

2009 Manual on Uniform Traffic Control Devices

Manual on Uniform Traffic Control Devices

for Streets and Highways

2009 Edition



2009 MUTCD (Final Rule)



Presented by

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Development of the 2009 MUTCD

- NPA published in the Federal Register on January 2, 2008
- Deadline for comments to docket was July 31, 2008
- Received 1,840 individual letters with over 15,000 comments
- Final Rule Published in the Federal Register on **December 16, 2009.**



How does the 2009 MUTCD Final Rule relate to the December 21, 2007 Final Rule on Maintaining Sign Retroreflectivity?

- Sign Retroreflectivity Rule modified the 2003 MUTCD as Revision 2 of that edition, and became effective on January 22, 2008
- NPA did not show the Rev. 2 changes, but ...
- The final rule for the 2009 MUTCD incorporates the sign retroreflectivity material that is already in effect

Formatting and Global Revisions



Paragraphs are numbered!



Guidance statements are italicized



Section 4B.01 General

Support:

- 01 Words such as pedestrians and bicyclists require sensitivity to these elements of “traffic.”
- 02 Standards for traffic control signals are designed for a variety of road users, including those who are fatigued or distracted, or who are not expected to be

Section 4B.02 Basis of Installation or Use

Guidance:

- 01 *The selection and use of traffic control signals should be based on the basis of installation or use and other conditions.*

Support:

- 02 A careful analysis of traffic operations at locations of signalized and unsignalized locations, including warrants, described in Chapter 4C, that determine if traffic signals might be justified.

Guidance:

- 03 *Engineering judgment should be applied to determine if traffic signals are warranted.*

Metric values have been removed from the text, figures, and tables

- Only English units are used in the text, tables, and figures of the 2009 MUTCD

New Appendix A2 includes the equivalent metric values for all English units used in the 2009 MUTCD

2009 Edition	APPENDIX A2																																																																																						
METRIC CONVERSIONS																																																																																							
<p>Throughout this Manual all dimensions and distances are provided in English units. Tables A2-1 through A2-4 show the equivalent Metric (International System of Units) value for each of the English unit numerical values that are used in this Manual.</p>																																																																																							
Table A2-1. Conversion of Inches to Millimeters																																																																																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr><th>Inches</th><th>Millimeters</th></tr> </thead> <tbody> <tr><td>0.25</td><td>6</td></tr> <tr><td>0.4</td><td>10</td></tr> <tr><td>0.5</td><td>13</td></tr> <tr><td>0.75</td><td>19</td></tr> <tr><td>1</td><td>25</td></tr> <tr><td>1.25</td><td>31</td></tr> <tr><td>2</td><td>50</td></tr> <tr><td>2.25</td><td>56</td></tr> <tr><td>2.5</td><td>62</td></tr> <tr><td>3</td><td>75</td></tr> </tbody> </table>	Inches	Millimeters	0.25	6	0.4	10	0.5	13	0.75	19	1	25	1.25	31	2	50	2.25	56	2.5	62	3	75	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr><th>Inches</th><th>Millimeters</th></tr> </thead> <tbody> <tr><td>3.5</td><td>87</td></tr> <tr><td>4</td><td>100</td></tr> <tr><td>4.5</td><td>113</td></tr> <tr><td>5</td><td>125</td></tr> <tr><td>6</td><td>150</td></tr> <tr><td>8</td><td>200</td></tr> <tr><td>9</td><td>225</td></tr> <tr><td>10</td><td>250</td></tr> <tr><td>10.4</td><td>260</td></tr> <tr><td>10.6</td><td>265</td></tr> </tbody> </table>	Inches	Millimeters	3.5	87	4	100	4.5	113	5	125	6	150	8	200	9	225	10	250	10.4	260	10.6	265	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr><th>Inches</th><th>Millimeters</th></tr> </thead> <tbody> <tr><td>12</td><td>300</td></tr> <tr><td>15</td><td>375</td></tr> <tr><td>16</td><td>400</td></tr> <tr><td>18</td><td>450</td></tr> <tr><td>21</td><td>525</td></tr> <tr><td>24</td><td>600</td></tr> <tr><td>27</td><td>675</td></tr> <tr><td>28</td><td>700</td></tr> <tr><td>30</td><td>750</td></tr> <tr><td>32</td><td>800</td></tr> </tbody> </table>	Inches	Millimeters	12	300	15	375	16	400	18	450	21	525	24	600	27	675	28	700	30	750	32	800	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr><th>Inches</th><th>Millimeters</th></tr> </thead> <tbody> <tr><td>36</td><td></td></tr> <tr><td>42</td><td></td></tr> <tr><td>48</td><td></td></tr> <tr><td>54</td><td></td></tr> <tr><td>60</td><td></td></tr> <tr><td>72</td><td></td></tr> <tr><td>84</td><td></td></tr> <tr><td>120</td><td></td></tr> </tbody> </table>	Inches	Millimeters	36		42		48		54		60		72		84		120	
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Revisions to the Introduction



MUTCD applies to private roads that are “open to public travel”



Toll roads and roads within shopping centers, airports, sports arenas, theme parks, and similar business or recreation facilities that are privately owned, but the public is allowed to travel without access restrictions

Parking areas and their driving aisles are not subject to MUTCD requirements



Compliance Dates

- New installations, replacements, rebuilds – must comply immediately
- New Table I-2 with specific compliance dates to retrofit or replace existing devices to meet 11 of the new Standards in the 2009 MUTCD

Table I-2. Target Compliance Dates Established by FHWA (Sheet 2 of 3)

2009 MUTCD Section Number(s)	2009 MUTCD Section Title	Specific Provision	Compliance Date
2C.50	Non-Vehicular Warning Signs	Elimination of crosswalk lines from crossing signs and use of diagonal downward pointing arrow (W16-7P) supplemental plaque if at the crossing (2003 MUTCD Section 2C.41)	January 17, 2011 (a)(b)
2C.61	PHOTO ENFORCED Plaque (W16-10P)	New plaque (2003 MUTCD Section 2C.53) (*)	December 22, 2013 (b)
2C.63	Object Marker Design and Placement Height	Width of stripes on Type 3 striped marker (2003 MUTCD Section 3C.01)	December 22, 2013 (b)
2D.43	Street Name Signs (D3-1 or D3-1a)	6-inch letter height for lettering on post-mounted Street Name signs (except on multi-lane streets with speed limits greater than 40 mph) (2000 MUTCD Section 2D.38)	January 9, 2012 (a)
2D.43	Street Name Signs (D3-1 or D3-1a)	8-inch letter height on post-mounted signs on multi-lane streets with speed limits greater than 40 mph and 12-inch letter height on overhead signs (2003 MUTCD Section 2D.38)	December 22, 2018 (b)
2D.44	Advance Street Name Signs (D3-2)	Requirements of new Section 2D.39 in the 2003 MUTCD	December 22, 2018 (b)
2D.45	Signing on Conventional Roads on Approaches to Interchanges	New requirement in the 2009 MUTCD for multi-lane approaches to interchanges to have guide signs to identify which direction of turn is to be made for access to each direction of the freeway or expressway	December 31, 2019

Previously-established dates

New compliance date in 2009 edition



Revisions to Part 1 – General



Section 1A.13 – Definitions

- All definitions now appear in Part 1 (Section 1A.13) and not in other Parts
- Approximately 70 new definitions have been added
- Approximately 35 existing definitions have been revised

Section 1A.13 – Meanings of text headings (Standard, Guidance, Option, Support) relocated and clarified

- Relocated from MUTCD Introduction to Section 1A.13
- Standard statements shall not be modified or compromised based on engineering judgment or engineering study

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:
- 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. Standard statements shall not be modified or compromised based on engineering judgment or engineering study.
 - B. **Guidance**—a statement of recommended, but not mandatory, practice in typical situations, with deviations allowed if engineering judgment or engineering study indicates the deviation to be appropriate. All Guidance statements are labeled, and the text appears in unbold type. The verb



The meanings of approximately 40 acronyms and abbreviations used in the MUTCD are now listed in a new Section 1A.14

Section 1A.14 Meanings of Acronyms and Abbreviations in this Manual

Standard:

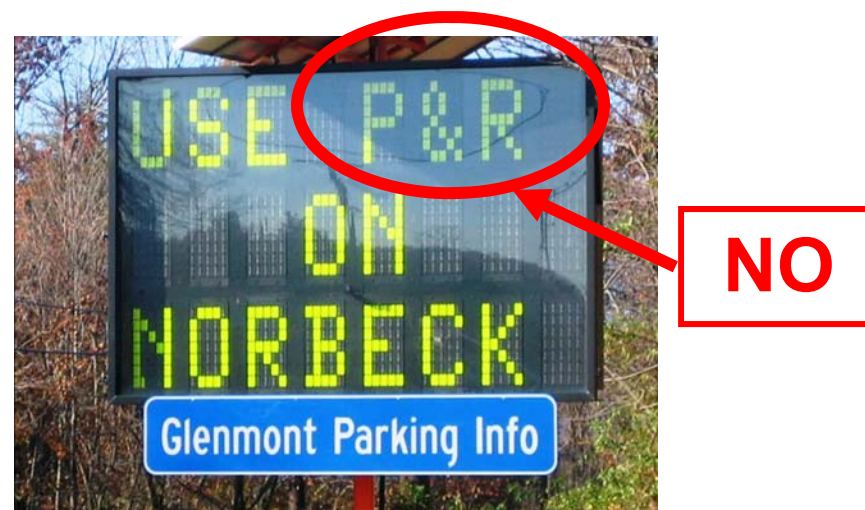
01 The following acronyms and abbreviations, when used in this Manual, shall have the following meanings:

1. AADT—annual average daily traffic
2. AASHTO—American Association of State Highway and Transportation Officials
3. ADA—Americans with Disabilities Act
4. ADAAG—Americans with Disabilities Accessibility Guidelines
5. ADT—average daily traffic
6. AFAD—Automated Flagger Assistance Device
7. ANSI—American National Standards Institute
8. CFR—Code of Federal Regulations
9. CMS—changeable message sign
10. dBA—A-weighted decibels
11. EPA—Environmental Protection Agency
12. ETC—electronic toll collection
13. EV—electric vehicle
14. FHWA—Federal Highway Administration
15. FRA—Federal Railroad Administration
16. FTA—Federal Transit Administration
17. HOT—high occupancy tolls



Section 1A.15 – Abbreviations on traffic control devices

- Additions, deletions
- Use on portable changeable message signs vs. use on fixed message signs and large permanent CMS
- Punctuation or characters other than letters or numerals should not be used on any signs



General Revisions to Part 2 – Signs



New chapters and revisions for Part 2

- Relocation of gates and barricades to Chapter 2B
- Relocation of object markers from Part 3 to Chapter 2C
- New Chapter 2F – Toll Road Signs
- New Chapter 2G – Preferential and Managed Lanes
- New Chapter 2H – General Information Signs
- New Chapter 2I – General Service Signs
- New Chapter 2L – Changeable Message Signs



Many new symbols

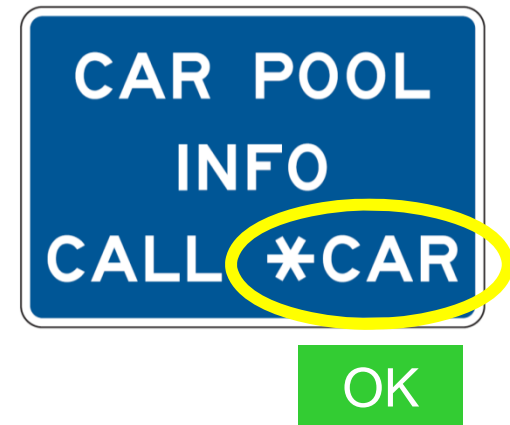


E-mail and Internet addresses and telephone numbers

- Internet addresses, e-mail addresses, domain names, URLs: prohibited on any sign, plaque, sign panel



- Phone numbers with more than 4 characters should not be shown on any sign, plaque, sign panel (including Specific Service logo panels), or CMS



Sign Colors

- **Optional use of fluorescent colors including fluorescent red**
- **Added purple for panels and plaques for electronic toll collection registration requirements**
- **Removed yellow for school area signs**
- **Require fluorescent yellow-green color for school area signs**
- **Optional use of fluorescent yellow-green color for pedestrian and bicycle application signs**

New option for the use of fluorescent colors



Fluorescent yellow

Standard yellow

Revisions incorporated into the 2009 MUTCD



2009 MUTCD (Final Rule)

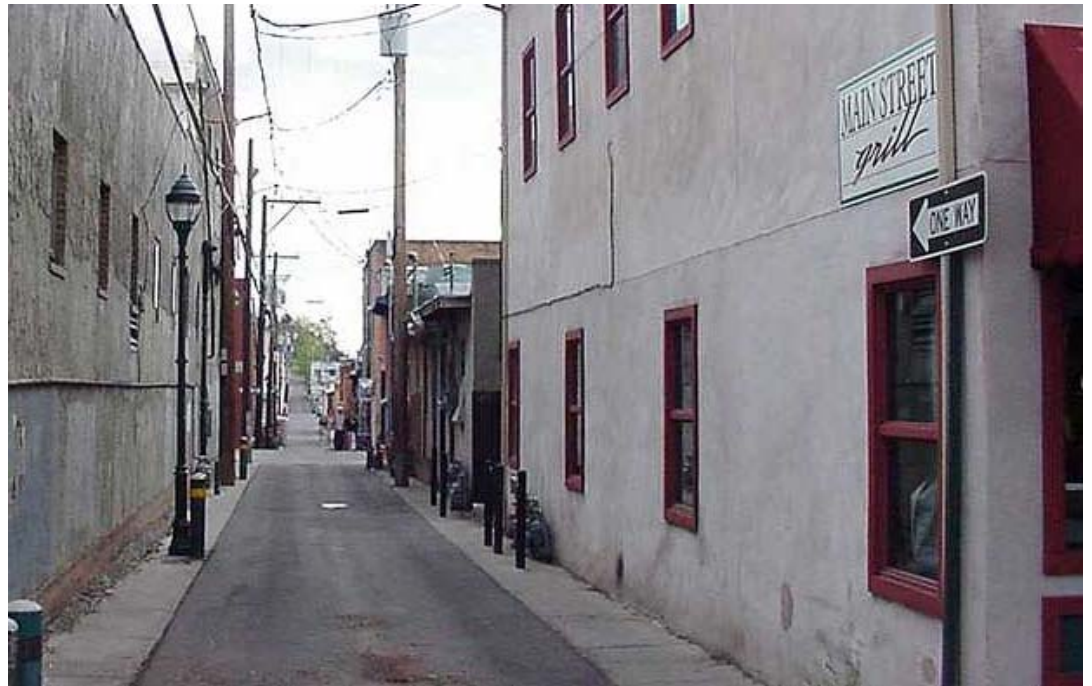
LEDs on signs

- **Optional for individual use within the border, or within the legend or symbol**
- **Shall not be placed within the background of a sign**
- **Shall not be grouped as a “de-facto” beacon**
- **For STOP or YIELD signs, LEDs may be placed within one border width from the border**

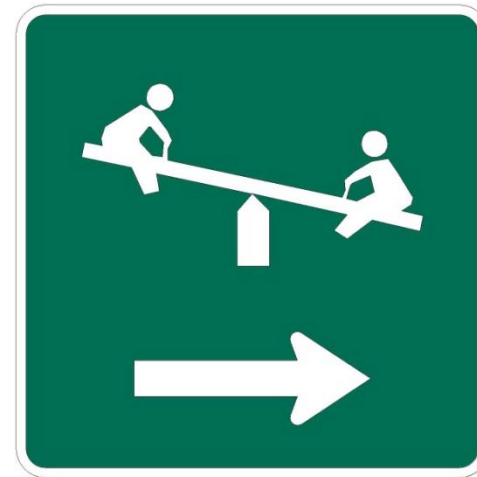
New and revised sign size tables

- Updated/expanded table for regulatory sign sizes
- New detailed sign size tables:
 - Warning signs
 - Conventional road guide signs
 - Freeway/expressway guide signs
 - General service signs
 - General information signs

Minimum sign size may be decreased by 6 inches in alleys that have restrictive physical conditions



Symbols from one type of sign shall not be used on a different type of sign



Not acceptable!

The playground symbol that is used on warning signs cannot be used on guide signs

Size of sign lettering should be based on 1 inch of letter height per 30 feet of legibility

- Based on 20/40 vision
- 1988 and earlier MUTCDs were 1 inch per 50 feet of legibility based on 20/20 vision
- 2003 MUTCD recommended 1 inch per 40 feet based on 20/33 vision

Lettering for place names and destinations

- Mixed-case lettering required for names of places, streets, and highways for guide signs
- Mixed-case lettering consists of an initial upper-case letter followed by lower-case letters
- Letter height is specified as the height of the initial upper-case letter



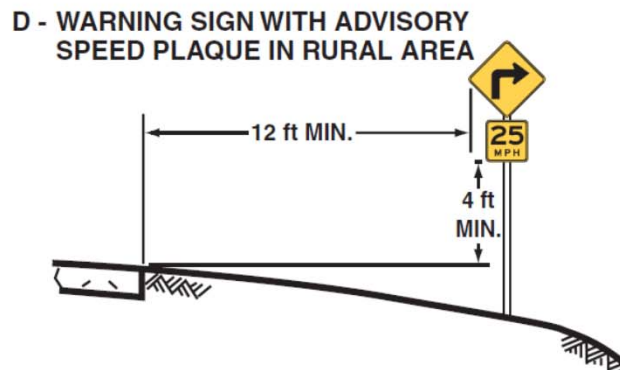
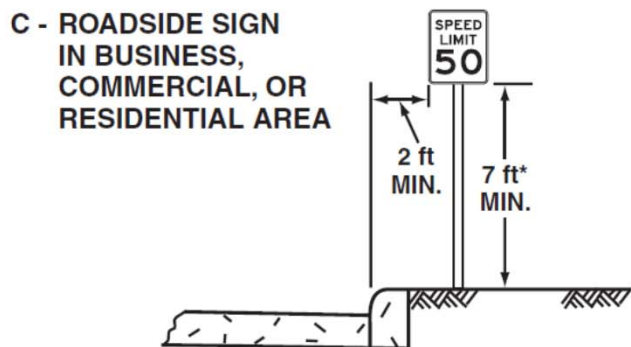
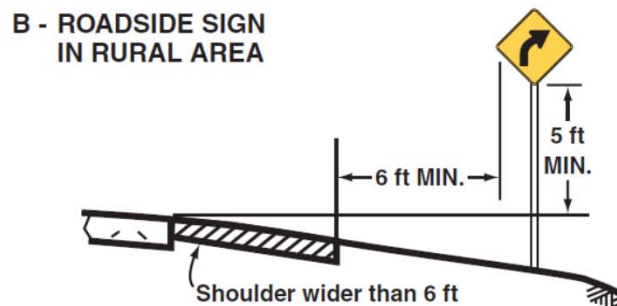
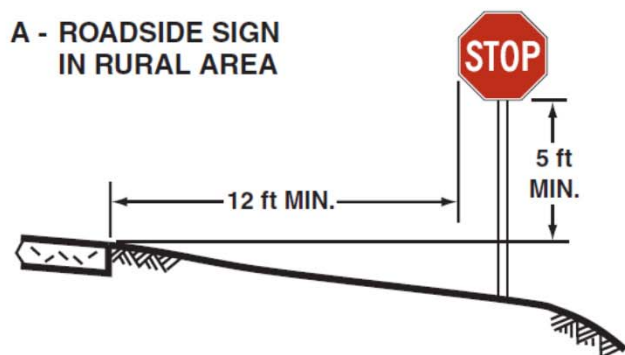


New options for sign conspicuity enhancement



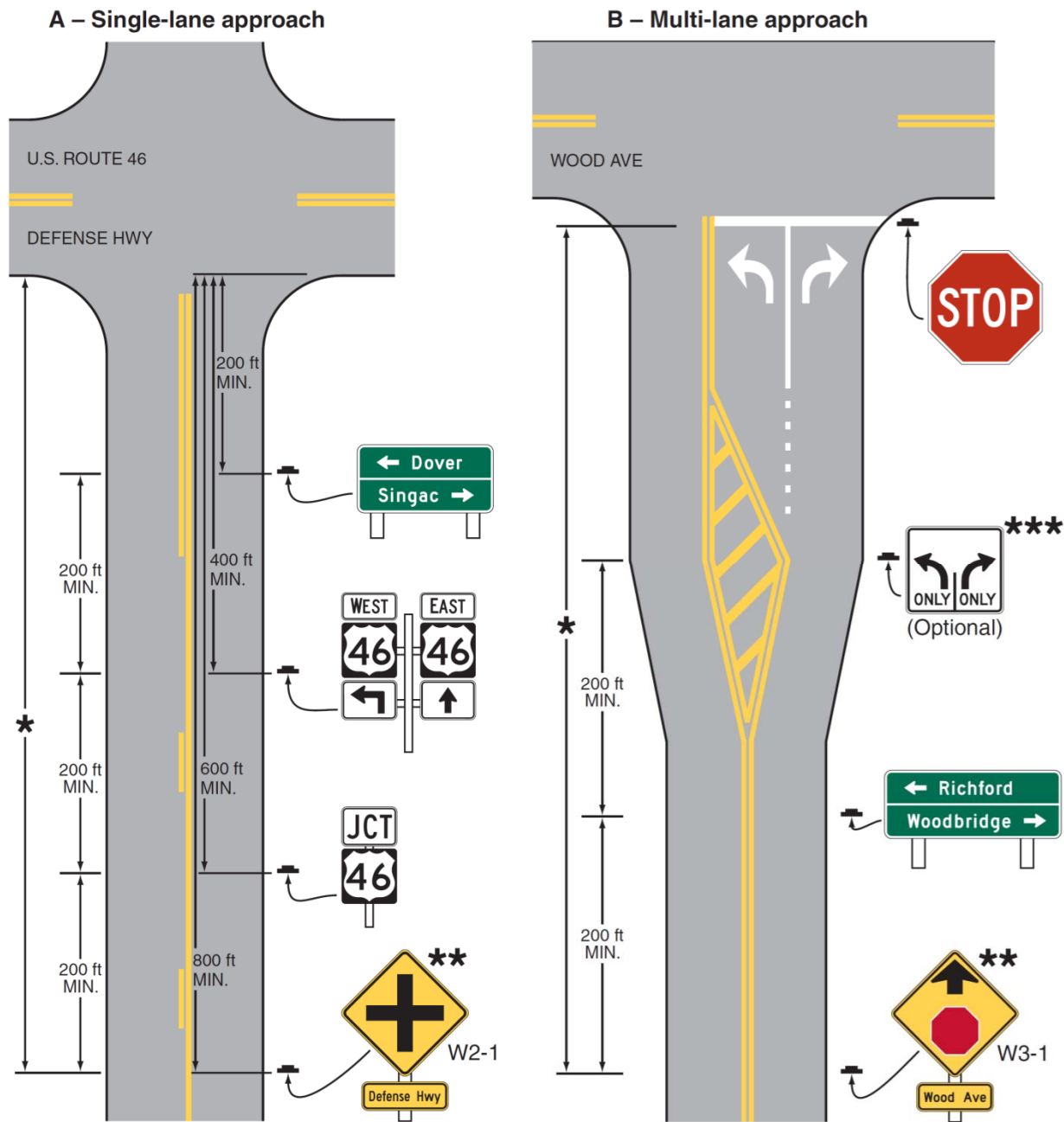
Heights and Lateral Locations of Signs

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



*Where parking or pedestrian movements are likely to occur

Relative locations of regulatory, warning, and guide signs for intersections



Revisions to Chapter 2B – Regulatory Signs, Barricades, and Gates



Larger sizes for certain signs on multi-lane roads with speed limits of 40 mph or more



Larger sizes for STOP signs

- **36 inches for any STOP sign facing a multi-lane approach**
- **36 inches for any multi-lane side road approach to a multi-lane road**
- **36 inches for any side road approach to a multi-lane road with a speed limit of 45 mph or higher**

New Guidance on the factors to be considered when establishing intersection right-of-way control



Based upon:

- Vehicular, bicycle and pedestrian volumes
- Number and angle of approaches
- Approach speeds
- Sight distance
- Reported crash performance

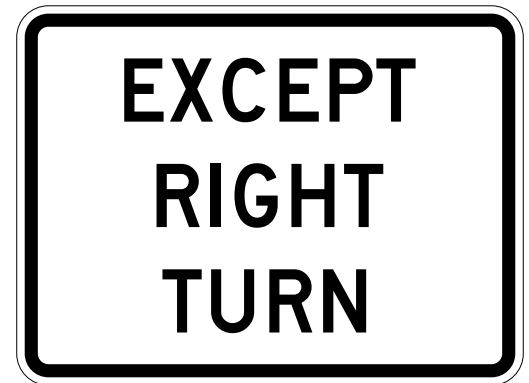


The use of 2-WAY,
3-WAY, and
4-WAY plaques is
prohibited

ALL-WAY plaque
remains as a
“shall” if STOP
signs are used on
all approaches



New plaque that may be used with STOP sign in special conditions



Placing two STOP signs or two YIELD signs on the same post for emphasis is prohibited



Signs mounted back-to-back with STOP or YIELD signs should stay within the edges – Do Not Obscure Shape



Stickers are allowable on signs and posts



Variant of signs for State laws requiring Stop vs. Yield to Pedestrians”



R1-5a



R1-5b



R1-9



R1-9a

In-street pedestrian crossing signs

- Placement locations
- Background may be fluorescent yellow or fluorescent yellow-green

Supports for in-street pedestrian crossing signs must be designed to bend over and bounce back when struck



Speed limits



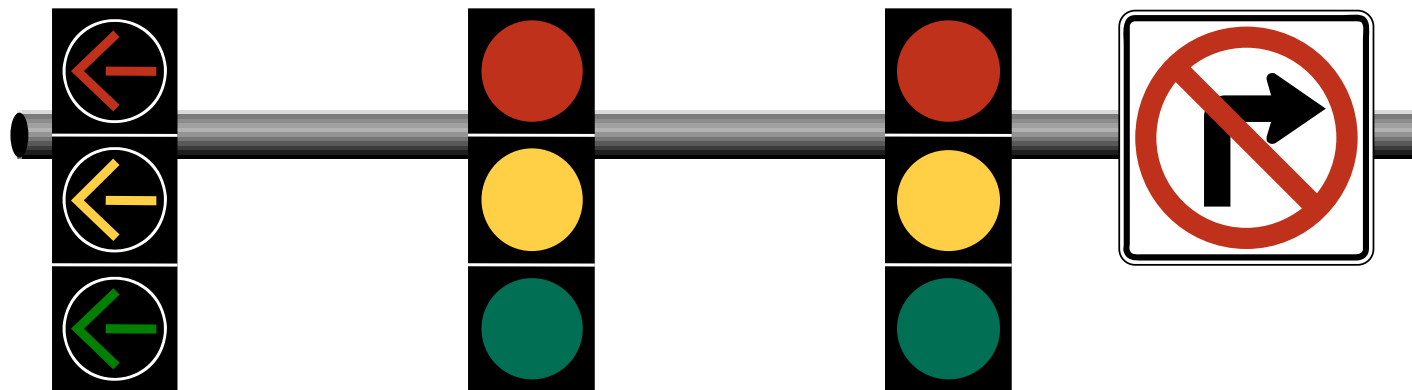
Studies for speed zones clarified

Speed limit reductions of more than 10 mph

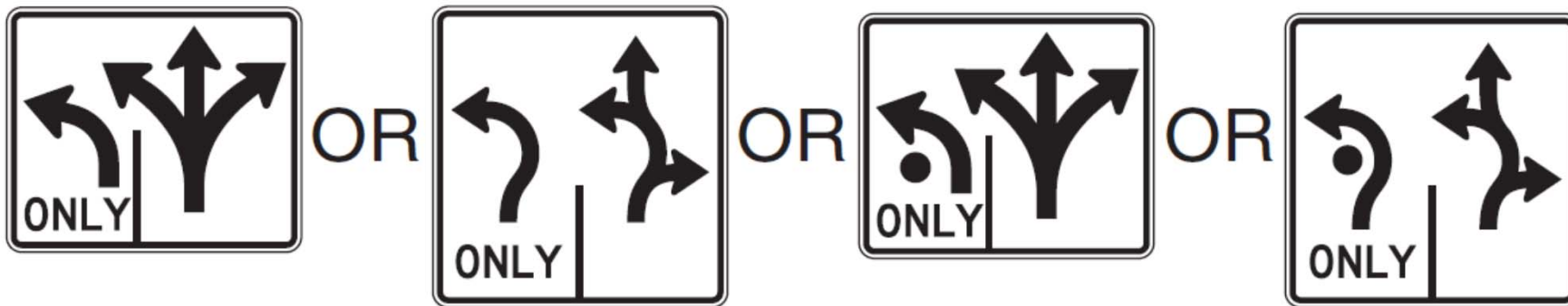
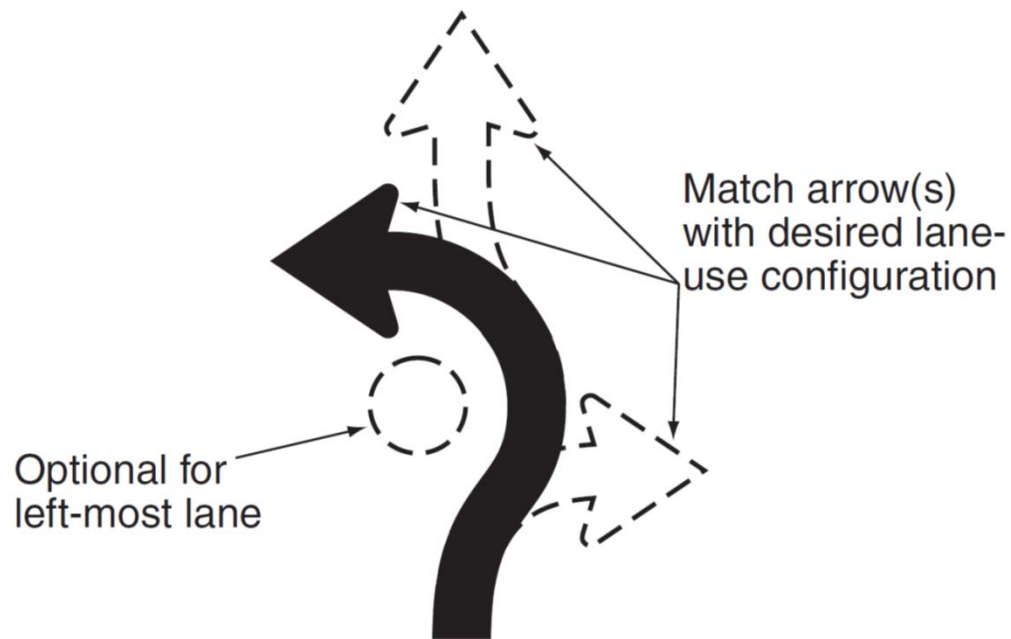
Reduced Speed Limit Ahead (W3-5) sign recommended



Movement prohibition signs at signalized intersections should be placed adjacent to the appropriate signal face(s)



New optional fish-hook arrows for use on lane-use control signs at roundabouts



New optional signs for enforcement of start of turn lanes



R3-20L



R3-20R

New regulatory signs



R4-16



R4-17



R4-18

New plaques that may be mounted with regulatory signs



Symbolic Do Not Pass sign NOT ADOPTED

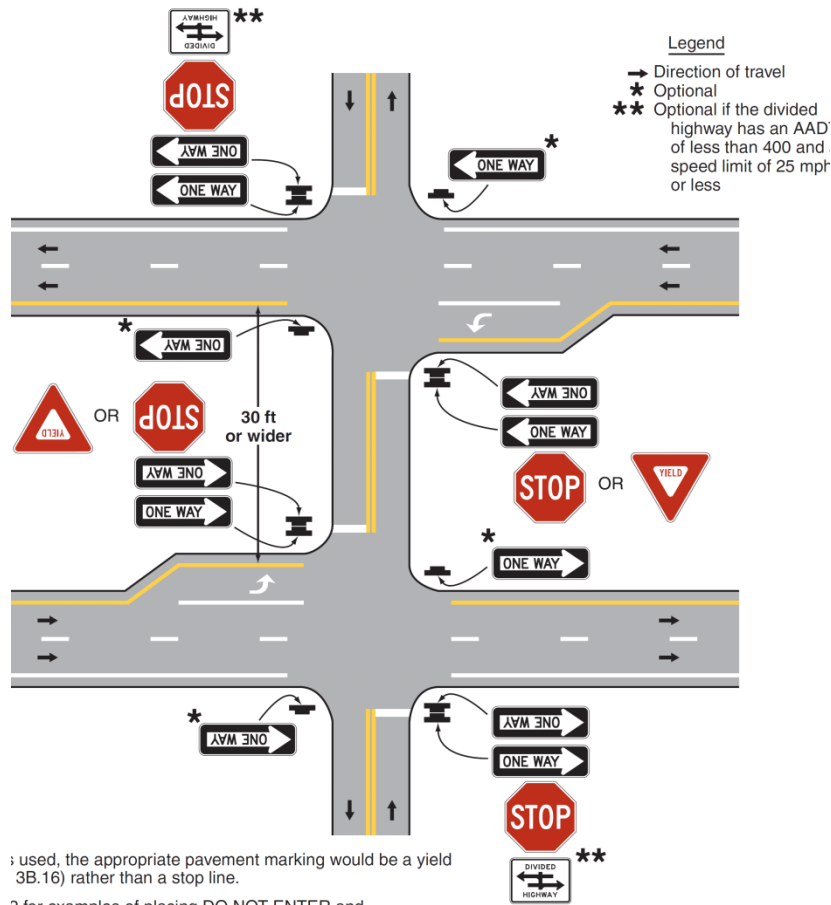


Word message sign was retained



**“Excluded”
and
“prohibited”
changed to
“NO”**

New One-Way sign requirements for Divided highways

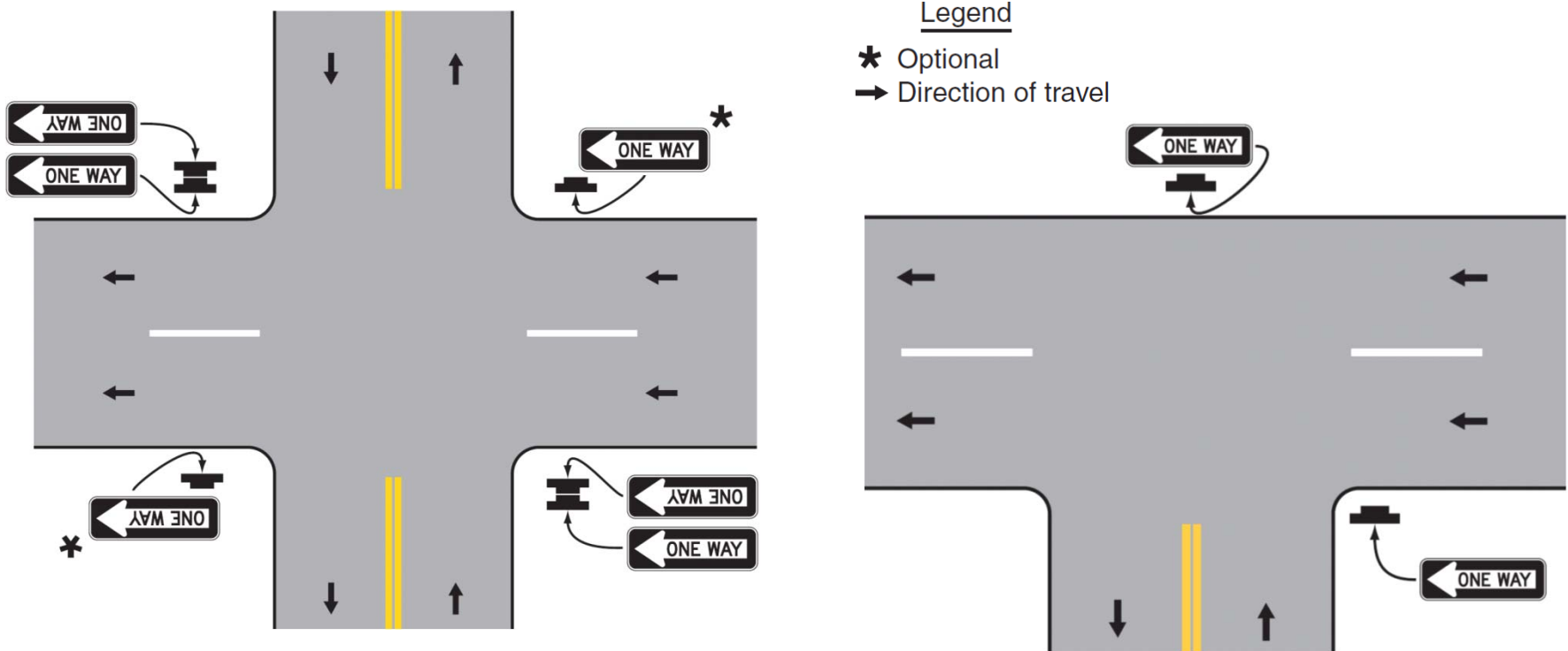


Median Width of 30 feet or more:

One-Way signs on near right and far left corners are required rather than recommended

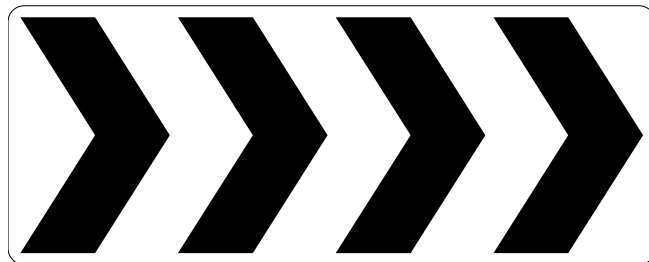
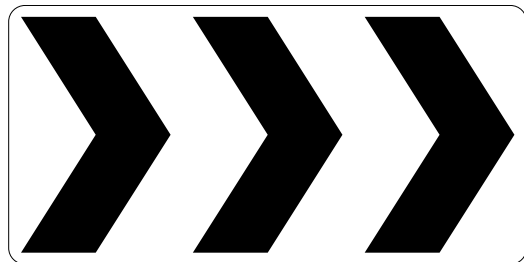
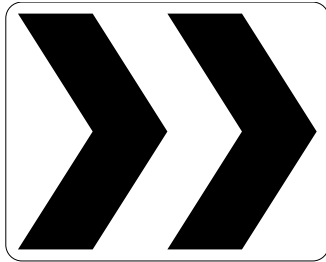
Far right One-Way signs are optional

Near side and far side One-Way signs required on the minor-street approaches at 4-way and T-intersections



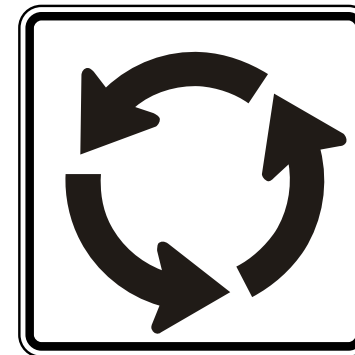


**Divided Highway signs shall be installed on approaches to divided highways with:
medians \geq 30 feet and
AADT \geq 400 and
speed limit \geq 30 mph**



**Roundabout Directional
Arrow signs
(on central island)**

New regulatory signs for use at roundabouts



**Roundabout Circulation
sign (with YIELD sign at
mini-roundabouts)**

Barricades and Gates

- **Barricades Standards and Guidance relocated from Part 3**
- **Colors of barricades for non-TTC use shall be retroreflective white and red**
- **New section on Gates for all traffic uses**
- **Red/white stripes on gates shall be vertical rather than diagonal**

Revisions to Chapter 2C – Warning Signs and Object Markers



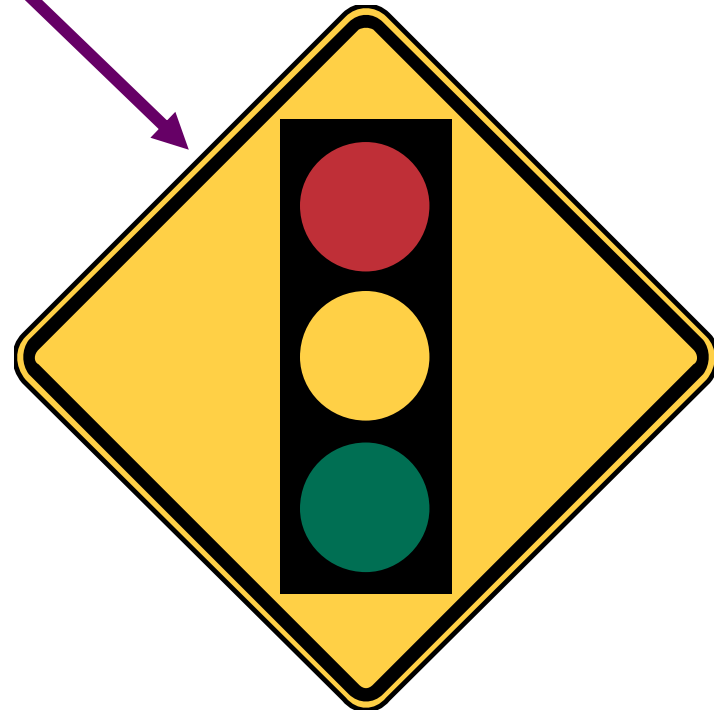
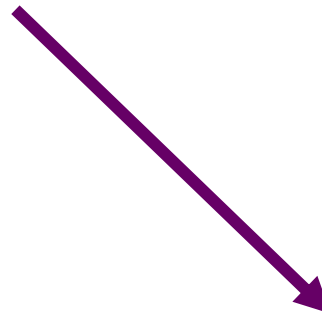


Some word message signs are deleted



Also – STOP AHEAD, YIELD AHEAD, SIGNAL AHEAD

36" x 36" minimum size for multi-lane conventional roads



Guidelines for advance placement of warning signs – Table 2C-4

- **Change to 20/40 visual acuity**
- **Assumption of legibility distance of 180 feet for Condition A (speed reduction and lane change)**
- **Assumption of minimum legend size of 6” lettering; if less, add 100 feet**
- **Assumption of legibility distance of 250 feet for Condition B (stop and deceleration)**

Application of horizontal alignment signs based upon curve differential speed

Table 2C-5. Horizontal Alignment Sign Selection

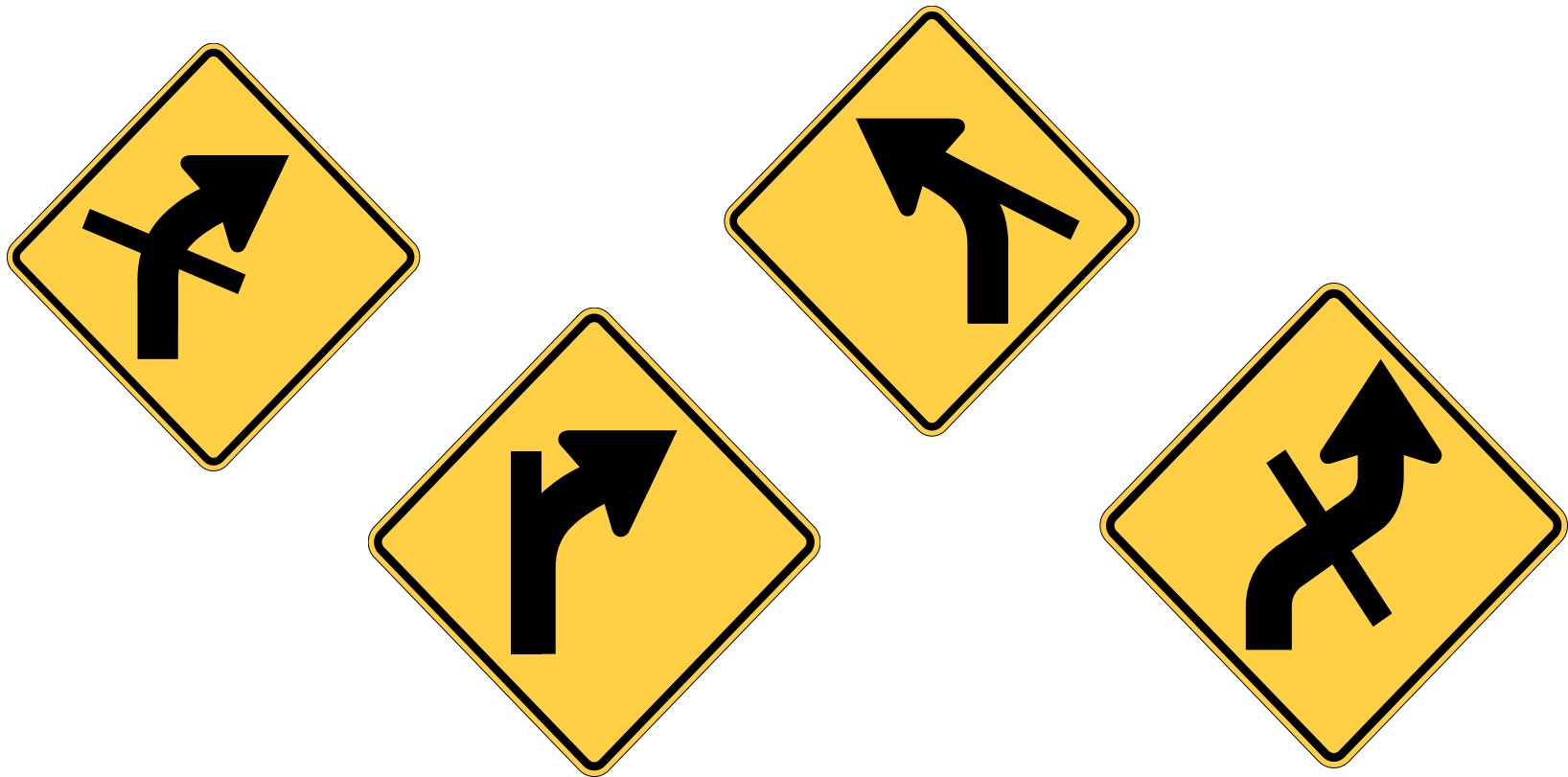
Type of Horizontal Alignment Sign	Difference Between Speed Limit and Advisory Speed				
	5 mph	10 mph	15 mph	20 mph	25 mph or more
Turn (W1-1), Curve (W1-2), Reverse Turn (W1-3), Reverse Curve (W1-4), Winding Road (W1-5), and Combination Horizontal Alignment/Intersection (W10-1) (see Section 2C.07 to 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

New criteria for the determination of advisory speeds

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:**
 - 16 degrees of ball-bank for speeds of 20 mph or less**
 - 14 degrees of ball-bank for speeds of 25 to 30 mph**
 - 12 degrees of ball-bank for speeds of 35 mph and higher**

New variations of combination horizontal alignment-intersection warning signs



New table for spacing of Chevron signs

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



**Chevron signs may be
mounted at 4-foot height**

New shoulder signs and plaques



New signs and plaque to warn of conditions that primarily affect motorcyclists



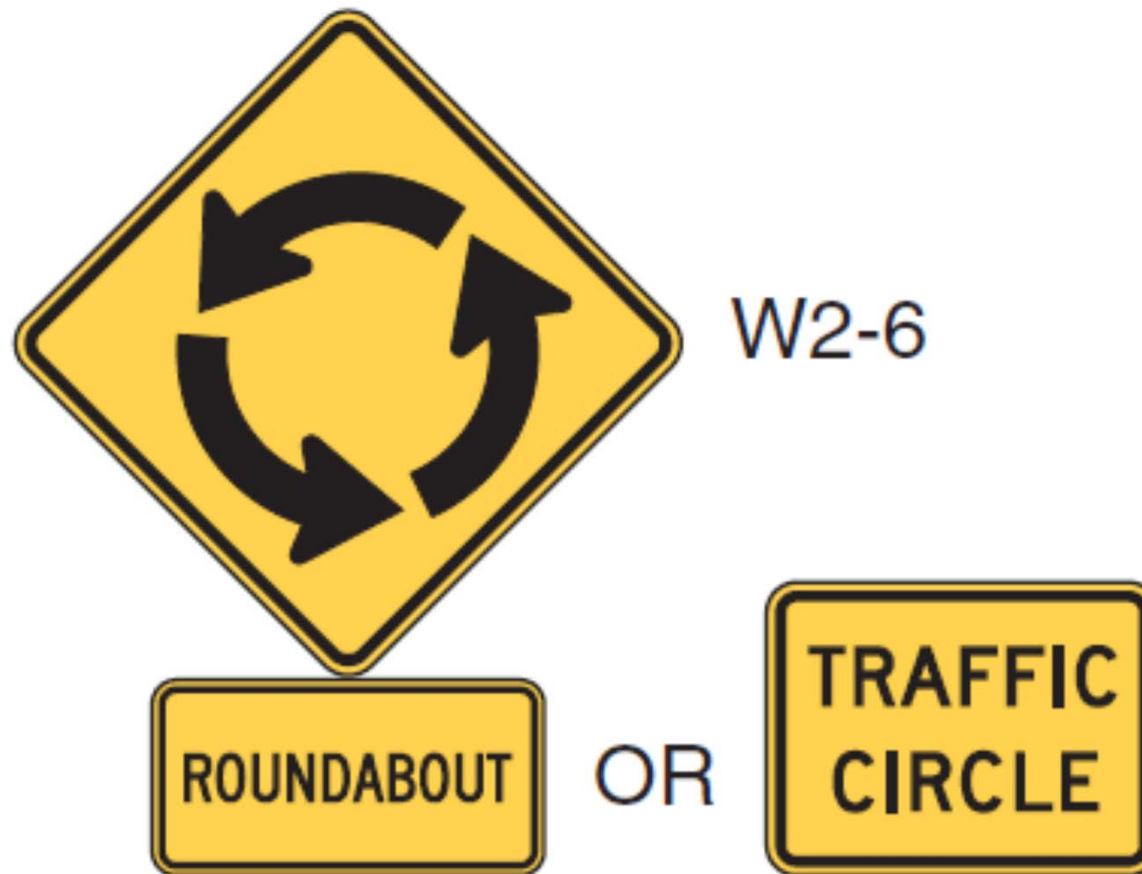
No Center Line sign



New warning signs for road flooding



New Roundabout plaque for circular intersection warning



New sign and plaque for combined pedestrian/bicycle crossing

Revisions incorporated into the 2009 MUTCD



2009 MUTCD (Final Rule)

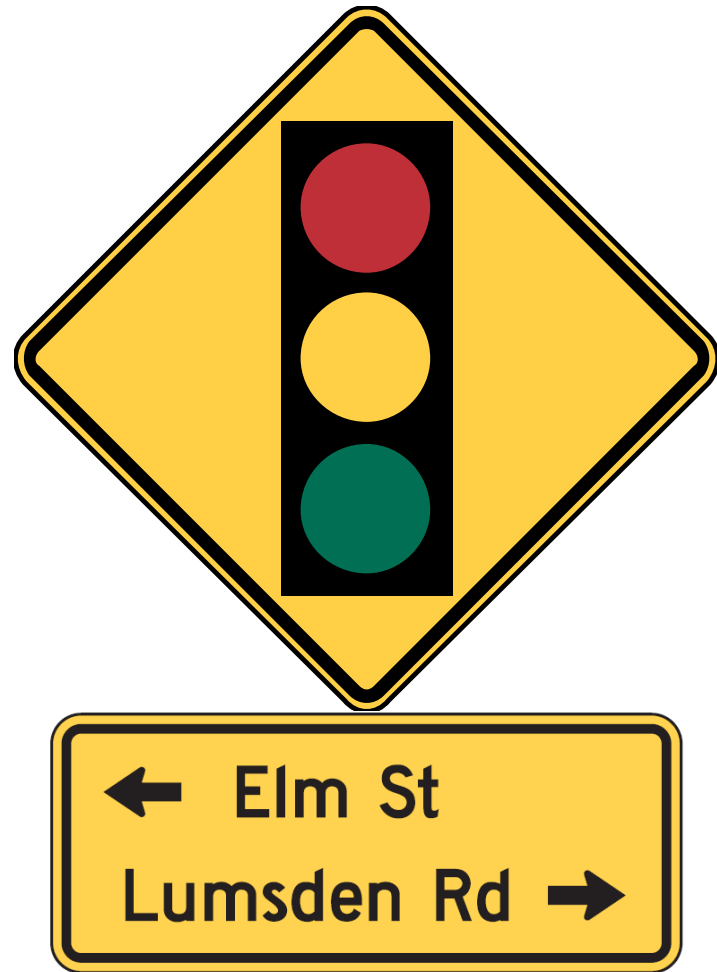
New symbol signs to warn of possible presence of large animals



New sign to warn of a traffic pattern revision



Order of names and use of arrows when two street names appear on an advance street name plaque





Plaques for use when STOP signs control all but one approach to the intersection

**Share the Road
plaque cannot be
used alone; can
ONLY be used to
supplement
another sign**



“New” plaque for mounting above a regulatory or advance warning sign to warn road users about a new regulation or condition



Object markers have been relocated from Part 3

Type 1 Object Markers
(obstructions within the roadway)



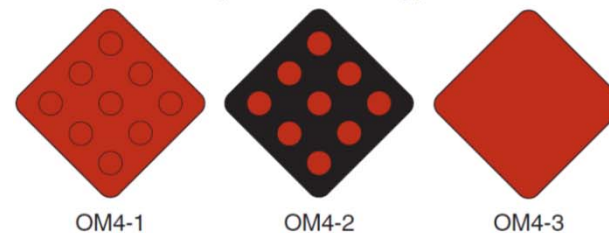
Type 2 Object Markers
(obstructions adjacent to the roadway)



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



Type 4 Object Markers
(end of roadway)



Object Markers for Approach Ends of Guardrails

- 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 a angle of 45 degrees toward the side of the obstruction on which traffic is to pass.



Revisions to Chapter 2D – Guide Signs for Conventional Roads

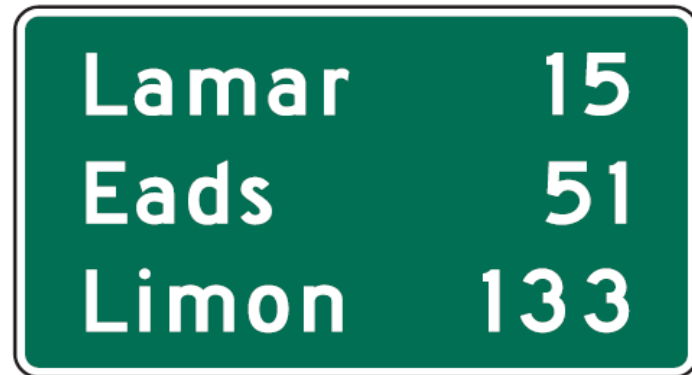




Option to use all upper-case letters for place names and street names is deleted



Guide signs should have no more than 3 lines of destination info





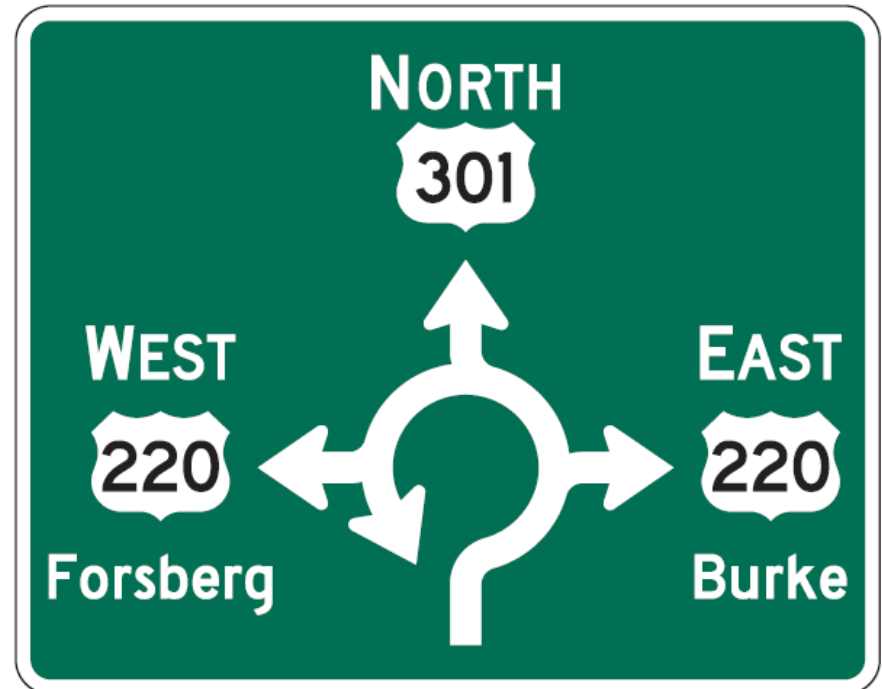
Provisions for use of pictographs on guide signs

Exceeds maximum size, not official seal



New guide signs for circular intersections

Revisions incorporated into the 2009 MUTCD



Route and auxiliary signs combined on a green background



Lane designation auxiliary signs



For dedicated or mandatory movement lanes only



M5-4



M5-5



M5-6

Combination lane-use and destination overhead guide signs





**Route shield may be used on a
Street Name sign**



Only alternatives to the green background color for Street Name signs are blue, brown, or white*

*** A black legend shall be used if a white background is used, otherwise the legend color shall be white**



New table for letter heights on Street Name signs

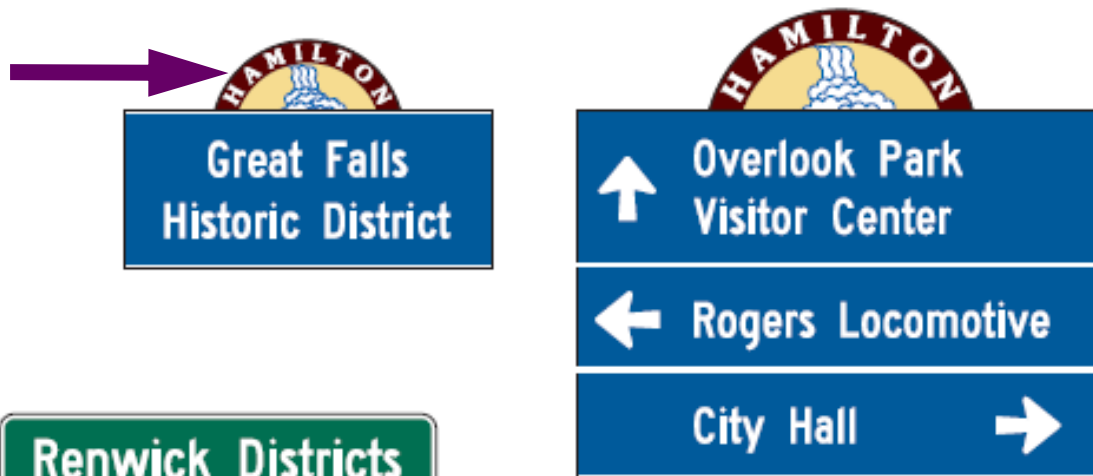
Table 2D-2. Recommended Minimum Letter Heights on Street Name Signs

Type of Mounting	Type of Street or Highway	Speed Limit	Recommended Minimum Letter Height	
			Initial Upper-Case	Lower-Case
Overhead	All types	All speed limits	12 inches	9 inches
Post-mounted	Multi-lane	More than 40 mph	8 inches	6 inches
Post-mounted	Multi-lane	40 mph or less	6 inches	4.5 inches
Post-mounted	2-lane	All speed limits	6 inches*	4.5 inches*

* On local two-lane streets with speed limits of 25 mph or less, 4-inch initial upper-case letters with 3-inch lower-case letters may be used.

New provisions for the design and use of community wayfinding guide signs

Enhancement markers



Color coding



Revisions to Chapter 2E – Guide Signs for Freeways and Expressways



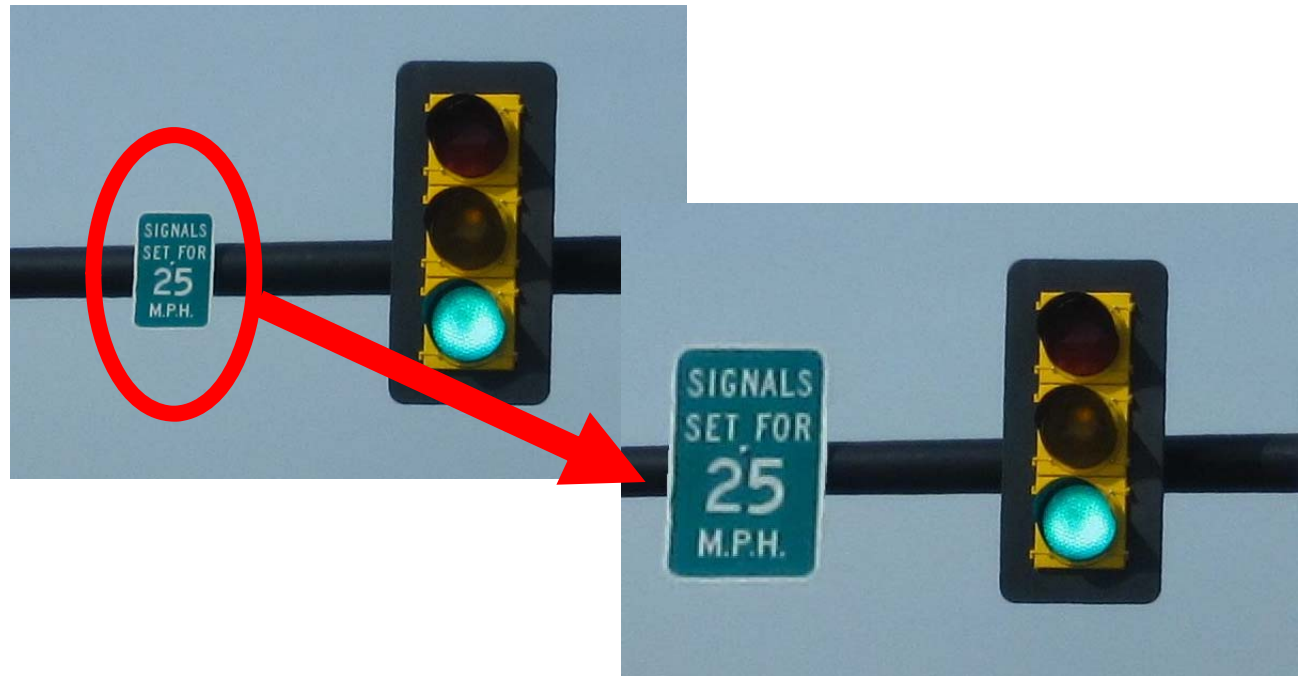
Revisions to Chapter 2H – General Information Signs

(relocated from Chapters 2D and 2E)

New chapter with sections relocated from Chapters 2D and 2E

- Traffic signal speed sign
- Reference location signs
- Other I-series general information signs
- Memorial signing
- Auto tour route signs
- Acknowledgement signs

Size of Traffic Signal Speed sign increased from 12" x 18" to 24" x 36"



Changeable message element permitted for varying the progression speed

Shields and trailblazer assemblies for designated auto tour routes (formerly trail signs)



- Auto Tour Route signs designed in accordance with provisions for route signs
- Independent assemblies allowed on freeways between discontinuous segments

New Vehicle Ferry Terminal sign



New provisions for the design and use of acknowledgement signs

Logo area exceeds $\frac{1}{3}$ sign area



Sign in vicinity of decision point



Revisions to Chapter 2I – General Service Signs (relocated from Chapters 2D and 2E)



General Service and Roadside Area signs are now in a separate chapter



“Dial” changed to “Call”



New Chapter 2L – Changeable Message Signs



Provisions for changeable message signs

- Legend height
- Color
- Phases per cycle
- Display time



Provisions for changeable message signs

- Other types of electronic-display CMS (limited-legend, blank-out) specifically identified for clarification of applicability
- Non-electronic displays (hinged-panel, rotating-drum, backlit scroll) follow same requirements as static signs



Revisions to Chapter 2M – Recreational and Cultural Interest Area Signs (formerly Chapter 2H)



Updated and expanded set of recreational and cultural interest area symbol signs



Memorial or dedication signing

John D Basilone
MEMORIAL BRIDGE

DEDICATED TO
Gov Alfred E Driscoll

- One sign per direction
- No extraneous information or decorative elements



Revisions to Chapter 2N – Emergency Management Signing (formerly Chapter 2I)



New option for fluorescent pink background when EM-6 or EM-7 signs are used for an incident situation



OR



Revisions to Part 3 – Markings



Section 3A.02 – Temporary masking of markings

- Allowed until old markings can be removed or obliterated, but...
- Only with material that is “approximately the same color as the pavement”



Section 3A.05 – Colors

- Purple Markings – only as optional supplement to lane lines or edge lines of toll plaza approach lanes that are restricted to vehicles with registered ETC accounts
- Blue RPMs – Not a TCD
 - Removed from MUTCD, except for new Section 3B.11 Support statement describing their use by emergency personnel in locating fire hydrants



Section 3B.01

A single yellow center line marking on a two-way roadway is specifically prohibited



Sections 3B.02 and 3B.10

Minimum taper lengths for longitudinal lines changed from Standard to Guidance

- Urban: 100 feet
- Rural: 200 feet



Section 3B.04

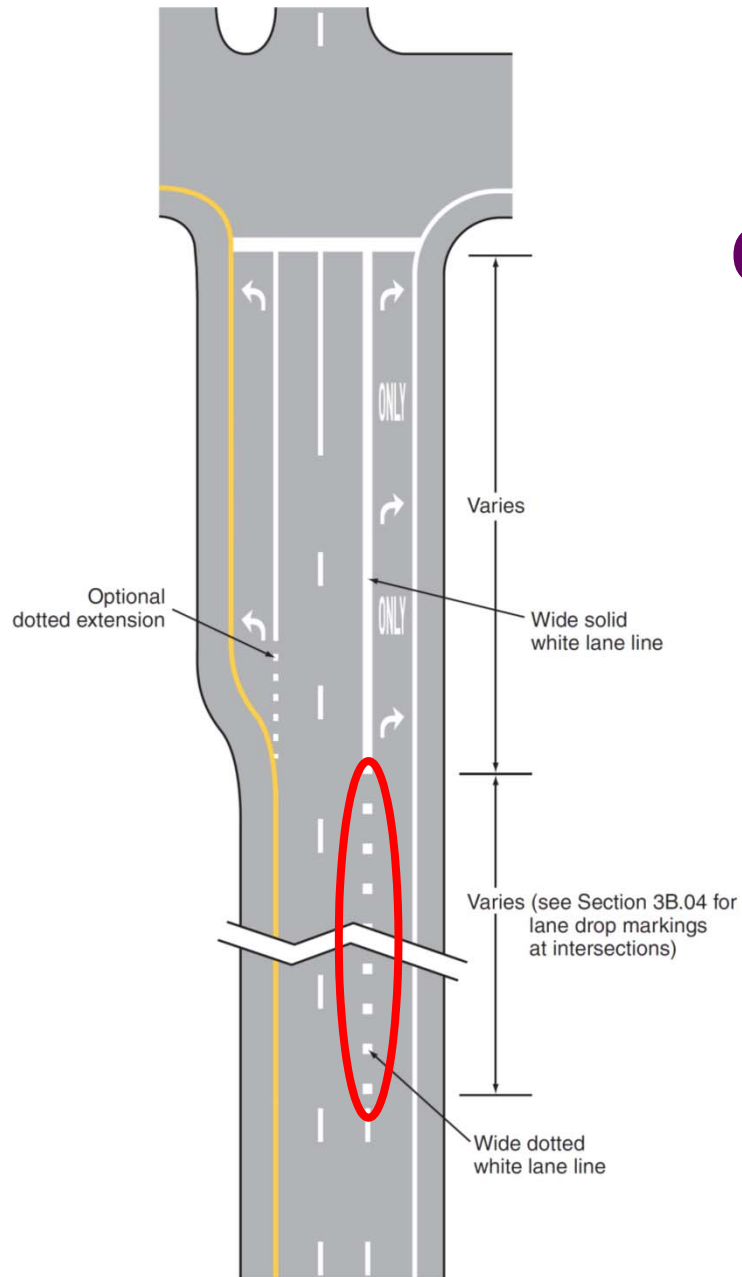
White Lane Line Markings

Dotted (not broken) lane lines shall be used for non-continuing lanes:

- Lane drops (wide dotted)
- Auxiliary lanes (wide dotted)
- Acceleration lanes (normal width dotted)
- Deceleration lanes (normal width dotted)

Applies on freeways, expressways, and conventional roads

Lane drops on conventional roads



2009 MUTCD (Final Rule)

Compliance date for replacing existing broken lane lines with dotted lane lines for non-continuing lanes:

- **December 31, 2016 or resurfacing, whichever occurs first**

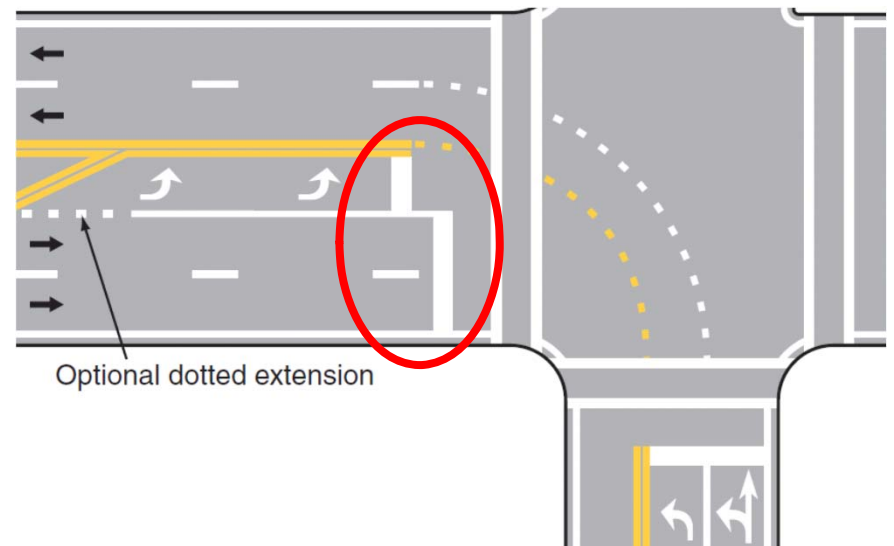
Section 3B.11 – Optional use of RPMs around noses of raised medians, curbs, or islands



Section 3B.16

Stop lines and yield lines

- Stop lines shall not be used where drivers are required by law to yield rather than come to a full stop
- Yield lines should not be used in advance of crosswalks across a roundabout approach or departure
- Stop lines and yield lines may be “staggered” on a lane-by-lane basis





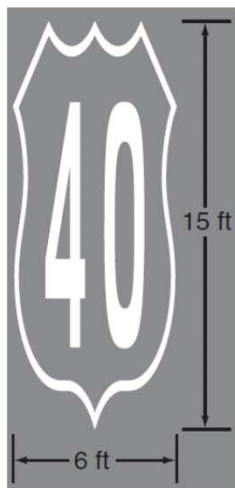
Section 3B.20 – Word, symbol, and arrow markings

Optional route shield pavement markings

A - Interstate Shield
on dark or
light pavement



B - U.S. Route Shield
on dark pavement



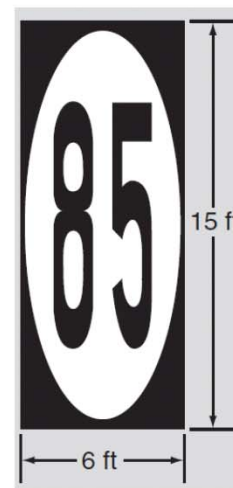
C - U.S. Route Shield
on light pavement



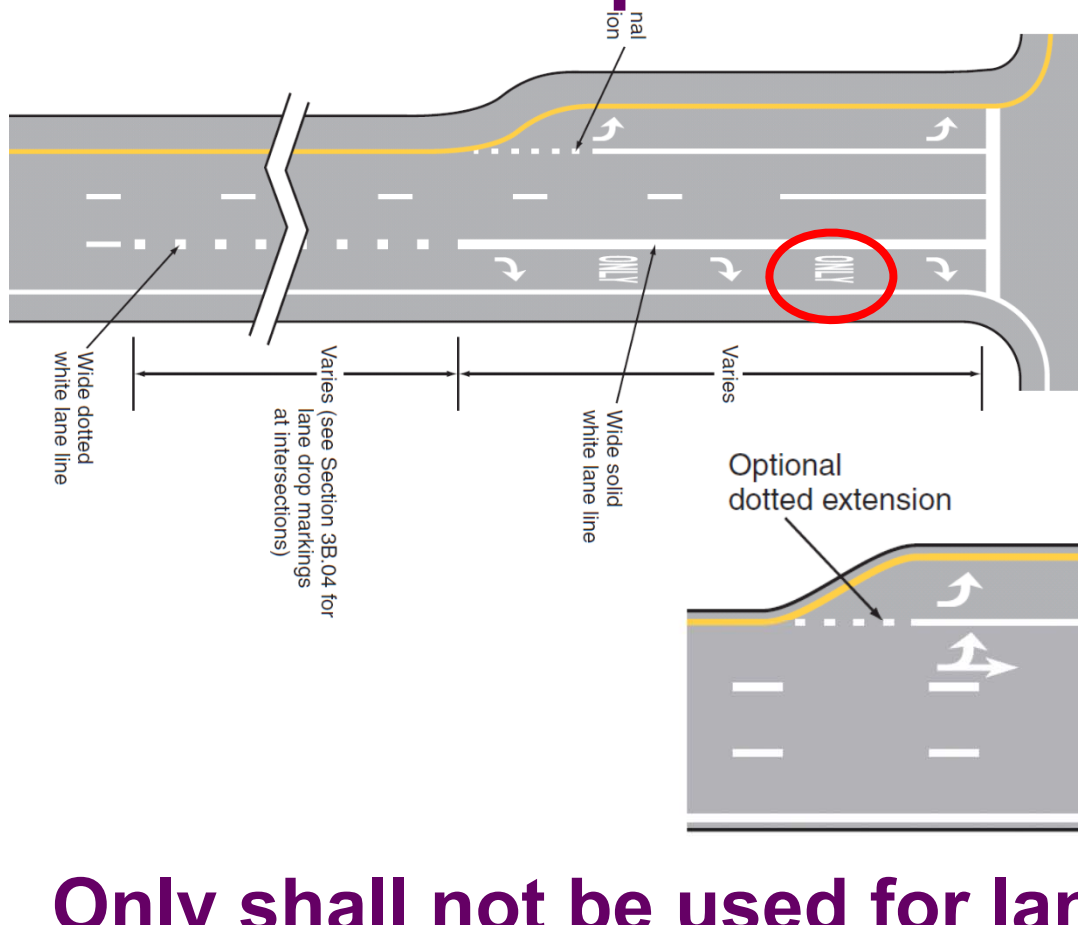
D - State Route Shield
on dark pavement



E - State Route Shield
on light pavement



Section 3B.20 – Revised Use & placement of lane-use arrows



“ONLY” markings should be used for “trap” lanes

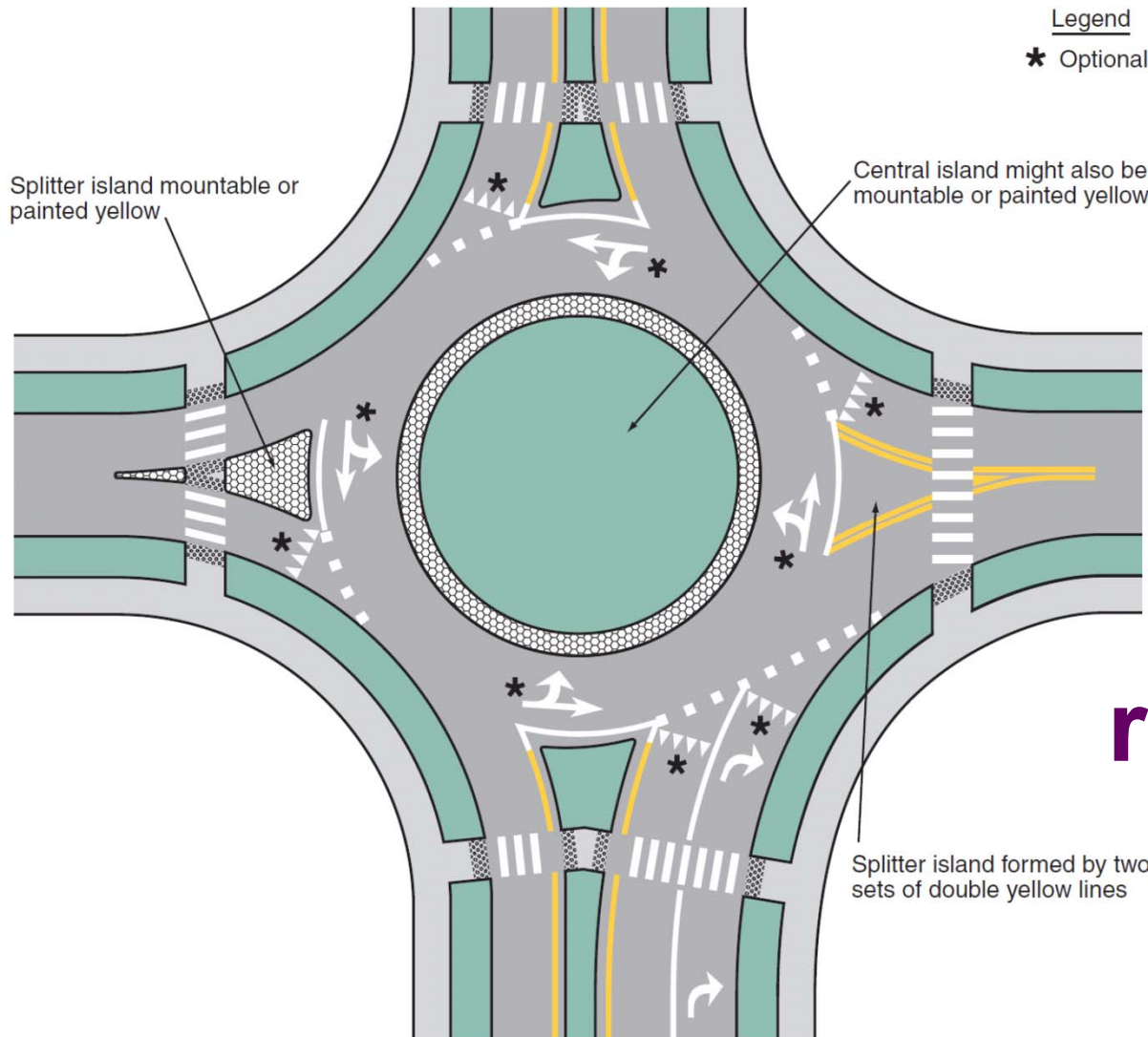
Only shall not be used for lane with more than one movement

Section 3B.20 – Recommended use of arrows in two-way left-turn lanes at certain locations



At start of lane and elsewhere along lane as needed

New Chapter 3C



Pavement markings at roundabouts

Section 3F.03 – Delineator Application



**Delineators should be used with
guardrails and other barriers**

Section 3G.01 – Colored pavements

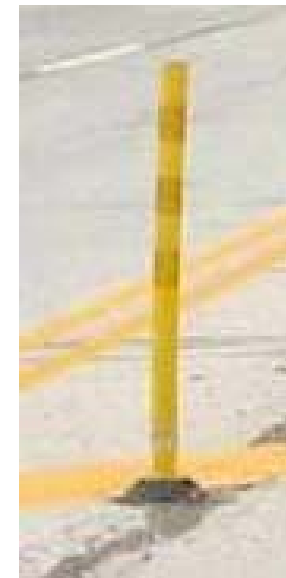
Non-retroreflective, for aesthetics only, not to communicate a message
= not a TCD



Retroreflective or intended to communicate a regulatory, warning, or guidance message = TCD
(shall comply with color code and other provisions for markings)



Chapter 3H – Channelizing devices used for emphasis of pavement marking patterns



Outside of TTC zones, when channelizing devices separate opposing traffic flows, retroreflective bands shall be yellow

Section 3I.06 – Pedestrian islands and medians

Reference to ADAAG regarding detectable warning surfaces to mark the boundary between pedestrian and vehicular areas



New Chapter 3J – Pavement markings used with longitudinal and transverse rumble strips



Revisions to Part 4 – Highway Traffic Signals



Section 4B.02

Steps for signal removal changed from option to guidance



- Installing a sign such as this is no longer one of the steps in the process.
- This is only one of several possible legends for a sign, if used.

Section 4C.04

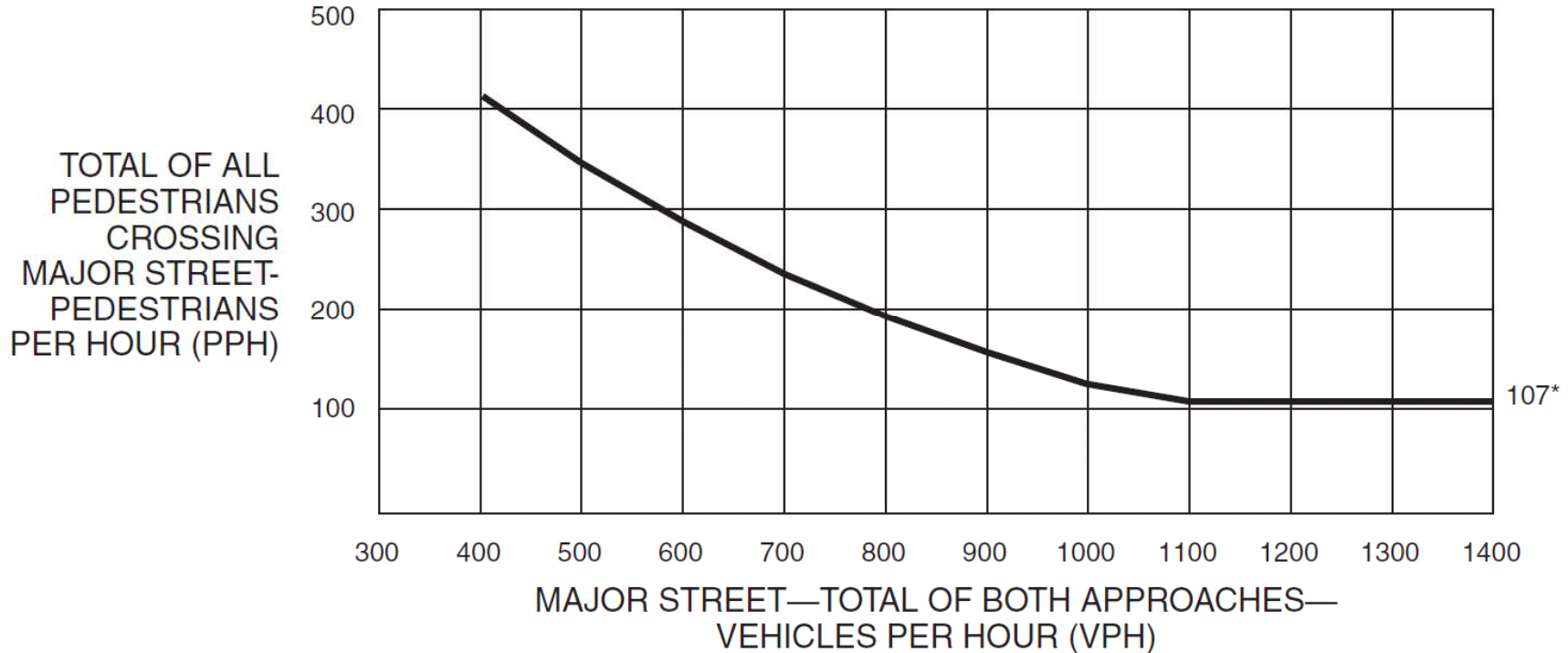
New guidance in Warrant 3 (Peak hour)

- **Signals installed under Warrant 3 (peak hour):**
 - should be traffic-actuated, and
 - may be operated in flashing mode during off-peak hours

Section 4C.05

Revisions to Warrant 4 (pedestrian volume)

Figure 4C-5. Warrant 4, Pedestrian Four-Hour Volume



*Note: 107 pph applies as the lower threshold volume.



Sections 4C.05 & 4C.06

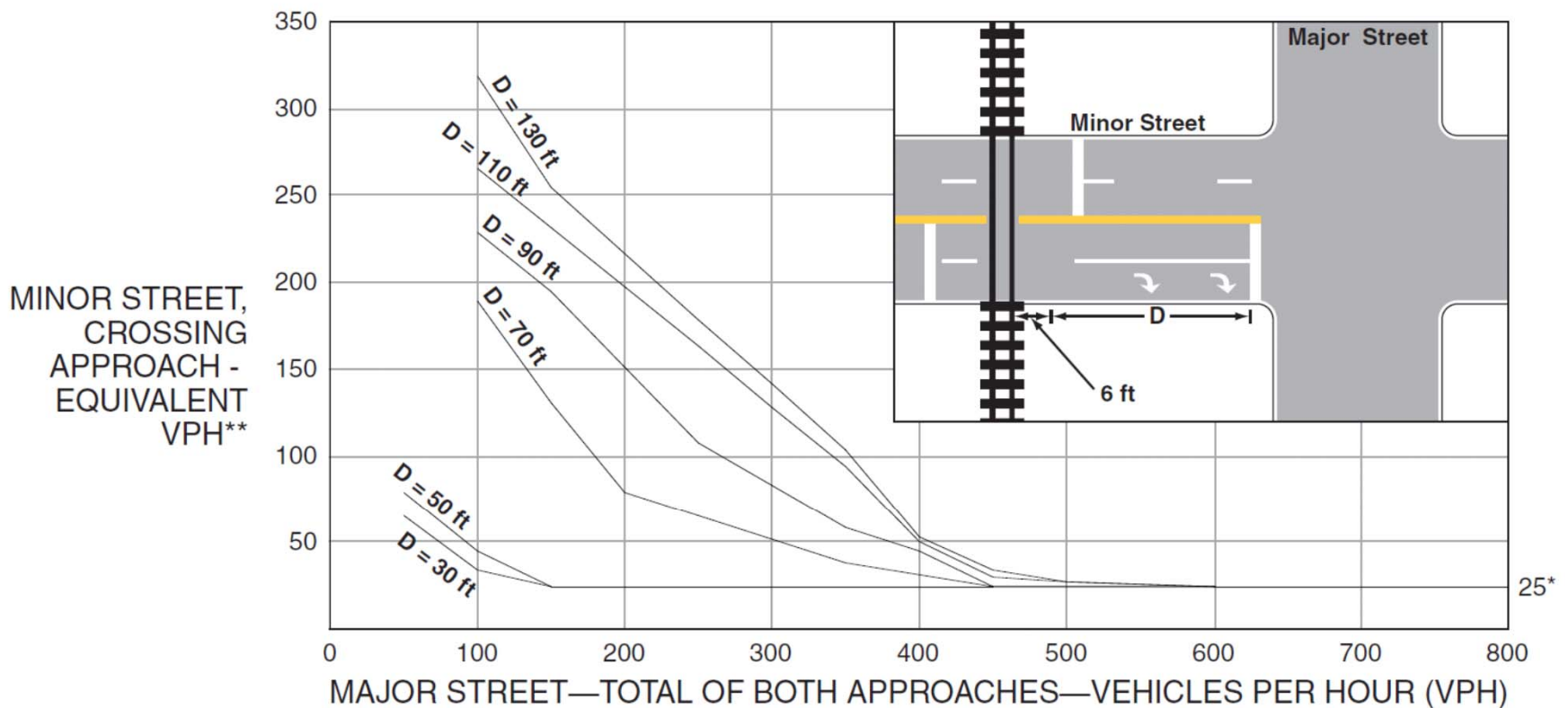
Signals based only on warrant 4 (ped volume) or warrant 5 (school crossing) should also control the minor street or driveway

- no “half-signals”



Section 4C.10 – New Warrant 9 for intersections near grade crossings

Figure 4C-10. Warrant 9, Intersection Near a Grade Crossing
(Two or More Approach Lanes at the Track Crossing)



* 25 vph applies as the lower threshold volume

** VPH after applying the adjustment factors in Tables 4C-2, 4C-3, and/or 4C-4, if appropriate

Section 4D.03

Use of No Pedestrian Crossing signs at signalized locations

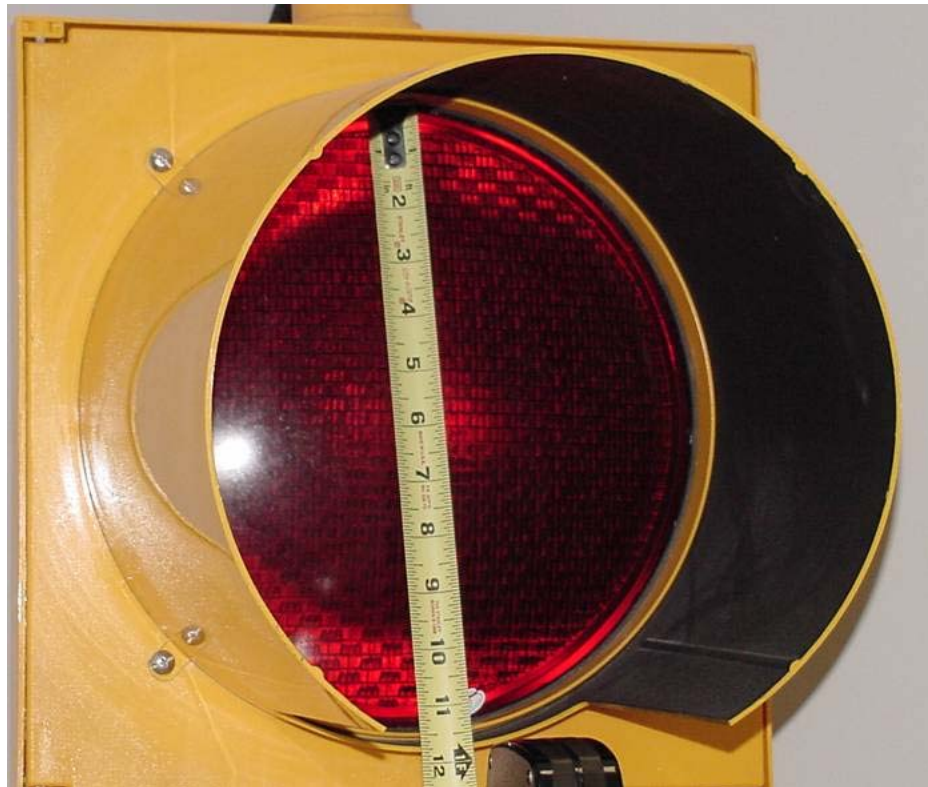


Where it is necessary or desirable to prohibit a pedestrian movement that is not practical to physically prevent by other means...

Sign should be used (rather than may)

Section 4D.07

12-inch indications required for all new traffic control signal faces



Six options for using new 8-inch indications in special circumstances

(incl. ≤ 30 mph if < 120 ft from stop line)

Section 4D.11 – Recommended minimum number of thru signal faces on approaches with speeds \geq 45 mph:

Table 4D-1. Recommended Minimum Number of Primary Signal Faces for Through Traffic on Approaches with Posted, Statutory, or 85th-Percentile Speed of 45 mph or Higher

Number of Through Lanes on Approach	Total Number of Primary Through Signal Faces for Approach*	Minimum Number of Overhead-Mounted Primary Through Signal Faces for Approach
1	2	1
2	2	1
3	3	2**
4 or more	4 or more	3**

NOTES: * A minimum of two through signal faces is always required (See Section 4D.11). These recommended numbers of through signal faces may be exceeded. Also, see cone of vision requirements otherwise indicated in Section 4D.13.

** If practical, all of the recommended number of primary through signal faces should be located overhead.

Section 4D.11 – Recommended number, location, and design of signal faces for approaches with speeds ≥ 45 mph:

Revisions incorporated into the 2009 MUTCD



2009 MUTCD (Final Rule)

Section 4D.12 – Optional yellow retroreflective borders around backplates



Section 4D.13 – Positioning of overhead separate signal faces for turn movements

- If installed overhead for a dedicated turn lane, the separate turn face shall be located over the turn lane (not necessarily centered over the lane)



Section 4D.26 – Yellow change intervals and red clearance intervals

- Durations shall be determined using engineering practices
 - Compliance date December 31, 2014 or when timing adjustments are made (whichever occurs first)
- Use of red clearance – changed from option to guidance, when indicated by application of engineering practices

Section 4D.27 Back-up power should be provided for signals with RR preemption



Section 4E.02 – Revised legal meaning of flashing upraised hand pedestrian signal indication

- **If signal is timed to provide sufficient time for pedestrians to cross the entire highway -- legal right to cross entire divided highway without stopping at the median.**
- **If signal timing provides only enough time for pedestrians to cross to the median -- median-mounted signs, ped signals, and pushbuttons (if actuated) are required.**

Section 4E.06 – Slower walking speed for calculating pedestrian clearance time (guidance)

~~4.0 feet per second~~

Ped. Clearance Time based on **3.5** feet / sec

[Exception allows 4.0 ft /sec if extended button press or passive ped detection allows slower peds to request additional crossing time]

Sum of Walk time + Ped. Clearance Time based on **3.0** feet per second for distance from ped detector to far side



Section 4E.07

Countdown pedestrian displays

- Required for all ped signals except where ped change interval is ≤ 7 sec.
- No specific compliance date for retrofitting existing ped signals (can remain w/o countdown until ped heads replaced)
- May be used even if ped change interval is 7 sec. or less



Accessible Pedestrian Signals (APS) and Accessible Detectors – combined and reorganized into five new sections

- **4E.09 – General**
- **4E.10 – Location**
- **4E.11 – Walk indications**
- **4E.12 – Tactile arrows and locator tones**
- **4E.13 – Extended press button features**

Reorganization of Chapters 4F-4N

- 4F – Pedestrian Hybrid Beacons
- 4G – Traffic Control Signals and Hybrid Beacons for Emergency Vehicle Access
- 4H – Traffic Control Signals for One-Lane, Two-Way Facilities
- 4I – Traffic Control Signals for Freeway Entrance Ramps
- 4J – Traffic Control for Movable Bridges
- 4K – Highway Traffic Signals at Toll Plazas
- 4L – Flashing Beacons
- 4M – Lane-Use Control Signals
- 4N – In-Roadway Lights

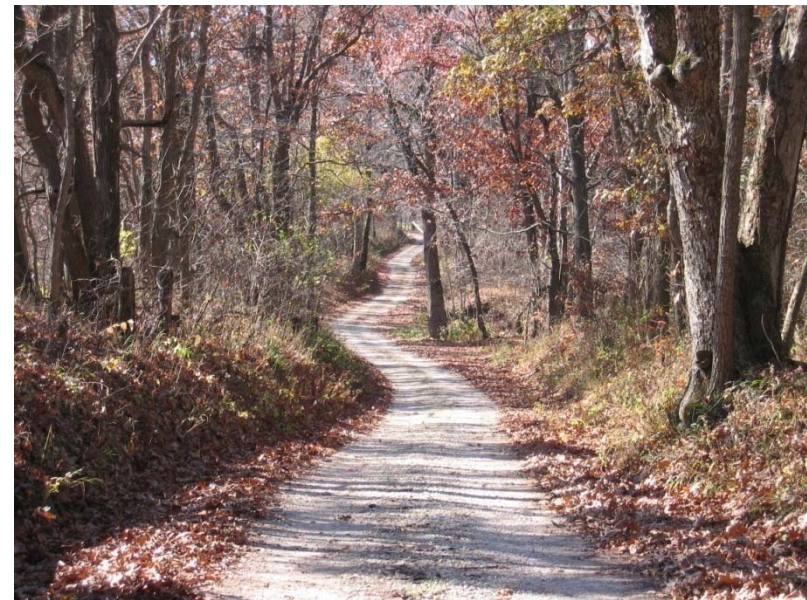
Revisions to Part 5 – Traffic Control Devices for Low-Volume Roads



Part 5 is not applicable on neighborhood residential streets



Not applicable



Applicable

Part 5 applies only outside of built-up areas of cities, towns, and communities

Typical sizes for signs and plaques on low-volume roads are the same sizes as for conventional roads

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

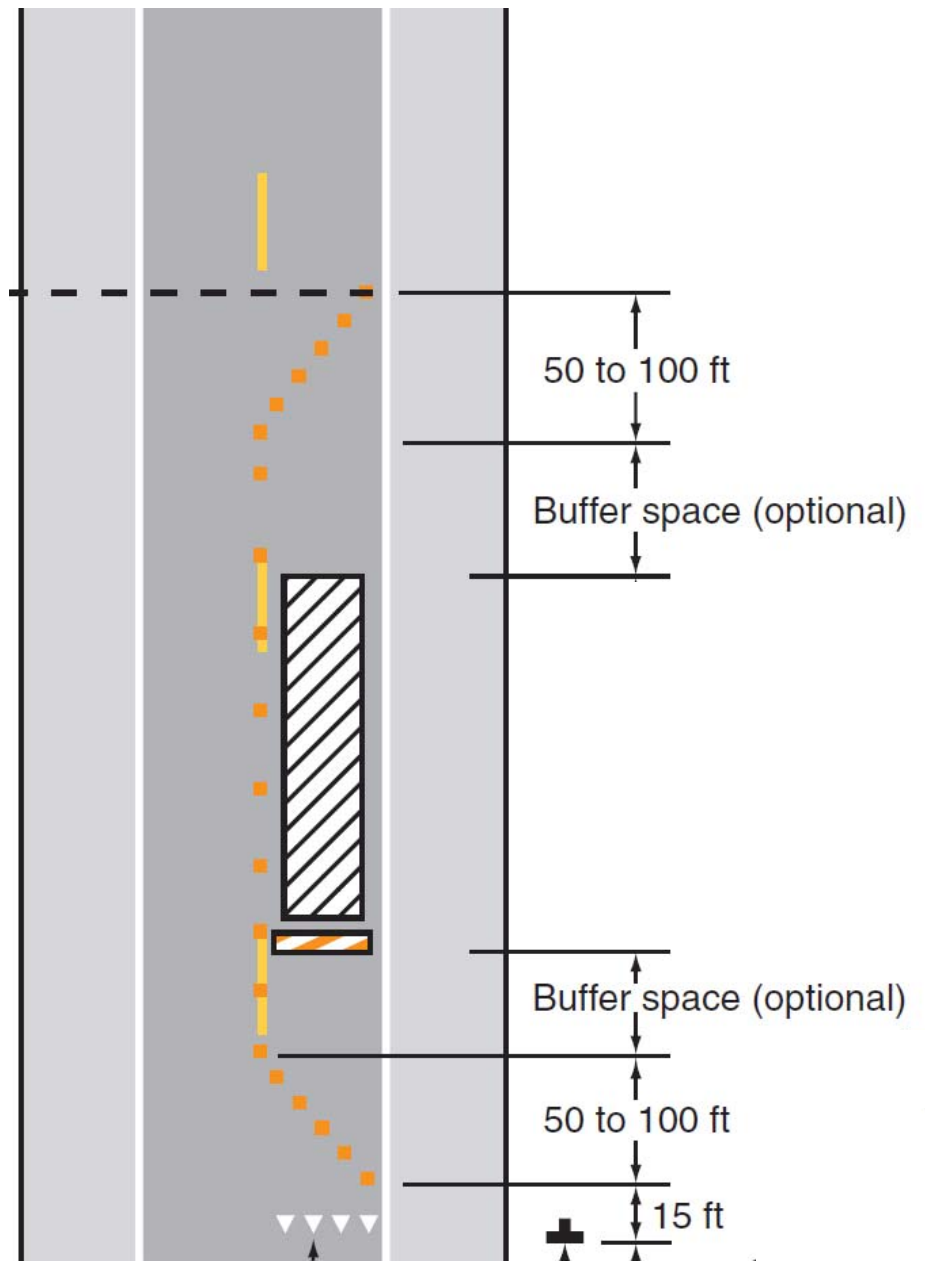
**For consistency with Part 3,
center lines may be placed on
low-volume roads with or without
edge lines**



Revisions to Part 6 – Temporary Traffic Control



Guidance on lengths of short tapers and downstream tapers



Minimum length for one-lane, two-way traffic taper added to Table 6C-3

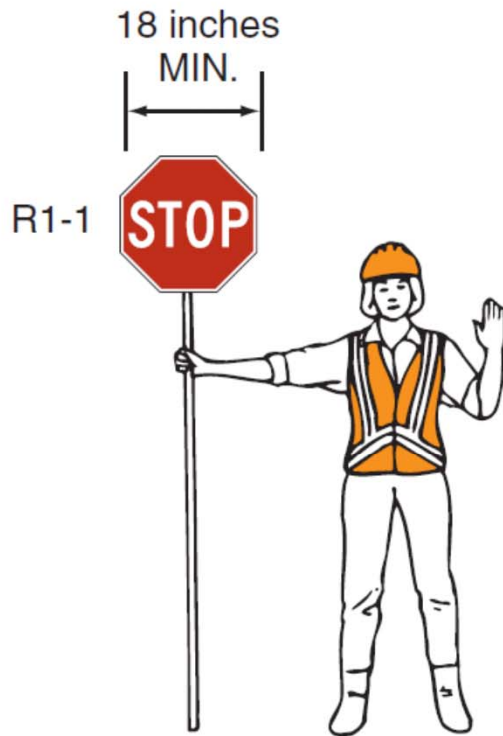
Type of Taper	Taper Length
Merging Taper	at least L
Shifting Taper	at least 0.5 L
Shoulder Taper	at least 0.33 L
One-Lane, Two-Way Traffic Taper	50 feet minimum, 100 feet maximum
Downstream Taper	100 feet per lane

High-visibility safety apparel

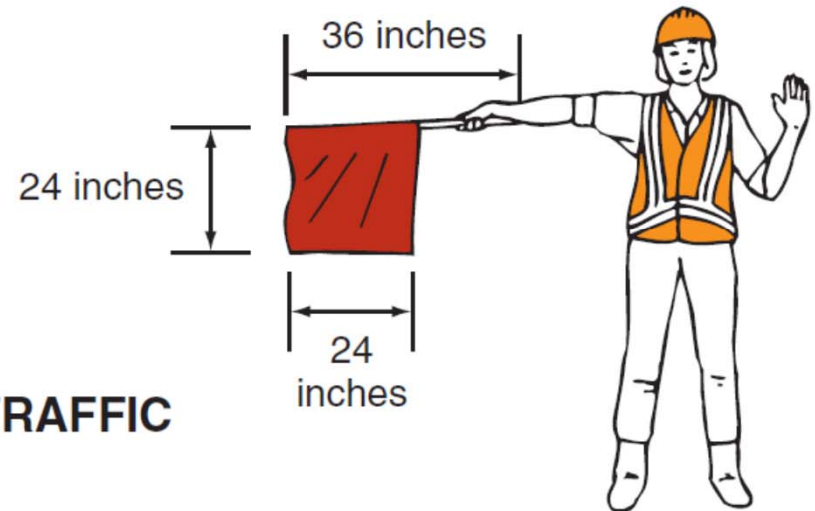


- Required for all workers within the public right of way
- Applies to all roads, not just those on the Federal-aid system
- Option for law enforcement and first responders to use new ANSI “public safety vests”
- Firefighters and law enforcement are exempted from the requirement under certain conditions
- December 31, 2011 compliance date on non Federal-aid highways

PREFERRED METHOD STOP/SLOW Paddle



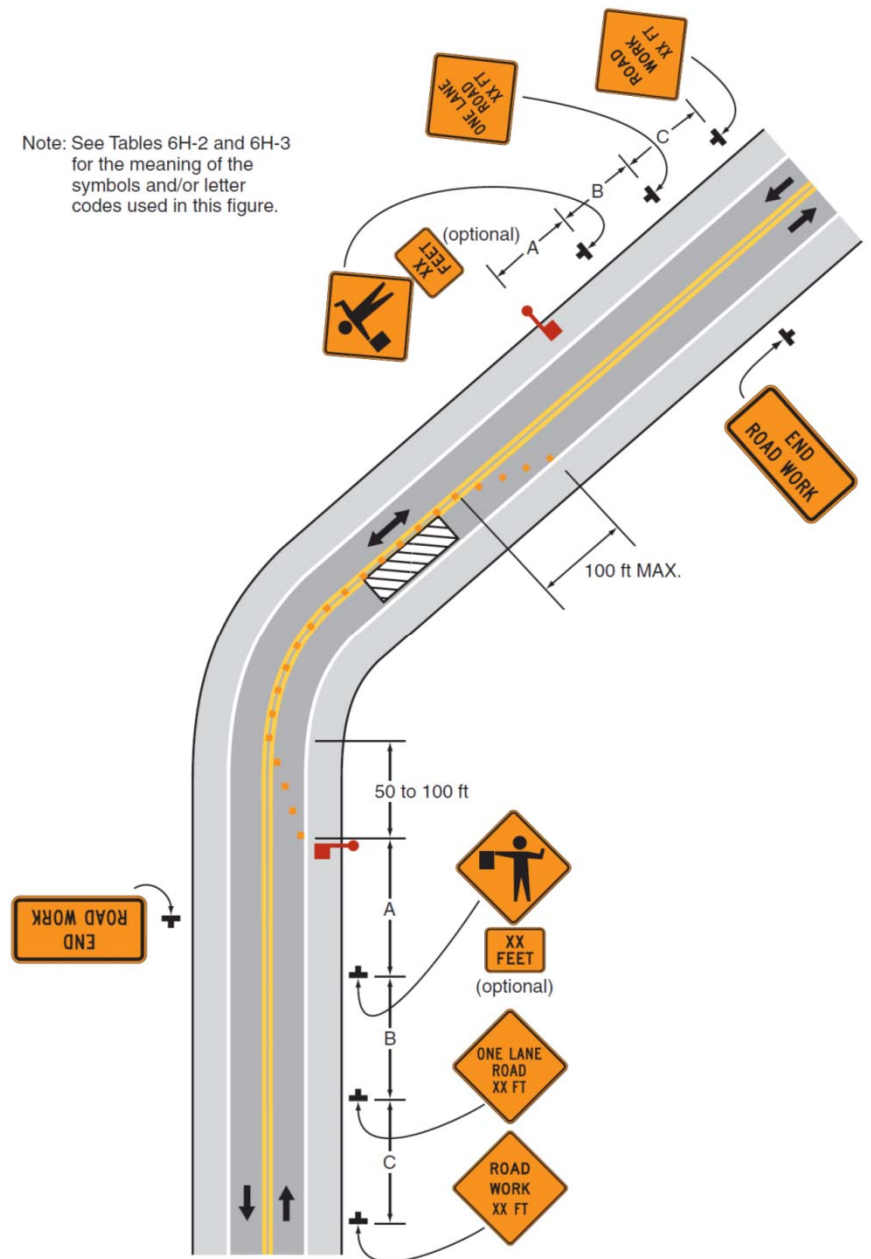
EMERGENCY SITUATIONS ONLY Red Flag



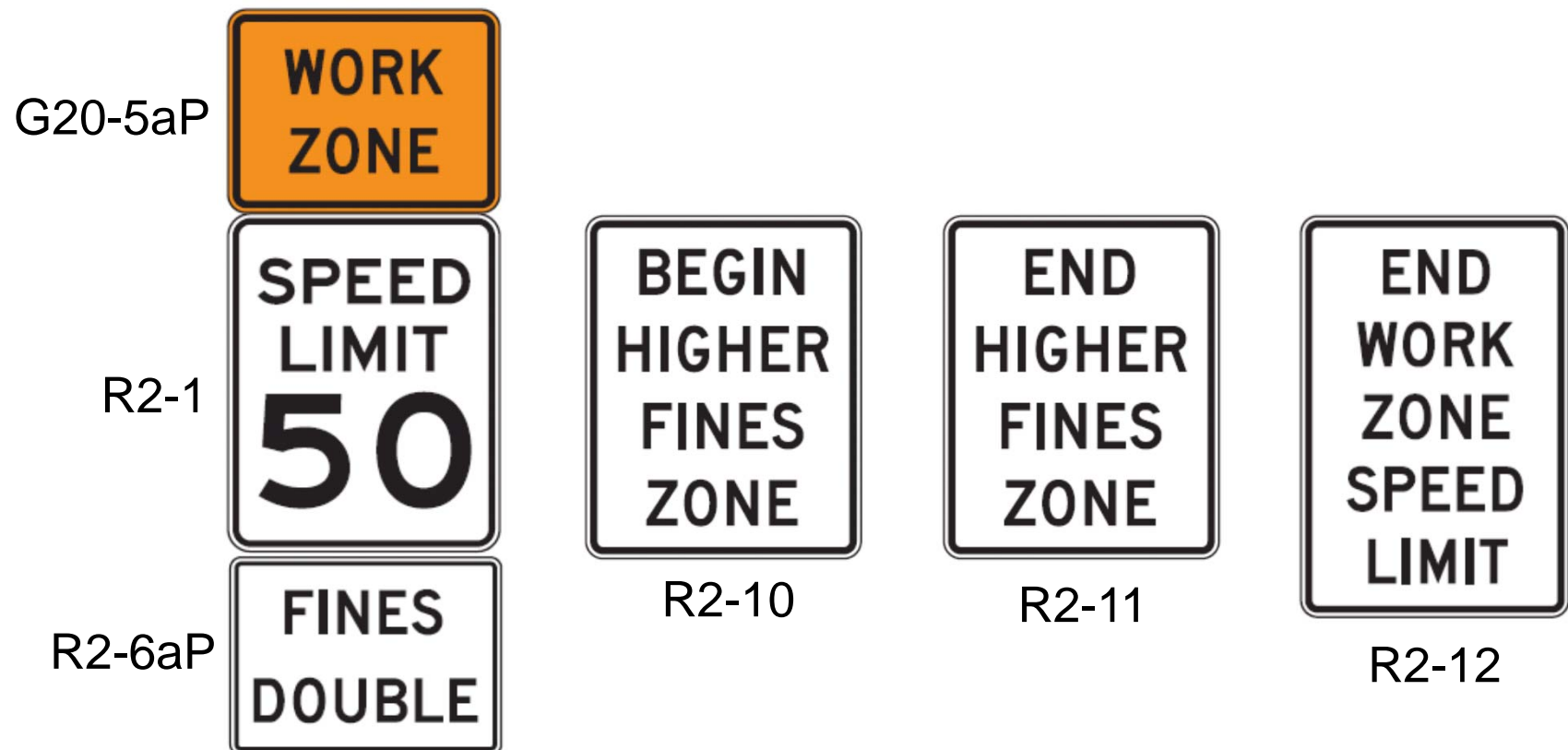
TO STOP TRAFFIC

Flaggers shall use a paddle, flag, or AFAD, not just hand signals

Two flaggers should be used for a one-lane, 2-way constriction unless TTC zone is short enough for the flagger to see from one end to the other



New optional and recommended signs and plaques to accompany Speed Limit signs in TTC zones



Center Lane Closed Ahead symbol sign has been removed from the MUTCD



W9-3



W9-3a



W8-17



W8-17P

New symbol sign and supplemental plaque for shoulder drop-off

Temporary Markings

- **Delineate path through the TTC zone when the permanent markings are either removed or obliterated during the work activities.**
- **Should not be left in place longer than 14 days**
- **Some allowable exceptions to normal longitudinal markings requirements**

Temporary RPMs in TTC zones

- **More provisions on color, patterns, and spacing, consistent with Part 3**
 - Colors and patterns shall simulate the markings for which they substitute
 - May be used to substitute for solid lines
- **Option to use a less expensive pattern of temporary RPMs to substitute for broken line segments**
 - Should not be used more than 14 days

Preemption of temporary signals in TTC zones



Provisions for traffic incident management

- A reference is made to the Incident Command System (ICS)
- All on-scene responders and news media personnel should wear high-visibility apparel
- Light sticks may be used in lieu of flares



Revisions to Part 7 – Traffic Control for School Areas



Deletion of material from Part 7

- **Sections 7A.05 through 7A.10**
- **Sections 7C.02 through 7C.06 covered in Chapter 3B**
- **Chapter 7D – Signals**
- **Student patrols in existing Chapter 7E**
- **Chapter 7F – Grade-Separated Crossings**

Use of minimum size of school signs

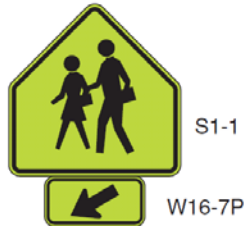
- **Application of the minimum sizes only where traffic volumes are low and speeds are 30 mph or lower**

FYG color required for all school warning signs

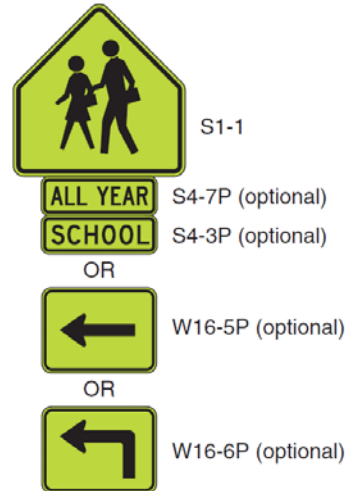
School Advance Crossing Assembly



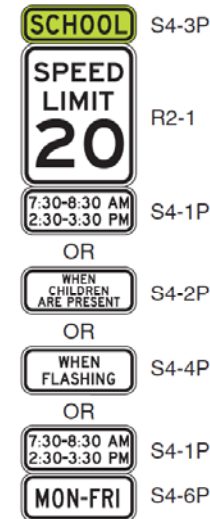
School Crossing Assembly



School Zone Sign



School Speed Limit Assembly



S3-1



S3-2



S4-5



S4-5a

New symbol sign to replace the S3-1 word message sign



S3-1

New sign to warn of school bus turnaround locations



S3-2

Warning of school zone in close proximity to an intersection



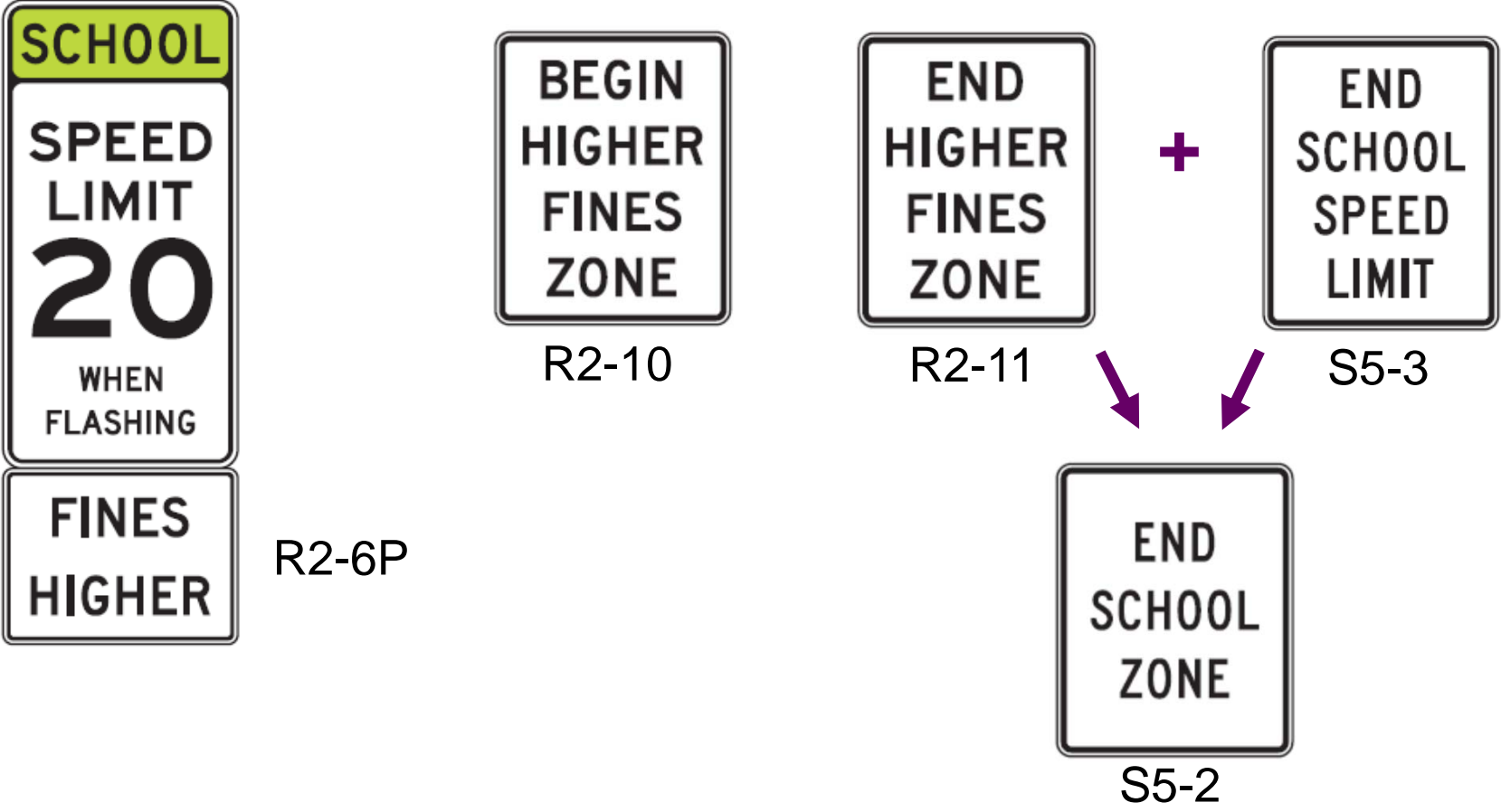
S1-1



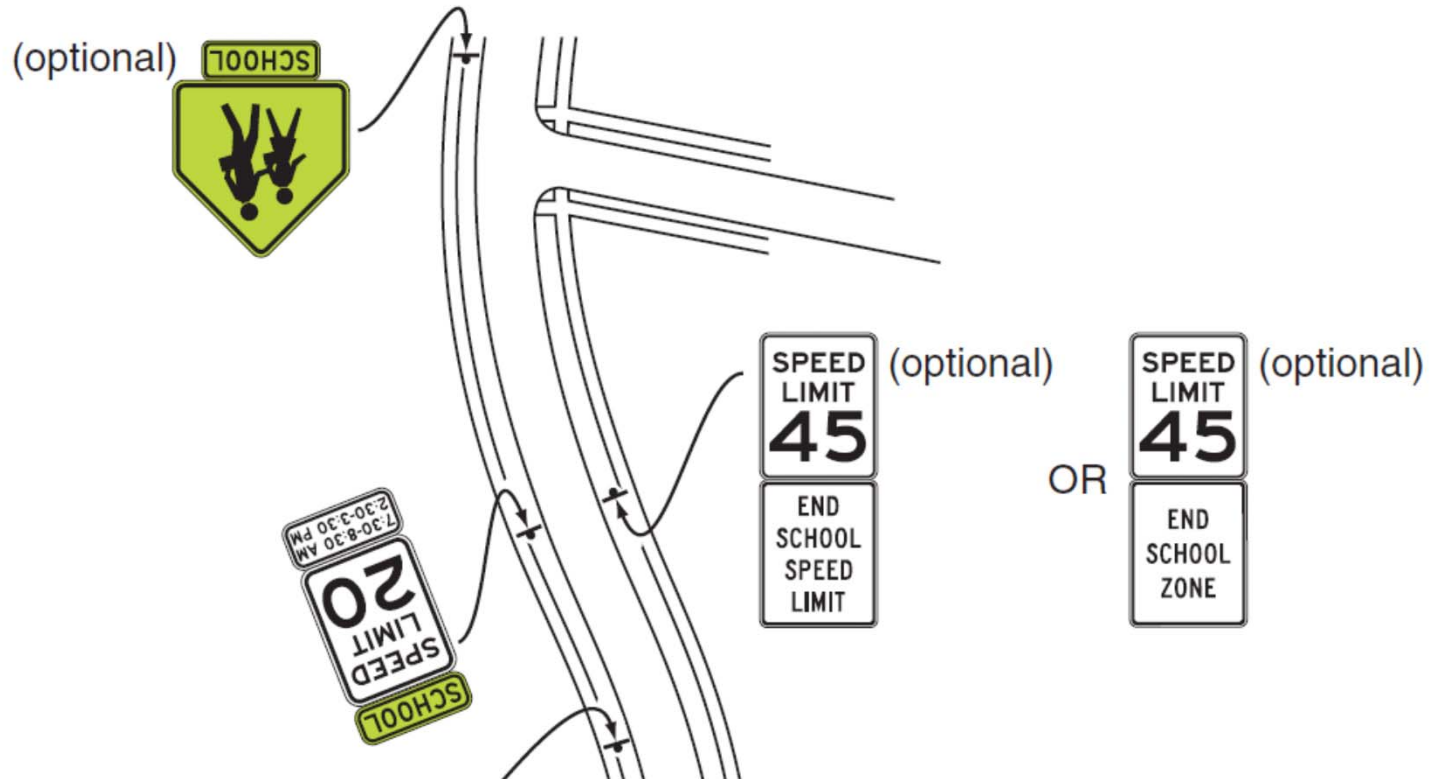
W16-6P



New signs for higher fines school zones



END SCHOOL SPEED LIMIT or END SCHOOL ZONE sign required at end of reduced school speed limit zone



Operating procedures for adult crossing guards changed from recommended to required

- Shall not direct traffic in the usual law enforcement regulatory sense
- Shall pick opportune times to create a sufficient gap in traffic flow
- Shall stand in roadway
- Shall use a **STOP** paddle

Adult school crossing guards and law enforcement personnel performing school crossing supervision must wear Class 2 high-visibility apparel

- **Compliance date December 31, 2011**

Revisions to Part 8 – Traffic Control for Railroad and LRT Grade Crossings

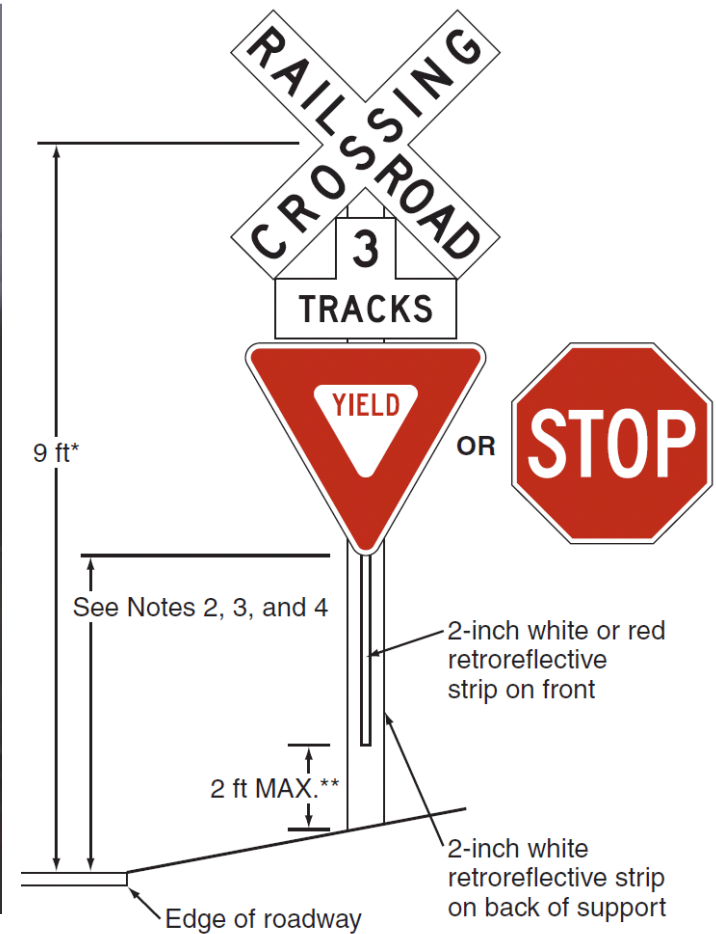


Parts 8 and 10 are combined

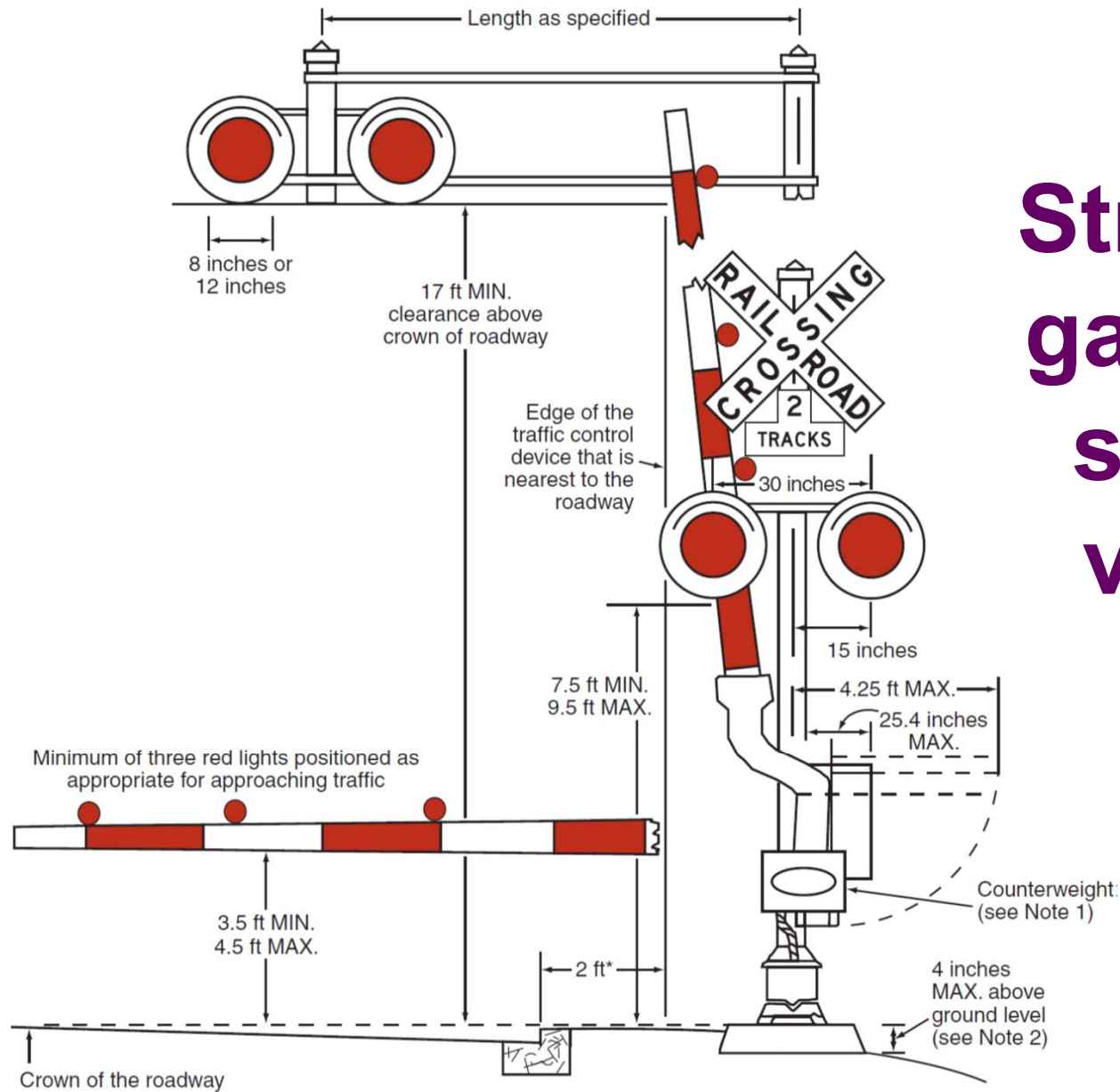
- **Reduces redundancy and cross-references**
- **“Grade crossing” is a new generic term**
- **Chapter 8C (Illumination) becomes Section 8A.06**

YIELD or STOP signs required at passive highway-rail grade crossings (Dec. 31, 2019 compliance date)

Revisions incorporated into the 2009 MUTCD



2009 MUTCD (Final Rule)



Stripes on gate arms shall be vertical

*For locating this reference line on an approach that does not have a curb, see Section 8C.01.



Revisions to Part 9 – Traffic Control for Bicycle Facilities



**New sign for
lanes that are
too narrow for
bicyclists and
motorists to
operate
side-by-side**



R4-11

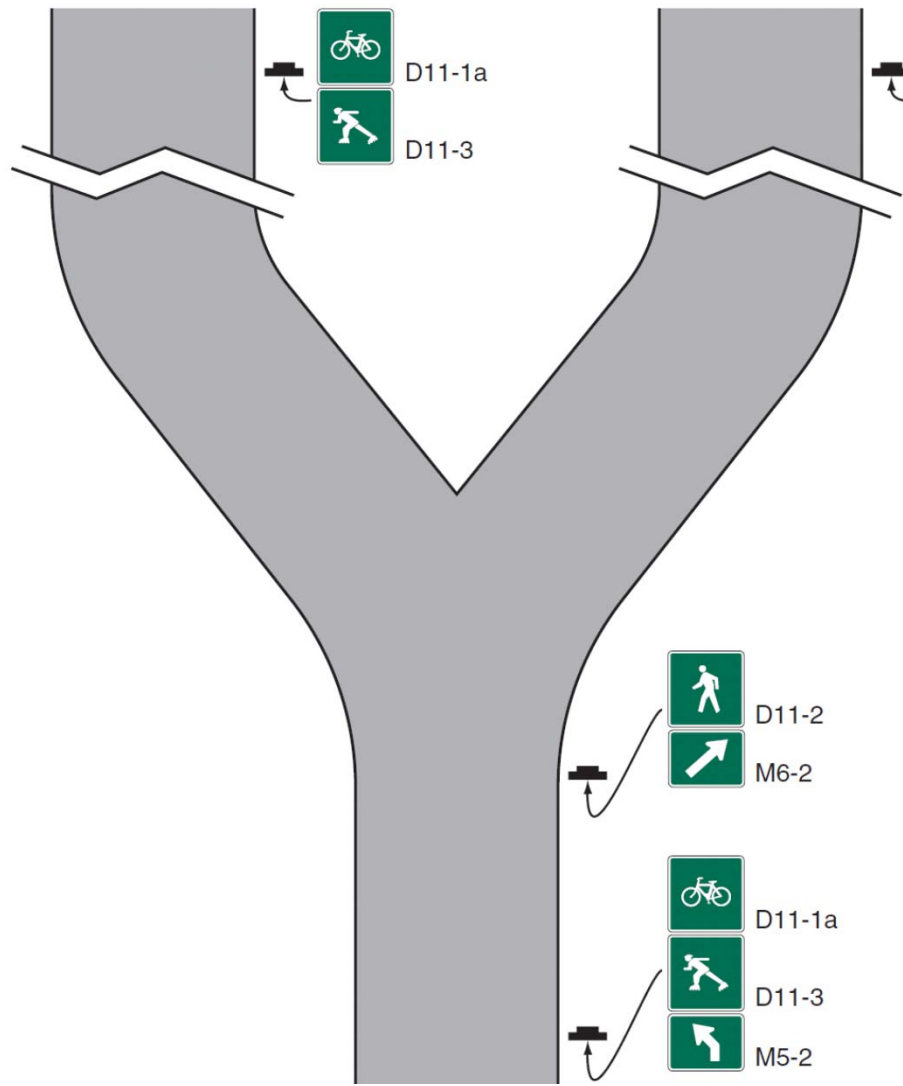
New bicycle destination guide signs



D1-3c



D11-1c



D11-1a



D11-2



D11-3



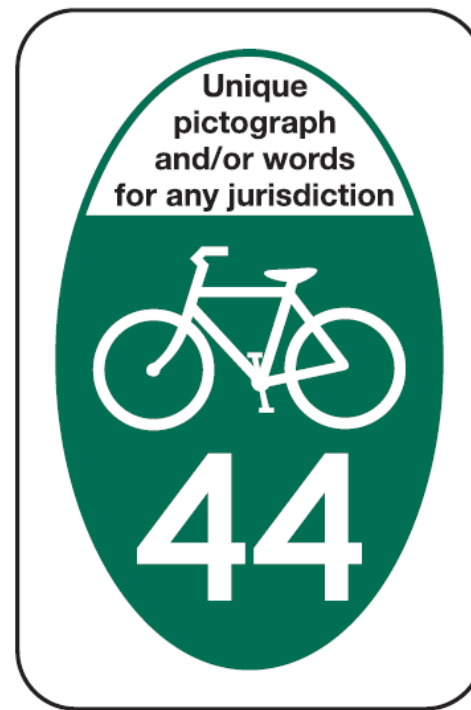
D11-4

New mode-specific guide signs for shared-use paths

New Bicycle Route sign that provides a place for a pictograph



M1-8



M1-8a