

National Committee on Uniform Traffic Control Devices

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Attachment No. 13
Item No.: 19A-RW-01

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

TECHNICAL COMMITTEE: Regulatory and Warning Signs Technical Committee
ITEM NUMBER: 19A-RW-01
TOPIC: Reducing Wrong Way Movements – NCHRP 881
ORIGIN OF REQUEST: RWSTC Task Force: Rich Meredith, James Sullivan, Robert Weber, Christina Dos Santos, Zoubir Ouadah, Tom Heydel
AFFECTED SECTIONS OF MUTCD: Sections 1A.13, 2A.23, 2B.09, 2B.32, 2B.37, 2B.38, 2B.40, 2B.41, 2B.42, 3B.20, and 4C.01, and Figures 2B-12, 14, 15, 16, 17, and 18

DEVELOPMENT HISTORY: Task force: 1/5/19, revised 1/10/19, updated 1/18/19, REVISED 6/12/19, 6/19/19, 6/21/19

- Approved by RW Technical Committee: 01/10/2019
- Approved by Markings Technical Committee: 01/10/2019
- Approved by Technical Committee following sponsor comments: 06/19/2019
- Approved by Markings Technical Committee: 06/19/2019
- Approved by NCUTCD Council: 06/21/2019

This is a proposal for recommended changes to the MUTCD that has been approved by the NCUTCD Council. This proposal does not represent a revision of the MUTCD and does not constitute official MUTCD standards, guidance, or options. It will be submitted to FHWA for consideration for inclusion in a future MUTCD revision. The MUTCD can be revised only by the FHWA through the federal rulemaking process.

SUMMARY: The intent of this proposal is to incorporate recommendations from NCHRP 881. There are more recent council approved changes to some of the sections where the report proposed edit. The task force tried following the intent of the report recommendations in developing suggested changes to the MUTCD text and figures.

DISCUSSION:

There are some inconsistencies in the text and figures related to one-way signing, wrong way movements and divided highway signing in the MUTCD that need clarification. One area needing to be addressed is the need to provide better clarity for measuring median widths in relation to treating cross streets as one or two intersections.

For median width determination, AASHTO, the UVC and the MUTCD definitions all contain language and figures related to where the median width is measured. However, the language and figures are inconsistent.

NCHRP report 881 studied Traffic Control Devices and Measures for Deterring Wrong-Way Movements. As an element of the research, the study reviewed data and literature in relation to the consideration of median width. The report recommends revisions to the definition of intersections at divided highway crossings based on the findings of its research data.

Additional supporting documents include:

- NCHRP Report 650, which evaluated median intersection design for rural high speed divided highways and made various recommendations related to the figures in the MUTCD.
- The Human Factors chapter 2 in the Highway Safety Manual published by AASHTO provides strong synthesis on human factors as they relate to driver behavior. It is essential that positive guidance is provided. Information related to one-way and wrong way movements needs to be provided to the driver at that time they need it without overloading them.

There needs to be assistance to the minor road drivers in particular when approaching rural high speed divided highways. In urban low speed environments, it is important to provide the regulatory one-way signing, but when medians are narrow and speed limits are lower, the amount of signing may be reduced. The 2009 MUTCD addresses this to some extent, but is not always clear.

One of the conclusions of NCHRP 881 is that placing DO NOT ENTER or WRONG WAY signs on the outside of a wrong way turn can help deter wrong way movements. On the other hand, placing these signs on the inside of a wrong way turn does not appear to provide additional benefit. Another conclusion is that use of pavement markings, such as stop or yield lines, centerlines in the median opening, and wrong way arrow marking in the through lanes also helps deter wrong way movements.

While the task force agreed with many of the reports recommended text and figure revisions, some of the recommended text edits were outdated due to more recent council approved revisions. The task force also found there were some additional edits suggested by the narrative of the NCHRP report, which resulted in some additional edits to figures that were not directed recommended in the report. Lastly, the report suggested moving language from a number of places and consolidating in a new section, referred to a 2B.40a. However, due in part to the more recent changes, it was decided to keep language in the current places in lieu of developing a new section.

RECOMMENDATION:

Following is a list of the MUTCD sections and figures with recommended revisions:

- Section 1A.13—Revised the definitions for “#94, Intersection” and for “#115, Median.”
- Section 2B.04d—YIELD Sign Applications – revised option statement language which was revised by Council on 01/08/2016

- Section 2A.23—Median Opening Treatments for Divided Highways with Wide Medians. Added language to expand Guidance, added support statement and new figure 2A-XX to help define Left-Turn paths.
- Section 2B.32—KEEP RIGHT and KEEP LEFT Signs – Added Option statements
- Section 2B.37—DO NOT ENTER Sign – Revised language revisions approved by Council on 06/28/2013.
 - ♦ Figure 2B-12 - Revised Figure revisions approved by Council on 06/28/2013
- Section 2B.38—WRONG WAY Sign – Revised Guidance statement language.
- Section 2B.40—ONE WAY Signs – revised Standard and Option language.
 - ♦ Figure 2B-14 – revised Optional signs and added optional pavement legends.
 - ♦ Figure 2B-15 – revised Optional signs and added optional pavement legends.
 - ♦ Figure 2B-16 – revised Optional signs, added DO NOT ENTER and WRONG WAY signs, and added optional pavement legends.
 - ♦ Figure 2B-17 – recommend deleting figure due to redundant information.
 - ♦ Figure 2B-18 – removed optional markings asterix and added reference to Part 3
- Section 2B.41—Wrong-Way Traffic Control at Interchange Ramps – Added language to Option statement.
- Section 2B.42—Divided Highway Crossing Signs – Revised Standard and Option statement language.
- Section 3B.20—Pavement Word, Symbol, and Arrow Markings – Revisions to Option Statements language.
- Section 4C.01 – Revisions to Guidance language.

RECOMMENDED MUTCD CHANGES

Proposed changes to the MUTCD are shown in underline blue and removed text are shown in ~~striketrough red~~. Changes previously approved by NCUTCD Council (but not yet adopted by FHWA) are shown in green double underline for additions and ~~green striketrough~~ for deletions. In some cases, background comments may be provided with the MUTCD text along with when an item was approved by Council. These comments are indicated by [highlighted light blue in brackets].

PART 1. GENERAL

CHAPTER 1A. GENERAL

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

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

94. Intersection—intersection is defined as follows:

- (a) The area embraced within the prolongation or connection of the lateral curb lines, or if none, the lateral boundary lines of the roadways of two highways that join one another at, or approximately at, right angles, or the area within which vehicles traveling on different highways that join at any other angle might come into conflict.

- (b) The junction of an alley or driveway with a roadway or highway shall not constitute an intersection, unless the roadway or highway at said junction is controlled by a traffic control device.
- ~~(c) If a highway includes two roadways that are 30 feet or more apart (see definition of Median), then every crossing of each roadway of such divided highway by an intersecting highway shall be a separate intersection.~~
- (c) If a highway includes two roadways separated by a median, then every crossing of each roadway of such divided highway by an intersecting highway shall be a separate intersection if the opposing left-turn paths cross and there is sufficient interior storage for the design vehicle. (see Figure 2A-XX)
- ~~(d) If both intersecting highways include two roadways that are 30 feet or more apart, then every crossing of any two roadways of such highways shall be a separate intersection.~~
- (de) At a location controlled by a traffic control signal, regardless of the distance between the separate intersections as defined in (c) ~~and (d)~~ above:
- (1) If a stop line, yield line, or crosswalk has not been designated on the roadway (within the median) between the separate intersections, the two intersections and the roadway (median) between them shall be considered as one intersection;
 - (2) Where a stop line, yield line, or crosswalk is designated on the roadway on the intersection approach, the area within the crosswalk and/or beyond the designated stop line or yield line shall be part of the intersection; and
 - (3) Where a crosswalk is designated on a roadway on the departure from the intersection, the intersection shall include the area extending to the far side of such crosswalk.

115. Median—the portion of a highway separating opposing directions of the traveled way ~~area between two roadways of a divided highway measured from edge of traveled way to edge of traveled way. The median excludes turn lanes. The median width might be different between intersections, interchanges, and at opposite approaches of the same intersection.~~ **NOTE:** Definitions approved by Edit Committee January 2019

PART 2. SIGNS

CHAPTER 2A. GENERAL

Section 2A.23 Median Opening Treatments for Divided Highways ~~with Wide Medians~~

Guidance:

~~01—Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings should be signed as two separate intersections.~~

01 A divided highway crossing should be signed and marked as separate intersections when both of the following conditions are present:

A. The paths of opposing left turns from the divided highway cross each other (see Figure 2A-XX) and

169 B. There is adequate storage in the interior approaches for the design vehicles expected to
170 cross the divided highway.

171 02 If either one or both of the conditions in paragraph 1 do not exist, the divided highway
172 crossing should be signed and marked as a single intersection.

173 03 At the crossing of two divided highways, engineering judgment should be used to determine
174 the number of separate intersections.

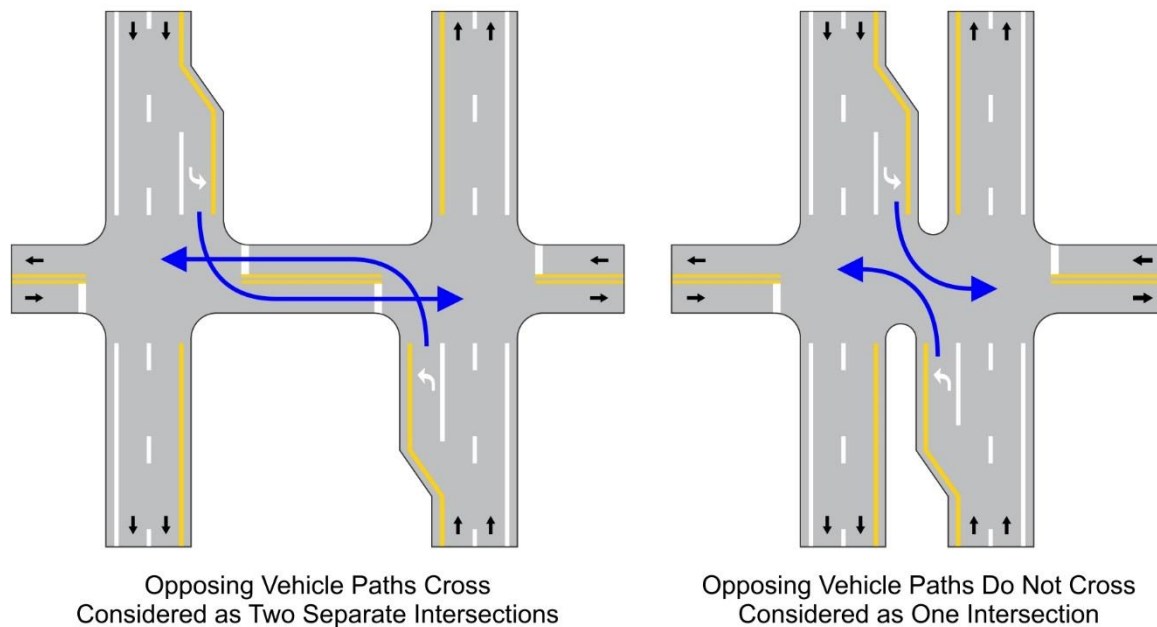
175 Option:

176 04 Divided highway crossings with median widths between 30 feet and 85 feet may function as
177 either one or two intersections depending upon the interaction of the opposing left-turn vehicle
178 paths and the available interior storage in the median for a crossing vehicle. Other factors that
179 could determine whether a divided highway crossing is operating as one or two intersections
180 include:

- 181 • the geometric design of the divided highway crossing,
 - 182 • the use of positive offset mainline left turn lanes
 - 183 • the length of the median opening (as measured parallel to the centerline of the divided
184 highway).
 - 185 • the geometric design of the median noses,
 - 186 • other roadway geometric considerations such as a skewed side street approach or a
187 variable median width,
 - 188 • intersection sight distance
 - 189 • the physical characteristics of the design vehicle, and
 - 190 • the observed prevailing driver behavior with regard to opposing left turn path interaction.
- 191

****New Figure****

Figure 2A-XX. Types of Left-Turn Paths at a Divided Highway Crossing



NOTE: Pavement markings are shown for clarity only.
Refer to Part 3 for guidance on markings.

Legend

➡ Direction of travel
➡ Vehicle path of Left Turn

CHAPTER 2B. REGULATORY SIGNS, BARRICADES, AND GATES

Section 2B.04 ~~Right-of-Way at Intersections~~ General Considerations at Intersections

Support:

~~01— 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.~~

01a Unsignalized intersections represent the most common forms of intersection right-of-way control. Selection of unsignalized control might be affected by specific requirements of state law or local ordinances.

01b Roundabouts, traffic circles and other circular intersections are types of intersections and are not traffic control devices. The YIELD sign at the roundabout is the traffic control device. The decision to convert an intersection from a traditional intersection to a roundabout is an engineering design, traffic operations, and/or safety decision and not a traffic control device decision. As such, criteria for conversion from a traditional intersection to a roundabout are not included in the MUTCD.

Guidance:

01c The type of traffic control used at an unsignalized intersection should be the least restrictive that provides appropriate levels of safety and efficiency.

Support:

01d Some types of right-of-way control that can exist at an unsignalized intersection are listed below in order from the least restrictive to the most restrictive.

A. No intersection control: There are no right-of-way traffic control devices on any of the approaches to the intersection. (See Section 2B.04c for guidance)

B. Yield Control: YIELD signs are placed on all approaches (for a roundabout), on opposing approaches for a 4-leg intersection, on a single approach for a 3-leg intersection, or in the median of a divided highway. The YIELD signs are placed on the minor road. (See Section 2B.04d for guidance).

C. Minor road stop control: STOP signs are typically placed on opposing approaches (for a 4-leg intersection) or on a single approach (for a 3-leg intersection). The STOP signs are normally placed on the minor road. (See Section 2B.04a for guidance on selecting the minor road).

D. All-way stop control: STOP signs are placed on all approaches to the intersection. (See Section 2B.04f for guidance).

~~01e 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:

~~02 When selecting a form of unsignalized intersection control 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. Where the term units/day or units/hour is indicated, it should be the total of vehicular, bicycle, and pedestrian volumes.~~

~~B. Driver yielding behavior with regard to all modes of conflicting traffic including bicyclists and pedestrians.~~

~~C. Number and angle of approaches;~~

~~D. Approach speeds;~~

~~E. Sight distance available on each approach; and~~

~~F. Reported crash experience.~~

~~G. The presence of a grade crossing near the intersection for queue back up from the intersection grade crossing.~~

~~03 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.~~

~~04 In addition, the use of YIELD or STOP signs should be considered at the intersection of two minor streets or local roads 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.~~
~~05 YIELD or STOP signs should not be used for speed control.~~

Support:

~~06 Section 2B.07 contains provisions regarding the application of multi-way STOP control at an intersection.~~

Guidance:

~~07 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.~~

~~08 A YIELD or STOP sign should not be installed on the higher volume roadway unless justified by an engineering study.~~

Support:

~~09 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:~~

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

~~— B. Controlling the direction that has obscured vision, dips, or bumps that already require drivers to use lower operating speeds; and~~

~~— C. Controlling the direction that has the best sight distance from a controlled position to observe conflicting traffic. (approved by Council 1/8/2016)~~

Standard:

10 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.

11 Except as provided in Section 2B.04d 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.

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

13 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:

14 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.

~~Support~~

~~15 Section 9B.03 contains provisions regarding the assignment of priority at a shared-use path/roadway intersection.~~

Section 2B.04a 05 STOP Sign (R1-1) and ALL WAY Plaque (R1-3P) Determining the Minor Road for Unsignalized Intersections (approved by Council 1/08/2016)

Guidance:

01 The selection of the minor road to be controlled by Yield or Stop signs should be based on one or more of the following criteria:

A. A roadway intersecting a designated through or numbered highway.

B. A roadway with the lower functional classification.

C. A roadway with the lower traffic volume.

D. A roadway with the lower speed limit.

E. A roadway that intersects with a roadway that has a higher priority for one or more modes of travel.

02 When two roadways that have relatively equal volumes, speeds, and/or other characteristics intersect, the following factors should be considered in selecting the minor road for installation of YIELD or STOP signs:

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

B. Controlling the direction that has obscured vision, dips, or bumps that already require drivers to use lower operating speeds; and

C. Controlling the direction that has the best sight distance from a controlled position to observe conflicting traffic.

Section 2B.04b. Alternatives to Changing Intersection Right-of-Way Control (approved by Council 1/08/2016)

Guidance:

01 Before converting to a more restrictive form of right-of-way control at an unsignalized intersection, consideration should be given to alternative treatments that address safety, operational, or other concern.

Option:

02 Alternatives that may be considered include, but are not limited to, the following:

A. Where Yield or Stop controlled, installing YIELD AHEAD or STOP AHEAD signs on the appropriate approaches to the intersection.

- B. Removing parking on one or more approaches;
C. Improving intersection sight distance;
D. Installing warning signs along the major street to warn road users approaching the intersection.
E. Relocating the stop line(s) and/or yield line to improve sight distance at the intersection;
F. Installing transverse rumble strips or other traffic calming measures designed to reduce speeds on the approaches;
G. Installing a red flashing beacon at the intersection to supplement Stop control;
H. Installing yellow flashing beacons on warning signs in advance of a STOP or YIELD sign controlled intersection on major- and/or minor-street approaches;
I. Adding one or more lanes on a minor-street approach to reduce the number of vehicles per lane on the approach;
J. Revising intersection geometrics by adding pedestrian refuge islands and or curb extensions at the intersection to channelize vehicular movements and reduce the time required for a vehicle to complete a movement;
K. Revising the geometrics at the intersection to add pedestrian median refuge islands and/or curb extensions;
L. Installing roadway lighting if a disproportionate number of crashes occur at night;
M. Restricting one or more turning movements, perhaps on a time-of-day basis, if alternate routes are available;
N. Installing a pedestrian hybrid beacon (see Chapter 4F), Rectangular Rapid Flash Beacons (Interim Approval IA.21) or In-Roadway Warning Lights (see Chapter 4N) if pedestrian safety is the major concern;
O. Converting to a roundabout; and
P. Employing other proven alternatives, depending on conditions at the intersection.

Section 2B.04c No Intersection Control (approved by Council 1/08/2016)

Guidance:

01 *The decision to use no intersection control should be based on engineering judgment.*

Option:

02 *The following factors may be considered:*

- A. Intersection sight distance is adequate on all approaches.
B. All approaches to the intersection are a single lane approaches and there are no separate turn lanes.
C. The combined vehicular, bicycle, and pedestrian volume (existing or projected) entering the intersection from all approaches averages less than 1,000 units per day or 80 units in the peak hour.
D. None of the approaches to the intersection are for a through highway.
E. The angle of intersection is between 90 and 75 degrees.
F. The functional classification of the intersecting streets is either the intersection of two local streets or the intersection of a local street with a collector street.

Section 2B.04d. Yield Control (approved by Council 1/08/2016)

Guidance:

01 *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.*

02 Yield control should be considered when engineering judgment indicates that all of the following conditions apply:

A. Intersection sight distance is adequate on the approaches to be controlled by YIELD signs.

B. Each approach to be controlled is a single lane.

C. One of the following crash-related criteria applies:

1. For changing from no intersection control to yield control, there have been two or more reported crashes in a 12 month period that are susceptible to correction by installation of a YIELD sign.

2. From changing from minor road stop control to yield control, there have been two or fewer reported crashes in a 12 month period.

D. Entering intersection volume of less than 1800 units per day or 140 units in the peak hour.

E. The angle of intersection is between 90 and 75 degrees.

F. The functional classification of the intersecting streets is either the intersection of two local streets or the intersection of a local street with a collector street.

Option:

03 Yield control may be established at an intersection when any of the following conditions apply:

A. At the second ~~intersection~~ ~~crossroad~~ of a divided highway ~~crossing or median break functioning as two separate intersections, where the median width at the intersection is 30 feet or greater.~~ (see Figures 2B-12 and 2B-15). In this case, a YIELD sign may be installed at the entrance to the second ~~intersection~~ ~~roadway~~.

B. 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 be a STOP sign.

C. At an intersection where a special problem exists and where engineering judgment indicates the problem to be susceptible to correction by use of the YIELD sign.

D. Facing the entering and exiting roadway for a merge-type movement if engineering judgment indicates that control is needed because acceleration or deceleration geometry and/or sight distance is not adequate for merging traffic operation.

E. On an approach to an intersection where the only permissible movement is a right turn movement with an intersection geometry similar to a channelized right turn lane or an approach to a roundabout.

Guidance:

04 The Yield signs should be installed on opposing minor-road approaches (for a 4-leg intersection) or on the minor-road approach for a 3-leg intersection (See Section 2B-XX) for information to identify the minor road. When two intersecting roadways have relatively equal volumes, speeds and other characteristics, yield control should be established on the approach that conflicts most with established pedestrian crossing activity or school walking routes or bicycle crossing activity.

Section 2B.09 YIELD Sign Applications (Section deleted by Council 1/08/2016)

~~Option:~~

~~01 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.~~

~~01a On low volume rural roads, a YIELD sign may be used at an intersection instead of a STOP sign if engineering judgment indicates that the YIELD would provide adequate control.~~

(approved by Council 1/10/2014)

~~Standard:~~

~~02 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.32 Keep Right and Keep Left Signs (R4-7, R4-8)

Option:

01 The Keep Right (R4-7) sign (see Figure 2B-10) may be used at locations where it is necessary for traffic to pass only to the right-hand side of a roadway feature or obstruction. The Keep Left (R4-8) sign (see Figure 2B-10) may be used at locations where it is necessary for traffic to pass only to the left-hand side of a roadway feature or obstruction.

Guidance:

02 At locations where it is not readily apparent that traffic is required to keep to the right, a Keep Right sign should be used.

03 If used, the Keep Right sign should be installed as close as practical to approach ends of raised medians, parkways, islands, and underpass piers. The sign should be mounted on the face of or just in front of a pier or other obstruction separating opposite directions of traffic in the center of the highway such that traffic will have to pass to the right-hand side of the sign.

Standard:

04 The Keep Right sign shall not be installed on the right-hand side of the roadway in a position where traffic must pass to the left-hand side of the sign.

Option:

05 The Keep Right sign may be omitted at intermediate ends of divisional islands and medians.

06 Word message KEEP RIGHT (LEFT) with an arrow (R4-7a or R4-7b) signs (see Figure 2B-10) may be used instead of the R4-7 or R4-8 symbol signs.

07 Where the obstruction obscures the Keep Right sign, the minimum placement height may be increased for better sign visibility.

08 A narrow Keep Right (R4-7c) sign (see Figure 2B-10) may be installed on the approach end of a median island that is less than 4 feet wide at the point where the sign is to be located.

Standard:

09 A narrow Keep Right (R4-7c) sign shall not be installed on a median island that has a width of 4 feet or more at the point where the sign is to be located.

Option:

09a The Keep Right sign may be installed in the median of a divided highway crossing that functions as a single intersection such that it is visible to traffic on the divided highway and angled as needed toward the applicable crossroad approach as shown in Figure 2B-16.

Support

09b Section 2B.40 provides more information about the use of the Keep Right sign in combination with or in lieu of ONE-WAY signs at divided highway crossings.

Standard:

09c If Keep Right signs are installed, they shall be placed as close as practical to the approach ends of the medians and shall be visible to traffic on the divided highway and angled as needed toward the applicable ~~each~~ crossroad approach as shown in Figure 2B-16.

Section 2B.37 DO NOT ENTER Sign (R5-1)

Standard:

01 The DO NOT ENTER (R5-1) sign (see Figure 2B-11) shall be used where ~~traffic is prohibited a two-way roadway becomes a one-way roadway as shown in Figure 2B-14, and near the downstream end of an Interchange exit ramp as shown in Figure 2B-18 (see Section 2B.41).~~from entering a restricted roadway. (approved by Council 6/28/2013)

01a Except as noted in paragraph 4, a DO NOT ENTER (R5-1) sign shall be installed at an intersection with a divided highway where the median width is 30 feet or greater crossing functions as two separate intersections as shown in Figure 2B-12.

Option:

01b A DO NOT ENTER (R5-1) sign may be installed at an intersection with a divided highway where the median width is less than 30 feet crossing functions as a single intersection as shown in Figure 2B-16.

01c A DO NOT ENTER (R5-1) sign may be omitted at an intersection with on a low speed urban street that is a divided highway at a crossing that functions as two separate intersections where the median width is 30 feet or greater.

Guidance:

02 The DO NOT ENTER sign, if used, should be placed directly in view of a road user at the point where a road user could wrongly enter a divided highway, one-way roadway, or ramp (see Figures 2B-12), 2B-14 and 2B-18). The sign should be mounted as shown in figure 2B.18 ~~on the right hand side of the roadway,~~ facing traffic that might enter the roadway or ramp in the wrong direction. At an intersection crossing with a divided highway that functions as a single intersection where the median width is less than 30 feet, the sign, if used should be placed on the outside edge of the roadway facing traffic that might enter the roadway in the wrong direction.

03 If the DO NOT ENTER sign would be visible to traffic to which it does not apply, the sign should be turned away from, or shielded from, the view of that traffic.

Option:

~~04 The DO NOT ENTER sign may be installed where it is necessary to emphasize the one-way traffic movement on a ramp or turning lane. (approved by Council 6-28-13)~~

04 SROPT: A DO NOT ENTER sign may be omitted only if an R4-7 or R6-1 is installed for divided roadway median openings when the operating speeds are less than 25 mph on a SITE ROADWAY OPEN TO PUBLIC TRAVEL. (approved by Council 1/08/2016)

05 A second DO NOT ENTER sign ~~on the left hand side of the roadway~~ may be used, particularly where traffic approaches from an intersecting roadway (see Figure 2B-12). (approved by Council 6/28/2013)

Option:

05a Red LEDs may be installed within the border of the DO NOT ENTER sign to enhance the conspicuity of the sign. The LEDs may be vehicle actuated to flash at the rates as shown in Section 2A.07 (09). (approved by Council 6/28/2014)

Support:

06 Section 2B.41 XX contains information regarding an optional lower mounting height for DO NOT ENTER signs that are located along an exit ramp facing a road user who is traveling in the wrong direction.

Figure 2B-11 Selective Exclusion Signs

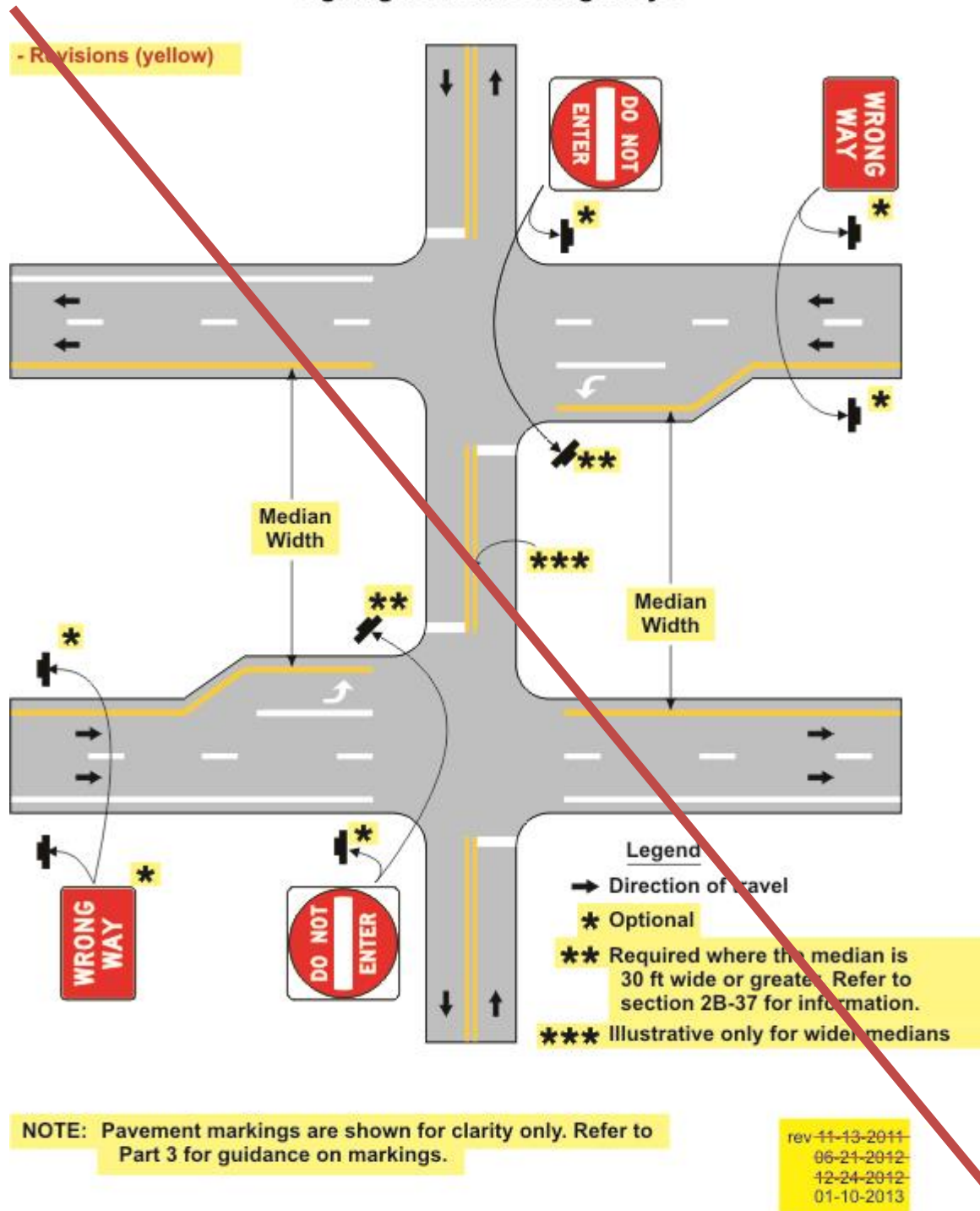
Add NO SNOWMOBILE Symbol sign (R5-XX) (approved by Council 6-19-09)



Add Snowmobile symbol above.

NOTE: REVISED FIGURE 2B-12 BELOW (approved by Council 6-28-13)

Figure 2B-12(rev). Locations of Do Not Enter and Wrong-Way Signing for Divided Highways

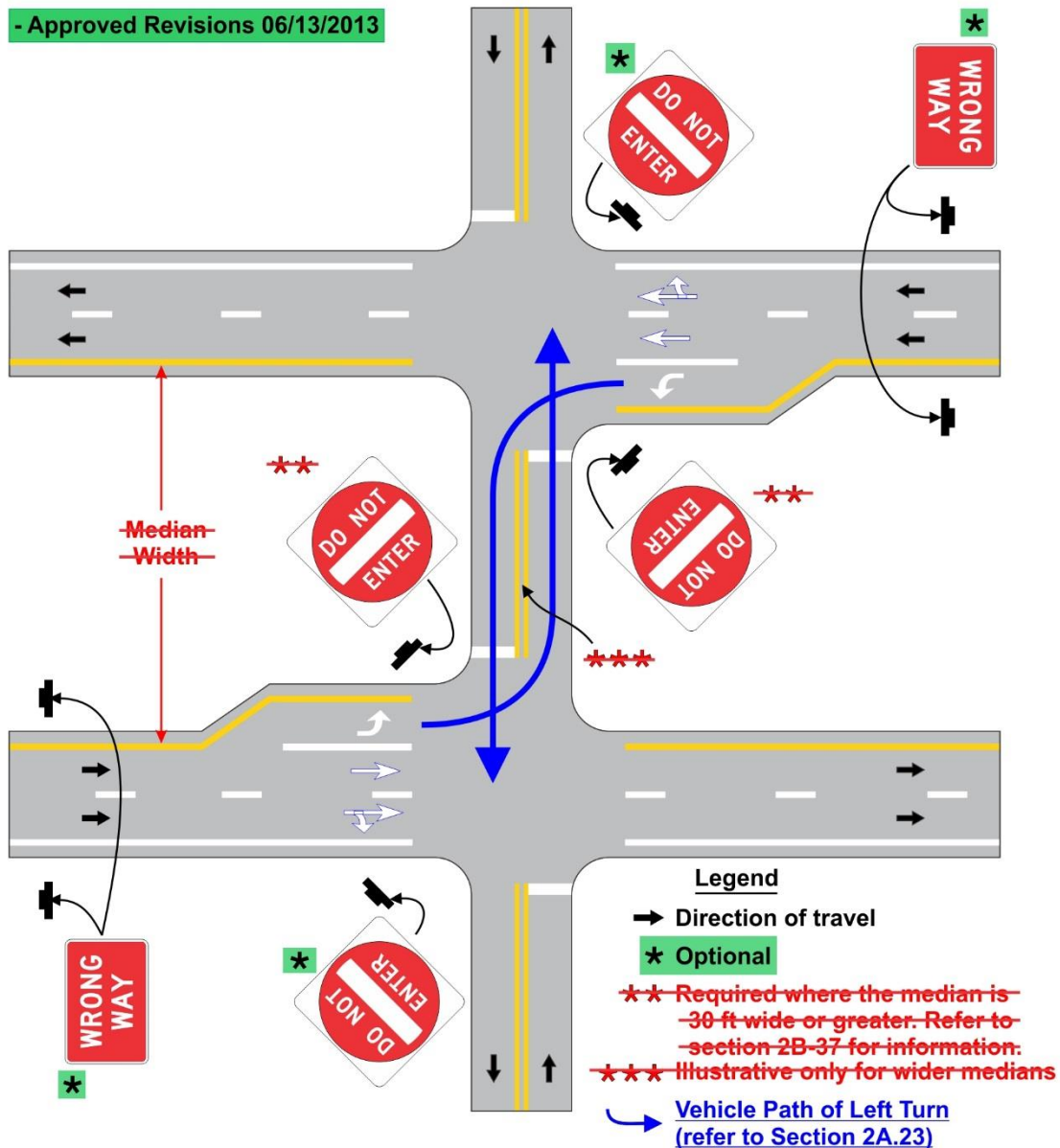


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NOTE: Additional Proposed Revisions to Figure 2B-12 are as follows:

Revised Figure 2B-12, Locations of Do Not Enter and Wrong Way Signing for Divided Highway Crossings that Function as Two Separate Intersections

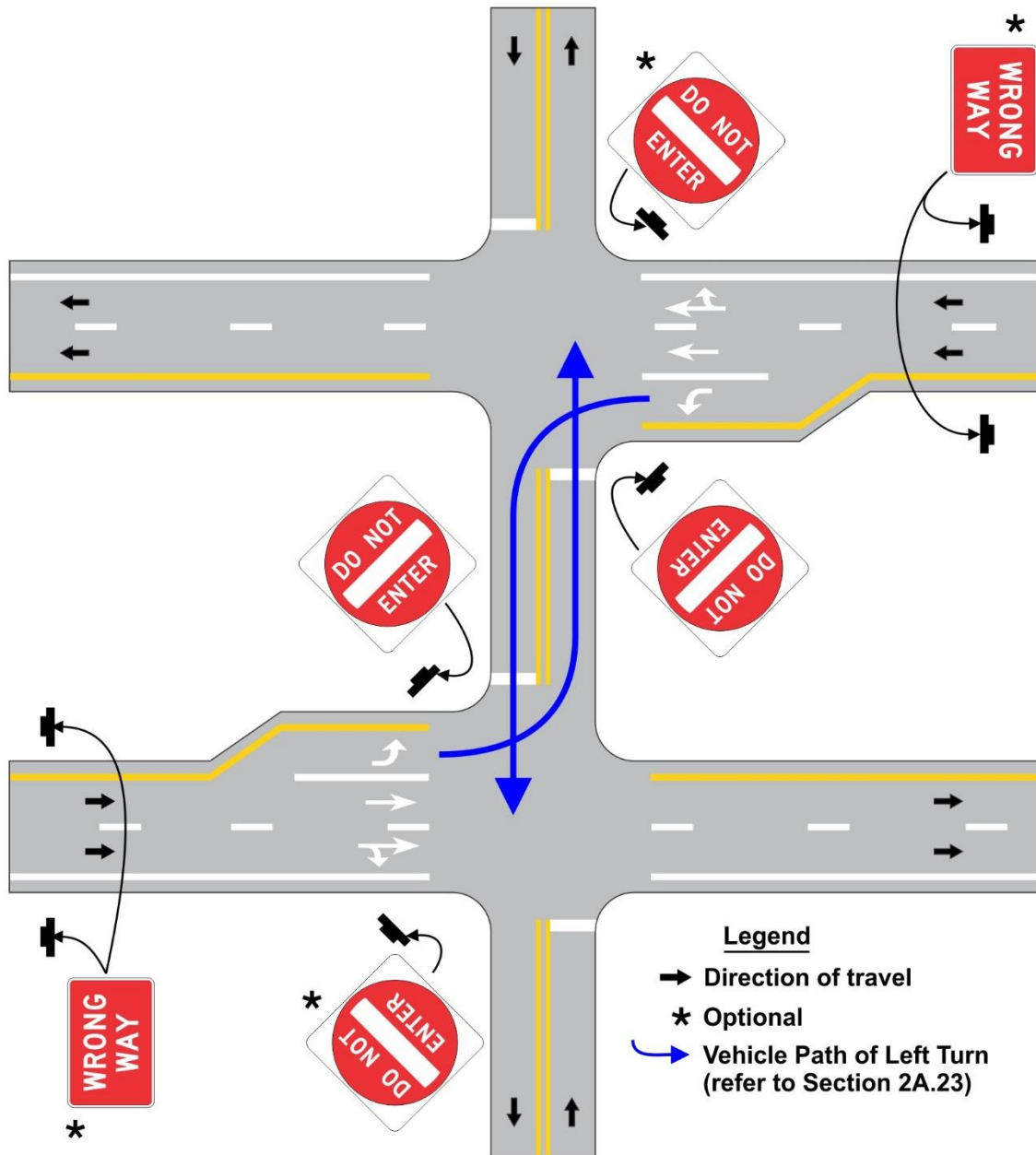
Figure 2B-12(rev). Locations of Do Not Enter and Wrong-Way Signing for Divided Highway Crossings that Function as Two Separate Intersections



NOTE: Pavement markings are shown for clarity only. Refer to Part 3 for guidance on markings.

NOTE: The following is a clean version of revised Figure 2B-12

Figure 2B-12. Locations of Do Not Enter and Wrong-Way Signing for Divided Highway Crossings that Function as Two Separate Intersections



**NOTE: Pavement markings are shown for clarity only.
Refer to Part 3 for guidance on markings.**

Section 2B.38 WRONG WAY Sign (R5-1a)

Option:

01 The WRONG WAY (R5-1a) sign (see Figure 2B-11) may be used as a supplement to the DO NOT ENTER sign where ~~an exit ramp intersects a crossroad or~~ a crossroad intersects a one-way roadway in a manner that does not physically discourage or prevent wrong-way entry (see Figure 2B-12).

Guidance:

02 *If used, the WRONG WAY sign should be placed at a location along the exit ramp or the one-way roadway farther from the crossroad than the DO NOT ENTER sign (see Section 2B.41).*

02a The WRONG WAY sign should be placed on the same side of the road as the DO NOT ENTER sign.

Support:

03 Section 2B.41 ~~XX~~ contains information regarding an optional lower mounting height for WRONG WAY signs that are located along an exit ramp facing a road user who is traveling in the wrong direction. (approved by Council 6/28/2013)

Option:

03a Red LEDs may be installed within the border of the WRONG WAY sign to enhance the conspicuity of the sign. The LEDs may be vehicle actuated to flash at the rates as shown in Section 2A.07(09). (approved by Council 6/28/2014)

Section 2B.40 ONE WAY Signs (R6-1, R6-2)

Standard:

01 Except as provided in Paragraph 6, the ONE WAY (R6-1 or R6-2) sign (see Figure 2B-13) shall be used to indicate streets or roadways upon which vehicular traffic is allowed to travel in one direction only.

02 ONE WAY signs shall be placed parallel to the one-way street at all alleys and roadways that intersect one-way roadways as shown in Figure 2B-14.

03 At the crossing of a roadway with a divided highway that functions as two separate intersections, ~~At an intersection with a divided highway that has a median width at the intersection itself of 30 feet or more,~~ ONE WAY signs shall be placed, visible to each crossroad approach, on the near right and far left corners of each intersection with the directional roadways (see Figure 2B-15).

04 At the crossing of a roadway with a divided highway that functions as a single intersection, ~~At an intersection with a divided highway that has a median width at the intersection itself of less than 30 feet,~~ Keep Right (R4-7) signs and/or ONE WAY signs shall be installed (see Figures 2B-16 ~~and 2B-17~~). If Keep Right signs are installed, they shall be placed as close as practical to the approach ends of the medians and shall be visible to traffic on the divided highway and angled (as needed) toward the applicable ~~each~~ crossroad approach as shown in Figure 2B-16. If ONE WAY signs are installed, they shall be placed on the near right and far left corners of the intersection and shall be visible to each crossroad approach.

Option:

05 At the crossing of a roadway with a divided highway, regardless of function as a single or separate intersections, ~~At an intersection with a divided highway that has a median width at the~~

~~intersection itself of less than 30 feet.~~ ONE WAY signs may also be placed on the far right corner of the intersection as shown in Figures [2B-15](#) and [2B-16](#) ~~and 2B-17~~.

06 ONE WAY signs may be omitted on the one-way roadways of divided highways, where the design of interchanges indicates the direction of traffic on the separate roadways.

[06a ONE WAY signs may be omitted from one corner of the intersection of a crossroad with an interchange ramp \(see Section 2B.41\).](#)

Standard:

07 If used at unsignalized intersections with one-way streets, ONE WAY signs shall be placed on the near right and the far left corners of the intersection facing traffic entering or crossing the one-way street (see Figure 2B-14).

08 If used at signalized intersections with one-way streets, ONE WAY signs shall be placed near the appropriate signal faces, on the poles holding the traffic signals, on the mast arm or span wire holding the signals, or at the locations specified for unsignalized intersections.

09 At unsignalized T-intersections where the roadway at the top of the T-intersection is a one-way roadway, ONE WAY signs shall be placed on the near right and the far side of the intersection facing traffic on the stem approach (see Figure 2B-14).

10 At signalized T-intersections where the roadway at the top of the T-intersection is a one-way roadway, ONE WAY signs shall be placed near the appropriate signal faces, on the poles holding the traffic signals, on the mast arm or span wire holding the signals, or at the locations specified for unsignalized intersections.

Option:

11 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.

Guidance:

12 *Where used on the central island of a roundabout, the mounting height of a ONE WAY 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.*

Support:

13 Using ONE WAY signs on the central island of a roundabout might result in some drivers incorrectly concluding that the cross street is a one-way street. Using Roundabout Directional Arrow signs might reduce this confusion. However, using ONE WAY signs might be necessary in States that have defined a roundabout as a series of T-intersections.

Option:

14 The BEGIN ONE WAY (R6-6) sign (see Figure 2B-13) may be used notify road users of the beginning point of a one direction of travel restriction on the street or roadway. The END ONE WAY (R6-7) sign (see Figure 2B-13) may be used notify road users of the ending point of a one direction of travel restriction on the street or roadway.

[14a SROPT: A ONE WAY sign may be omitted for site roadways open to public travel that intersect one-way driving aisles when wrong way pavement marking arrows and/or stop line the full width of the aisle and/or stop markings are used. \(approved by Council 1/08/2016\)](#)

Figure 2B-13 ONE WAY and Divided Highway Crossing Signs

Figure 2B-13. ONE WAY and Divided Highway Crossing Signs

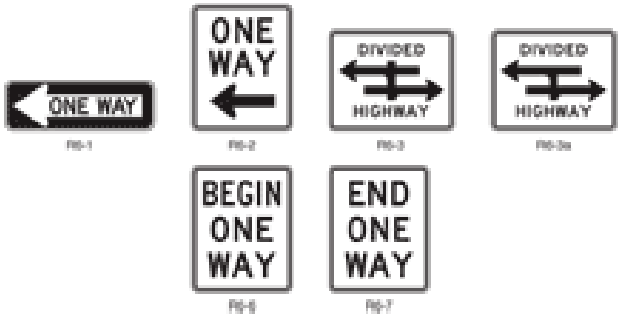
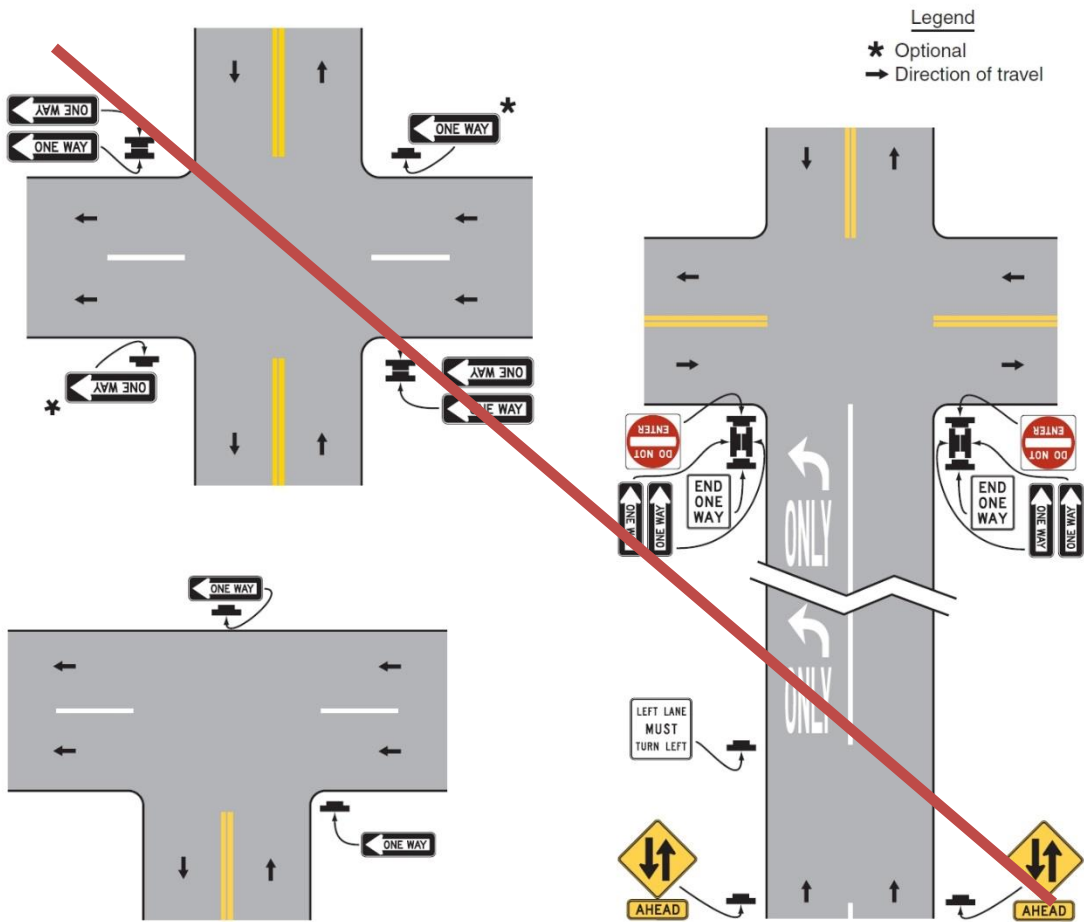


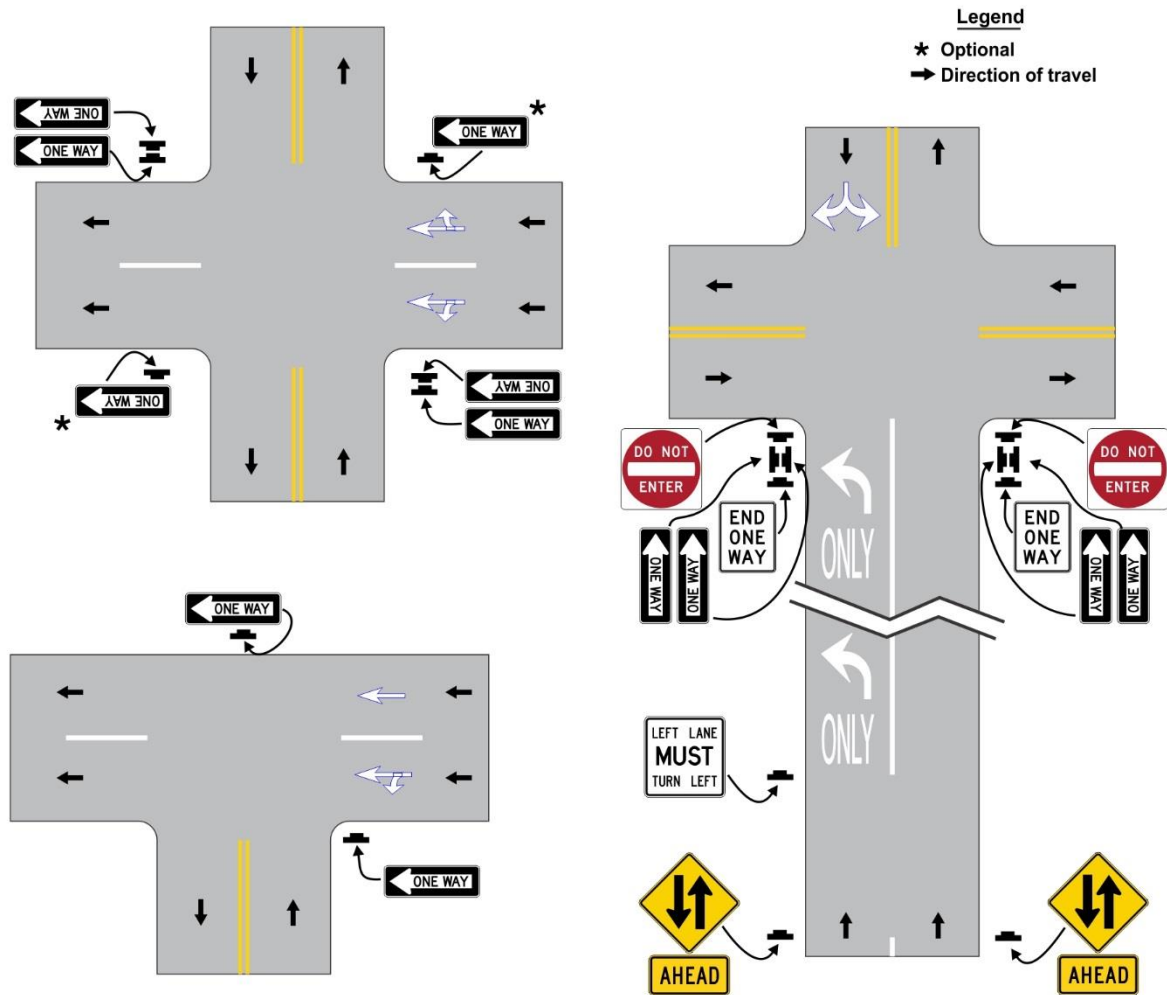
Figure 2B-14 Locations of ONE WAY Signs (2009)

Figure 2B-14. Locations of ONE WAY Signs



665 **Revised Figure 2B-14, Locations of ONE Way Signs as follows:**

Figure 2B-14. Locations of ONE WAY Signs

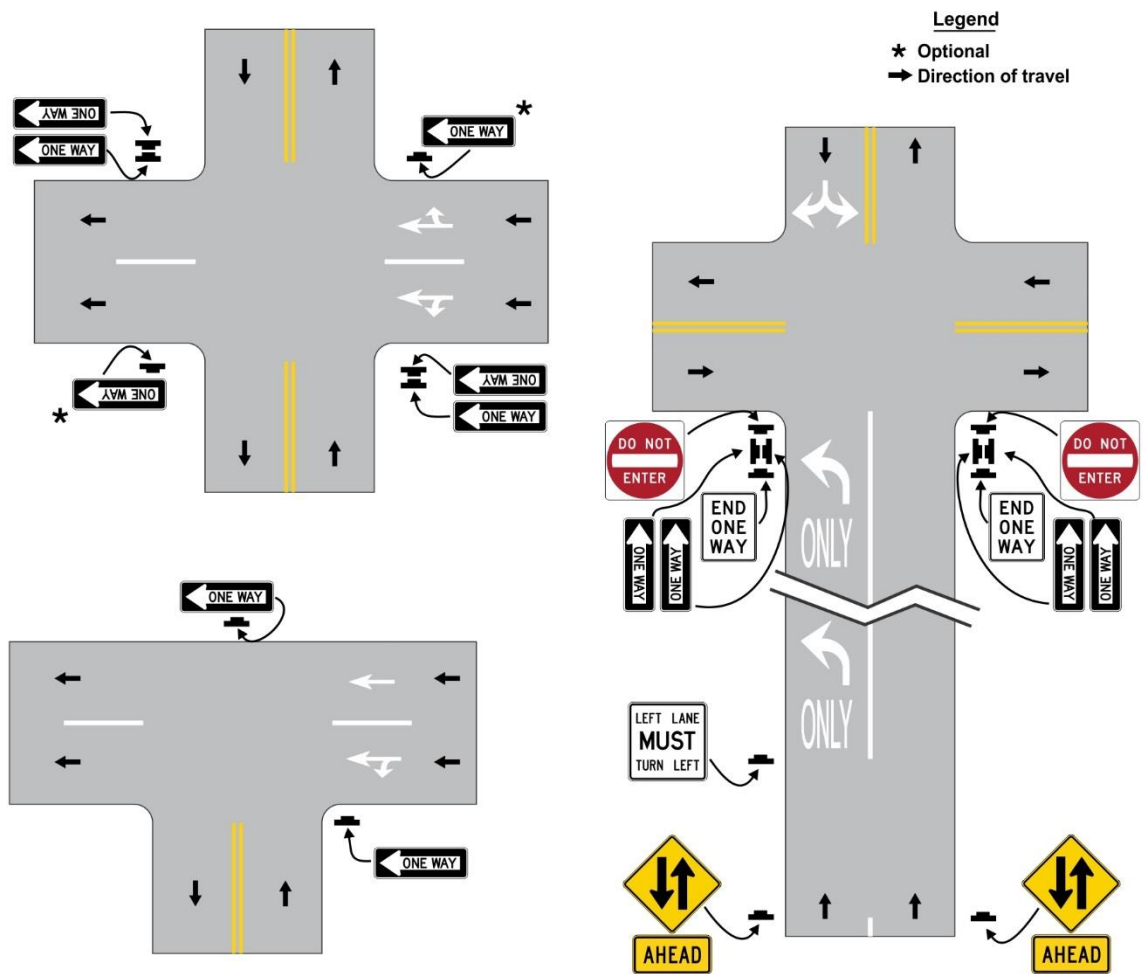


NOTE: Pavement markings are shown for clarity only. Refer to Part 3 for guidance on markings.

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NOTE: The following is a clean version of revised Figure 2B-14

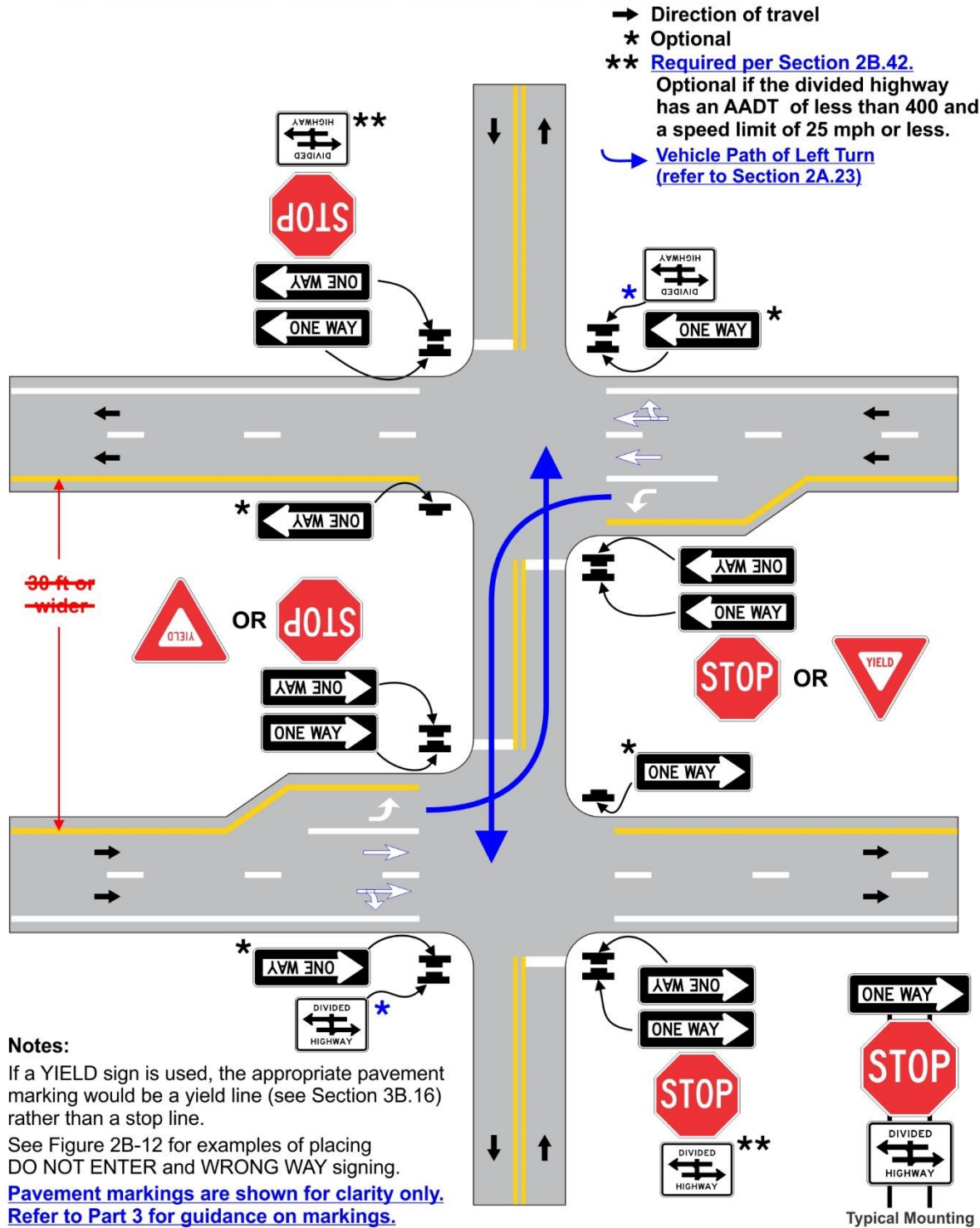
Figure 2B-14. Locations of ONE WAY Signs



NOTE: Pavement markings are shown for clarity only. Refer to Part 3 for guidance on markings.

672 Figure 2B-15 ONE WAY Signing for Divided Highway Crossings with Medians of 30 Feet
 673 or Wider that Function as Two Separate Intersections

Figure 2B-15. ONE WAY Signing for Divided Highway ~~with Median Widths of 30 Feet or Wider~~
Crossings that Function as Two Separate Intersections. Legend



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NOTE: The following is a clean version of revised Figure 2B-15

Figure 2B-15. ONE WAY Signing for Divided Highway Crossings that Function as Two Separate Intersections.

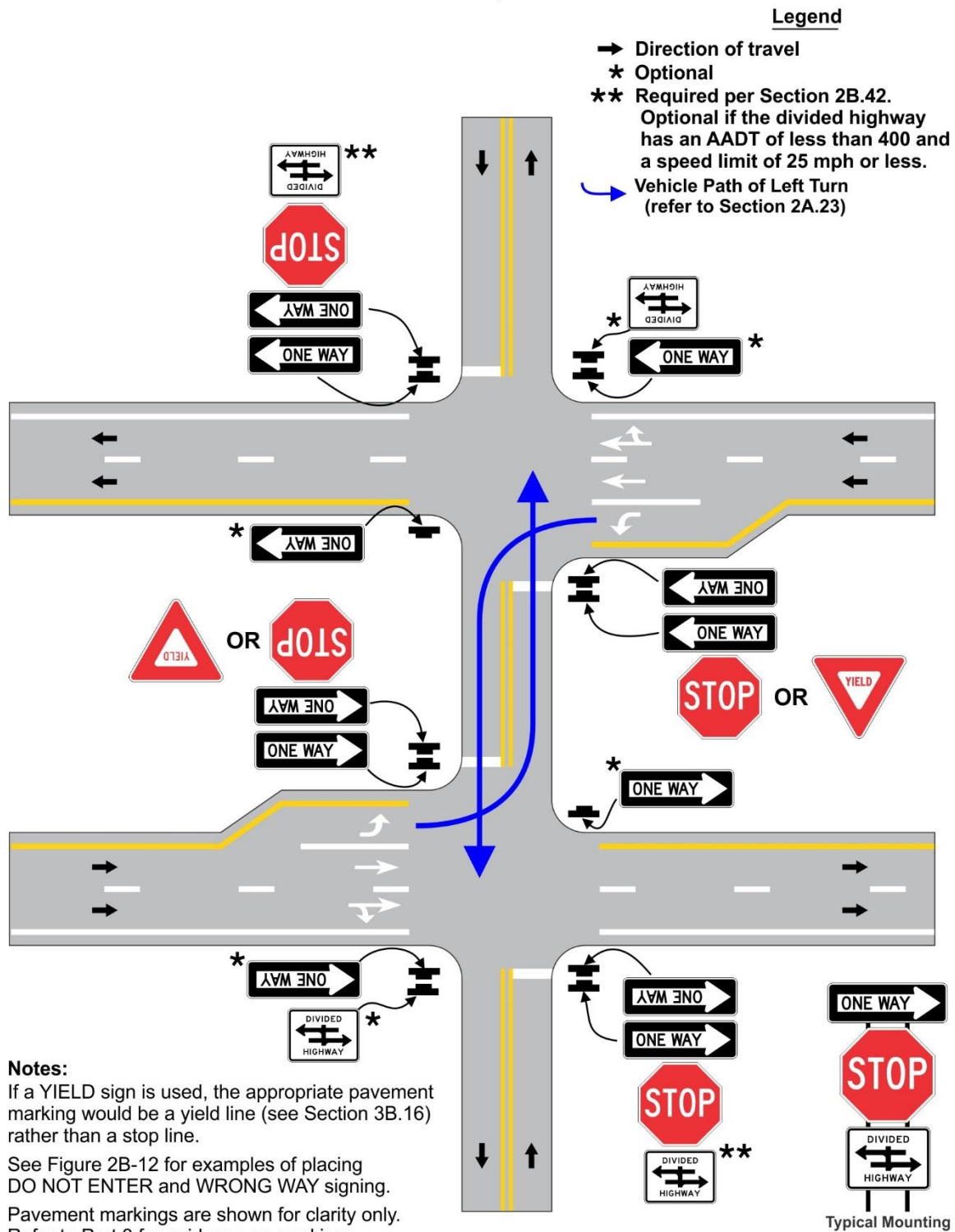
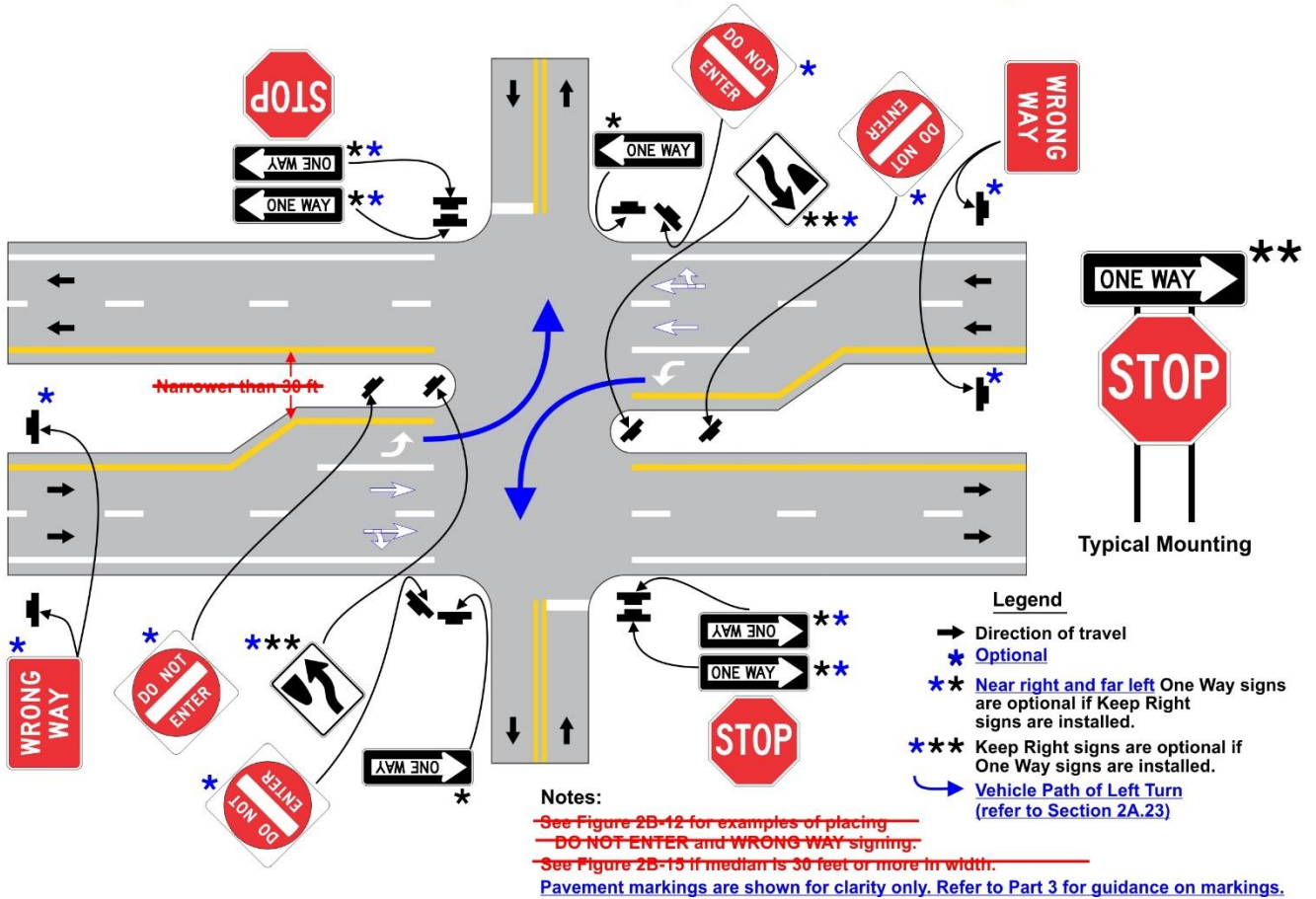


Figure 2B-16 ONE WAY, DO NOT ENTER, and WRONG WAY Signing for Divided Highways Crossings with Median Widths Narrower Than 30 Feet that function as a Single Intersection

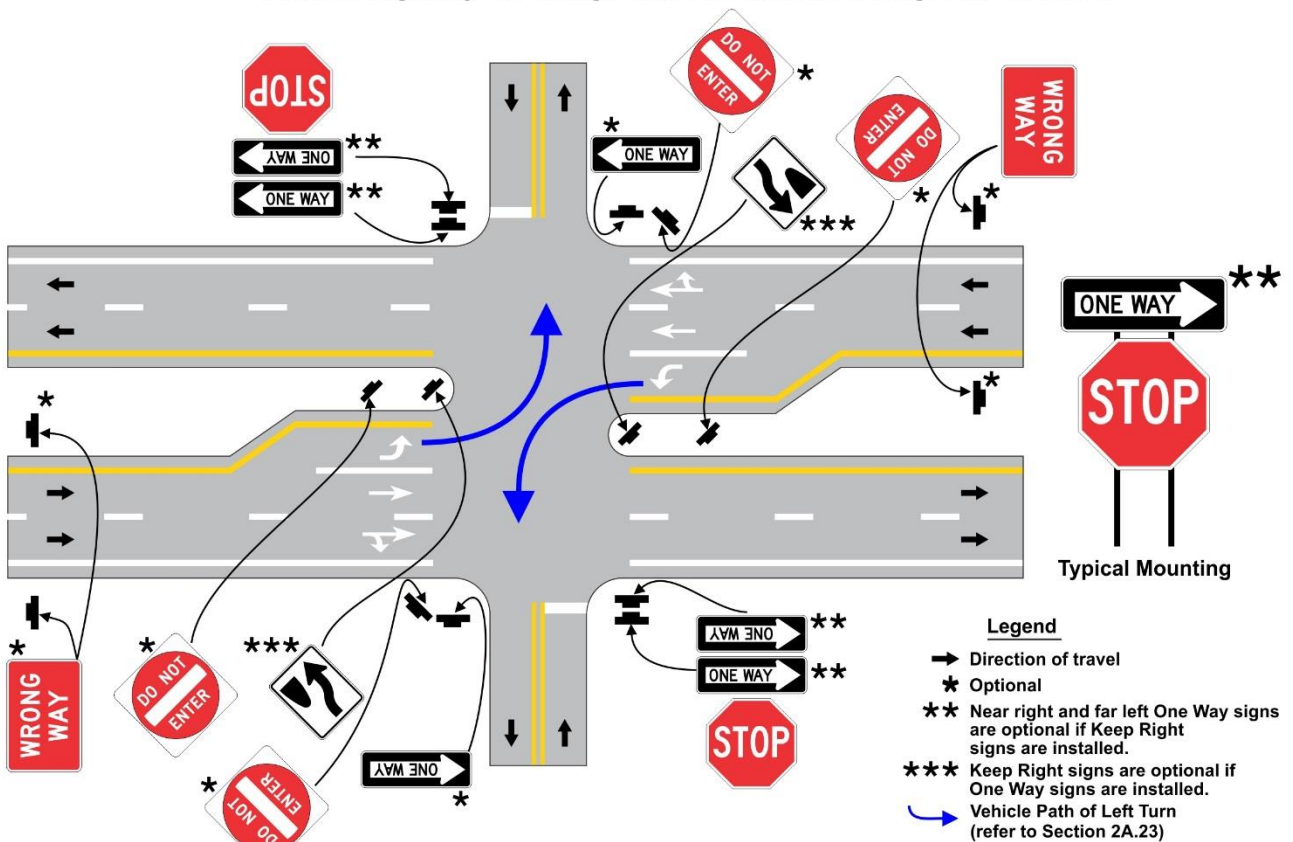
Figure 2B-16. ONE WAY, DO NOT ENTER, and WRONG WAY Signing for Divided Highways with Median Widths Narrower Than 30 Feet Crossings that Function as a Single Intersection



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NOTE: The following is a clean version of revised Figure 2B-16

Figure 2B-16. ONE WAY, DO NOT ENTER, and WRONG WAY Signing for Divided Highway Crossings that Function as a Single Intersection



Notes:

Pavement markings are shown for clarity only. Refer to Part 3 for guidance on markings.

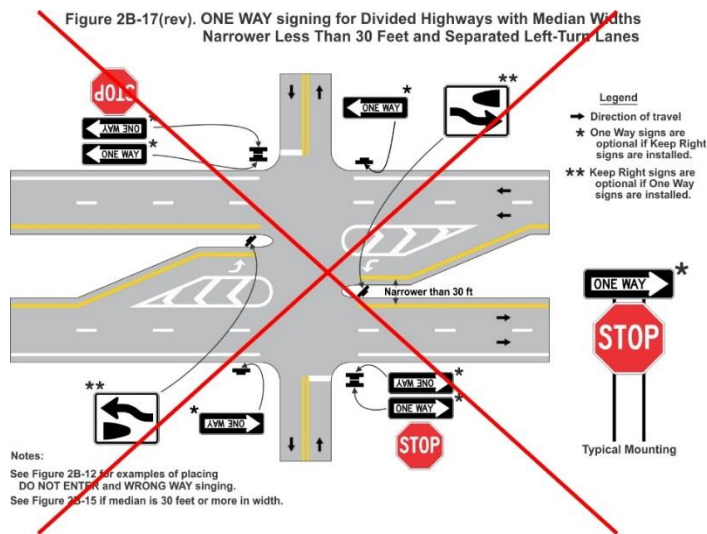
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Figure 2B-17 ONE WAY Signing for Divided Highways with Median Widths Narrower Than 30 Feet and Separated Left-Turn Lanes

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Section 2B.41. Wrong-Way Traffic Control at Interchange Ramps

Relocate 2B.41 following 2B.38 so that all Wrong Way/Do Not Enter Sections are in consecutive order. (approved by Council 6/28/2013)

Standard:

01 **At interchange exit ramp terminals where the ramp intersects a crossroad in such a manner that wrong-way entry could inadvertently be made, the following signs shall be used (see Figure 2B-18):**

- A. **At least one ONE WAY sign for each direction of travel on the crossroad shall be placed where the exit ramp intersects the crossroad.**
- B. **At least one DO NOT ENTER sign shall be conspicuously placed near the downstream end of the exit ramp in positions appropriate for full view of a road user starting to enter wrongly from the crossroad.**
- C. **At least one WRONG WAY sign shall be placed on the exit ramp facing a road user traveling in the wrong direction.**

Guidance:

02 *In addition, the following pavement markings should be used (see Figure 2B-18):*

- A. *On two-lane paved crossroads at interchanges, double solid yellow lines should be used as a center line for an adequate distance on both sides approaching the ramp intersections.*
- B. *Where crossroad channelization or ramp geometrics do not make wrong-way movements difficult, a lane-use arrow should be placed in each lane of an exit ramp near the crossroad terminal where it will be clearly visible to a potential wrong-way road user.*

Option:

03 **The following traffic control devices may be used to supplement the signs and pavement markings described in Paragraphs 1 and 2:**

- A. Additional ONE WAY signs may be placed, especially on two-lane rural crossroads, appropriately in advance of the ramp intersection to supplement the required ONE WAY sign(s).
- B. Additional WRONG WAY signs may be used.
- C. Slender, elongated wrong-way arrow pavement markings (see Figure 3B-24) intended primarily to warn wrong-way road users that they are traveling in the wrong direction may be placed upstream from the ramp terminus (see Figure 2B-18) to indicate the correct direction of traffic flow. Wrong-way arrow pavement markings may also be placed on the exit ramp at appropriate locations near the crossroad junction to indicate wrong-way movement. The wrong-way arrow markings may consist of pavement markings or bidirectional red-and-white raised pavement markers or other units that show red to wrong-way road users and white to other road users (see Figure 3B-24).
- D. Lane-use arrow pavement markings may be placed on the exit ramp and crossroad near their intersection to indicate the permissive direction of flow.
- E. Freeway entrance signs (see Section 2D.46) may be used.
- F. Lane control signs or movement prohibition signs may be used on the approaches to the exit ramp.

Guidance:
 04 On interchange entrance ramps where the ramp merges with the through roadway and the design of the interchange does not clearly make evident the direction of traffic on the separate roadways or ramps, a ONE WAY sign visible to traffic on the entrance ramp and through roadway should be placed on each side of the through roadway near the entrance ramp merging point as illustrated in Figure 2B-19.

Option:
 05 At locations where engineering judgment determines that a special need exists, other standard warning or prohibitive methods and devices may be used as a deterrent to the wrong-way movement.
 06 Where there are no parked cars, pedestrian activity or other obstructions such as snow or vegetation, and if an engineering study indicates that a lower mounting height would address wrong-way movements on freeway or expressway exit ramps, a DO NOT ENTER sign(s) and/or a WRONG WAY sign(s) that is located along the exit ramp facing a road user who is traveling in the wrong direction may be installed at a minimum mounting height of 3 feet, measured vertically from the bottom of the sign to the elevation of the near edge of the pavement.

Support:
 07 Sections 2B.44XX, 2B.37 and 2B.38 contains further information on signing to avoid wrong-way movements at at-grade intersections on expressways. (approved by Council 6-28-13)

Figure 2B-18. Example of Application of Regulatory Signing and Pavement Markings at an Exit Ramp Termination to Deter Wrong-Way Entry

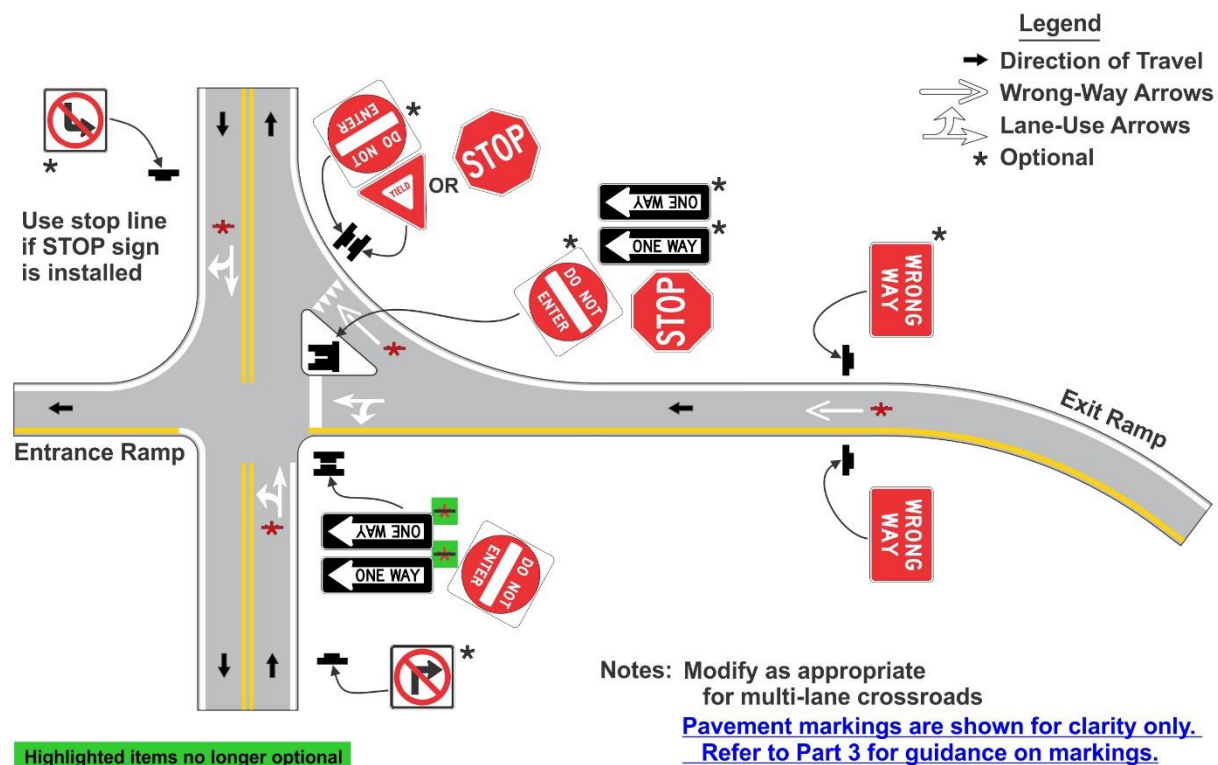


Figure 2B-19 Example of Application of Regulatory Signing and Pavement Markings at an Entrance Ramp Terminal Where the Design Does Not Clearly Indicate the Direction of Flow



Section 2B.42 Divided Highway Crossing Signs (R6-3, R6-3a)

Standard:

01 On unsignalized minor-street approaches from which both left turns and right turns are permitted onto a divided highway ~~that has a median width at the intersection itself of 30 feet or more~~ at a crossing that functions as two separate intersections (see Section 2A.23), except as provided in Paragraph 2, a Divided Highway Crossing (R6-3 or R6-3a) sign (see Figure 2B-13) shall be used to advise road users that they are approaching an intersection with a divided highway (see Figure 2B-15).

Option:

02 If the divided highway ~~that has a median width at the intersection itself of 30 feet or more~~ has a traffic volume of less than 400 AADT and a speed limit of 25 mph or less at a crossing that functions as two separate intersections, the Divided Highway Crossing signs facing the unsignalized minor-street approaches may be omitted.

03 A Divided Highway Crossing sign may be used on signalized minor-street approaches from which both left turns and right turns are permitted onto a divided highway to advise road users that they are approaching an intersection with a divided highway.

Standard:

04 If a Divided Highway Crossing sign is used at a four-legged intersection, the R6-3 sign shall be used. If used at a T-intersection, the R6-3a sign shall be used.

05 The Divided Highway Crossing sign shall be located on the near right corner of the intersection, mounted beneath a STOP or YIELD sign or on a separate support.

Option:

06 An additional Divided Highway Crossing sign may be installed on the left-hand side of the approach to supplement the Divided Highway Crossing sign on the near right corner of the intersection.

783 **PART 3. MARKINGS**

784 **CHAPTER 3B. PAVEMENT AND CURB MARKINGS**

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788 **Section 3B.20 Pavement Word, Symbol, and Arrow Markings**

789 **Support:**

790 01 Word, symbol, and arrow markings on the pavement are used for the purpose of guiding,
791 warning, or regulating traffic. These pavement markings can be helpful to road users in some
792 locations by supplementing signs and providing additional emphasis for important regulatory,
793 warning, or guidance messages, because the markings do not require diversion of the road user's
794 attention from the roadway surface. Symbol messages are preferable to word messages.
795 Examples of standard word and arrow pavement markings are shown in Figures 3B-23 and 3B-
796 24. For arrow pavement markings in the vicinity of highway-rail grade crossings, see Section
797 8B.23. For arrow pavement markings in the vicinity of highway-light rail transit grade crossing,
798 see Section 10C.25. Previously approved by Council 6/20/2009

799 **Option:**

800 02 Word, symbol, and arrow markings, including those contained in the "Standard Highway
801 Signs and Markings" book (see Section 1A.11), may be used as determined by engineering
802 judgment to supplement signs and/or to provide additional emphasis for regulatory, warning, or
803 guidance messages. Among the word, symbol, and arrow markings that may be used are the
804 following:

805 **A. Regulatory:**

- 806 1. STOP
- 807 2. YIELD
- 808 3. RIGHT (LEFT) TURN ONLY
- 809 4. 25 MPH
- 810 5. Lane-use and wrong-way arrows
- 811 6. Diamond symbol for HOV lanes
- 812 7. Other preferential lane word markings

813 **B. Warning:**

- 814 1. STOP AHEAD
- 815 2. YIELD AHEAD
- 816 3. YIELD AHEAD triangle symbol
- 817 4. SCHOOL XING
- 818 5. SIGNAL AHEAD
- 819 6. PED XING
- 820 7. SCHOOL
- 821 8. R X R
- 822 9. BUMP
- 823 10. HUMP
- 824 11. Lane-reduction arrows

825 **C. Guide:**

- 826 1. Route numbers (route shield pavement marking symbols and/or words such as I-81,
827 US 40, STATE 135, or ROUTE 10)

2. Cardinal directions (NORTH, SOUTH, EAST, or WEST)
3. TO
4. Destination names or abbreviations thereof

Standard:

03 Word, symbol, and arrow markings shall be white, except as otherwise provided in this Section.

04 Pavement marking letters, numerals, symbols, and arrows shall be installed in accordance with the design details in the Pavement Markings chapter of the “Standard Highway Signs and Markings” book (see Section 1A.11).

Guidance:

05 Letters and numerals should be 6 feet or more in height.

06 Word and symbol markings should not exceed three lines of information.

07 If a pavement marking word message consists of more than one line of information, it should read in the direction of travel. The first word of the message should be nearest to the road user.

08 Except for the two opposing arrows of a two-way left-turn lane marking (see Figure 3B-7), the longitudinal space between word or symbol message markings, including arrow markings, should be at least four times the height of the characters for low-speed roads, but not more than ten times the height of the characters under any conditions.

09 The number of different word and symbol markings used should be minimized to provide effective guidance and avoid misunderstanding.

10 Except for the SCHOOL word marking (see Section 7C.03), pavement word, symbol, and arrow markings should be no more than one lane in width.

11 Pavement word, symbol, and arrow markings should be proportionally scaled to fit within the width of the facility upon which they are applied.

Option:

12 On narrow, low-speed shared-use paths, the pavement words, symbols, and arrows may be smaller than suggested, but to the relative scale.

13 Pavement markings simulating Interstate, U.S., State, and other official highway route shield signs (see Figure 2D-3) with appropriate route numbers, but elongated for proper proportioning when viewed as a marking, may be used to guide road users to their destinations (see Figure 3B-25).

Standard:

14 Except at the ends of aisles in parking lots, the word STOP shall not be used on the pavement unless accompanied by a stop line (see Section 3B.16) and STOP sign (see Section 2B.05). At the ends of aisles in parking lots, the word STOP shall not be used on the pavement unless accompanied by a stop line.

15 The word STOP shall not be placed on the pavement in advance of a stop line, unless every vehicle is required to stop at all times.

Option:

16 A yield-ahead triangle symbol (see Figure 3B-26) or YIELD AHEAD word pavement marking may be used on approaches to intersections where the approaching traffic will encounter a YIELD sign at the intersection.

Standard:

17 **The yield-ahead triangle symbol or YIELD AHEAD word pavement marking shall not be used unless a YIELD sign (see Section 2B.08) is in place at the intersection. The yield-ahead symbol marking shall be as shown in Figure 3B-26.**

Guidance:

18 *The International Symbol of Accessibility parking space marking (see Figure 3B-22) should be placed in each parking space designated for use by persons with disabilities.*

Option:

19 A blue background with white border may supplement the wheelchair symbol as shown in Figure 3B-22.

Support:

20 Lane-use arrow markings (see Figure 3B-24) are used to indicate the mandatory or permissible movements in certain lanes (see Figure 3B-27) and in two-way left-turn lanes (see Figure 3B-7).

Guidance:

21 *Lane-use arrow markings (see Figure 3B-24) should be used in lanes designated for the exclusive use of a turning movement, including turn bays, except where engineering judgment determines that physical conditions or other markings (such as a dotted extension of the lane line through the taper into the turn bay) clearly discourage unintentional use of a turn bay by through vehicles. Lane-use arrow markings should also be used in lanes from which movements are allowed that are contrary to the normal rules of the road (see Drawing B of Figure 3B-13). When used in turn lanes, at least two arrows should be used, one at or near the upstream end of the full-width turn lane and one an appropriate distance upstream from the stop line or intersection (see Drawing A of Figure 3B-11).*

Option:

22 An additional arrow or arrows may be used in a turn lane. When arrows are used for a short turn lane, the second (downstream) arrow may be omitted based on engineering judgment.

22a Lane-use arrows may be used in the lanes of a divided highway to deter wrong-way movements at the crossing of the divided highway with a crossroad (see Figures 2B-12, 2B-14, 2B-15 and 2B-16).

Guidance:

23 *Where opposing offset channelized left-turn lanes exist, lane-use arrow markings should be placed near the downstream terminus of the offset left-turn lanes to reduce wrong-way movements ~~(see Figure 2B-17).~~*

Support:

24 An arrow at the downstream end of a turn lane can help to prevent wrong way movements.

Standard:

25 Where through lanes approaching an intersection become mandatory turn lanes, lane-use arrow markings (see Figure 3B-24) shall be used and shall be accompanied by standard signs.

Guidance:

26 *Where through lanes approaching an intersection become mandatory turn lanes, ONLY word markings (see Figure 3B-23) should be used in addition to the required lane-use arrow*

markings and signs (see Sections 2B.19 and 2B.20). These markings and signs should be placed well in advance of the turn and should be repeated as necessary to prevent entrapment and to help the road user select the appropriate lane in advance of reaching a queue of waiting vehicles (see Drawing A of Figure 3B-11).

Option:

27 On freeways or expressways where a through lane becomes a mandatory exit lane, lane-use arrow markings may be used on the approach to the exit in the dropped lane and in an adjacent optional through-or-exit lane if one exists.

Guidance:

28 A two-way left-turn lane-use arrow pavement marking, with opposing arrows spaced as shown in Figure 3B-7, should be used at or just downstream from the beginning of a two-way left-turn lane.

Option:

29 Additional two-way left-turn lane-use arrow markings may be used at other locations along a two-way left-turn lane where engineering judgment determines that such additional markings are needed to emphasize the proper use of the lane.

Standard:

30 A single-direction lane-use arrow shall not be used in a lane bordered on both sides by yellow two-way left-turn lane longitudinal markings.

31 Lane-use, lane-reduction, and wrong-way arrow markings shall be designed as shown in Figure 3B-24 and in the “Standard Highway Signs and Markings” book (see Section 1A.11).

Option:

32 The ONLY word marking (see Figure 3B-23) may be used to supplement the lane-use arrow markings in lanes that are designated for the exclusive use of a single movement (see Figure 3B-27) or to supplement a preferential lane word or symbol marking (see Section 3D.01).

Standard:

33 The ONLY word marking shall not be used in a lane that is shared by more than one movement.

Guidance:

34 Where a lane-reduction transition occurs on a roadway with a speed limit of 45 mph or more, the lane-reduction arrow markings shown in Drawing F in Figure 3B-24 should be used (see Figure 3B-14). Except for acceleration lanes, where a lane-reduction transition occurs on a roadway with a speed limit of less than 45 mph, the lane-reduction arrow markings shown in Drawing F in Figure 3B-24 should be used if determined to be appropriate based on engineering judgment.

Option:

35 Lane-reduction arrow markings may be used in long acceleration lanes based on engineering judgment.

Guidance:

36 Where crossroad channelization or ramp geometrics do not make wrong-way movements difficult, the appropriate lane-use arrow should be placed in each lane of an exit ramp near the

crossroad terminal where it will be clearly visible to a potential wrong-way road user (see Figure 2B-18).

Option:

³⁷ The wrong-way arrow markings shown in Drawing D in Figure 3B-24 may be placed near the downstream terminus of a ramp as shown in Figures 2B-18 and 2B-19, or at other locations where lane-use arrows are not appropriate, to indicate the correct direction of traffic flow and to discourage drivers from traveling in the wrong direction.

^{37a} The wrong-way arrow marking may be used upstream of the intersection at a divided highway crossing to deter wrong-way movements. They may be used in lieu of or in addition to lane-use arrows.