or plaque.

Support:

These conflicts might be relatively confined, or might occur randomly over a segment of roadway.

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Guidance:

*If used in advance of a pedestrian, snowmobile, or equestrian crossing, the W11-2, W11-6, W11-7, and W11-9 signs should be supplemented with plaques (see Section 2C.55) (**Refer to MUTCD**) with the legend AHEAD or XX FEET to inform road users that they are approaching a point where crossing activity might occur.*

Standard:

If a post-mounted W11-2, W11-6, W11-7, or W11-9 sign is placed at the location of the crossing point where pedestrians, snowmobilers, or equestrians might be crossing the roadway, a diagonal downward pointing arrow (W16-7P) plaque shall be mounted below the sign. If the W11-2, W11-6, W11-7, or W11-9 sign is mounted overhead, the W16-7P plaque shall not be used.

Option:

A Pedestrian Crossing (W11-2) sign may be placed overhead or may be post-mounted with a diagonal downward pointing arrow (W16-7P) plaque at the crosswalk location where Yield Here To (Stop Here For) Pedestrians signs (see Section 2B.11) (**Refer to MUTCD**) have been installed in advance of the crosswalk.

Standard:

If a W11-2 sign has been post-mounted at the crosswalk location where a Yield Here To (Stop Here For) Pedestrians sign is used on the approach, the Yield Here To (Stop Here For) Pedestrians sign shall not be placed on the same post as or block the road user's view of the W11-2 sign.

Option:

An advance Pedestrian Crossing (W11-2) sign with an AHEAD or a distance supplemental plaque may be used in conjunction with a Yield Here To (Stop Here For) Pedestrians sign on the approach to the same crosswalk.

The crossing location identified by a W11-2, W11-6, W11-7, or W11-9 sign may be defined with crosswalk markings (see Section 3B.18) (**Refer to MUTCD**).

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The W11-2 and W11-9 signs and their related supplemental plaques may have a fluorescent yellow-green background with a black legend and border.

Guidance:

When a fluorescent yellow-green background is used, a systematic approach featuring one background color within a zone or area should be used. The mixing of standard yellow and fluorescent yellow-green backgrounds within a selected site area should be avoided.

Option:

A Warning Beacon (see Section 4L.03) (**Refer to MUTCD**) may be used with any Non-Vehicular Warning sign to indicate specific periods when the condition or activity is present or is likely to be present, or to provide enhanced sign conspicuity.

A supplemental WHEN FLASHING (W16-13P) plaque may be used with any Non-Vehicular Warning sign that is supplemented with a Warning Beacon to indicate specific periods when the condition or activity is present or is likely to be present.

(NOTE: Other nonvehicular signs approved by the ND DOT (RW 158, RW 148, RW 353 and RW 119). The ND DOT Programming Division has layouts for these signs. The sign numbers are state numbers.)

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RW 158



RW 148



RW 353



RW 119

Section 2C.51 Playground Sign (W15-1)

Option:

The Playground (W15-1) sign (see Figure 2C-11) may be used to give advance warning of a designated children's playground that is located adjacent to the road.

The Playground sign may have a fluorescent yellow-green background with a black legend and border.

Guidance:

If the access to the playground area requires a roadway crossing, the application of crosswalk pavement markings (see Section 3B.18) (Refer to MUTCD) and Non-Vehicular Warning signs (see Section 2C.50) should be considered

Section 2C.63 Object Marker Design and Placement Height

Support:

Type 1, 2, and 3 object markers are used to mark obstructions within or adjacent to the roadway. Type 4 object markers are used to mark the end of a roadway.

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Standard:

When used, object markers (see Figure 2C-13) shall not have a border and shall consist of an arrangement of one or more of the following types:

- Type 1—a diamond-shaped sign, at least 18 inches on a side, consisting of either a yellow (OM1-1) or black (OM1-2) sign with nine yellow retroreflective devices, each with a minimum diameter of 3 inches, mounted symmetrically on the sign, or an all-yellow retroreflective sign (OM1-3).
- Type 2—either a marker (OM2-1V or OM2-1H) consisting of three yellow retroreflective devices, each with a minimum diameter of 3 inches, arranged either horizontally or vertically on a white sign measuring at least 6 x 12 inches; or an all-yellow horizontal or vertical retroreflective sign (OM2-2V or OM2-2H), measuring at least 6 x 12 inches.
- Type 3—a stripped marker, 12 x 36 inches, consisting of a vertical rectangle with alternating black and retroreflective yellow stripes sloping downward at an angle of 45 degrees toward the side of the obstruction on which traffic is to pass. The minimum width of the yellow and black stripes shall be 3 inches.
- Type 4—a diamond-shaped sign, at least 18 inches on a side, consisting of either a red (OM4-1) or black (OM4-2) sign with nine red retroreflective devices, each with a minimum diameter of 3 inches, mounted symmetrically on the sign, or an all-red retroreflective sign (OM4-3).

Support:

A better appearance can be achieved if the black stripes are wider than the yellow stripes.

Type 3 object markers with stripes that begin at the upper right side and slope downward to the lower left side are designated as right object markers (OM3-R). Object markers with stripes that begin

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at the upper left side and slope downward to the lower right side are designated as left object markers (OM3-L).

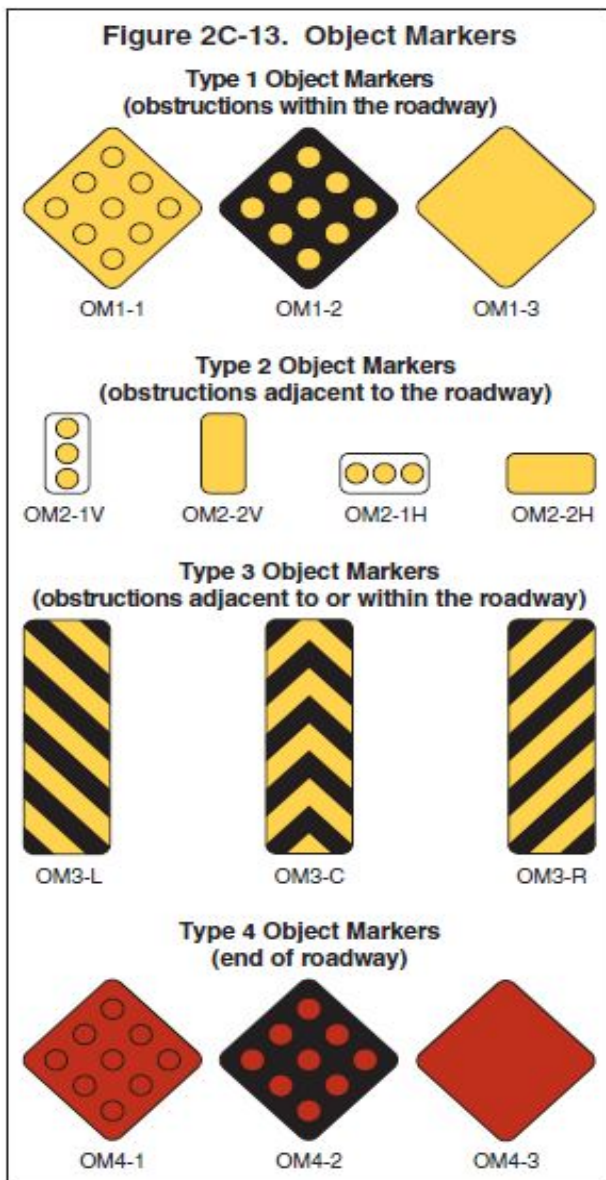
Guidance:

When used for marking obstructions within the roadway or obstructions that are 8 feet or less from the shoulder or curb, the minimum mounting height, measured from the bottom of the object marker to the elevation of the near edge of the traveled way, should be 4 feet.

When used to mark obstructions more than 8 feet from the shoulder or curb, the clearance from the ground to the bottom of the object marker should be at least 4 feet.

Object markers should not present a vertical or horizontal clearance obstacle for pedestrians.

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Option:

When object markers or markings are applied to an obstruction that by its nature requires a lower or higher mounting, the vertical mounting height may vary according to need.

Support:

Section 9B.26 (**Refer to MUTCD**) contains information regarding the use of object markers on shared-use paths.

Section 2C.64 Object Markers for Obstructions Within the Roadway

Standard:

Obstructions within the roadway shall be marked with a Type 1 or Type 3 object marker. In addition to markers on the face of the obstruction, warning of approach to the obstruction shall be given by appropriate pavement markings (see Section 3B.10) (Refer to MUTCD).

Option:

To provide additional emphasis, a Type 1 or Type 3 object marker may be installed at or near the approach end of a median island.

To provide additional emphasis, large surfaces such as bridge piers may be painted with diagonal stripes, 12 inches or greater in width, similar in design to the Type 3 object marker.

Standard:

The alternating black and retroreflective yellow stripes (OM3-L, OM3-R) shall be sloped down at an angle of 45 degrees toward the side on which traffic is to pass the obstruction. If traffic can pass to either side of the obstruction, the alternating black and retroreflective yellow stripes (OM3-C) shall form chevrons that point upwards.

Option:

Appropriate signs (see Sections 2B.32 and 2C.25) (**Refer to MUTCD**) directing traffic to one or both sides of the obstruction may be used instead of the object marker.

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Section 2C.65 Object Markers for Obstructions Adjacent to the Roadway

Support:

Obstructions not actually within the roadway are sometimes so close to the edge of the road that they need a marker. These include underpass piers, bridge abutments, handrails, ends of traffic barriers, utility poles, and culvert headwalls. In other cases there might not be a physical object involved, but other roadside conditions exist, such as narrow shoulders, drop-offs, gores, small islands, and abrupt changes in the roadway alignment, that might make it undesirable for a road user to leave the roadway, and therefore would create a need for a marker.

Standard:

If a Type 2 or Type 3 object marker is used to mark an obstruction adjacent to the roadway, the edge of the object marker that is closest to the road user shall be installed in line with the closest edge of the obstruction.

Where Type 3 object markers are applied to the approach ends of guardrail and other roadside appurtenances, sheeting without a substrate shall be directly affixed to the approach end of the guardrail in a rectangular shape conforming to the size of the approach end of the guardrail with alternating black and retroreflective yellow stripes sloping downward at an angle of 45 degrees toward the side of the obstruction on which traffic is to pass.

Type 1 and Type 4 object markers shall not be used to mark obstructions adjacent to the roadway.

Guidance:

Standard warning signs in this Chapter should also be used where applicable.

Section 2C.66 Object Markers for Ends of Roadways

Support:

The Type 4 object marker is used to warn and alert road users of the end of a roadway in other than construction or maintenance areas.

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Standard:

If an object marker is used to mark the end of a roadway, a Type 4 object marker shall be used.

Option:

The Type 4 object marker may be used in instances where there are no alternate vehicular paths.

Where conditions warrant, more than one marker, or a larger marker with or without a Type 3 Barricade (see Section 2B.67), may be used at the end of the roadway.

Standard:

The minimum mounting height, measured vertically from the bottom of a Type 4 object marker to the elevation of the near edge of the traveled way, shall be 4 feet.

Guidance:

Appropriate advance warning signs in this Chapter should be used.

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PART 3 - MARKINGS

CHAPTER 3A. GENERAL

Section 3A.01 Functions and Limitations

Support:

Marking on highways and on private roads open to public travel have important functions in providing guidance and information for the road user. Major marking types include pavement and curb markings, delineators, colored pavements, channelizing devices, and islands. In some cases, markings are used to supplement other traffic control devices such as signs, signals, and other markings. In other instances, markings are used alone to effectively convey regulations, guidance, or warnings in ways not obtainable by the use of other devices. (**NOTE: Refer to PART 3 of the MUTCD for information on “Markings”**)

PART 4 – HIGHWAY TRAFFIC SIGNALS

CHAPTER 4A. GENERAL

Section 4A.01 Types

Support:

The following types and uses of highway traffic signals are discussed in Part 4: traffic control signals; pedestrian signals; hybrid beacons; emergency-vehicle signals; traffic control signals for one-lane, two-way facilities; traffic control signals for freeway entrance ramps; traffic control signals for movable bridges; toll plaza traffic signals; flashing beacons; lane-use control signals; and in-roadway lights. (**Refer to Part 4 of the MUTCD for information on “Highway Traffic Signals”.**)

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PART 5 – TRAFFIC CONTROL DEVICES FOR LOW- VOLUME ROADS

CHAPTER 5A. GENERAL

Section 5A.01 Function

Standard:

A low-volume road shall be defined for this Part of the Manual as follows:

A. A low-volume road shall be a facility lying outside of built-up areas of cities, towns, and communities, and it shall have a traffic volume of less than 400 AADT.

B. A low-volume road shall not be a freeway, an expressway, an interchange ramp, a freeway service road, a road on a designated State highway system, or a residential street in a neighborhood. In terms of highway classification, it shall be a variation of a conventional road or a special purpose road as defined in Section 1A.13.

C. A low-volume road shall be classified as either paved or unpaved.

Support:

Low-volume roads typically include agricultural, recreational, resource management and development such as mining and logging and grazing, and local roads in rural areas.

Guidance:

The needs of unfamiliar road users for occasional, recreational, and commercial transportation purposes should be considered.

Support:

At some locations on low-volume roads, the use of traffic control devices might be needed to provide the road user limited, but essential, information regarding regulation, guidance, and warning.

Other Parts of this Manual contain provisions applicable to all low-volume roads; however, Part 5 specifically supplements and

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references the provisions for traffic control devices commonly used on low-volume roads.

Section 5A.02 Application

Support:

It is possible, in many cases, to provide essential information to road users on low-volume roads with a limited number of traffic control devices. The focus might be on devices that:

- A. Warn of conditions not normally encountered,
- B. Prohibit unsafe movements, or
- C. Provide minimal destination guidance.

Standard:

The provisions contained in Part 5 shall not prohibit the installation or the full application of traffic control devices on a low-volume road where conditions justify their use.

Guidance:

Additional traffic control devices and provisions contained in other Parts of the Manual should be considered for use on low-volume roads.

Support:

Section 1A.09 contains information regarding the assistance that is available to jurisdictions that do not have engineers on their staffs who are trained and/or experienced in traffic control devices.

Section 5A.03 Design

Standard:

Traffic control devices for use on low-volume roads shall be designed in accordance with the provisions contained in Part 5, and where required, in other applicable Parts of this Manual.

The typical sizes for signs and plaques installed on low-volume roads shall be as shown in Table 5A-1.

The sizes in the minimum column shall only be used on low-volume roads where the 85th-percentile speed or posted speed limit is less than 35 mph.

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Guidance:

The sizes in the oversized column should be used where engineering judgment indicates a need based on high vehicle operating speeds, driver expectancy, traffic operations, or roadway conditions.

Option:

Signs and plaques larger than those shown in Table 5A-1 may be used (see Section 2A.11).

Table 5A-1. Sign and Plaque Sizes on Low-Volume Roads
(Sheet 1 of 2)

| Sign or Plaque | Sign Designation | Section | Sign Sizes | | |
|---------------------------------|------------------|---------|--------------|---------|--------------|
| | | | Typical | Minimum | Oversized |
| Stop | R1-1 | 5B.02 | 30 x 30 | — | 36 x 36 |
| Yield | R1-2 | 5B.02 | 30 x 30 x 30 | — | 36 x 36 x 36 |
| Speed Limit (English) | R2-1 | 5B.03 | 24 x 30 | 18 x 24 | 36 x 48 |
| Do Not Pass | R4-1 | 5B.04 | 24 x 30 | — | 36 x 48 |
| Pass With Care | R4-2 | 5B.04 | 24 x 30 | 18 x 24 | 36 x 48 |
| Keep Right | R4-7 | 5B.04 | 24 x 30 | 18 x 24 | 36 x 48 |
| Do Not Enter | R5-1 | 5B.04 | 30 x 30 | — | 36 x 36 |
| No Trucks | R5-2 | 5B.04 | 24 x 24 | — | 30 x 30 |
| One Way | R6-2 | 5B.04 | 18 x 24 | — | 24 x 30 |
| No Parking (symbol) | R8-3 | 5B.05 | 24 x 24 | 18 x 18 | 30 x 30 |
| No Parking | R8-3a | 5B.05 | 18 x 24 | — | 24 x 30 |
| No Parking (plaque) | R8-3cP,3dP | 5B.05 | 24 x 18 | 18 x 12 | 30 x 24 |
| Road Closed | R11-2 | 5B.04 | 48 x 30 | — | — |
| Road Closed, Local Traffic Only | R11-3a | 5B.04 | 60 x 30 | — | — |
| Bridge Out, Local Traffic Only | R11-3b | 5B.04 | 60 x 30 | — | — |
| Road Closed to Thru Traffic | R11-4 | 5B.04 | 60 x 30 | — | — |
| Weight Limit | R12-1 | 5B.04 | 24 x 30 | — | 36 x 48 |
| Grade Crossing (Crossbuck) | R15-1 | 5F.02 | 48 x 9 | — | — |
| Number of Tracks (plaque) | R15-2P | 5F.02 | 27 x 18 | — | — |
| Horizontal Alignment | W1-1,2,3,4,5 | 5C.02 | 30 x 30 | — | 36 x 36 |
| One-Direction Large Arrow | W1-6 | 5C.02 | 36 x 18 | — | 48 x 24 |
| Two-Direction Large Arrow | W1-7 | 5C.02 | 36 x 18 | — | 48 x 24 |
| Chevron Alignment | W1-8 | 5C.02 | 12 x 18 | — | 18 x 24 |
| Intersection Warning | W2-1,2,3,4,5,6 | 5C.03 | 30 x 30 | — | 36 x 36 |
| Stop Ahead | W3-1 | 5C.04 | 30 x 30 | — | 36 x 36 |
| Yield Ahead | W3-2 | 5C.04 | 30 x 30 | — | 36 x 36 |
| Be Prepared to Stop | W3-4 | 5G.05 | 36 x 36 | — | 48 x 48 |
| Narrow Bridge | W5-2 | 5C.05 | 30 x 30 | — | 36 x 36 |
| One Lane Bridge | W5-3 | 5C.06 | 30 x 30 | — | 36 x 36 |
| Hill | W7-1 | 5C.07 | 30 x 30 | — | 36 x 36 |
| XX % Grade (plaque) | W7-3P | 5C.07 | 24 x 18 | — | 30 x 24 |
| Next XX Miles (plaque) | W7-3aP | 5C.09 | 24 x 18 | — | 30 x 24 |
| Pavement Ends | W8-3 | 5C.08 | 30 x 30 | — | 36 x 36 |
| Truck Crossing | W8-6 | 5C.09 | 30 x 30 | — | 36 x 36 |

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| | | | | | |
|---------------------------------------|------------|-------|---------|--------|---------|
| <i>Loose Gravel</i> | W8-7 | 5G.05 | 30 x 30 | — | 36 x 36 |
| <i>Rough Road</i> | W8-8 | 5G.05 | 30 x 30 | — | 36 x 36 |
| <i>Road May Flood</i> | W8-18 | 5G.05 | 30 x 30 | — | 36 x 36 |
| <i>Grade Crossing Advance Warning</i> | W10-1 | 5F.03 | 30 Dia. | — | 36 Dia. |
| <i>Grade Crossing Advance Warning</i> | W10-2,3,4 | 5F.03 | 30 x 30 | — | 36 x 36 |
| <i>Trains May Exceed 80 mph</i> | W10-8 | 5F.06 | 30 x 30 | — | 36 x 36 |
| <i>Storage Space Symbol</i> | W10-11 | 5F.06 | 30 x 30 | — | 36 x 36 |
| <i>Skewed Crossing</i> | W10-12 | 5F.06 | 30 x 30 | — | 36 x 36 |
| <i>Entering/Crossing</i> | W11 Series | 5C.09 | 30 x 30 | — | 36 x 36 |
| <i>Advisory Speed (plaque)</i> | W13-1P | 5C.10 | 18 x 18 | — | 24 x 24 |
| <i>Dead End/No Outlet</i> | W14-1,2 | 5C.11 | 30 x 30 | — | 36 x 36 |
| <i>Dead End/No Outlet</i> | W14-1a,2a | 5C.11 | 36 x 9 | 24 x 6 | — |

Table 5A-1. Sign and Plaque Sizes on Low-Volume Roads (Sheet 2 of 2)

| Sign or Plaque | Sign Designation | Section | Sign Sizes | | |
|---------------------------------------|------------------|---------|--------------|---------|--------------|
| | | | Typical | Minimum | Oversized |
| <i>No Passing Zone (pennant)</i> | W14-3 | 5G.05 | 40 x 40 x 30 | — | 48 x 48 x 36 |
| <i>Supplemental Distance (plaque)</i> | W16-2P | 5C.09 | 24 x 18 | 18 x 12 | 30 x 24 |
| <i>Diagonal Arrow (plaque)</i> | W16-7P | 5C.09 | 24 x 12 | — | 30 x 18 |
| <i>Ahead (plaque)</i> | W16-9P | 5C.09 | 24 x 12 | — | 30 |
| <i>No Traffic Signs</i> | W18-1 | 5C.12 | 30 x 30 | 24 x 24 | 36 x 36 |
| <i>Road Work (with distance)</i> | W20-1 | 5G.05 | 36 x 36 | — | 48 x 48 |
| <i>Road Closed (with distance)</i> | W20-3 | 5G.05 | 36 x 36 | — | 48 x 48 |
| <i>One Lane Road (with distance)</i> | W20-4 | 5G.05 | 36 x 36 | — | 48 x 48 |
| <i>Flagger</i> | W20-7 | 5G.05 | 36 x 36 | — | 48 x 48 |
| <i>Workers</i> | W21-1 | 5G.05 | 36 x 36 | — | 48 x 48 |
| <i>Fresh Oil</i> | W21-2 | 5G.05 | 30 x 30 | — | 48 x 48 |
| <i>Road Machinery Ahead</i> | W21-3 | 5G.05 | 30 x 30 | — | 48 x 48 |
| <i>Shoulder Work</i> | W21-5 | 5G.05 | 36 x 36 | — | 48 x 48 |
| <i>Survey Crew</i> | W21-6 | 5G.05 | 36 x 36 | — | 48 x 48 |
| <i>Utility Work (with distance)</i> | W21-7 | 5G.05 | 36 x 36 | — | 48 x 48 |

- Notes: 1. Larger sizes may be used when appropriate
2. Dimensions are shown in inches and are shown as width x height

Standard:

All signs shall be retroreflective or illuminated to show the same shape and similar color both day and night, unless specifically stated otherwise in other applicable Parts of this Manual. The requirements for sign illumination shall not be considered to be satisfied by street, highway, or strobe lighting.

All markings shall be visible at night and shall be retroreflective unless ambient illumination provides adequate visibility of the markings.

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Section 5A.04 Placement

Standard:

Except as provided in Paragraph 3 (Option below), the traffic control devices used on low-volume roads shall be placed and positioned in accordance with the lateral, longitudinal, and vertical placement provisions contained in Part 2 and other applicable Sections of this Manual.

Guidance:

The placement of warning signs should comply with the guidance contained in Section 2C.05 and other applicable Sections of this Manual.

Option:

A lateral offset of not less than 2 feet from the roadway edge to the roadside edge of a sign may be used where roadside features such as terrain, shrubbery, and/or trees prevent lateral placement in accordance with Section 2A.19.

Standard:

If located within a clear zone, post-mounted sign supports shall be yielding, breakaway, or shielded with a longitudinal barrier or crash cushion as required in Section 2A.19.

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CHAPTER 5B. REGULATORY SIGNS

Section 5B.01 Introduction

Support:

The purpose of a regulatory sign is to inform highway users of traffic laws or regulations, and to indicate the applicability of legal requirements that would not otherwise be apparent.

The provisions for regulatory signs are contained in Chapter 2B and in other Sections of this Manual.

Provisions for regulatory signs that are specific to low-volume roads are contained in this Chapter.

Section 5B.02 STOP and YIELD Signs (R1-1 and R1-2)

Guidance:

STOP (R1-1) and YIELD (R1-2) signs (see Figure 5B-1) should be considered for use on low-volume roads where engineering judgment or study, consistent with the provisions of Sections 2B.04 to 2B.10, indicates that either of the following conditions applies:

A. An intersection of a less-important road with a main road where application of the normal right-of-way rule might not be readily apparent.

B. An intersection that has restricted sight distance for the prevailing vehicle speeds.

Section 5B.03 Speed Limit Signs (R2 Series)

Standard:

If used, Speed Limit (R2 series) signs (see Figure 5B-1) shall display the speed limit established by law, ordinance, regulation, or as adopted by the authorized agency following an engineering study.

The displayed speed limits shall be in multiples of 5 mph.

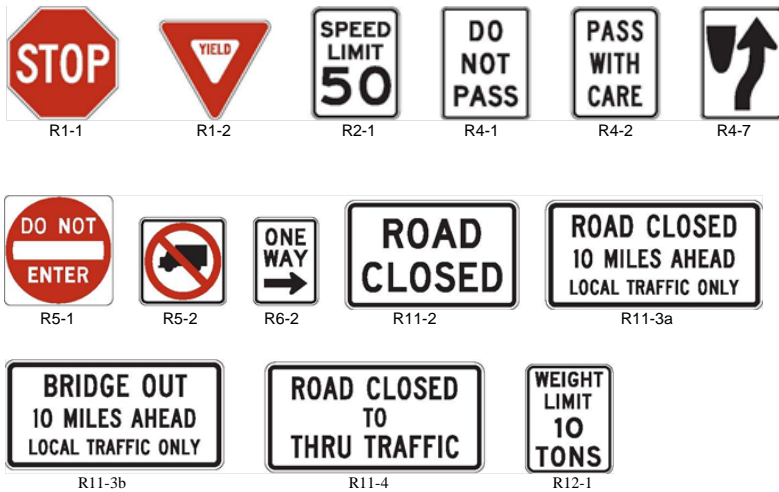
Speed limits shall be established in accordance with Section 2B.13.

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Option:

Speed limit signs may be used on low-volume roads that carry traffic from, onto, or adjacent to higher-volume roads that have posted speed limits.

Figure 5B-1. Regulatory Signs on Low-Volume Roads



Section 5B.04 Traffic Movement and Prohibition Signs (R3, R4, R5, R6, R9, R10, R11, R12, R13, and R14 Series)

Support:

The regulatory signs (see Figure 5B-1) in these series inform road users of required, permitted, or prohibited traffic movements involving turn, alignment, exclusion, and pedestrians.

Standard:

If used, signs for traffic prohibitions or restrictions shall be placed in advance of the prohibition or restriction so that traffic can use an alternate route or turn around.

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Guidance:

Signs should be used on low-volume roads to indicate traffic prohibitions and restrictions such as road closures and weight restrictions.

Option:

Signs for traffic prohibitions or restrictions may be used on a low-volume road near and at the intersections or the connections with a higher class of road, and where the regulatory message is essential for transition from the low-volume road to the higher-class facility or vice versa.

Section 5B.05 Parking Signs (R8 Series)

Option:

Parking signs (see Figure 5B-2) may be installed selectively on low-volume roads with due consideration of enforcement.

Section 5B.06 Other Regulatory Signs

Standard:

Other regulatory signs used on low-volume roads that are not discussed in Part 5 shall comply with the provisions contained in other Parts of this Manual.

Figure 5B-2. Parking Signs and Plaques on Low-Volume Roads



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CHAPTER 5C. WARNING SIGNS

Section 5C.01 Introduction

Support:

The purpose of a warning sign is to provide advance warning to the road user of unexpected conditions on or adjacent to the roadway that might not be readily apparent.

The provisions for warning signs are contained in Chapter 2C and in other Sections of this Manual. Provisions for warning signs that are specific to low-volume roads are contained in this Chapter.

Section 5C.02 Horizontal Alignment Signs (W1-1 through W1-8)

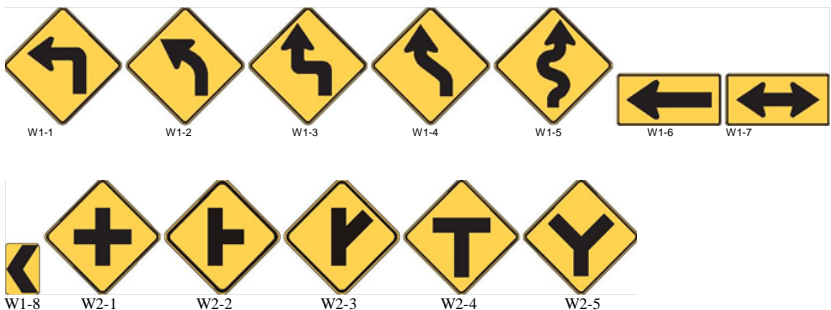
Support:

Horizontal Alignment signs (see Sections 2C.06 through 2C.12 and Figure 5C-1) include curve, reverse turn, reverse curve, winding road, large arrow, and chevron alignment signs.

Option:

Horizontal Alignment signs may be used where engineering judgment indicates a need to inform the road user of a change in the horizontal alignment of the roadway.

**Figure 5C-1. Horizontal Alignment and Intersection
Warning Signs and Plaques and Object Markers on Low-
Volume Roads**



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Type 1 Object Markers (obstructions within the roadway)



Type 2 Object Markers (obstructions adjacent to the roadway)



Type 3 Object Markers (obstructions adjacent to or within the roadway)



Type 4 Object Markers (end of roadway)



Section 5C.03 Intersection Warning Signs (W2-1 through W2-6)

Support:

Intersection signs (see Figure 5C-1) include the crossroad, side road, T-symbol, Y-symbol, and circular intersection signs.

Option:

Intersection signs may be used where engineering judgment indicates a need to inform the road user in advance of an intersection.

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Section 5C.04 Stop Ahead and Yield Ahead Signs (W3-1, W3-2)

Standard:

A Stop Ahead (W3-1) sign (see Figure 5C-2) shall be used where a STOP sign is not visible for a sufficient distance to permit the road user to bring the vehicle to a stop at the STOP sign.

A Yield Ahead (W3-2) sign (see Figure 5C-2) shall be used where a YIELD sign is not visible for a sufficient distance to permit the road user to bring the vehicle to a stop, if necessary, at the YIELD sign.

Section 5C.05 NARROW BRIDGE Sign (W5-2)

Option:

The NARROW BRIDGE (W5-2) sign (see Figure 5C-2) may be used on an approach to a bridge or culvert that has a clear width less than that of the approach roadway.

Section 5C.06 ONE LANE BRIDGE Sign (W5-3)

Guidance:

A ONE LANE BRIDGE (W5-3) sign (see Figure 5C-2) should be used on low-volume two-way roadways in advance of any bridge or culvert:

- A. Having a clear roadway width of less than 16 feet, or
- B. Having a clear roadway width of less than 18 feet when commercial vehicles constitute a high proportion of the traffic, or
- C. Having a clear roadway width of 18 feet or less where the approach sight distance is limited on the approach to the structure.

Option:

Roadway alignment and additional warning may be provided on the approach to a bridge or culvert by the use of object markers and/or delineators.

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Section 5C.07 Hill Sign (W7-1)

Option:

An engineering study of vehicles and road characteristics, such as percent grade and length of grade, may be conducted to determine hill signing requirements.

Section 5C.08 PAVEMENT ENDS Sign (W8-3)

Option:

A PAVEMENT ENDS (W8-3) sign (see Figure 5C-2) may be used to warn road users where a paved surface changes to a gravel or earth road surface.

Section 5C.09 Vehicular Traffic Warning and Non-Vehicular Warning Signs (W11 Series and W8-6)

Guidance:

Vehicular Traffic Warning signs (see Figure 5C-2) should be used to alert road users to locations where frequent unexpected entries into the roadway by trucks, bicyclists, farm vehicles, fire trucks, and other vehicles might occur. Such signs should be used only at locations where the road user's sight distance is restricted or the condition, activity, or entering traffic would be unexpected.

Option:

Non-Vehicular Warning signs (see Figure 5C-2) may be used to alert road users in advance of locations where unexpected entries into the roadway or shared use by pedestrians, large animals, or other crossing activities might occur.

A W7-3aP, W16-2P, or W16-9P supplemental plaque (see Figure 5C-2), with the legend NEXT XX MILES, XX FEET, or AHEAD may be installed below a Vehicular Traffic Warning or Non-Vehicular Warning sign (see Sections 2C.49 and 2C.50) to inform road users that they are approaching a portion of the roadway or a point where crossing activity might occur.

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**Figure 5C-2. Other Warning Signs and Plaques on
Low-Volume Roads**



Standard:

When a Non-Vehicular Warning sign is placed at the location of the crossing point, a diagonal downward pointing arrow (W16-7P) plaque (see Figure 5C-2) shall be mounted below the sign.

Guidance:

If the activity is seasonal or temporary, the sign should be removed or covered when the condition or activity does not exist.

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Section 5C.10 Advisory Speed Plaque (W13-1P)

Option:

An Advisory Speed (W13-1P) plaque (see Figure 5C-1) may be mounted below a warning sign when the condition requires a reduced speed.

Section 5C.11 DEAD END or NO OUTLET Signs (W14-1, W14-1a, W14-2, W14-2a)

Option:

The DEAD END (W14-1) and NO OUTLET (W14-2) signs (see Figure 5C-2) and the DEAD END (W14-1a) and NO OUTLET (W14-2a) signs (see Figure 5C-2) may be used to warn road users of a road that has no outlet or that terminates in a dead end or cul-de-sac.

Guidance:

If used, these signs should be placed at a location that gives drivers of large commercial or recreational vehicles an opportunity to select a different route or turn around.

Section 5C.12 NO TRAFFIC SIGNS Sign (W18-1)

Option:

A W18-1 warning sign (see Figure 5C-2) with the legend NO TRAFFIC SIGNS may be used only on unpaved, low-volume roads to advise users that no signs are installed along the distance of the road. If used, the sign may be installed at the point where road users would enter the low-volume road or where, based on engineering judgment, the road user might need this information.

A W7-3aP, W16-2P, or W16-9P supplemental plaque (see Figure 5C-2) with the legend NEXT XX MILES, XX FEET, or AHEAD may be installed below the W18-1 sign when appropriate.

Section 5C.13 Other Warning Signs

Standard:

Other warning signs used on low-volume roads that are not discussed in Part 5, but are in this Manual, shall comply with the provisions contained in other Parts of this Manual. Warning

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signs that are not provided in this Manual shall comply with the provisions in Sections 2C.02 and 2C.03.

Section 5C.14 Object Markers and Barricades

Support:

The purpose of object markers is to mark obstructions located within or adjacent to the roadway, such as bridge abutments, drainage structures, and other physical objects.

Guidance:

The end of a low-volume road should be marked with a Type 4 object marker in compliance with Section 2C.66.

Option:

A Type 3 Barricade may be used where engineering studies or judgment indicates a need for a more visible end-of-roadway treatment (see Section 2B.67).

Standard:

Barricades used on low-volume roads shall comply with the provisions contained in Section 2B.67.

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CHAPTER 5F. TRAFFIC CONTROL FOR HIGHWAY-RAIL GRADE CROSSINGS

Section 5F.01 Introduction

Support:

The provisions for highway-rail grade crossing traffic control devices are contained in Part 8 and in other Sections of this Manual.

Traffic control for highway-rail grade crossings includes all signs, signals, markings, illumination, and other warning devices and their supports along roadways either approaching or at highway-rail grade crossings. The purpose of this traffic control is to promote a safer and more efficient operation of both rail and highway traffic at highway-rail grade crossings.

(Refer to Chapter 24-09 of the North Dakota Century Code which also has excerpts included in the Appendix of this of this document that refer to materials on Railroad Crossings in North Dakota)

Section 5F.02 Grade Crossing (Crossbuck) Sign and Number of Tracks Plaque (R15-1, R15-2P)

Support:

In most States, the Grade Crossing (Crossbuck) (R15-1) sign (see Figure 5F-1) requires road users to yield the right-of-way to rail traffic at a highway-rail grade crossing.

Standard:

The Crossbuck (R15-1) sign shall be used at all highway-rail grade crossings, except as otherwise provided in Section 8B.03. For all low-volume roads, Crossbuck signs shall be used on the right-hand side of each approach. If there are two or more tracks, the supplemental Number of Tracks (R15-2P) plaque (see Figure 5F-1) shall display the number of tracks and shall be installed below the Crossbuck sign.

A strip of retroreflective white material not less than 2 inches in width shall be used on the back of each blade of each Crossbuck sign for the length of each blade, at all highway-rail

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grade crossings, except those where Crossbuck signs have been installed back-to-back.

A vertical strip of retroreflective white material, not less than 2 inches in width, shall be used on each support at passive highway-rail grade crossings for the full length of the front and back of the support from the Crossbuck sign or Number of Tracks plaque to within 2 feet above the ground, except on the side of those supports where a STOP (R1-1) or YIELD (R1-2) sign or flashing lights have been installed or on the back side of supports for Crossbuck signs installed on one-way streets.

Section 5F.03 Grade Crossing Advance Warning Signs (W10 Series)

Standard:

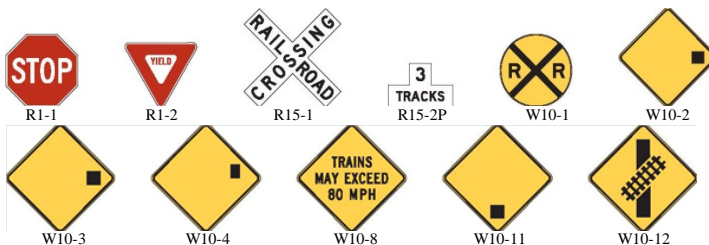
Except as provided in Paragraph 2, a Grade Crossing Advance Warning (W10-1) sign (see Figure 5F-1) shall be used on all low-volume roads in advance of every highway-rail grade crossing.

Option:

The Grade Crossing Advance Warning sign may be omitted for highway-rail grade crossings that are flagged by train crews.

The W10-2, W10-3, and W10-4 signs (see Figure 5F-1) may be used on low-volume roads that run parallel to railroad tracks to warn road users making a turn that they will encounter a highway-rail grade crossing soon after making the turn.

Figure 5F-1. Highway-Rail Grade Crossing Signs and Plaques for Low-Volume Roads



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Section 5F.04 STOP and YIELD Signs (R1-1, R1-2)

Standard:

The use and application at passive highway-rail grade crossings on low-volume roads of Crossbuck Assemblies with YIELD (R1-2) signs or STOP (R1-1) signs shall comply with the provisions of Section 8B.04.

At all highway-rail grade crossings where YIELD or STOP signs are installed, Yield Ahead (W3-2) or Stop Ahead (W3-1) signs shall also be installed if the criteria for their installation in Section 2C.36 is met.

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CHAPTER 5G. TEMPORARY TRAFFIC CONTROL ZONES

Section 5G.02 Applications

Guidance:

Planned work phasing and sequencing should be the basis for the use of traffic control devices for temporary traffic control



zones. Part 6 (Refer to MUTCD) should be consulted for specific traffic control requirements and examples where construction or maintenance work is planned.

Support:

Maintenance activities might not require extensive temporary traffic control if the traffic volumes and speeds are low.

Option:

The traffic applications shown in Figures 6H-1, 6H-10, 6H-11, 6H-13, 6H-15, 6H-16, and 6H-18 of Part 6 (Refer to MUTCD) are among those that may be used on low-volume roads.

Support:

Table 6H-3 (Refer to MUTCD) provides distances for the advance placement of the traffic control devices shown in the typical applications.

Option:

For low-volume roadways with speeds of 30 miles per hour or less, a minimum distance of 100 feet may be used for the advance placement distance and the distance between signs shown in the typical applications.

For temporary traffic control zones on low-volume roads that require flaggers, a single flagger may be adequate if the flagger is visible to approaching traffic from all appropriate directions.

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Section 5G.05 Other Traffic Control Devices

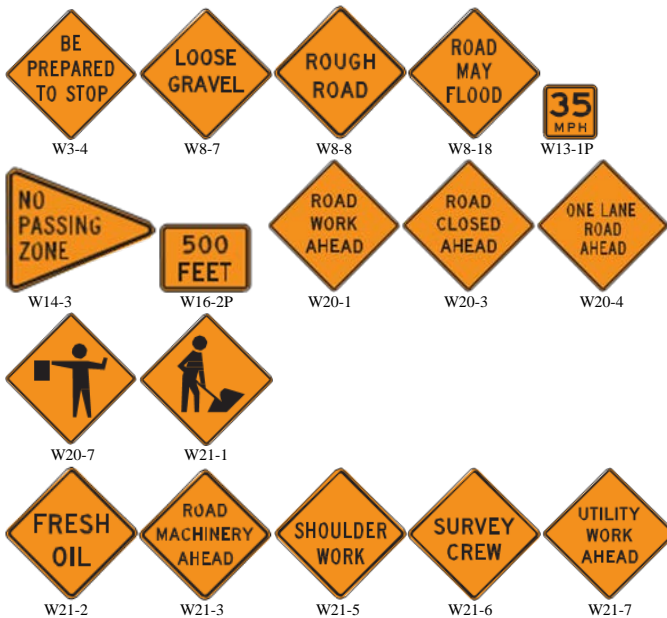
Standard:

Other traffic control devices, such as other signs, signals, and illumination that are used on low-volume roads in temporary traffic control zones, but are not described in Part 5, shall comply with the provisions contained in other Parts of this Manual (MUTCD).

Support:

Some of the signs that might be applicable in a temporary traffic control zone on a low-volume road are shown in Figure 5G-1.

Figure 5G-1. Temporary Traffic Control Signs and Plaques on Low-Volume Roads



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PART 6 – TEMPORARY TRAFFIC CONTROL

CHAPTER 6A. GENERAL

Section 6A.01 General

Standard:

The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, or on private roads open to public travel (see definition in Section 1A.13), including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents. (Refer to PART 6 of the MUTCD for information on “Temporary Traffic Control” or Part 5G of the MUTCD or portions in this document for “Temporary Traffic Control” on low-volume roads)

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CHAPTER 6F. TEMPORARY TRAFFIC CONTROL DEVICES

Section 6F.01 Types of Devices

Guidance:

The design and applications of TTC devices used in the TTC zones should consider the needs of all road users (motorists, bicycles, and pedestrians), including those with disabilities.

Standard:

All traffic control devices used for construction, maintenance, utility, or incident management operations on a street, highway, or private road open to public travel (see definition in 1A.13 [MUTCD]) shall comply with the applicable provisions of this Manual.

Section 6F.68 Type 1, 2, or 3 Barricades

Support:

A barricade is a portable or fixed device having from one to three rails with appropriate markings and is used to control road users by closing, restricting, or delineating all or a portion of the right-of-way.

As shown in Figure 6F-7, barricades are classified as Type 1, Type 2, or Type 3.

Standard:

Stripes on barricade rails shall be alternating orange and white retroreflective stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Except as provided in Paragraph 4, the stripes shall be 6 inches wide.

Option:

When rail lengths are less than 36 inches, 4-inch wide stripes may be used.

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Standard:

The minimum length for Type 1 and Type 2 Barricades shall be 24 inches, and the minimum length for Type 3 Barricades shall be 48 inches. Each barricade rail shall be 8 to 12 inches wide.

Guidance:

Where barricades extend entirely across a roadway, the stripes should slope downward in the direction toward which road users must turn.

Where both right and left turns are provided, the barricade stripes should slope downward in both directions from the center of the barricade or barricades.

Where no turns are intended, the stripes should be positioned to slope downward toward the center of the barricade or barricades.

Barricade rails should be supported in a manner that will allow them to be seen by the road user, and in a manner that provides a stable support that is not easily blown over or displaced.

The width of the existing pedestrian facility should be provided for the temporary facility if practical. Traffic control devices and other construction materials and features should not intrude into the usable width of the sidewalk, temporary pathway, or other pedestrian facility. When it is not possible to maintain a minimum width of 60 inches throughout the entire length of the pedestrian pathway, a 60 x 60-inch passing space should be provided at least every 200 feet to allow individuals in wheelchairs to pass.

Barricade rail supports should not project into pedestrian circulation routes more than 4 inches from the support between 27 and 80 inches from the surface as described in Section 4.4.1 of the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)” (see Section 1A.11).

Option:

For Type 1 Barricades, the support may include other unstriped horizontal rails necessary to provide stability.

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Guidance:

On high-speed expressways or in other situations where barricades may be susceptible to overturning in the wind, ballasting should be used.

Option:

Sandbags may be placed on the lower parts of the frame or the stays of barricades to provide the required ballast.

Support:

Type 1 or Type 2 Barricades are intended for use in situations where road user flow is maintained through the TTC zone.

Option:

Barricades may be used alone or in groups to mark a specific condition or they may be used in a series for channelizing road users.

Type 1 Barricades may be used on conventional roads or urban streets.

Guidance:

Type 2 or Type 3 Barricades should be used on freeways and expressways or other high-speed roadways. Type 3 Barricades should be used to close or partially close a road.

Option:

Type 3 Barricades used at a road closure may be placed completely across a roadway or from curb to curb.

Guidance:

Where provision is made for access of authorized equipment and vehicles, the responsibility for Type 3 Barricades should be assigned to a person who will provide proper closure at the end of each work day.

Support:

When a highway is legally closed but access must still be allowed for local road users, barricades usually are not extended completely across the roadway.

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Standard:

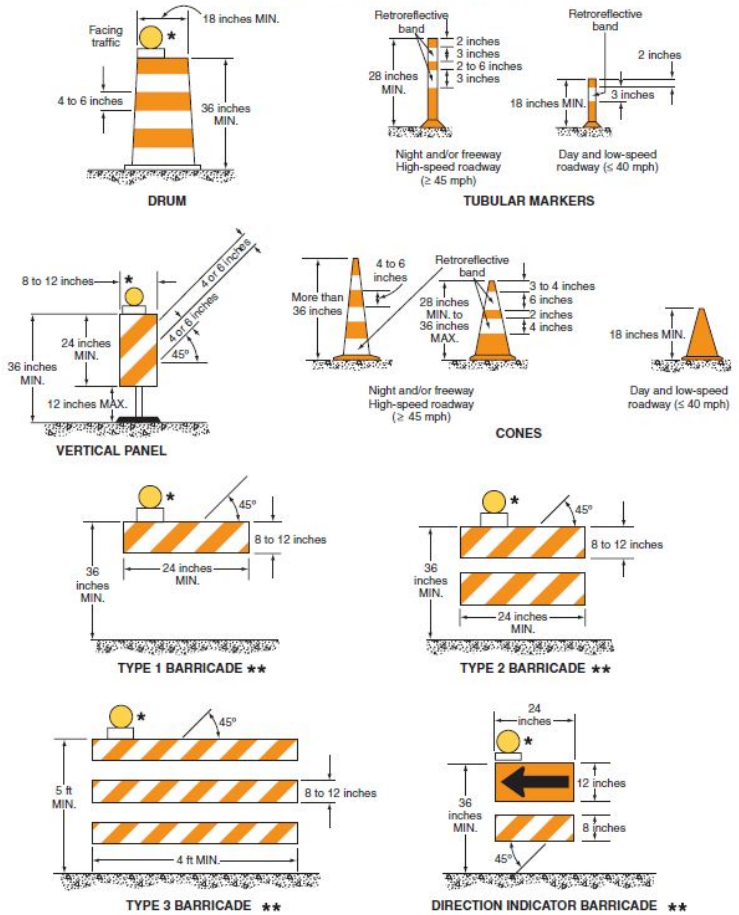
A sign shall be installed with the appropriate legend concerning permissible use by local road users (see Section 6F.09 [MUTCD]). Adequate visibility of the barricades from both directions shall be provided.

Option:

Signs may be installed on barricades (see Section 6F.03 [MUTCD]).

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Figure 6F-7. Channelizing Devices



* Warning lights (optional)
 ** Rail stripe widths shall be 6 inches, except that 4-inch wide stripes may be used if rail lengths are less than 36 inches. The sides of barricades facing traffic shall have retroreflective rail faces.

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CHAPTER 6G. TYPE OF TEMPORARY TRAFFIC CONTROL ZONE ACTIVITIES

Section 6G.01 Typical Applications

Support:

Each TTC is different. Many variables, such as location of work, highway type, geometrics, vertical and horizontal alignment, intersections, interchanges, road user volume, road vehicle mix (buses, trucks, and cars), and road user speeds affect the needs of each zone. The goal of TTC in work zones is safety with minimum disruption to road users. The key factor in promoting TTC zone safety is proper judgment.

Typical applications (TAs) of TTC zones are organized according to duration, location, type of work, and highway type. Table 6H-1 (**Refer to MUTCD**) is an index of these typical applications. These typical applications include the use of various TTC methods, but do not include a layout for every conceivable work situation.

CHAPTER 6H. TYPICAL APPLICATIONS

Section 6H.01 Typical Applications

Support:

Chapter 6G contains discussions of typical TTC activities. This Chapter presents typical applications for a variety of situations commonly encountered. While not every situation is addressed, the information illustrated can generally be adapted to a broad range of conditions.

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PART 7 – TRAFFIC CONTROL FOR SCHOOL AREAS

CHAPTER 7B. SIGNS

Section 7B.01 Size of School Signs

Standard:

Except as provided in Section 2A.11, the sizes of signs and plaques to be used on conventional roadways in school areas shall be as shown in Table 7B-1.

The sizes in the Conventional Road column shall be used unless engineering judgment determines that a minimum or oversized sign size would be more appropriate.

The sizes in the Minimum column shall be used only where traffic volumes are low and speeds are 30 mph or lower, as determined by engineering judgment.

Guidance:

The sizes in the Oversized column should be used on roadways that have four or more lanes with posted speed limits of 40 mph or higher.

Option:

The sizes in the Oversized column may also be used at other locations that require increased emphasis, improved recognition, or increased legibility.

Signs and plaques larger than those shown in Table 7B-1 may be used (see Section 2A.11).

Table 7B-1. School Area Sign and Plaque Sizes

| Sign | Sign Designation | Section | Conventional Road | Minimum | Oversized |
|-------------------------------------|---------------------------|--------------|-------------------|---------|-----------|
| School | S1-1 | 7B.08 | 36 x 36 | 30 x 30 | 48 x 48 |
| School Bus Stop Ahead | S3-1 | 7B.13 | 36 x 36 | 30 x 30 | 48 x 48 |
| School Bus Turn Ahead | S3-2 | 7B.14 | 36 x 36 | 30 x 30 | 48 x 48 |
| Reduced School Speed Limit Ahead | S4-5, S4-5a | 7B.16 | 36 x 36 | 30 x 30 | 48 x 48 |
| School Speed Limit XX When Flashing | S5-1 | 7B.15 | 24 x 48 | — | 36 x 72 |
| End School Zone | S5-2 | 7B.09 | 24 x 30 | — | 36 x 48 |
| End School Speed Limit | S5-3 | 7B.15 | 24 x 30 | — | 36 x 48 |
| In-Street Ped Crossing | R1-6, R1-6a, R1-6b, R1-6c | 7B.11, 7B.12 | 12 x 36 | — | — |
| Speed Limit (School Use) | R2-1 | 7B.15 | 24 x 30 | — | 36 x 48 |
| Begin Higher Fines Zone | R2-10 | 7B.10 | 24 x 30 | — | 36 x 48 |
| End Higher Fines Zone | R2-11 | 7B.10 | 24 x 30 | — | 36 x 48 |

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| Plaque | Sign Designation | Section | Conventional Road | Minimum | Oversized |
|------------------------------------|------------------|---------------------------|-------------------|---------|-----------|
| X:XX to X:XX AM X:XX to X:XX PM | S4-1P | 7B.15 | 24 x 10 | — | 36 x 18 |
| When Children Are Present | S4-2P | 7B.15 | 24 x 10 | — | 36 x 18 |
| School | S4-3P | 7B.09, 7B.15 | 24 x 8 | — | 36 x 12 |
| When Flashing | S4-4P | 7B.15 | 24 x 10 | — | 36 x 18 |
| Mon-Fri | S4-6P | 7B.15 | 24 x 10 | — | 36 x 18 |
| All Year | S4-7P | 7B.09 | 24 x 12 | — | 30 x 18 |
| Fines Higher | R2-6P | 7B.10 | 24 x 18 | — | 36 x 24 |
| XX Feet | W16-2P | 7B.08 | 24 x 18 | — | 30 x 24 |
| XX Ft | W16-2aP | 7B.08 | 24 x 12 | — | 30 x 18 |
| Turn Arrow | W16-5P | 7B.08, 7B.09, 7B.11 | 24 x 12 | — | 30 x 18 |
| Advance Turn Arrow | W16-6P | 7B.08, 7B.09, 7B.11 | 24 x 12 | — | 30 x 18 |
| Diagonal Arrow | W16-7P | 7B.12 | 24 x 12 | — | 30 x 18 |
| Diagonal Arrow (optional size) | W16-7P | 7B.12 | 21 x 15 | — | — |
| Ahead | W16-9P | 7B.11 | 24 x 12 | — | 30 x 18 |

- Note: 1. Larger sizes may be used when appropriate
 2. Dimensions are shown in inches and are shown as width x height
 3. Minimum sign sizes for multi-lane conventional roads shall be as shown in the Conventional Road column

Section 7B.07 Sign Color for School Warning Signs

Standard:

School warning signs, including the “SCHOOL” portion of the School Speed Limit (S5-1) sign and including any supplemental plaques used in association with these warning signs, shall have a fluorescent yellow-green background with a black legend and border unless otherwise provided in the Manual for a specific sign.

Section 7B.08 School Sign (S1-1) and Plaques

Support:

Many state and local jurisdictions find it beneficial to advise road users that they are approaching a school that is adjacent to a highway, where additional care is needed, even though no school crossing is involved and the speed limit remains unchanged. Additionally, some jurisdictions designate school zones that have a unique legal standing in that fines for speeding or other traffic violations within designated school zones are increased or special enforcement techniques such as photo radar systems are used. It is important and sometimes legally necessary to mark the beginning and end points of these designated school zones so that the road user is given proper notice.

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The School (S1-1) sign (see Figure 7B-1) has the following four applications:

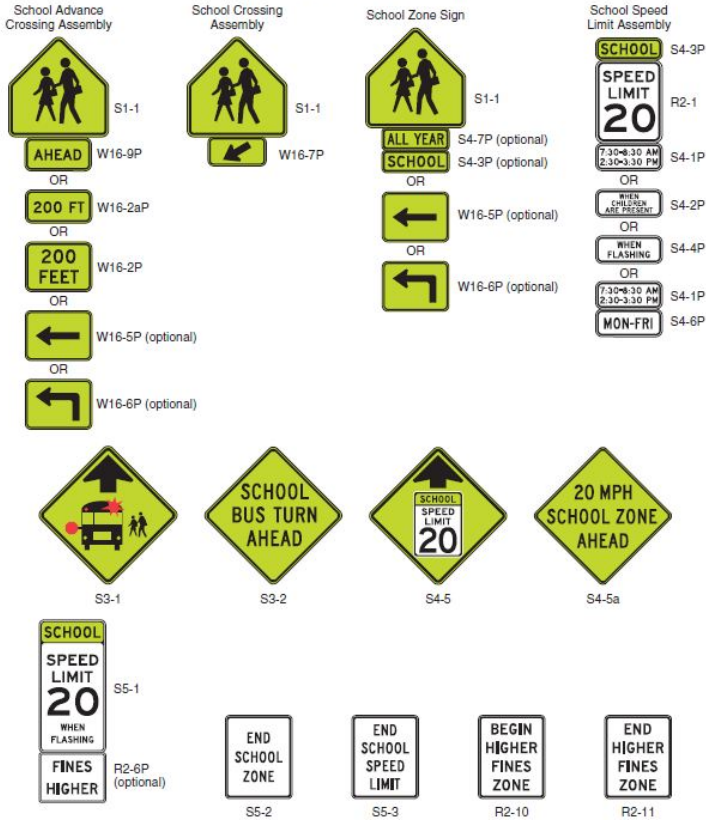
- A. School Area – the S1-1 sign can be used to warn road users that they are approaching a school area that might include school buildings or grounds, a school crossing, or school related activity adjacent to the highway.
- B. *School Zone* – the S1-1 sign can be used to identify the location of the beginning of a designated school zone (see Section 7B.09).
- C. School Advance Crossing – if combined with an AHEAD (W16-9P) plaque or an XX FEET (W16-2P or W16-2aP) plaque to comprise the School Advance Crossing assembly, the S1-1 sign can be used to warn road users that they are approaching a crossing where schoolchildren cross the roadway (see Section 7B.11).
- D. School Crossing – if combined with a diagonal downward pointing arrow (W16-7P) plaque to comprise the School Crossing assembly, the S1-1 sign can be used to warn approaching road users of the location of a crossing where schoolchildren cross the roadway (see Section 7B.12).

Option:

If a school area is located on a cross street in close proximity to the intersection, a School (S1-1) sign with a supplemental arrow (W16-5P or W16-6P) plaque may be installed on each approach of the street or highway to warn road users making a turn onto the cross street that they will encounter a school area soon after making the turn.

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Figure 7B-1. School Area Signs



Section 7B.09 School Zone Sign (S1-1) and Plaques (S4-3P, S4-7P) and END SCHOOL ZONE Sign (S5-2)

Standard:

If a school zone has been designated under State or local statute, a School (S1-1) sign (see Figure 7B-1) shall be installed to identify the beginning point(s) of the designated school zone.

Option:

A School Zone (S1-1) sign may be supplemented with a SCHOOL (S4-3P) plaque (see Figure 7B-1).

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A School Zone (S1-1) sign may be supplemented with an ALL YEAR (S4-7P) plaque (see Figure 7B-1) if the school operates on a 12-month schedule.

The downstream end of a designated school zone may be identified with an END SCHOOL ZONE (S5-2) sign (see Figure 7B-1).

If a school zone is located on a cross street in close proximity to the intersection, a School Zone (S1-1) sign with a supplemental arrow (W16-5P or W16-6P) plaque may be installed on each approach of the street or highway to warn road users making a turn onto the cross street that they will encounter a school zone soon after making the turn.

Section 7B.11 School Advance Crossing Assembly

Standard:

The School Advance Crossing assembly (see Figure 7B-1) shall consist of a School (S1-1) sign supplemented with an AHEAD (W16-9P) plaque or an XX FEET (W16-2P or W16-2aP) plaque.

Except as provided in the following paragraph, a School Advance Crossing assembly shall be used in advance (see Table 2C-4 for advance placement guidelines) of the first School Crossing assembly (see Section 7B.12) that is encountered in each direction as traffic approaches a school crosswalk.

Option:

The School Advance Crossing assembly may be omitted where a School Zone (S1-1) sign (see Section 7B.09) is installed to identify the beginning of a school zone in advance of the School Crossing assembly.

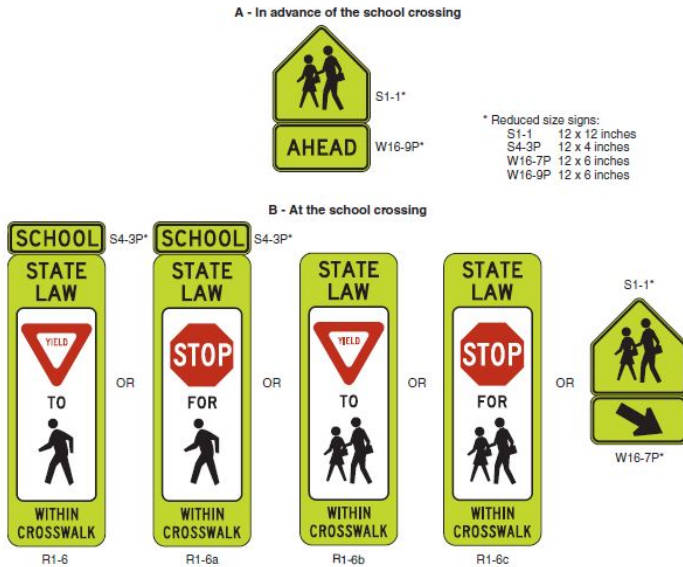
If a school crosswalk is located on a cross street in close proximity to an intersection, a School Advance Crossing assembly with a supplemental arrow (W16-5P or W16-6P) plaque may be installed on each approach of the street or highway to warn road users making a turn onto the cross street that they will encounter a school crosswalk soon after making the turn.

A 12-inch reduced size in-street School (S1-1) sign (see Figure 7B-6), installed in compliance with the mounting height and special mounting support requirements for In-Street Pedestrian

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Crossing (R1-6 or R1-6a) signs (see Section 2B.12), may be used in advance of a school crossing to supplement the post-mounted school warning signs. A 12 x 6-inch reduced size AHEAD (W16-9P) plaque may be mounted below the reduced size in-street School (S1-1) sign.

Figure 7B-6. In-Street Signs in School Areas



* Reduced size signs:
 S1-1 12 x 12 inches
 S4-3P 12 x 4 inches
 W16-7P 12 x 6 inches
 W16-9P 12 x 6 inches

- Notes:
1. The use of the STATE LAW legend is optional on the R1-6 series signs (see Section 7B.12).
 2. The use of the SCHOOL plaque above the R1-6 and R1-6a signs is optional.

Section 7B.12 School Crossing Assembly

Standard:

If used, the School Crossing assembly (see Figure 7B-1) shall be installed at the school crossing, or as close to it as possible, and shall consist of a School (S1-1) sign supplemented with a diagonal downward pointing arrow (W16-7P) plaque to show the location of the crossing.

The School Crossing assembly shall not be used at crossings other than those adjacent to schools and those on established school pedestrian routes.

The School Crossing assembly shall not be installed on approaches controlled by a STOP or YIELD sign.

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Option:

The In-Street Pedestrian Crossing (R1-6 or R1-6a) sign (see Section 2B.12 and Figure 7B-6) or the In-Street Schoolchildren Crossing (R1-6b or R1-6c) sign (see Figure 7B-6) may be used at unsignalized school crossings. If used at a school crossing, a 12 x 4-inch SCHOOL (S4-3P) plaque (see Figure 7B-6) may be mounted above the sign. The STATE LAW legend on the R1-6 series signs may be omitted.

The Overhead Pedestrian Crossing (R1-9 or R1-9a) sign (see Section 2B.12) may be modified to replace the standard pedestrian symbol with the standard schoolchildren symbol and may be used at unsignalized school crossings. The STATE LAW legend on the R1-9 series signs may be omitted.

A 12-inch reduced size in-street School (S1-1) sign (see Figure 7B-6) may be used at an unsignalized school crossing instead of the In-Street Pedestrian Crossing (R1-6 or R1-6a) or the In-Street Schoolchildren Crossing (R1-6b or R1-6c) sign. A 12 x 6-inch reduced size diagonal downward pointing arrow (W16-7P) plaque may be mounted below the reduced size in-street School (S1-1) sign.

Standard:

If an In-Street Pedestrian Crossing sign, an In-Street Schoolchildren Crossing sign, or a reduced size in-street School (S1-1) sign is placed in the roadway, the sign support shall comply with the mounting height and special mounting support requirements for In-Street Pedestrian Crossing (R1-6 or R1-6a) signs (see Section 2B.12).

The In-Street Pedestrian Crossing sign, the In-Street Schoolchildren Crossing sign, the Overhead Pedestrian Crossing sign, and the reduced size in-street School (S1-1) sign shall not be used at signalized locations.

Section 7B.13 School Bus Stop Ahead Sign (S3-1)

Guidance:

The School Bus Stop Ahead (S3-1) sign (see Figure 7B-1) should be installed in advance of locations where a school bus, when stopped to pick up or discharge passengers, is not visible to road users for an adequate distance and where there is no opportunity to relocate the school bus stop to provide adequate sight distance.

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Section 7B.14 SCHOOL BUS TURN AHEAD Sign (S3-2)

Option:

The SCHOOL BUS TURN AHEAD (S3-2) sign (see Figure 7B-1) may be installed in advance of locations where a school bus turns around on a roadway at a location not visible to approaching road users for a distance as determined by the “0” column under Condition B of Table 2C-4, and where there is no opportunity to relocate the school bus turn around to provide the distance provided in Table 2C-4.

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PART 8 – TRAFFIC CONTROL FOR RAILROAD AND LIGHT TRASIT GRADE CROSSINGS

CHAPTER 8B. SIGNS

(Refer to Chapter 24-09 of the North Dakota Century Code which has excerpts included in the Appendix of this document that refer to materials on Railroad Crossings in North Dakota)

Section 8B.06 Grade Crossing Advance Warning Signs (W10 Series)

Standard:

A Highway-Rail Grade Crossing Advance Warning (W10-1) sign (see Figure 8B-4) shall be used on each highway in advance of every highway-rail grade crossing, and every highway-LRT grade crossing in semi-exclusive alignments, except in the following circumstances:

- A. On an approach to a grade crossing from a T-intersection with a parallel highway if the distance from the edge of the track to the edge of the parallel roadway is less than 100 feet and W10-3 signs are used on both approaches of the parallel highway;
- B. On low-volume, low-speed highways crossing minor spurs or other tracks that are infrequently used and road users are directed by an authorized person on the ground to not enter the crossing at all times that approaching rail traffic is about to occupy the crossing;
- C. In business or commercial areas where active grade crossing traffic control devices are in use; or
- D. Where physical conditions do not permit even a partially effective display of the sign.

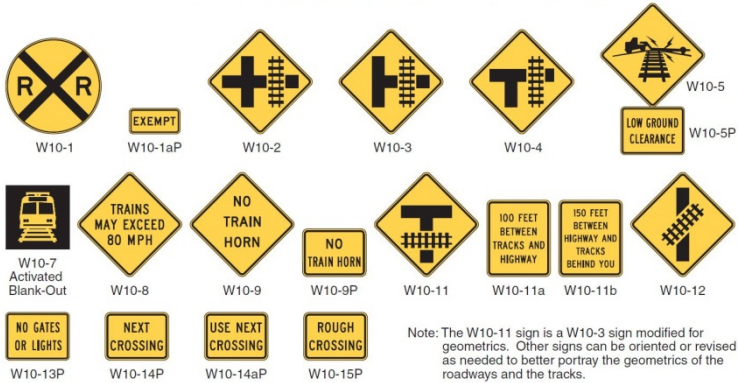
The placement of the Grade Crossing Advance Warning sign shall be in accordance with Section 2C.05 and Table 2C-4.

A Yield Ahead (W3-2) or Stop Ahead (W3-1) Advance Warning sign (see Figure 2C-6) shall also be installed if the criteria for their installation given in Section 2C.36 is met. If a

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Yield Ahead or Stop Ahead sign is installed on the approach to the crossing, the W10-1 sign shall be installed upstream from the Yield Ahead or Stop Ahead sign. The Yield Ahead or Stop Ahead sign shall be located in accordance with Table 2C-4. The minimum distance between the signs shall be in accordance with Section 2C.05 and Table 2C-4.

Figure 8B-4. Warning Signs and Plaques for Grade Crossings



Option:

On divided highways and one-way streets, an additional W10-1 sign may be installed on the left-hand side of the roadway.

Standard:

If the distance between the tracks and a parallel highway, from the edge of the tracks to the edge of the parallel roadway, is less than 100 feet, W10-2, W10-3, or W10-4 signs (see Figure 8B-4) shall be installed on each approach of the parallel highway to warn road users making a turn that they will encounter a grade crossing soon after making a turn, and a W10-1 sign for the approach to the tracks shall not be required to be between the tracks and the parallel highway.

If the W10-2, W10-3, or W10-4 signs are used, sign placement in accordance with the guidelines for Intersection Warning signs in Table 2C-4 using the speed of through traffic shall be measured from the highway intersection.

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Guidance:

If the distance between the tracks and the parallel highway, from the edge of the tracks to the edge of the parallel roadway, is 100 feet or more, a W10-1 sign should be installed in advance of the grade crossing, and the W10-2, W10-3, or W10-4 signs should not be used on the parallel highway.

Section 8B.07 EXEMPT Highway-Rail Grade Crossing Plaques (R15-3P, W10-1aP)

Option:

When authorized by law or regulation, a supplemental EXEMPT (R15-3P) plaque with a white background may be used below the Crossbuck sign or Number of Tracks plaque, if present, at the grade crossing, and a supplemental EXEMPT (W10-1aP) plaque (see Figure 8B-4) with a yellow background may be used below the Grade Crossing Advance Warning (W10 series) sign.

Where neither the Crossbuck sign nor the advance warning signs exist for a particular highway-LRT grade crossing, an EXEMPT (R15-3P) plaque with a white background may be placed on its own post on the near right-hand side of the approach to the crossing.

Support:

These supplemental plaques inform drivers of highway vehicles carrying passengers for hire, school buses carrying students, or highway vehicles carrying hazardous materials that a stop is not required at certain designated grade crossings, except when rail traffic is approaching or occupying the grade crossing, or the driver's view is blocked.

Section 8B.10 TRACKS OUT OF SERVICE Sign (R8-9)

Option:

The TRACKS OUT OF SERVICE (R8-9) sign may be used at a grade crossing instead of a Crossbuck (R15-1) sign and a Number of Tracks (R15-2P) plaque or instead of a Crossbuck Assembly when railroad or LRT tracks have been temporarily or permanently abandoned, but only until such time that the tracks are removed or covered.

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Standard:

When tracks are out of service, traffic control devices and gate arms shall be removed and the signal heads shall be removed or hooded or turned from view to clearly indicate that they are not in operation.

The R8-9 sign shall be removed when the tracks have been removed or covered or when the grade crossing is returned to service.

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PART 9 – TRAFFIC CONTROL FOR BICYCLE FACILITIES

CHAPTER 9A. GENERAL

Section 9A.02 Scope

Support:

Part 9 covers signs, pavement markings, and highway traffic signals specifically related to bicycle operation on both roadways and shared-use paths. **(Refer to PART 9 of MUTCD for information on “Traffic Control for Bicycle Facilities”)**

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APPENDIX

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NDCC CHAPTER 24-07 - Minimum Maintenance Roads

The following information regarding minimum maintenance roads is extracted from North Dakota Century Code:

24-07-35. Designation of minimum maintenance road.

A board having jurisdiction as described in this chapter, and the governing body of a city, may designate a road under its jurisdiction as a minimum maintenance road in accordance with sections 24-07-35 through 24-07-37. The designation may be made only if the board or governing body determines that the road to be so designated is used only occasionally or intermittently for passenger and commercial travel. Further, the designation cannot be made if the road is used as a schoolbus route, mail route, or as the only access to any existing residence. In its action designating the minimum maintenance road, the board or governing body shall identify the beginning and end of the road. The board or governing body shall notify each adjoining political subdivision of a designation made under this section. If a road runs along the boundary of political subdivisions, the designation as a minimum maintenance road is not applicable unless the board or governing body of each adjoining political subdivision agrees with the designation.

24-07-36. Required signs on minimum maintenance roads.

The body making a designation of a minimum maintenance road shall post signs at the beginning of the road and at regular intervals along the road. The signs must conform to standards adopted by the director by rule. If the signs are properly posted, that fact is prima facie evidence that adequate notice of the road's status as a minimum maintenance road has been given to the public.

24-07-37. Limitations on designation of minimum maintenance roads.

A road is not eligible for designation as a minimum maintenance road if federal highway aid to this state would be reduced as a result of that designation. A road is not eligible for that designation if additional right-of-way or easement by eminent domain is required for constructing or designating the road as a minimum maintenance road, unless the consent of the landowner is given or the designation is necessary for drainage or public safety.

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30 in x 18 in
White background - Black Legend

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NDCC CHAPTER 24-09 – Railroad Crossings

The following information regarding railroad crossings in North Dakota is extracted from North Dakota Century Code:

24-09-01.1. Standard railroad crossing warning systems (Excerpt from section only)

The standard warning system at each public highway grade crossing must be railroad crossbucks and advance warning signs designed and located pursuant to section 39-13-07. These signing requirements and standards must be deemed adequate and appropriate for warning of the existence and nature of each railroad crossing for all purposes whatsoever.

24-09-02. Uniform warning systems at railroad crossings.

The department shall adopt and prescribe uniform warning systems in conformity with sections 39-13-06 and 39-13-07 for use at public grade crossings in this state which will be deemed adequate and appropriate warning of the existence and nature of such grade crossings for all purposes whatsoever.

24-09-03. Railroads to establish signs.

At each grade crossing in this state hereafter established and at each grade crossing where and when the existing crossing signs are replaced, the railway company operating the railroad thereat shall erect and maintain on the highway on each side of the railroad track or tracks, and within a distance of seventy-five feet from the nearest rail, one or more of such uniform home-crossing signs.

24-09-04. Advance warning signs - Exceptions.

The sole signing duty of the road authority, except as otherwise designated by the commission under section 24-09-08, at public grade crossings in the state is the erection and maintenance of advance warning signs in accordance with the manual on uniform traffic control devices. The road authorities have a reasonable length of time, not exceeding two years, in which to fully implement this requirement.

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24-09-05. Stop signs may be required.

At each grade crossing where, because of the dangers attendant upon its use, the reasonable protection to life and property makes it necessary for all persons approaching the same to stop before crossing the railroad tracks thereat, stop signs shall be installed. The department, after performing an engineering study of the crossing, may designate any crossing requiring such additional protection as a stop crossing and shall notify the road authority with jurisdiction over the roadway of such designation and of the location where the stop sign is to be installed. Within thirty days after such notification, the road authority shall erect uniform stop signs on separate posts at the designated location on each side of said crossing.

24-09-08. Additional safeguards at crossings may be required.

The commission, upon written application made to it by the director, the board of county commissioners of any county, the board of supervisors of any township, any municipality, the railroad company, or upon its own motion, shall investigate and determine whether any railroad grade crossing over any state, county, township, or municipal highway in the state is dangerous to life and property and needs protection further than that set out in this chapter, and may order the same protected in any manner it may find reasonable and proper, including a requirement that the railroad company separate the grades. In such cases, the commission shall give the railroad company interested such notice of the investigation as it deems reasonable and an opportunity to be heard before any order is made. The railroad company interested, within thirty days after the service of a copy of such order upon it, may appeal to the county within which such crossing is situated.

24-09-09. Warning devices must be approved by department of transportation.

The department, so far as practicable, shall secure uniformity in the devices used to protect grade crossings. No such devices may be installed until same have been approved by the department. Except for devices prescribed under section 24-09-08, all devices installed, which conflict with the devices approved by the department, either in their design or method of operation, so as to create a hazardous condition to travel at such crossing, must be modified immediately by

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the railway company controlling the same so as to conform to those approved by the department.

24-09-10. Changing or closing railroad crossing – Power of public service commission – Hearing.

It is in the interest of public safety to eliminate unnecessary railroad grade crossings whenever reasonable access can be safely provided at another crossing. Whenever it is desired, either by the public officials having the necessary authority or by the railway company operating the railroad, to establish, vacate, or relocate any crossing of a public highway and railroad, or to separate grades, and an agreement cannot be reached between the public official and the railway company, either as to the necessity for establishing, vacating, or relocating a crossing or for separating grades, as to place, manner of construction, or as a reasonable division of the expense, either party may file a petition with the commission, setting forth the facts and submitting the matter to it for determination. The commission, after giving notice as it shall deem reasonable, shall conduct a hearing and shall issue its order determining whether there should be an establishment, vacation, or relocation of the crossing in question, or a separation of grades, and dividing the expense of the establishment, relocation, or separation of grades. Irrespective of the establishment, relocation, or the consideration of further reasonable protection of a crossing, if the commission finds any railroad crossing to be unnecessary or unsafe, it shall order the crossing closed after reasonable notice and hearing. Whenever a final order is entered vacating or closing a crossing, it must be vacated or closed at the railroad companies expense.

24-09-12. Advertising signs not to obstruct or resemble crossing signs.

No person, firm, corporation, or limited liability company may place or maintain any advertising sign or other similar obstruction upon, over, or adjacent to any highway between any approach sign and the grade crossing which it marks, nor may any person, firm, corporation, or limited liability company place or maintain, upon, over, or adjacent to any public highway in this state any sign or symbol in any manner resembling the signs provided for in this chapter.

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NDCC CHAPTER 24-15 – Temporary Roadblocks

24-15-01. Definition.

For the purpose of this chapter, a temporary roadblock means any structure, device, or means used by police, sheriffs, game wardens, highway patrolmen, agents of the federal bureau of investigation, or officers of the United States border patrol, for the purpose of controlling traffic through a point on a highway, road, or street, whereby all vehicles may be slowed or stopped.

24-15-02. Authority to establish roadblocks.

The duly authorized law enforcement officers are hereby authorized to establish in their respective jurisdictions, or in other jurisdictions within the state, temporary roadblocks upon the highways, roads, and streets of this state for the purpose of apprehending persons wanted for violation of the laws of this state, or of any other state, or of the United States of America, and using the highways, roads, or streets of this state for the purpose of escape.

24-15-03. Minimum requirements.

For the purpose of warning and protecting the traveling public, the minimum requirements to be met by such officers establishing temporary roadblocks are:

The temporary roadblock must be established at a point on the highway clearly visible at a distance of not less than three hundred feet [91.44 meters] in either direction.

At a point of the temporary roadblock, at least one red light must be placed at the point of the temporary roadblock which must display an intermittent or flashing beam of light, clearly visible to the oncoming traffic at a distance of not less than three hundred feet [91.44 meters] under normal atmospheric conditions. The intermittent or flashing beam of light may be provided by lighting which is part of the equipment of a class A authorizing emergency vehicle.

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NDCC CHAPTER 39-09 – Speed Restrictions

The following information regarding speed restrictions is extracted from North Dakota Century Code:

39-09-01.1. Care required in operating vehicle.

Any person driving a vehicle upon a highway shall drive the vehicle in a careful and prudent manner, having due regard to the traffic, surface, and width of the highway and other conditions then existing, and shall give such warnings as are reasonably necessary for safe operation under the circumstances. No person may drive any vehicle upon a highway in a manner to endanger the life, limb, or property of any person.

39-09-02. Speed limitations.

1. Subject to the provisions of section 39-09-01 and except in those instances when a lower speed is specified in this chapter, it presumably is lawful for the driver of a vehicle to drive the same at a speed not exceeding:
 - a. Twenty miles an hour when passing a school during school recess or while children are going to or leaving school during opening or closing hours, unless a lower speed is designated or posted by local authorities.
 - b. Twenty miles an hour when approaching within fifty feet and in traversing an intersection of highways when the driver's view is obstructed. A driver's view is deemed to be obstructed when at any time during the last fifty feet of the driver's approach to such intersection, the driver does not have a clear and uninterrupted view of such intersection and of the traffic upon all of the highways entering such intersection for a distance of two hundred feet from such intersection.
 - c. Twenty miles an hour when the driver's view of the highway ahead is obstructed within a distance of one hundred feet.
 - d. Twenty-five miles an hour on any highway in a business district or in a residence district or in a public park, unless a different speed is designated and posted by local authorities.

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- e. Fifty-five miles an hour on gravel, dirt, or loose surface highways, and on paved two-lane county and township highways if there is no speed limit posted, unless otherwise permitted, restricted, or required by conditions.
 - f. Sixty-five miles an hour on paved two-lane highways if posted for that speed, unless otherwise permitted, restricted, or required by conditions.
 - g. Seventy miles an hour on paved and divided multilane highways, unless otherwise permitted, restricted, or required by conditions.
 - h. Seventy-five miles an hour on access-controlled, paved and divided, multilane interstate highways, unless otherwise permitted, restricted, or required by conditions.
2. The director may designate and post special areas of state highways where lower speed limits apply. Differing limits may be established for different times of the day within highway construction zones which are effective when posted upon appropriate fixed or variable speed limit signs.
 3. Except as provided by law, it is unlawful for any person to drive a vehicle upon a highway at a speed that is unsafe or at a speed exceeding the speed limit prescribed by law or established pursuant to law.
 4. In charging a violation of the provisions of this section, the complaint must specify the speed at which the defendant is alleged to have driven and the speed which this section prescribes is prima facie lawful at the time and place of the alleged offense.

39-09-03. When local authorities may or shall alter maximum speed - Limits – Signs posted.

1. Whenever local authorities in their respective jurisdictions, on the basis of an engineering and traffic investigation, determine that the maximum speed permitted under this title is greater or less than is reasonable and safe under the conditions found to exist upon a highway or part of a highway, the local authority may determine and declare a reasonable and safe maximum limit thereon which:

- a. Decreases the limit at intersections;

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- b. Increases the limit within an urban district but not to more than fifty-five miles per hour; or
 - c. Decreases the limit outside an urban district.
2. Local authorities in their respective jurisdictions shall determine by an engineering and traffic investigation the proper maximum speed for arterial streets and shall declare a reasonable and safe maximum limit thereon which may be greater or less than the maximum speed permitted under this chapter for an urban district.
3. Any altered limit established as herein above authorized shall be effective at all times or during hours of darkness or at other times as may be determined when appropriate signs giving notice thereof are erected upon such street or highway.
4. Any alteration of maximum limits on state highways or extensions thereof in a municipality by local authorities may not be effective until such alteration has been approved by the director.
5. Not more than six such alterations as hereinabove authorized may be made per mile along a street or highway, except in the case of reduced limits at intersections, and the difference between adjacent limits may not be more than ten miles per hour.

39-09-04.1. Special speed limitation

1. No person may drive a vehicle over any bridge or other elevated structure constituting a part of a highway at a speed which is greater than the maximum speed which can be maintained without hazard to such bridge or structure, when such structure is sign posted as provided in this section.
2. The director or other authority having jurisdiction may conduct an investigation of any public bridge, causeway, or viaduct and if the director finds that such structure cannot safely withstand the traveling of vehicles at the speed otherwise permissible under this chapter, such director or other authority shall determine and declare the maximum speed of vehicles such structure can withstand. The director or other authority shall cause or permit signs to be erected and maintained at a distance of one hundred feet from each end of such structure. Such signs must state the maximum

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speed permissible over such structure. The findings and determination of the director or other authority are conclusive evidence of the maximum speed which can be maintained without hazard to any such structure.

39-09-07.1. Speed zones - Reduction limitation.

Except for highway construction zones, no street, road, or highway in the state highway system or any other township, county, or state road or highway may be posted in a manner which reduces the maximum speed limit on the street, road, or highway by more than twenty miles per hour between any two signs so posted in a speed zone. The maximum speed limit reduction between any two signs posted in a highway construction zone may not exceed thirty miles per hour.

39-09-09. Minimum speed limits.

1. An individual may not drive a motor vehicle at a reduced speed so as to impede the normal and reasonable movement of traffic except when reduced speed is necessary for safe operation or in compliance with law.
2. If the director and the superintendent of the highway patrol, acting jointly, or a local authority within the authority's jurisdiction, determines on the basis of an engineering and traffic investigation that slow speeds on any highway or part of a highway impede the safe, normal, and reasonable movement of traffic, the director and superintendent or the local authority may determine and declare a minimum speed limit below which an individual may not drive a vehicle except when necessary for safe operation or in compliance with law, and that limit is effective when posted upon appropriate fixed or variable signs.

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NDCC CHAPTER 39-13 – Traffic Signs

The following information regarding traffic signs is extracted from North Dakota Century Code:

39-13-03. Local parking regulations not enforceable where sign illegible or not in proper position.

Local parking and other special regulations are not enforceable against an alleged violator if, at the time and place of the alleged violation, an appropriate sign giving notice thereof is not in proper position and sufficiently legible to be seen by an ordinarily observant person.

39-13-05. Injuring signs prohibited.

No person may deface, injure, knock down, or remove any sign posted as provided in this chapter.

39-13-06. Authority to adopt manual on uniform traffic-control devices.

The director shall adopt a manual and specifications for a uniform system of traffic-control devices, consistent with the provisions of law, for use upon all highways and streets in this state. Such uniform system must correlate with and so far as possible conform to the system set forth in the most recent addition of the manual promulgated as a national standard by the federal highway administrator.

39-13-07. No traffic-control device to be manufactured or sold which does not conform.

No person, firm, corporation, or limited liability company may sell or offer for sale to street and highway authorities, and no such authorities may purchase or manufacture any traffic-control device which does not conform to the manual unless specifically approved by the director.

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TYPICAL TRAFFIC CONTROL EXAMPLES

The following pages include typical examples of “some” simple traffic control layouts that may be considered for use in basic traffic control situations. This does not mean these examples are meant to meet all situations. It is recommended that applicable sections of the MUTCD also be referred to and/or if not clear or situation appears to be more complicated, seek additional assistance from individuals with expertise in traffic control.

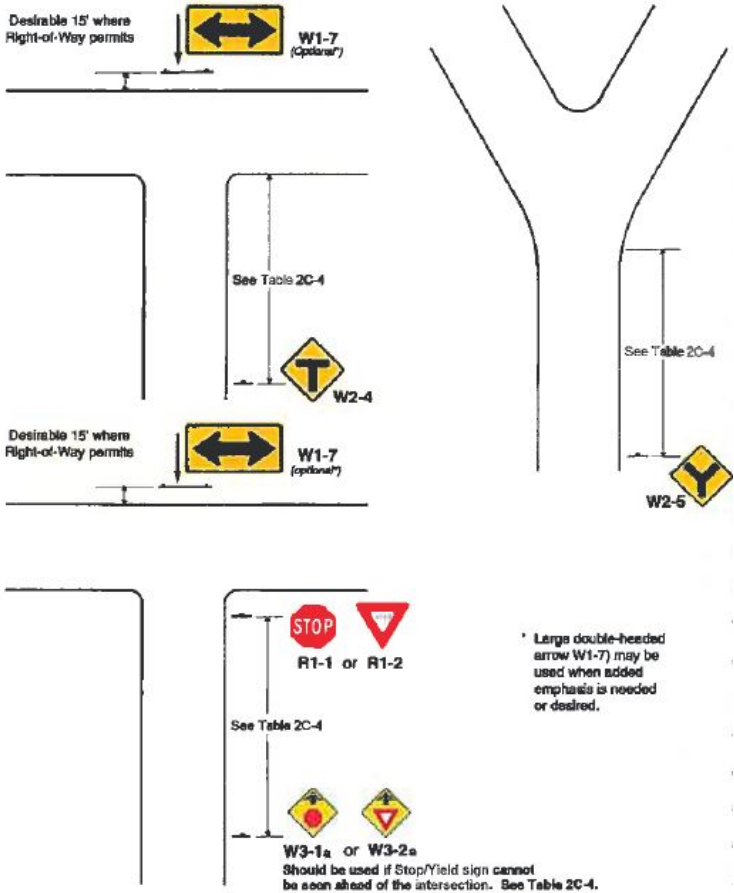
Another source of possible layout information is available from the following NDDOT website link:

<http://www.dot.nd.gov/dotnet2/view/std drawings.aspx>

The MUTCD also has information on various examples to utilize in addressing traffic control situations.

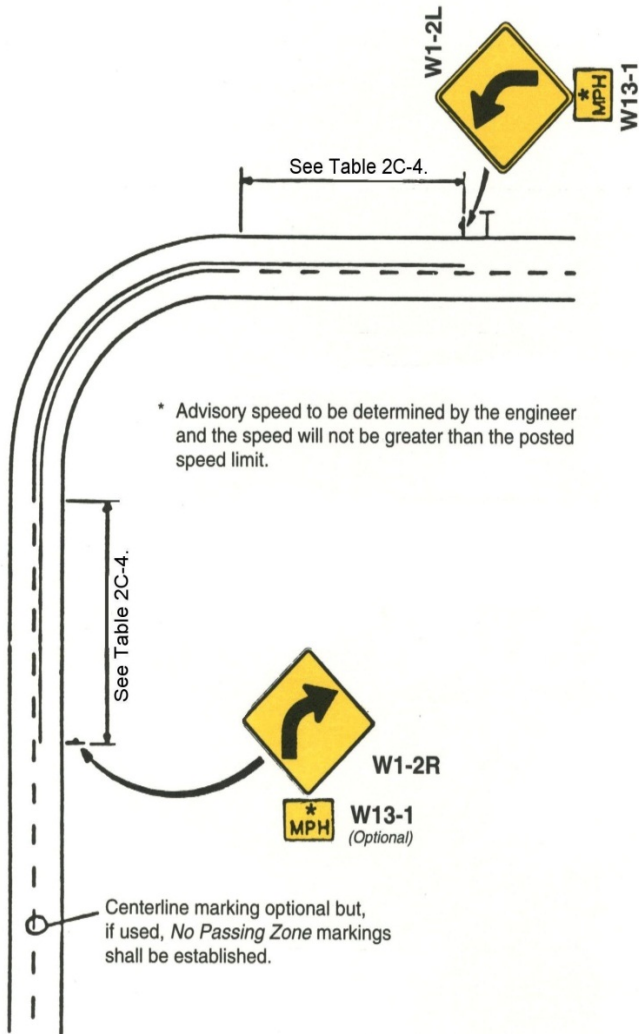
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Typical Location of Signs on T and Y Intersections



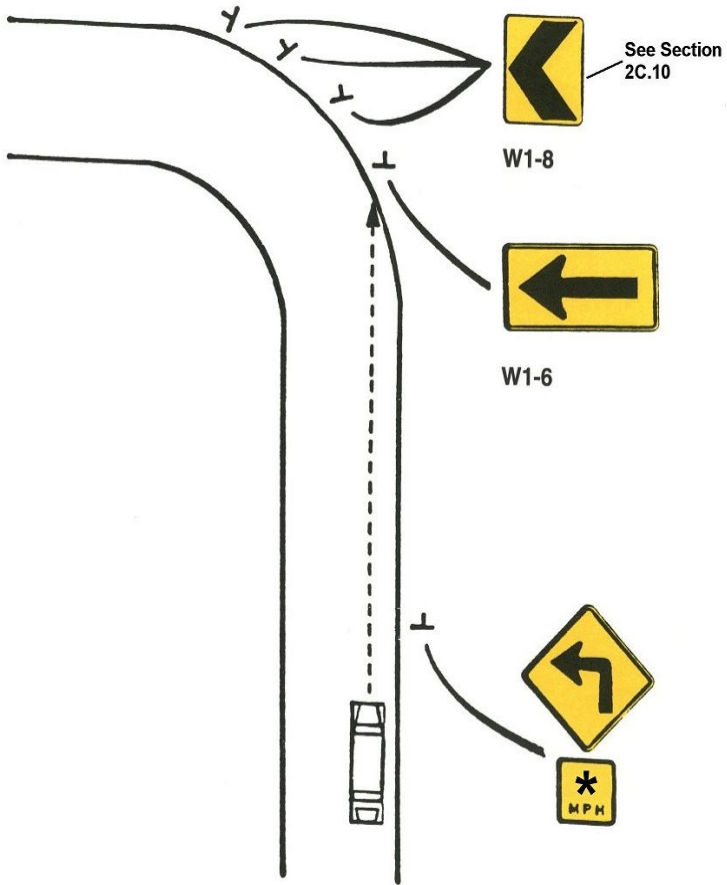
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Figure 17B Typical Signing and Pavement Marking
on a Curve with Safe Driving Speed 35 mph or Greater.



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Figure 18 Typical Installation for Chevron (W1-8)
and/or Large Arrow (W1-6)

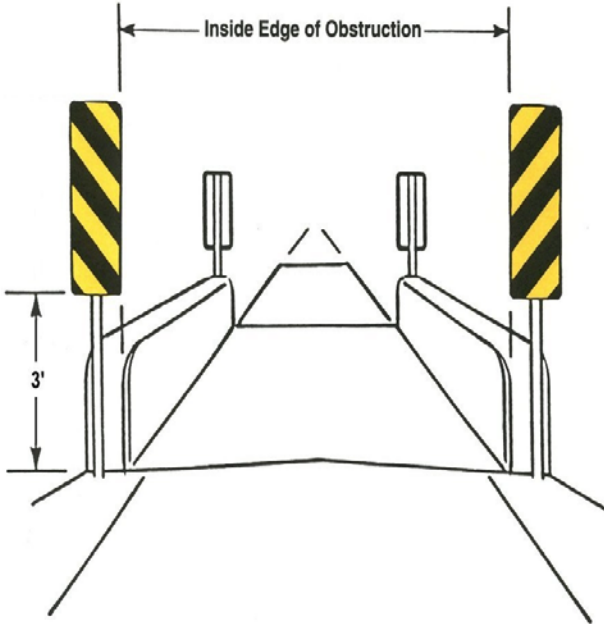


* Advisory Speed to be determined by the engineer and the speed will not be greater than the posted speed limit.

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Location

These markers should be placed with the near edge of the marker in line with the edge, or portion, of the obstruction closest to traffic.

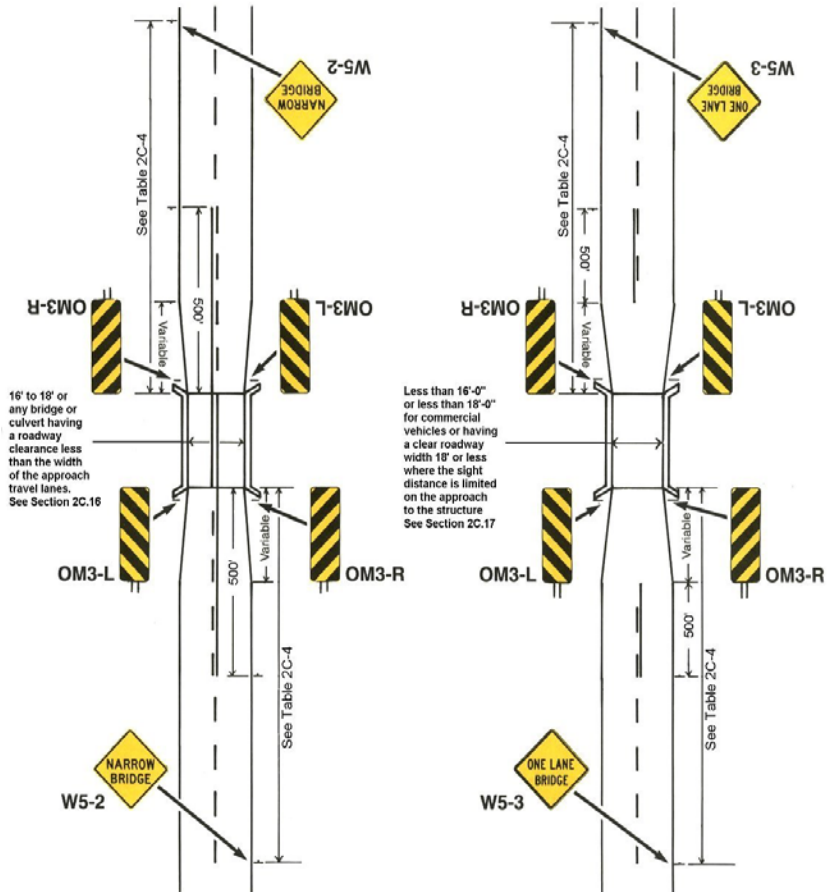


When object markers are installed below the normal mounting height of 3', the authority must keep weeds mowed in front of the signs and periodic cleaning is necessary for the signs to be visible.

If used, the inside edge of the marker shall be in line with the inner edge of the obstruction.

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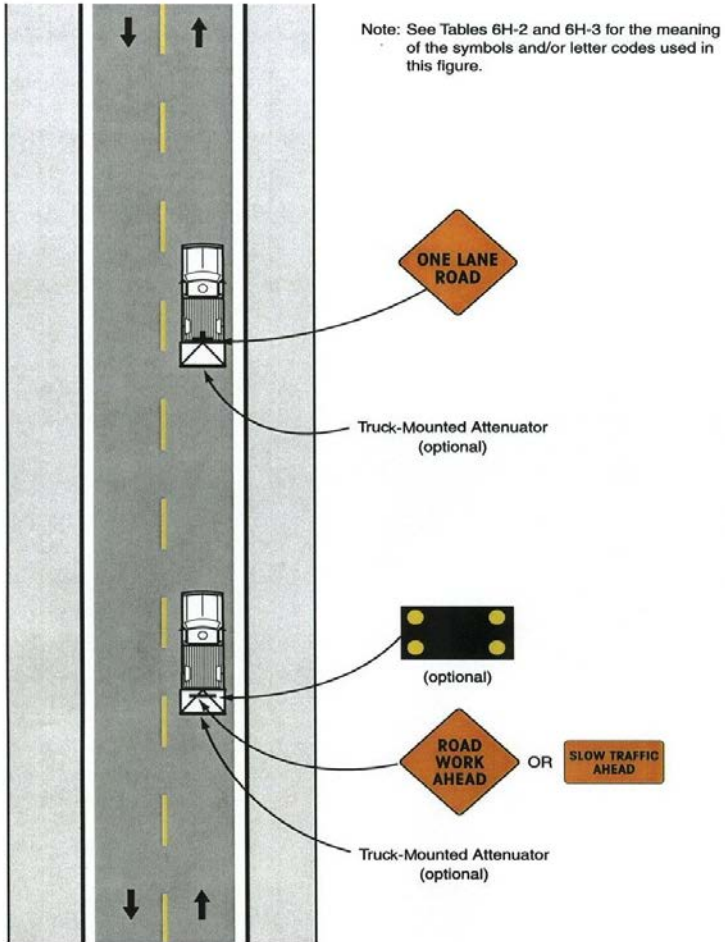
Typical Signing and Marking for a Narrow Structure and a One-Lane Structure.



Note: Inside edge of Object Marker shall be mounted flush with inside of hubguards or bridge rail.

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


Figure 6H-17. Mobile Operations on Two-Lane Road (TA-17)



Typical Application 17

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Table 6H-2. Meaning of Symbols on Typical Application Diagrams

| | |
|---|--|
|  | Arrow panel |
|  | Arrow panel support or trailer |
|  | Channelizing device |
|  | Direction of traffic |
|  | Direction of temporary traffic detour |
|  | Flagger |
|  | High-level warning device (Flag tree) |
|  | Luminaire |
|  | Pavement markings that should be removed for a long-term project |
|  | Sign (Shown facing left) |
|  | Temporary barrier |
|  | Temporary barrier with warning lights |
|  | Surveyor |
|  | Traffic or Pedestrian signal |
|  | Truck-mounted attenuator |
|  | Type III Barricade |
|  | Crash Cushion |
|  | Changeable message sign or support trailer |
|  | Warning lights |
|  | Work space |
|  | Work vehicle |

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**Table 6H-3. Meaning of Letter Codes on
Typical Application Diagrams**

| Road Type | Distance Between Signs** | | |
|---------------------|--------------------------|-------|-------|
| | A | B | C |
| Urban (low speed)* | 100 | 100 | 100 |
| Urban (high speed)* | 350 | 350 | 350 |
| Rural | 500 | 500 | 500 |
| Expressway/ Freeway | 1,000 | 1,500 | 2,640 |

* Speed category to be determined by highway agency

** Distances are shown in feet. The column headings A, B, and C are the dimensions shown in Figures 6H-1 through 6H-46. The A dimension is the distance from the transition or point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The third sign is the first one in a three-sign series encountered by a driver approaching a temporary traffic control zone.)

Formulas for L are as follows:

For speed limits of 40 mph or less: (Only include formula in ().

$$L = \frac{WS^2}{155} \quad (L = \frac{WS^2}{60})$$

For speed limits of 45 mph or greater:

$$L = \frac{WS}{1.6} \quad (L = WS)$$

Where: L = taper length in feet

W = width of offset in feet

S = posted speed limit, or off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

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