CHAPTER 2C. WARNING SIGNS AND OBJECT MARKERS

Chapter 2C Subchapter and Section Organization

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GENERAL

Section 2C.01 Application of Warning Signs

Standard:

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

02 **Warning signs shall be retroreflective or illuminated (see Section 2A.21).**

Guidance:

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

Section 2C.02 Design of Warning Signs

Standard:

01 **Except as provided in Paragraph 2 of this Section or unless specifically designated otherwise, all warning signs shall be diamond-shaped (square with one diagonal vertical) with a black legend and border on a yellow background. Warning signs shall be designed in accordance with the sizes, shapes, colors, and legends contained in the "Standard Highway Sign Designs for Texas" publication (see Section 1A.05).**

Option:

02 A warning sign that is larger than the size shown in the Oversized column in Table 2C-1 for that particular sign may be diamond-shaped or may be rectangular or square in shape.

Support:

03 The use of a shape other than diamond-shaped is typical for overhead installations.

04 Section 2A.05 contains information on allowable methods to accommodate a diamond-shaped warning sign where the lateral space available in which to install a diamond-shaped warning sign is constrained, such as in urban locations, when mounting on a narrow median barrier or adjacent to a retaining wall, including the display of the standard legend in a vertically oriented rectangle.

05 The use of LEDs in the border and legend of warning signs is described in Section 2A.12.

Option:

06 Except for symbols on warning signs, minor modifications may be made to the design provided that the essential appearance characteristics are met. Modifications may be made to the symbols shown on combined horizontal alignment/intersection signs (see Section 2C.09) and intersection warning signs (see Section 2C.41) in order to approximate the geometric configuration of the intersecting roadway(s).

07 Word message warning signs other than those provided in this Manual may be developed and installed by State and local highway agencies for conditions otherwise not addressed by standard signs (see Section 2A.04).

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

Standard:

09 **Warning signs regarding conditions associated with school buses and schools and their related supplemental plaques shall have a black legend and border on a fluorescent yellow-green background (see Section 7B.01).**

Option:

10 Consistent with the provisions of Section 4S.03, a Warning Beacon may be used in combination with a warning sign.

Table 2C-1. Warning Sign and Plaque Sizes (Sheet 1 of 5)

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Minimum	Oversized
			Single Lane	**Multi-Lane				
Horizontal Alignment	W1-1,2,3,4,5	2C.07	30 x 30*	36 x 36	36 x 36	36 x 36	—	48 x 48
One-Direction Large Arrow	W1-6	2C.10	48 x 24	48 x 24	60 x 30	60 x 30	—	60 x 30
Two-Direction Large Arrow	W1-7	2C.43	48 x 24	48 x 24	—	—	—	60 x 30
Chevron Alignment	W1-8	2C.08	18 x 24	18 x 24	30 x 36	36 x 48	—	24 x 30
Combination Horizontal Alignment/Intersection	W1-10,10a,10b, 10c,10d,10e	2C.09	36 x 36	36 x 36	36 x 36	48 x 48	—	—
Hairpin Curve	W1-11	2C.07	30 x 30	30 x 30	36 x 36	48 x 48	—	48 x 48
Curve Blocks View	W1-11T	2C.07	30 x 30*	36 x 36	36 x 36	48 x 48	—	48 x 48
Curve Blocks View (plaque)	W1-11PT	2C.64A	24 x 18	24 x 18	24 x 18	—	—	—
Truck Rollover	W1-13	2C.11	36 x 36	36 x 36	36 x 36	48 x 48	—	48 x 48
270-degree Loop	W1-15	2C.07	30 x 30	30 x 30	36 x 36	48 x 48	—	48 x 48
Intersection Warning	W2-1,2,3,3a, 4,5,6,7,8	2C.41	30 x 30	30 x 30	36 x 36	—	24 x 24	48 x 48
Traffic Entering When Flashing	W2-10	2C.42	36 x 36	36 x 36	48 x 48	—	—	—
Traffic Approaching When Flashing	W2-11	2C.42	36 x 36	36 x 36	48 x 48	—	—	—
Stop, Yield, Signal Ahead	W3-1,2,3	2C.35	30 x 30	30 x 30	48 x 48	48 x 48	30 x 30	—
Be Prepared to Stop	W3-4	2C.35	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30	—
Reduced Speed Limit Ahead	W3-5	2C.40	36 x 36	36 x 36	48 x 48	48 x 48	—	—
XX MPH Speed Zone Ahead	W3-5a	2C.40	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Variable Speed Zone Ahead	W3-5b	2C.40	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Draw Bridge	W3-6	2C.36	36 x 36	36 x 36	48 x 48	—	—	60 x 60
Ramp Meter Ahead	W3-7	2C.37	36 x 36	36 x 36	—	—	—	—
Ramp Metered When Flashing	W3-8	2C.37	36 x 36	36 x 36	—	—	—	—
Merge	W4-1	2C.45	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Thru Traffic Merge Right	W4-1aT	2C.45	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Lane Ends	W4-2	2C.47	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Added Lane	W4-3	2C.46	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Cross Traffic Does Not Stop (plaque)	W4-4P	2C.66	24 x 12	24 x 12	36 x 18	—	—	48 x 24
Traffic From Left (Right) Does Not Stop (plaque)	W4-4aP	2C.66	24 x 12	24 x 12	36 x 18	—	—	48 x 24
Oncoming Traffic Does Not Stop (plaque)	W4-4bP	2C.66	24 x 12	24 x 12	36 x 18	—	—	48 x 24
Entering Roadway Merge	W4-5	2C.45	36 x 36	36 x 36	48 x 48	48 x 48	—	—
No Merge Area (plaque)	W4-5aP	2C.45	18 x 24	18 x 24	24 x 30	24 x 30	—	—
Entering Roadway Added Lane	W4-6	2C.46	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Heavy Merge from Right (Left)	W4-7	2C.49	36 x 36	36 x 36	48 x 48	48 x 48	—	

* The minimum size required for diamond-shaped warning signs facing traffic on multi-lane conventional roads shall be 36" x 36" per Section 2C.03.

** The minimum size for diamond-shaped warning signs on state-maintained conventional roads should be 36" x 36". All other signs and plaques on state-maintained conventional roadways should use the multi-lane size as a standard.

Notes:

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

Table 2C-1. Warning Sign and Plaque Sizes (Sheet 2 of 5)

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Minimum	Oversized
			Single Lane	**Multi-Lane				
Single Lane Transition	W4-8	2C.48	36 x 36	36 x 36	36 x 36	48 x 48	—	48 x 48
Road Narrows	W5-1	2C.17	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Narrow Bridge	W5-2	2C.18	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Narrow Underpass	W5-2a	2C.18	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	
One Lane Bridge	W5-3	2C.19	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
One Lane Underpass	W5-3a	2C.19	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	
Divided Highway	W6-1	2C.20	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Divided Highway Ends	W6-2	2C.21	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Two-Way Traffic	W6-3	2C.51	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Two-Way Traffic (3-Lane)	W6-5	2C.52	36 x 36	36 x 36	48 x 48	—	—	—
Two-Way Traffic (3-Lane)	W6-5a	2C.52	36 x 36	36 x 36	48 x 48	—	—	—
Hill	W7-1	2C.14	30 x 30*	36 x 36	36 x 36	36 x 36	24 x 24*	48 x 48
Hill with Grade	W7-1a	2C.14	30 x 30*	36 x 36	36 x 36	36 x 36	24 x 24*	48 x 48
Use Low Gear (plaque)	W7-2P	2C.64	24 x 18	24 x 18	—	—	—	—
Trucks Use Lower Gear (plaque)	W7-2bP	2C.64	24 x 18	24 x 18	—	—	—	—
XX% Grade (plaque)	W7-3P	2C.64	24 x 18	24 x 18	—	—	—	—
Next XX Miles (plaque)	W7-3aP	2C.61	24 x 18	24 x 18	—	—	—	—
XX% Grade, XX Miles (plaque)	W7-3bP	2C.64	24 x 18	24 x 18	—	—	—	—
Runaway Truck Ramp XX Miles	W7-4	2C.15	84 x 48	84 x 48	120 x 72	120 x 72	—	—
Runaway Truck Ramp Entrance Direction	W7-4b	2C.15	84 x 54	84 x 54	120 x 78	120 x 78	—	—
Truck Escape Ramp	W7-4c	2C.15	78 x 60	78 x 60	78 x 60	78 x 60	—	—
Sand, Gravel, Paved (plaques)	W7-4dP, 4eP,4fP	2C.15	24 x 12	24 x 12	24 x 12	24 x 12	—	—
Hill Blocks View	W7-6	2C.16	30 x 30*	36 x 36	36 x 36	—	—	48 x 48
Hill Blocks View (plaque)	W7-6PT	2C.64A	24 x 18	24 x 18	24 x 18	—	—	—
Bump or Dip	W8-1,2	2C.26	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Pavement Ends	W8-3	2C.28	36 x 36	36 x 36	48 x 48	—	30 x 30*	—
Soft Shoulder	W8-4	2C.29	36 x 36	36 x 36	48 x 48	48 x 48	24 x 24*	48 x 48
Slippery When Wet	W8-5	2C.30	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Road Condition (plaques)	W8-5P,5bP,5cP	2C.30	24 x 18	24 x 18	30 x 24	36 x 30	—	36 x 30
Ice (plaque)	W8-5aP	2C.30	24 x 12	24 x 12	30 x 18	30 x 18	—	—
Truck Crossing	W8-6	2C.54	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Loose Gravel	W8-7	2C.30	36 x 36	36 x 36	36 x 36	—	24 x 24*	48 x 48
Loose Sand	W8-7aT	2C.30	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24	48 x48

* The minimum size required for diamond-shaped warning signs facing traffic on multi-lane conventional roads shall be 36" x 36" per Section 2C.03.

**** The minimum size for diamond-shaped warning signs on state-maintained conventional roads should be 36" x 36". All other signs and plaques on state-maintained conventional roadways should use the multi-lane size as a standard.**

Notes:

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

Table 2C-1. Warning Sign and Plaque Sizes (Sheet 3 of 5)

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Minimum	Oversized
			Single Lane	**Multi-Lane				
Rough Road	W8-8	2C.30	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Low Shoulder	W8-9	2C.29	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Uneven Lanes	W8-11	2C.30	36 x 36	36 x 36	36 x 36	48 x 48	—	48 x 48
No Center Line	W8-12	2C.32	36 x 36	36 x 36	36 x 36	48 x 48	—	—
Bridge May Ice in Cold Weather	W8-13aT	2C.30	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Fallen Rocks	W8-14	2C.30	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Grooved Pavement	W8-15	2C.31	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Motorcycle (plaque)	W8-15aP	2C.31	24 x 18	24 x 18	30 x 24	36 x 30	—	36 x 30
Metal Bridge Deck	W8-16	2C.31	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Shoulder Drop-Off	W8-17	2C.29	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Shoulder Drop-Off (plaque)	W8-17P	2C.29	24 x 18	24 x 18	30 x 24	36 x 30	—	36 x 30
Road May Flood	W8-18	2C.34	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Water Crossing	W8-18aT	2C.34	36 x 36	36 x 36	36 x 36	48 x 48	—	48 x 48
When Flooded Turn Around Don't Drown	W8-18bT	2C.34	48 x 48	48 x 48	48 x 48	48 x 48	—	48 x 48
Depth Gauge	W8-19	2C.34	12 x 72	12 x 72	—	—	—	—
Flood Gauge (plaque)	W8-19aPT	2C.34	18 x 12	18 x 12	—	—	—	—
Gusty Winds Area	W8-21	2C.34	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Fog Area	W8-22	2C.34	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
No Shoulder	W8-23	2C.29	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Shoulder Ends	W8-25	2C.29	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Road Ends	W8-26	2C.24	30 x 30	36 x 36	—	—	—	—
Street Ends	W8-26a	2C.24	30 x 30	36 x 36	—	—	—	—
Road Ends	W8-26T	2C.24	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Right (Left) Lane Ends	W9-1	2C.47	36 x 36	36 x 36	36 x 36	48 x 48	30 x 30*	48 x 48
Lanes Merge	W9-4	2C.48	36 x 36	36 x 36	36 x 36	48 x 48	30 x 30*	48 x 48
Right (Left) Lane for Exit Only	W9-7	2C.50	60 x 36	60 x 36	96 x 60	132 x 72	—	—
Bicycle	W11-1	2C.54	30 x 30	30 x 30	36 x 36	—	—	48 x 48
Pedestrian	W11-2	2C.55	30 x 30*	36 x 36	36 x 36	—	—	48 x 48
Large Animals	W11-3,4,16,17, 18,19,20,21,22	2C.55	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Farm Vehicle	W11-5	2C.54	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Snowmobile	W11-6	2C.55	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Equestrian	W11-7	2C.55	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Emergency Vehicle	W11-8	2C.54	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Handicapped	W11-9	2C.55	30 x 30*	36 x 36	36 x 36	—	—	48 x 48
Truck	W11-10	2C.54	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48

* The minimum size required for diamond-shaped warning signs facing traffic on multi-lane conventional roads shall be 36" x 36" per Section 2C.03.

** The minimum size for diamond-shaped warning signs on state-maintained conventional roads should be 36" x 36". All other signs and plaques on state-maintained conventional roadways should use the multi-lane size as a standard.

Notes:

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

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Table 2C-1. Warning Sign and Plaque Sizes (Sheet 4 of 5)

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Minimum	Oversized
			Single Lane	**Multi-Lane				
Golf Cart	W11-11	2C.54	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Emergency Signal Ahead (plaque)	W11-12P	2C.54	36 x 30	36 x 30	36 x 30	—	—	—
Watch for Emergency Vehicles	W11-12T	2C.54	36 x 36	36 x 36	36 x 36	—	—	—
Horse-Drawn Vehicle	W11-14	2C.54	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Trail Crossing	W11-15	2C.54	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Trail Crossing	W11-15a	2C.54	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Trail Crossing (plaque)	W11-15P	2C.54	24 x 18	24 x 18	30 x 24	—	—	36 x 30
Double Arrow	W12-1	2C.23	30 x 30*	36 x 36	36 x 36	—	—	—
Clearance Advance	W12-2	2C.25	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Clearance Overhead	W12-2a	2C.25	84 x 24	84 x 24	84 x 24	84 x 24	—	—
Clearance - Lane Overhead	W12-2b	2C.25	96 x 24	96 x 24	96 x 24	96 x 24	—	—
Low Clearance (plaque)	W12-2PT	2C.25	24 x 18	24 x 18	24 x 18	24 x 18	—	—
Low Clearance X Miles Ahead	W12-4T	2C.25	Varies x 36	Varies x 36	—	—	—	—
Advisory Speed (plaque)	W13-1P	2C.59	18 x 18	18 x 18	24 x 24	30 x 30	—	30 x 30
Advisory Speed Confirmation (plaque)	W13-1aP	2C.59	48 x 15	48 x 15	60 x 18	60 x 18	48 x 15	72 x 24
Advisory Exit or Ramp Speed	W13-2,3	2C.12	24 x 30	24 x 30	36 x 48	48 x 60	—	48 x 60
On Ramp (plaque)	W13-4P	2C.12A	—	—	36 x 36	36 x 36	—	—
Ramp (plaque)	W13-4aPT	2C.25	—	—	36 x 18	36 x 18	—	—
Combination Horizontal Alignment/Advisory Exit or Ramp Speed Loop	W13-6,7,8,9	2C.12	24 x 42	24 x 42	36 x 66	36 x 66	—	48 x 84
Combination Horizontal Alignment/Advisory Exit or Ramp Speed Turn	W13-10,11	2C.12	24 x 36	24 x 36	36 x 54	36 x 54	—	48 x 72
Combination Horizontal Alignment/Advisory Exit or Ramp Speed - Truck Rollover	W13-12,13	2C.12	24 x 42	24 x 42	36 x 66	36 x 66	—	48 x 84
Vehicle Speed Feedback Sign	W13-20	2C.13	24 x 30	30 x 36	36 x 48	48 x 60	—	—
Vehicle Speed Feedback (plaque)	W13-20aP	2C.13	24 x 18	30 x 24	36 x 30	48 x 36	—	—
Dead End, No Outlet	W14-1,2	2C.24	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Dead End, No Outlet (with arrow)	W14-1a,2a	2C.24	36 x 9	36 x 9	—	—	24 x 6	—
No Passing Zone	W14-3	2C.53	48 x 48 x 36	48 x 48 x 36	64 x 64 x 48	64 x 64 x 48	40 x 40 x 30	64 x 64 x 48
Playground	W15-1	2C.56	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
In Road (plaque)	W16-1P	2C.67	18 x 12	18 x 12	24 x 18	—	—	24 x 18

* The minimum size required for diamond-shaped warning signs facing traffic on multi-lane conventional roads shall be 36" x 36" per Section 2C.03.

** The minimum size for diamond-shaped warning signs on state-maintained conventional roads should be 36" x 36". All other signs and plaques on state-maintained conventional roadways should use the multi-lane size as a standard.

Notes:

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

Table 2C-1. Warning Sign and Plaque Sizes (Sheet 5 of 5)

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Minimum	Oversized
			Single Lane	**Multi-Lane				
In Street (plaque)	W16-1aP	2C.67	18 x 12	18 x 12	24 x 18	—	—	24 x 18
XX Feet (2-line plaque)	W16-2P	2C.61	24 x 18	24 x 18	30 x 24	30 x 24	—	30 x 24
XX Ft (1-line plaque)	W16-2aP	2C.61	24 x 12	24 x 12	—	—	—	30 x 18
XX Miles (2-line plaque)	W16-3P	2C.61	30 x 24	30 x 24	—	—	—	—
XX Miles (1-line plaque)	W16-3aP	2C.61	36 x 12	36 x 12	—	—	—	—
Next XX Feet (plaque)	W16-4P	2C.61	30 x 24	30 x 24	—	—	—	—
Supplemental Arrow (plaque)	W16-5P,6P	2C.62	21 x 15	21 x 15	—	—	—	30 x 21
Diagonal Downward Arrow (plaque)	W16-7P	2C.63	21 x 15	21 x 15	—	—	—	30 x 21
Dual Downward Diagonal Arrow (plaque)	W16-7aP	2C.63	21 x 15	21 x 15	—	—	—	30 x 21
Advance Street Name (1-line plaque)	W16-8P	2C.65	Varies x 8	Varies x 8	—	—	—	—
Advance Street Name (2-line plaque)	W16-8aP	2C.65	Varies x 15	Varies x 15	—	—	—	—
Ahead (plaque)	W16-9P	2C.55	24 x 12	24 x 12	30 x 18	—	—	30 x 18
Traffic Circle (plaque)	W16-12P	2C.41	24 x 18	24 x 18	—	—	—	—
Roundabout (plaque)	W16-12aP	2C.41	24 x 12	24 x 12	—	—	—	—
When Flashing (plaque)	W16-13P	2C.55	24 x 18	24 x 18	30 x 24	—	—	—
New (plaque)	W16-15P	2C.60	24 x 12	24 x 12	—	—	—	—
Notice (plaque)	W16-18P	2A.11	24 x 12	24 x 12	—	—	—	—
Except Bicycles (plaque)	W16-20P	2C.68	24 x 12	24 x 12	—	—	—	—
XX Miles (plaque)	W16-22PT	2B.64	Varies x 12	Varies x 12	—	—	—	—
Bridge (plaque)	W16-23PT	2B.64	Varies x 12	Varies x 12	—	—	—	—
Speed Hump	W17-1	2C.27	30 x 30*	36 x 36	—	—	24 x 24*	48 x 48
Rock Slides, Earth Slides	W17-11T, 12T	2C.30	36 x 36	36 x 36	36 x 36	48 x 48	—	—
Watch for Smoke on Road	W17-14T	2C.34	36 x 36	36 x 36	36 x 36	48 x 48	—	—
Watch for Mud on Road	W17-15T	2C.30	36 x 36	36 x 36	36 x 36	48 x 48	—	—
No Traffic Signs	W18-1	2C.33	30 x 30*	36 x 36	—	—	24 x 24*	36 x 36
Freeway Ends XX Miles	W19-1	2C.22	—	—	—	144 x 48	—	—
Freeway Ends	W19-3	2C.22	—	—	—	48 x 48	—	—
All Traffic Must Exit	W19-5	2C.22	—	—	90 x 48	90 x 48	—	—
New Traffic Pattern Ahead	W23-2	2C.38	36 x 36	36 x 36	—	—	—	—
New Signal Operation Ahead	W23-2a	2C.38	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Oncoming Traffic Has (May Have) Extended Green	W25-1,2	2C.44	24 x 30	24 x 30	—	—	—	—
Watch for Stopped Traffic	W26-1	2C.39	36 x 36	36 x 36	48 x 48	48 x 48	—	—

* The minimum size required for diamond-shaped warning signs facing traffic on multi-lane conventional roads shall be 36" x 36" per Section 2C.03.

** The minimum size for diamond-shaped warning signs on state-maintained conventional roads should be 36" x 36". All other signs and plaques on state-maintained conventional roadways should use the multi-lane size as a standard.

Notes:

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

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Section 2C.03 Size of Warning Signs and Plaques

Standard:

01 **Except as provided in Section 2A.07, the sizes for warning signs shall be as shown in Table 2C-1.**

Support:

02 Section 2A.07 contains information regarding the applicability of the various columns in Table 2C-1.

Standard:

03 **Except as provided in Paragraph 5 of this Section, the minimum size for all diamond-shaped warning signs facing traffic on a multi-lane conventional road where the posted speed limit is higher than 35 mph shall be 36 x 36 inches.**

04 **The minimum size for supplemental warning plaques that are not included in Table 2C-1 shall be as shown in Table 2C-2.**

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

Size of Warning Sign	Size of Supplemental Plaque			
	Rectangular			Square
	1 Line	2 Lines	Arrow	
24 x 24	24 x 12	24 x 18	21 x 15	18 x 18
30 x 30				
36 x 36	30 x 18	30 x 24	30 x 21	24 x 24
48 x 48				

Notes:

1. Larger supplemental plaques may be used when appropriate.

2. Dimensions are shown as width x height, in inches.

Option:

05 If a diamond-shaped warning sign is placed on the left-hand side of a multi-lane roadway to supplement the installation of the same warning sign on the right-hand side of the roadway, the minimum size identified in the Single Lane column in Table 2C-1 may be used.

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

Guidance:

07 *The minimum size for all diamond-shaped warning signs facing traffic on exit and entrance ramps at major interchanges connecting an Expressway or Freeway with an Expressway or Freeway (see Section 2E.11) should be the size identified in Table 2C-1 for the mainline roadway classification (Expressway or Freeway). If a minimum size is not provided in the Freeway column, the Expressway size should be used. If a minimum size is not provided in the Freeway or the Expressway column, the Oversized size should be used.*

08 *The minimum size for all diamond-shaped warning signs facing traffic on exit and entrance ramps at all other interchanges (see Section 2E.11) should be 36 x 36 inches.*

09 *The typical size of warning signs used on low-volume rural roads with operating speeds of 30 mph or less should be in accordance with the minimum column of Table 2C-1.*

Section 2C.04 Placement of Warning Signs

Support:

01 Information on the placement of warning signs is contained in Sections 2A.13 through 2A.18.

02 The time needed for detection, recognition, decision, and reaction is called the Perception-Response Time (PRT). Table 2C-3 is provided as an aid for determining warning sign location. The distances shown in Table 2C-3 can be adjusted for roadway features, other signing, and to improve visibility.

Guidance:

03 *Warning signs should be placed so that they provide an adequate PRT. The distances contained in Table 2C-3 should be applied with engineering judgment.*

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

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

Table 2C-3. Guidelines for Advance Placement of Warning Signs

Posted or 85th-Percentile Speed	Advance Placement Distance[1] (ft)																	
	Condition A: Speed reduction and lane changing in heavy traffic[2]	Condition B: Deceleration to the listed advisory speed (mph) for the condition																
		0[3]	5[4]	10[4]	15[4]	20[4]	25[4]	30[4]	35[4]	40[4]	45[4]	50[4]	55[4]	60[4]	65[4]	70[4]	75[4]	80[4]
20 mph	225	115	N/A[5]	N/A[5]	N/A[5]	—	—	—	—	—	—	—	—	—	—	—	—	—
25 mph	325	155	N/A[5]	N/A[5]	N/A[5]	N/A[5]	—	—	—	—	—	—	—	—	—	—	—	—
30 mph	460	200	N/A[5]	N/A[5]	N/A[5]	N/A[5]	N/A[5]	—	—	—	—	—	—	—	—	—	—	—
35 mph	565	250	N/A[5]	N/A[5]	N/A[5]	N/A[5]	N/A[5]	N/A[5]	—	—	—	—	—	—	—	—	—	—
40 mph	670	305	200	100	100	100	100	N/A[5]	N/A[5]	—	—	—	—	—	—	—	—	—
45 mph	775	360	250	125	125	100[6]	100[6]	100[6]	100[6]	N/A[5]	—	—	—	—	—	—	—	—
50 mph	885	425	325	200	200	175	150	125	125	100[6]	N/A[5]	—	—	—	—	—	—	—
55 mph	990	495	400	275	250	225	225	200	175	125	100[6]	N/A[5]	—	—	—	—	—	—
60 mph	1,100	570	475	350	350	325	300	275	250	200	150	100[6]	N/A[5]	—	—	—	—	—
65 mph	1,200	645	550	450	425	400	375	350	325	275	250	200	150	100[6]	—	—	—	—
70 mph	1,250	730	625	525	525	500	475	450	425	375	325	275	225	150	100[6]	—	—	—
75 mph	1,350	820	725	625	625	600	575	550	525	475	425	375	325	250	175	100[6]	—	—
80 mph	1,475	910	825	725	725	700	675	625	600	550	500	450	400	350	275	200	125	—
85 mph	1,600	1,010	925	825	825	800	775	750	725	675	625	575	525	450	375	300	225	150

1 The distances are adjusted for a sign legibility distance of 180 feet for Condition A. The distances for Condition B (with the exception of the potential stop condition) have been adjusted for a sign legibility distance of 250 feet, which is appropriate for an alignment warning symbol sign. For Conditions A and B, warning signs with less than 6-inch legend or more than four words, a minimum of 100 feet should be added to the advance placement distance to provide adequate legibility of the warning sign.

2 Typical conditions are locations where the road user must use extra time to adjust speed and change lanes in heavy traffic because of a complex driving situation. Typical signs are Merge and Lane Ends. The distances are determined by providing the driver a PRT of 14.0 to 14.5 seconds for vehicle maneuvers (2018 AASHTO Policy, Table 3-3, Decision Sight Distance, Avoidance Maneuver E) and adjusted for a legibility distance of 180 feet for the appropriate sign. Rev. 1

3 Typical condition is the warning of a potential stop situation. Typical signs are Stop Ahead, Yield Ahead, Signal Ahead, and Intersection Warning signs. The distances are based on the 2018 AASHTO Policy, Table 3-1, Stopping Sight Distance, providing a PRT of 2.5 seconds, a deceleration rate of 11.2 feet/second^2.

4 Typical conditions are locations where the road user must decrease speed to maneuver through the warned condition. Typical signs are Turn, Curve, Reverse Turn, or Reverse Curve. The distance is determined by providing a 2.5 second PRT, a vehicle deceleration rate of 10 feet/second^2, and adjusted for a sign legibility distance of 250 feet.

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

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

Note: Warning signs that advise road users about conditions that are not related to a specific location, such as Deer Crossing or SOFT SHOULDER, can be installed in an appropriate location, based on engineering judgment.

HORIZONTAL ALIGNMENT WARNING SIGNS AND PLAQUES

Section 2C.05 Horizontal Alignment Warning Signs – General

Support:

01 A variety of horizontal alignment warning signs (see Figure 2C-1), pavement markings (see Chapter 3B), and delineation (see Chapter 3G) can be used to advise motorists of a change in the roadway alignment. Uniform application of these traffic control devices with respect to the amount of change in the roadway alignment conveys a consistent message establishing driver expectancy and promoting effective roadway operations. The design and application of horizontal alignment warning signs to meet those requirements are addressed in Sections 2C.05 through 2C.12.

02 The following list identifies treatments that might be used in advance of or within a change in horizontal alignment:

A. Horizontal alignment (Turn (W1-1), Curve (W1-2, W1-10 series, W1-11, W1-13, W1-15), Reverse Turn (W1-3), Reverse Curve (W1-4), Winding Road (W1-5), Exit Speed (W13-2), Ramp Speed (W13-3), and Combination Horizontal Alignment (Advisory Exit or Ramp Speed W13-6 through W13-11)) signs (see Sections 2C.07, 2C.09, and 2C.12)
B. Advisory Speed (W13-1P) plaque (see Section 2C.59)
C. Chevron Alignment (W1-8) signs (see Section 2C.08)
D. Delineators (see Chapter 3G)
E. One-Direction Large Arrow (W1-6) sign (see Section 2C.10)
F. Raised Retroreflective Pavement Markers (see Sections 3B.15 through 3B.17)
G. Sign or marking conspicuity enhancements (see Section 2A.11)
H. Wide edge lines (see Section 3A.04)
I. Pavement word, symbol and arrow markings (symbol or words) (see Sections 3B.20 through 3B.22)
J. Rumble strips (see Chapter 3K)
K. Vehicle Speed Feedback Sign (see Section 2C.13)
L. Speed reduction markings (see Section 3B.28)

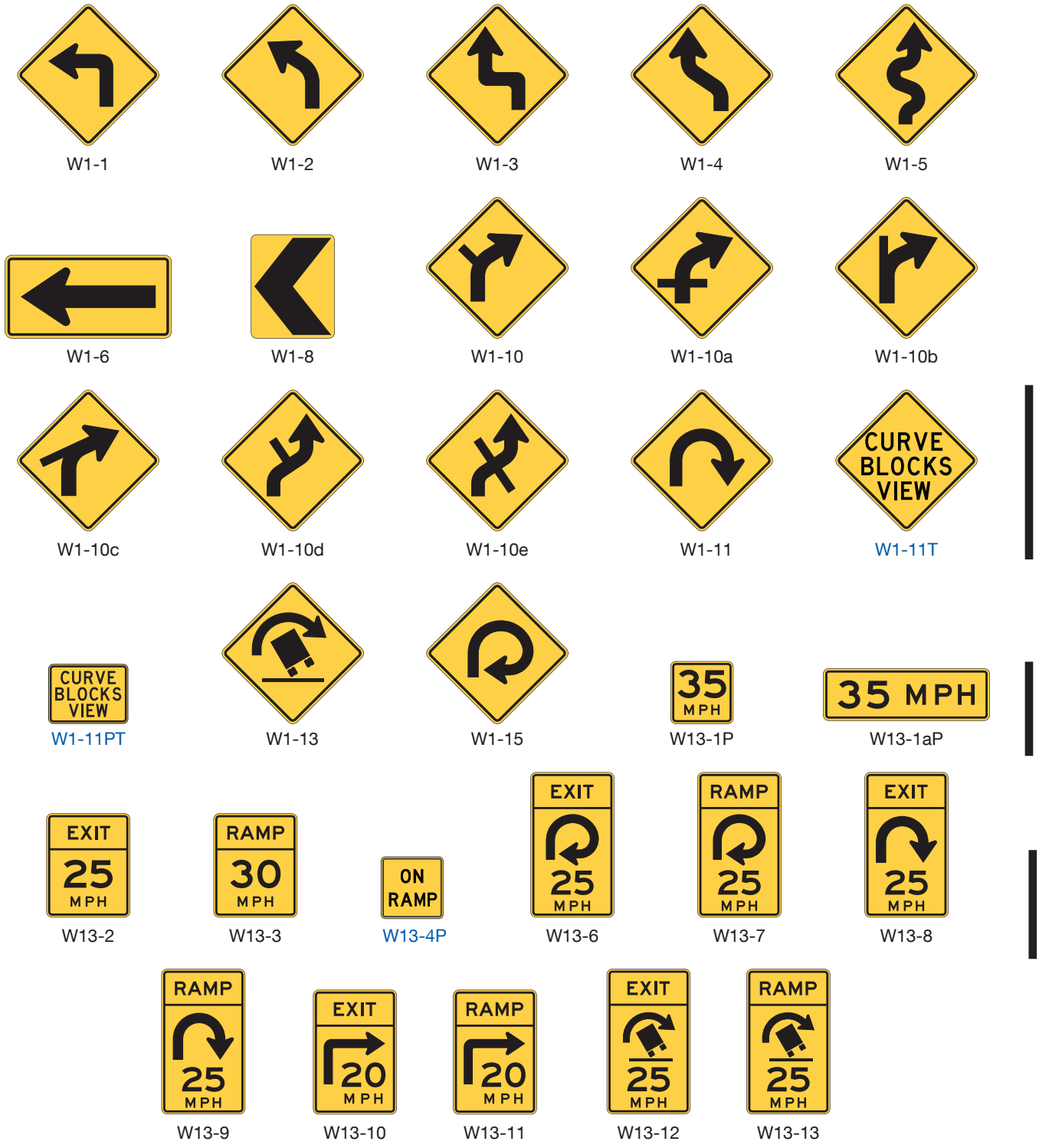
03 In addition, considerations other than traffic control devices, such as improved surface friction (high friction surface treatments), pavement edge treatments, lighting improvements, increased superelevation, and rumble strips, might be used in advance of or within a change in horizontal alignment.

Guidance:

04 *Except as provided in Section 2C.06, the selection of traffic control devices used to warn road users of a change in horizontal alignment or to provide guidance in navigating the change in horizontal alignment should be based on consideration of one or more of the following factors:*

A. The speed of traffic on the approach to the change in horizontal alignment
B. The recommended advisory speed for the change in horizontal alignment
C. The difference between the speed limit and the advisory speed, or the speed differential for the change in horizontal alignment
D. Daily traffic volumes on the roadway
E. The typical mix of vehicle types on the roadway
F. Sight distance throughout the change in horizontal alignment
G. Other types of traffic control devices that are used in advance of and within the change in horizontal alignment on the same roadway segment
H. The crash history of the change in horizontal alignment
I. The presence of driveways or intersections within the curve radius
J. Roadway geometry of the change in horizontal alignment

Figure 2C-1. Horizontal Alignment Signs and Plaques



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

Section 2C.06 Device Selection for Changes in Horizontal Alignment

Standard:

01 **The criteria shown in Chart A of Table 2C-4 shall be used to determine the need for devices for changes in horizontal alignment. If the use of a device or devices is indicated by Chart A of Table 2C-4, then Chart B of Table 2C-4 shall be used to specify the type(s) of devices to be used in advance of, and/or along, a horizontal curve, except as provided in Paragraphs 3, 5, and 6 of this Section. The speed differential in Chart B of Table 2C-4 shall be the difference between the horizontal curve's advisory speed and the roadway's posted speed limit, statutory speed limit, or the 85th percentile speed on the approach to the curve. (See Section 2C.59 for the use of the Advisory Speed Plaque.)** Rev. 1

Support:

02 Chart A of Table 2C-4 represents existing AADT, type of roadway, and whether or not there are existing markings.

Option:

03 Additional or supplemental devices may be used for a change in horizontal alignment on the basis of engineering judgment.

04 Devices for changes in horizontal alignment may be omitted when the speed limit on the approach to an alignment change is 20 mph or less.

05 Devices for changes in horizontal alignment may be omitted on urban streets with an AADT of 1,000 vehicles per day or less. Rev. 1

Support:

06 For purposes of selecting traffic control devices for changes in horizontal alignment, an arterial or collector is considered to have pavement markings when either a center line, edge lines, or both are present. Warrants for center lines and edge lines are provided in Sections 3B.02 and 3B.10, respectively.

Table 2C-4. Application of Traffic Control Devices for Changes in Horizontal Alignment

A - Determination of the Need for Devices for Changes in Horizontal Alignment[1]

Roadway Type	AADT			
	Less than 1,000	1,000-2,999	3,000-3,999	Greater than 3,999
Freeways and Expressways	Required	Required	Required	Required
Arterial or Collector without Pavement Markings[2]	Optional	Recommended	Required	Required
Arterial or Collector with Pavement Markings[2]	Optional	Recommended	Recommended	Required
All other roadways	Optional	Optional	Optional	Optional

[1] If devices are determined to be needed, the selection of the device(s) is based on Chart B below.

[2] An arterial or collector is considered to have pavement markings when either a center line, edge lines, or both are present.

B - Selection of Devices for Changes in Horizontal Alignment

Speed Differential[3]	Devices for Change in Horizontal Alignment[3]
5 mph	Pavement markings or advance horizontal alignment warning sign on paved roadways. Advance horizontal alignment warning sign on unpaved roadways.[4, 6]
10 mph	Advance horizontal alignment warning sign[6]
15 mph	Delineators[5] and advance horizontal alignment warning sign[6]
20 mph or more	Chevrons[5] and advance horizontal alignment warning sign[6]

[3] The provisions for the use of Horizontal Alignment warning signs and devices are contained in Section 2C.06. The need for devices is determined by Chart A above.

[4] A roadway is considered to have pavement markings when either a center line, edge lines, or both are present.

[5] Section 2C.10 contains information about the use of a One-Direction Large Arrow (W1-6) sign in place of or to supplement delineators and chevrons.

[6] The need for an Advisory Speed Plaque (W13-1P) is determined by Chart C below.

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C - Use of Advisory Speed Plaque for Horizontal Alignment Changes

Speed Differential	Use of Advisory Speed Plaque (W13-1P)[7]
5 mph	Optional
10 mph	Recommended
15 mph or more	Required

[7] See Section 2C.59

Section 2C.07 Horizontal Alignment Signs (W1-1 through W1-5, W1-11, W1-11T, and W1-15)

Standard:

01 **If Table 2C-4 indicates that a horizontal alignment sign (see Figure 2C-1) is required, recommended, or allowed, the sign installed in advance of the curve shall be a Curve (W1-2) sign unless a different sign is recommended or allowed by the provisions of this Section.**

Guidance:

02 *A Turn (W1-1) sign should be used instead of a Curve (W1-2) sign in advance of a horizontal curve that has an advisory speed of 30 mph or less.*

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

Support:

04 Figure 2C-2 provides examples of warning signs used for turns and curves.

Option:

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

06 A NEXT XX MILES (W7-3aP) supplemental distance plaque (see Section 2C.61) may be installed below the Winding Road sign where continuous roadway curves exist for a specific distance.

07 If the curve has a change in horizontal alignment of 135 degrees or more, the Hairpin Curve (W1-11) sign may be used instead of a Turn or Curve sign.

08 If the curve has a change of direction of approximately 270 degrees, such as on a cloverleaf interchange ramp, the 270-degree Loop (W1-15) sign may be used instead of a Turn or Curve sign.

Guidance:

09 *When the Hairpin Curve sign or the 270-degree Loop sign is installed, either a One-Direction Large Arrow (W1-6) sign or Chevron Alignment (W1-8) signs should be installed on the outside of the turn or curve.*

Option:

10 The CURVE BLOCKS VIEW (W1-11T) sign (see Figure 2C-1) may be used in advance of a horizontal curve to advise road users to reduce speed as they approach, as only limited stopping sight distance is available.

Guidance:

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

Support:

12 Section 2C.64A provides an optional CURVE BLOCKS VIEW (W1-11PT) supplemental plaque for use with a horizontal alignment sign.

Figure 2C-2. Examples of Warning Signs for Changes in Horizontal Alignment (Sheet 1 of 2)

A – Curve

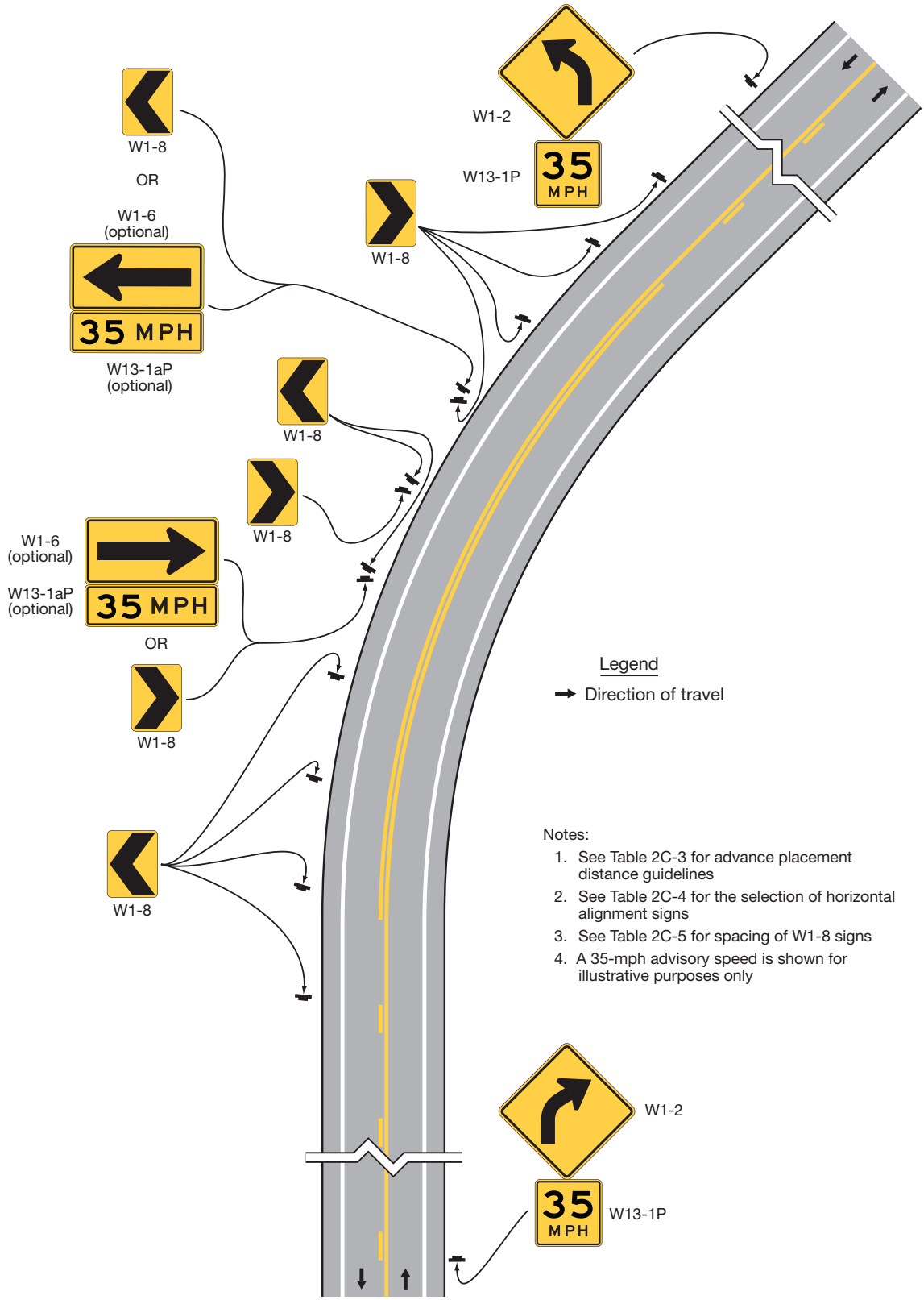
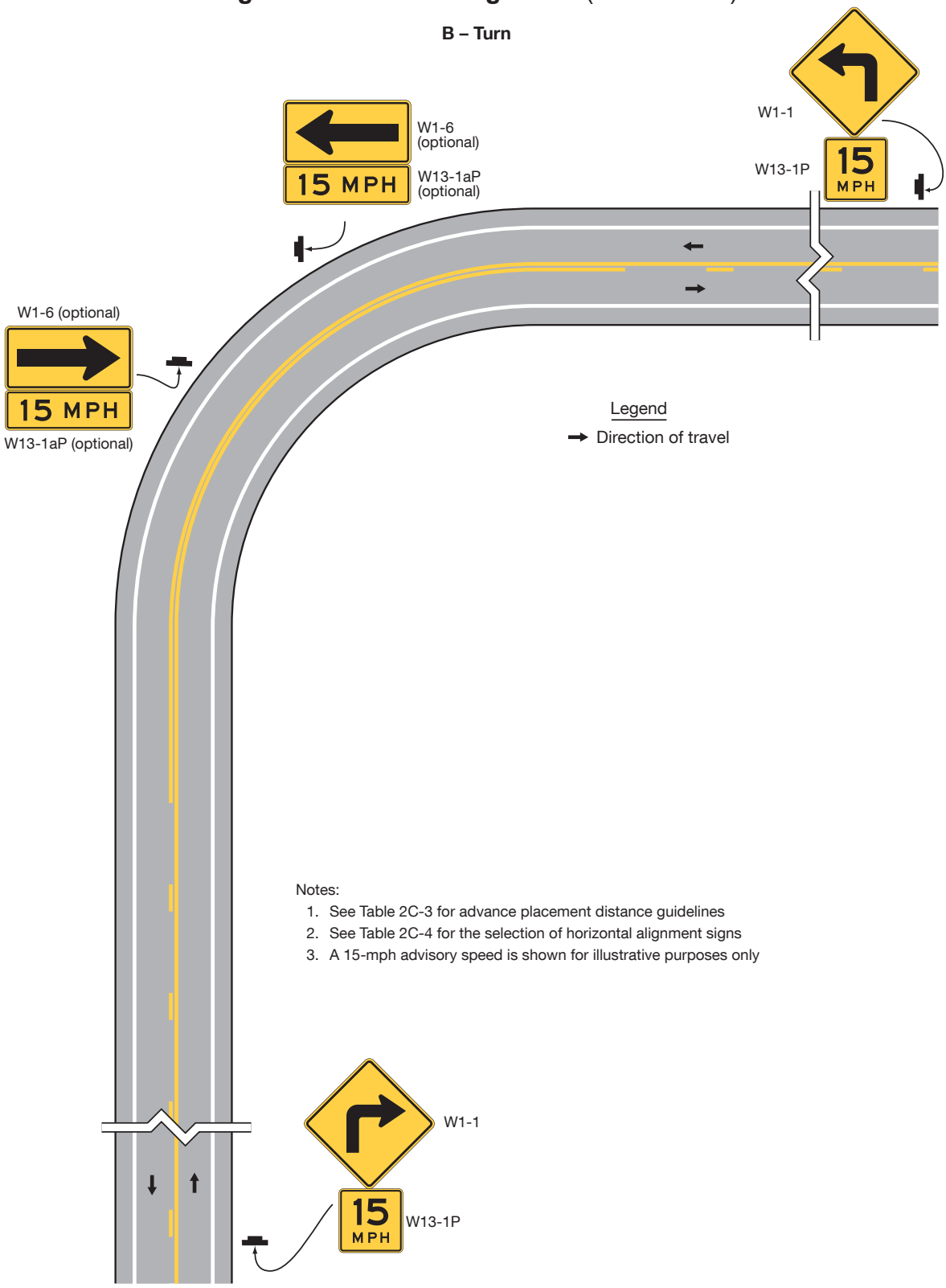


Figure 2C-2. Examples of Warning Signs for Changes in Horizontal Alignment (Sheet 2 of 2)



Notes:

1. See Table 2C-3 for advance placement distance guidelines
2. See Table 2C-4 for the selection of horizontal alignment signs
3. A 15-mph advisory speed is shown for illustrative purposes only

Section 2C.08 Chevron Alignment Sign (W1-8)

Standard:

01 **The use of the Chevron Alignment (W1-8) sign (see Figures 2C-1 and 2C-2) to provide additional emphasis and guidance for a change in horizontal alignment shall be in accordance with the information shown in Table 2C-4.**

Option:

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

Standard:

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

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

Guidance:

05 *The approximate spacing of Chevron Alignment signs on the turn or curve measured from the point of curvature (PC) should be as shown in Table 2C-5.*

06 *The Chevron Alignment signs should be visible for a sufficient distance to provide the road user with adequate time to react to the change in alignment.*

Table 2C-5. Typical Spacing of Chevron Alignment Signs on Horizontal Curves

Advisory Speed	Curve Radius	Sign Spacing
20 to 30 mph		80 feet
50 to 60 mph	701 to 1,250 feet	160 feet

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

Option:

07 LEDs may be used to enhance the conspicuity of Chevron Alignment signs (see Section 2A.12).

Standard:

08 **The LEDs used in the Chevron Alignment sign shall consist of yellow LEDs outlining the chevron symbol.**

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

10 **Chevron Alignment signs shall not be used to mark obstructions within or adjacent to the roadway, including the beginning of guardrails or barriers, as this is the function of an object marker (see Section 2C.70).**

11 **Chevron Alignment signs directing traffic to the right shall not be used in the central island of a roundabout or a neighborhood traffic circle.**

Section 2C.09 Combination Horizontal Alignment/Intersection Signs (W1-10 Series)

Option:

01 The Turn (W1-1) sign, the Curve (W1-2) sign, and the Reverse Curve (W1-4) sign may be combined with the Cross Road (W2-1) sign or the Side Road (W2-2 or W2-3) sign to create a combination Horizontal Alignment/Intersection (W1-10 series) sign (see Figure 2C-1) that depicts the condition where an intersection occurs within or immediately adjacent to a turn or curve.

Support:

02 Section 2C.65 contains information about the use of an advance street name plaque to identify an intersecting road.

Guidance:

03 *Elements of the combination Horizontal Alignment/Intersection sign related to horizontal alignment should comply with the provisions of Section 2C.07, and elements related to intersection configuration should comply with the provisions of Section 2C.41. The symbol design should approximate the configuration of the intersecting roadway(s). No more than one Cross Road or two Side Road symbols should be displayed on any one combination Horizontal Alignment/Intersection sign.*

Standard:

04 **The use of the combination Horizontal Alignment/Intersection sign shall be in accordance with the provisions of Section 2C.07 for the appropriate Turn or Curve sign.**

Section 2C.10 One-Direction Large Arrow Sign (W1-6)

Option:

01 A One-Direction Large Arrow (W1-6) sign may be used to supplement a Turn (W1-1) or Reverse Turn (W1-3) sign (see Figure 2C-2) to emphasize the abrupt curvature.

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

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A. Site conditions limit the number of delineators or Chevron Alignment signs that are visible; or
B. The number of delineators or Chevron Alignment signs that can be installed within the chnage in horizontal alignment is less than the number determined by spacing specified in Sections 2C.08 or 3G.04.

Standard:

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

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

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

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

Guidance:

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

Section 2C.11 Truck Rollover Sign (W1-13)

Option:

01 A Truck Rollover (W1-13) sign (see Figure 2C-1) may be used as a supplement to a horizontal alignment warning sign to warn drivers of vehicles with a high center of gravity, such as trucks, tankers, and recreational vehicles, of a curve or turn where there are:

A. Past incidents of truck rollovers at the specific location,
B. High volumes of trucks, or
C. A speed differential (see Section 2C.06) that might pose a greater risk for vehicles with high centers of gravity.

Guidance:

02 *Where engineering judgment determines the need for the installation of a Truck Rollover (W1-13) sign, it should be located downstream of the horizontal alignment warning sign in advance of the curve.*

Standard:

03 **If a Truck Rollover (W1-13) sign is used, it shall be accompanied by an Advisory Speed (W13-1P) plaque indicating the recommended speed for vehicles with a higher center of gravity.**

Option:

04 The Truck Rollover sign may include conspicuity enhancements, or may be a blank-out sign, activated by the detection of an approaching vehicle with a high center of gravity that is traveling in excess of the recommended speed for the condition.

Support:

05 The curved arrow on the Truck Rollover sign shows the direction of roadway curvature. The truck tips in the opposite direction.

Section 2C.12 Advisory Exit and Ramp Speed Signs (W13-2 and W13-3) and Combination Horizontal Alignment/Advisory Exit and Ramp Speed Signs (W13-6 through W13-13)

Standard:

01 **Where an advisory speed is posted in advance of a freeway or expressway exit, the Advisory Exit Speed (W13-2) sign (see Figure 2C-1) shall be used.**

02 **Where an advisory speed is posted in advance of a conventional road ramp or to another roadway or roadside facility, the Advisory Ramp Speed (W13-3) sign (see Figure 2C-1) shall be used.**

03 **An Advisory Exit Speed or Advisory Ramp Speed sign shall be used when the difference between the mainline roadway speed limit and the exit or ramp advisory speed in the vicinity of the departure is 20 mph or greater.**

Guidance:

04 *An Advisory Exit Speed or Advisory Ramp Speed sign should be used when the difference between the mainline roadway speed limit and the exit or ramp advisory speed in the vicinity of the departure is 15 mph.*

Option:

05 An Advisory Exit Speed or Advisory Ramp Speed sign may be used based on engineering judgment when the difference between the mainline roadway speed limit and the exit or ramp advisory speed in the vicinity of the departure is 10 mph or less.

06 The Combination Horizontal Alignment/Advisory Exit Speed (W13-6, W13-8, and W13-10) signs (see Figure 2C-1) may be used in lieu of the Advisory Exit Speed (W13-2) sign, and the combination Horizontal Alignment/Advisory Ramp Speed (W13-7, W13-9, and W13-11) signs (see Figure 2C-1) may be used in lieu of the Advisory Ramp Speed (W13-3) sign.

07 The Combination Truck Rollover/Advisory Exit Speed and Truck Rollover/Advisory Ramp Speed (W13-12 and W13-13) signs (see Figure 2C-1) may be used in lieu of the W13-2 and W13-3 signs respectively if the tip over condition is in the vicinity of the gore.

Standard:

08 **Roadway geometrics represented on the Combination Horizontal Alignment/Advisory Exit and Combination Horizontal Alignment/Advisory Ramp Speed signs (see Figure 2C-1) shall be limited to the standard signs shown in this Manual.**

Guidance:

09 *If used, the Advisory Exit Speed sign or the Combination Horizontal Alignment/Advisory Exit Speed sign should be installed along the deceleration lane. The Advisory Exit Speed or the Combination Horizontal Alignment/Advisory Exit Speed signs should be visible in time for the road user to decelerate and make an exiting maneuver.*

10 *Regulatory Speed Limit signs (see Section 2B.21) should not be located in the vicinity of exit ramps or deceleration lanes, particularly where they will conflict with the advisory speed displayed on the Advisory Exit or Ramp Speed signs.*

Support:

11 Section 2C.06 contains provisions for the determination of the displayed advisory speed.

12 Table 2C-3 lists recommended advance sign placement distances for deceleration to various advisory speeds.

Option:

13 Where there is a need to remind road users of the recommended advisory speed, a horizontal alignment warning sign with an advisory speed plaque displaying the same advisory speed may be installed at a downstream location along the ramp.

Guidance:

14 *If the ramp curvature changes to the extent that it warrants a lower advisory speed, a horizontal alignment warning sign with the new advisory speed should be displayed in advance of the change in curvature.*

Option:

15 The One-Direction Large Arrow (W1-6) sign may be installed beyond the exit gore on the outside of the curve to provide additional warning of an immediate change in curvature. When used in conjunction with the exit speed, the One-Direction Large Arrow (W1-6) sign may be supplemented with a Confirmation Advisory Speed (W13-1aP) plaque (see Figure 2C-1) when the plaque is not used with the Exit Gore (E5-1 series) sign.

Guidance:

16 *The horizontal alignment symbol displayed on the Combination Horizontal Alignment/Advisory Exit and Ramp Speed signs should be consistent with the horizontal geometry of the ramp.*

Support:

17 Examples of advisory speed signing for exit ramps are shown in Figure 2C-3.

Figure 2C-3. Examples of Exit Ramp Advisory Speed and Other Warning Signs (Sheet 1 of 5)

A – Loop ramp with constant controlling curvature along ramp proper

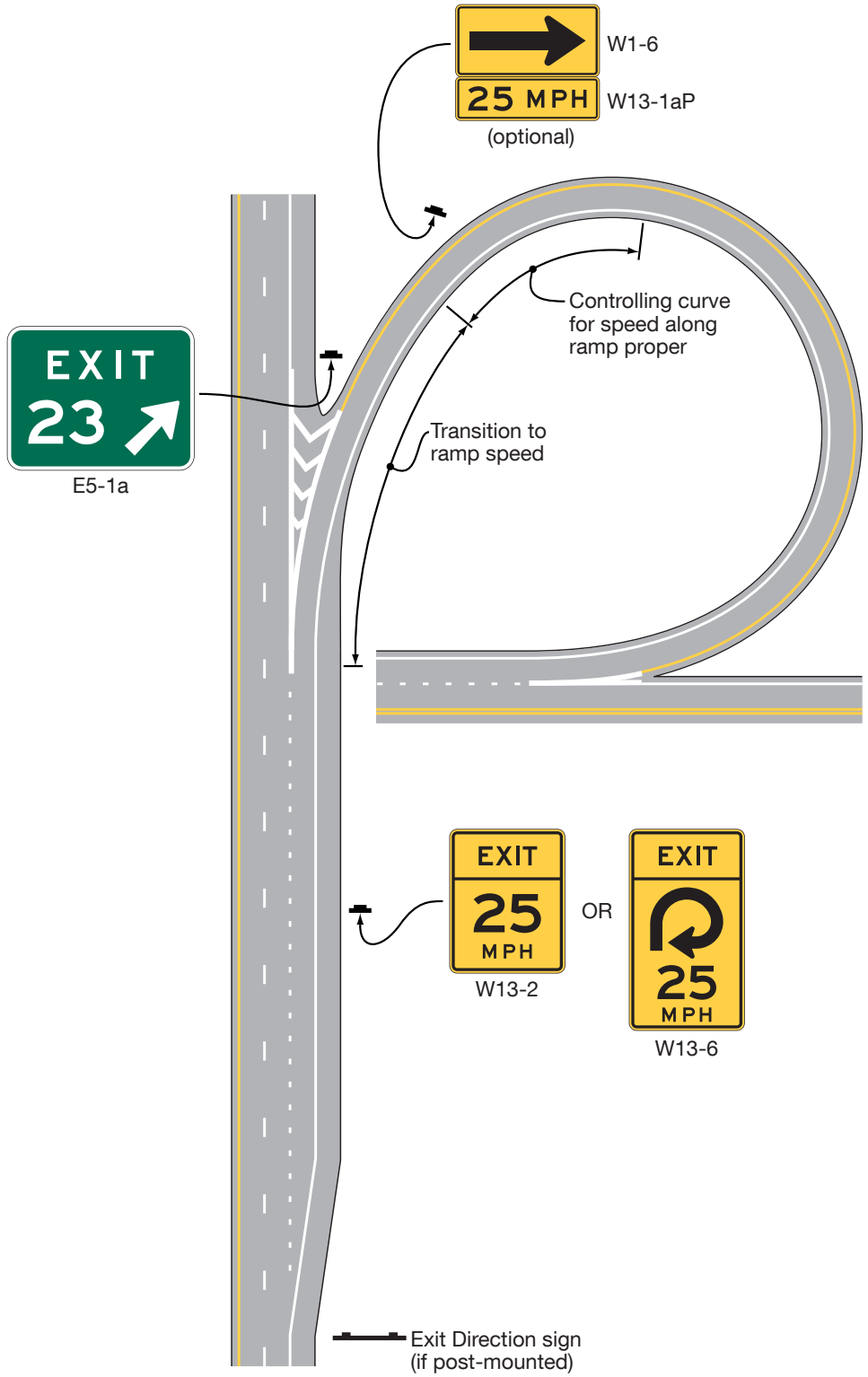
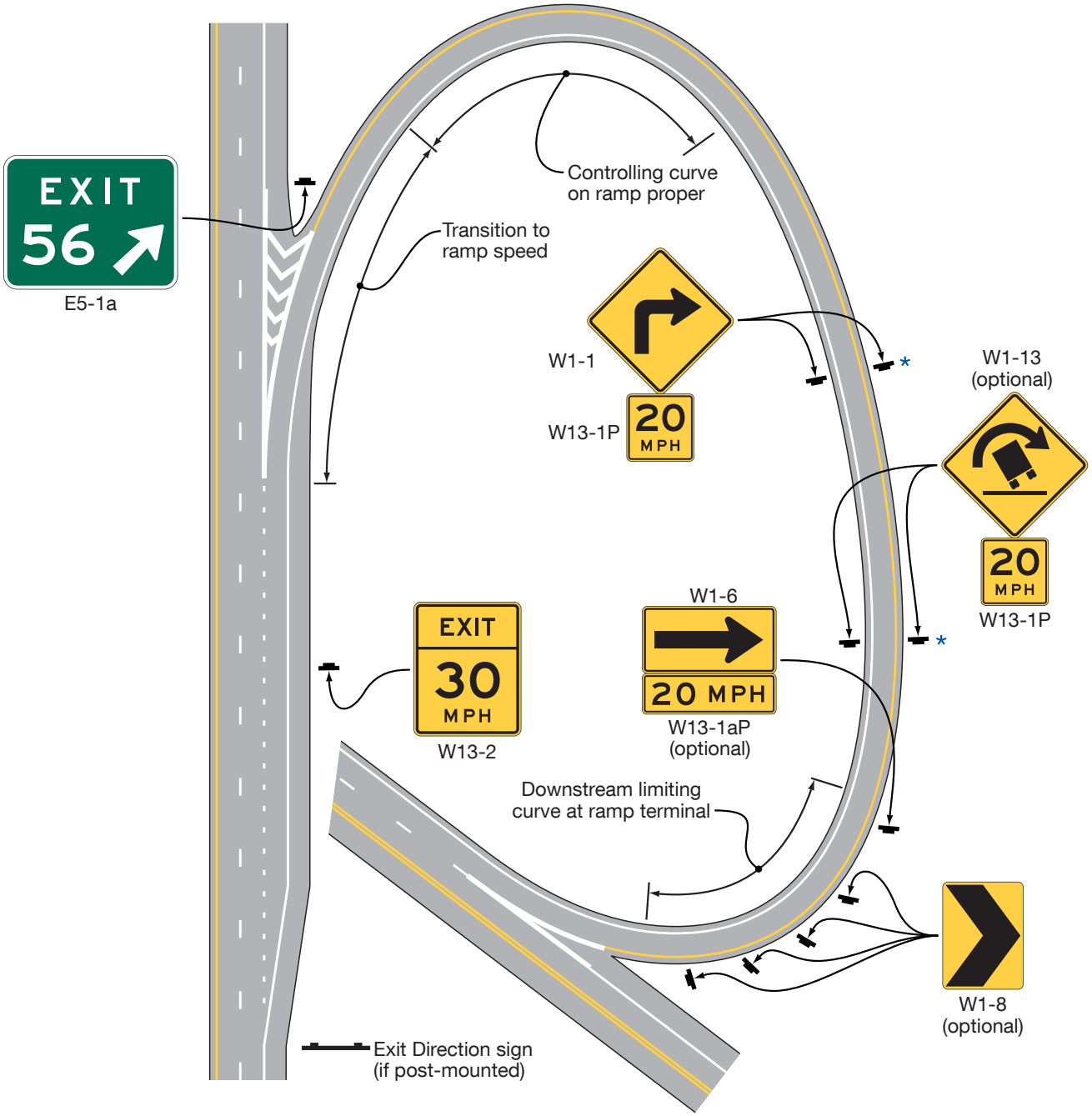


Figure 2C-3. Examples of Exit Ramp Advisory Speed and Other Warning Signs (Sheet 2 of 5)

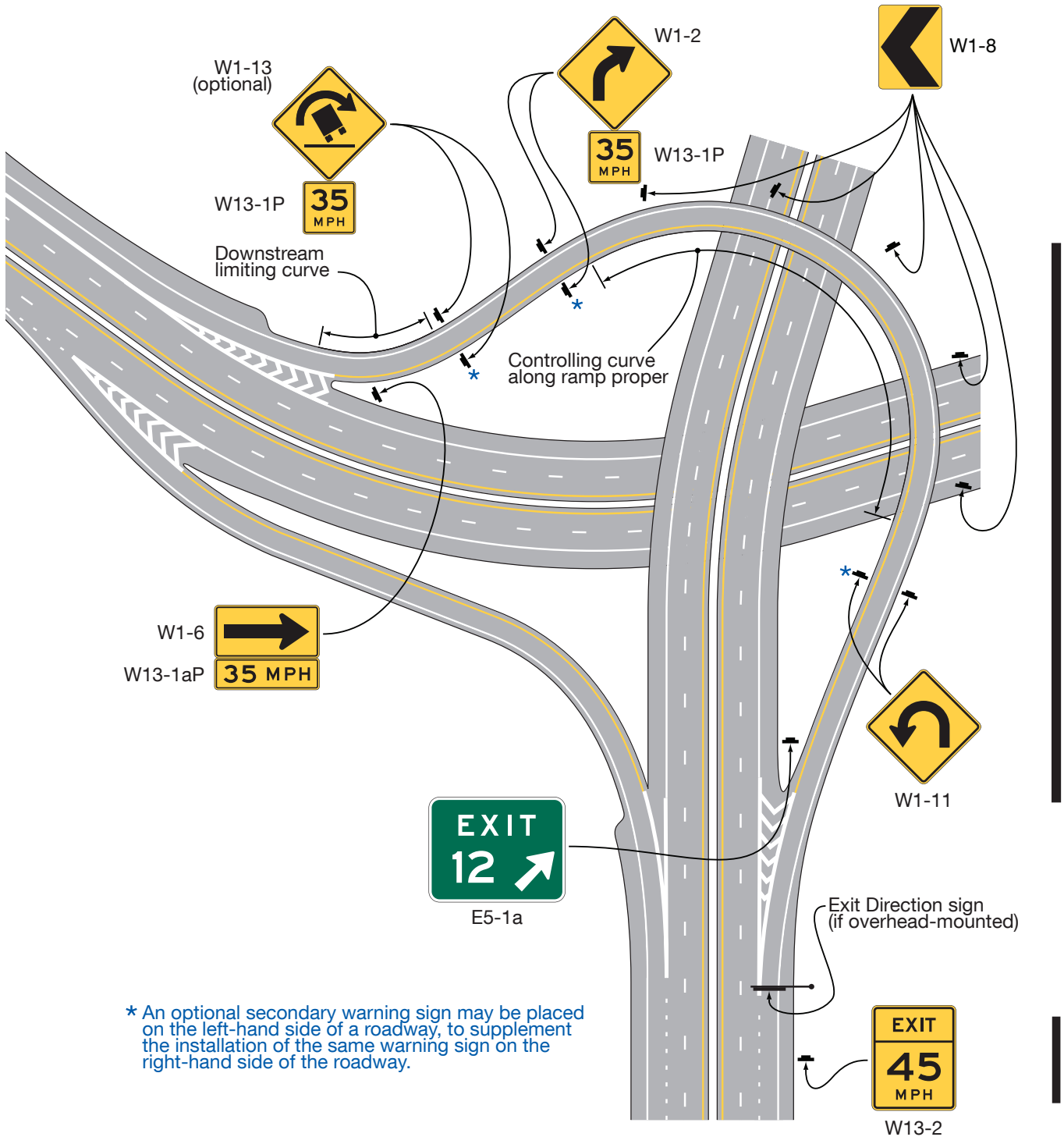
B – Loop ramp with downstream limiting curvature



* An optional secondary warning sign may be placed on the left-hand side of a roadway, to supplement the installation of the same warning sign on the right-hand side of the roadway.

Figure 2C-3. Examples of Exit Ramp Advisory Speed and Other Warning Signs (Sheet 3 of 5)

C – Directional ramp



* An optional secondary warning sign may be placed on the left-hand side of a roadway, to supplement the installation of the same warning sign on the right-hand side of the roadway.

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Figure 2C-3. Examples of Exit Ramp Advisory Speed and Other Warning Signs (Sheet 4 of 5)

D – Diagonal ramp

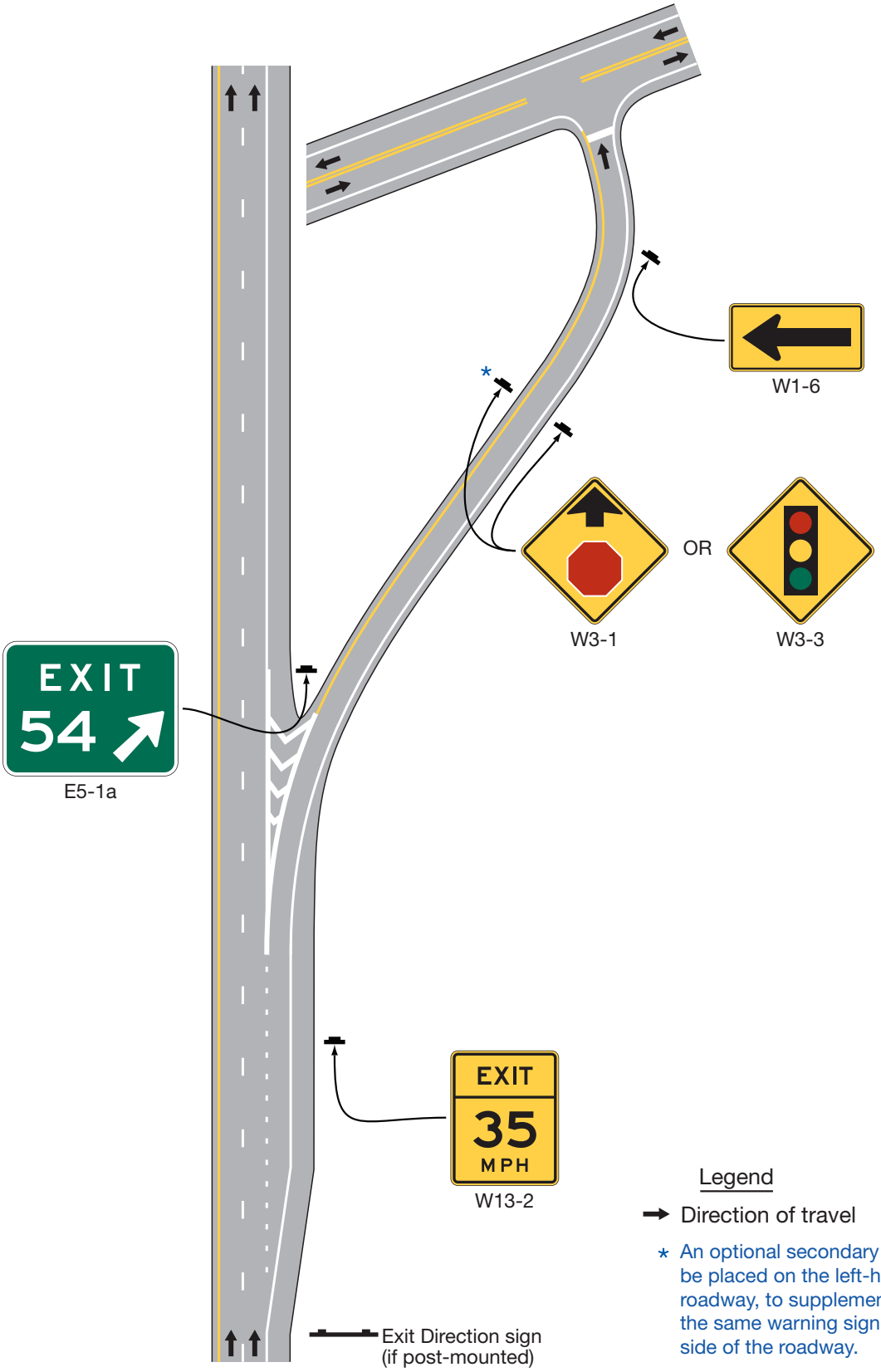
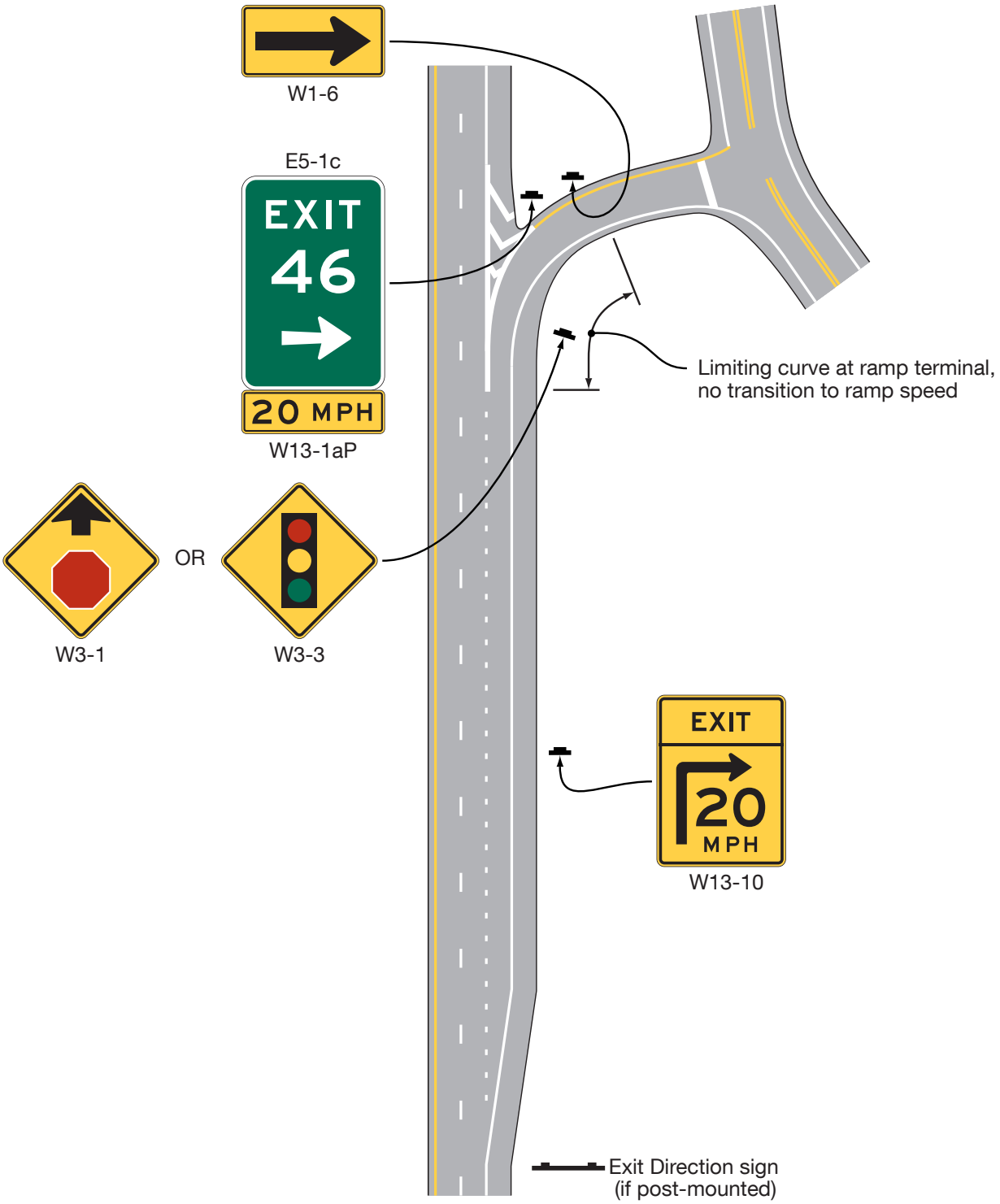


Figure 2C-3. Examples of Exit Ramp Advisory Speed and Other Warning Signs (Sheet 5 of 5)

E – Short ramp length with limiting curve near ramp terminal



Section 2C.12A ON RAMP Plaque (W13-4P)

Guidance:

01 *When a warning sign is used for a condition on a ramp, the ON RAMP (W13-4P) plaque (see Figure 2C-1) should be used to supplement that advance warning sign.*

Section 2C.13 Vehicle Speed Feedback Sign and Plaque (W13-20 and W13-20aP)

Support:

01 A Vehicle Speed Feedback (W13-20) sign or (W13-20aP) plaque (see Figure 2C-4) that displays the speed of an approaching vehicle to the vehicle operator are sometimes used to provide warning to drivers of their speed in relation to either a speed limit (R2-1) sign or a horizontal alignment warning sign assembly with a posted advisory speed.

Figure 2C-4. Vehicle Speed Feedback Sign and Plaque



W13-20 W13-20aP

Standard:

02 **The Vehicle Speed Feedback (W13-20aP) plaque shall only be mounted below a Speed Limit (R2-1) sign (see Section 2B.21) to display the speed of an approaching vehicle in relation to the posted speed limit.**

03 **The Vehicle Speed Feedback (W13-20) sign shall only be an independent installation near the point of curvature of a horizontal curve (see Section 2C.06) to supplement the advisory speed that is displayed with the horizontal alignment warning sign.**

04 **The legend YOUR SPEED shall be a black legend on a yellow retroreflective background, except as provided in Sections 6H.01 and 7B.01. The changeable legend displaying the speed of the approaching vehicle shall be a yellow luminous legend on a black opaque background. The vehicle speed displayed on the changeable portion of the sign shall be displayed as an integer. The Vehicle Speed Feedback sign and plaque shall not flash, strobe, change color, or use other animated elements integrated into the changeable legend display. When no vehicles are approaching, the changeable display shall not display a legend.**

Guidance:

05 *The changeable portion of the Vehicle Speed Feedback legend should be approximately the same height, width, and stroke of those on the Speed Limit sign it supplements or is mounted below.*

06 *When a W13-20aP plaque is used with a Speed Limit sign it should be approximately the same width as the Speed Limit sign it is mounted below.*

VERTICAL GRADE WARNING SIGNS AND PLAQUES

Section 2C.14 Hill Signs (W7-1 and W7-1a)

Guidance:

01 *The Hill (W7-1) sign (see Figure 2C-5) should be used in advance of a downgrade where the length, percent of grade, horizontal curvature, and/or other physical features require special precautions on the part of road users.*

02 *The Hill sign and supplemental grade (W7-3P) plaque (see Figure 2C-5 and Section 2C.64) used in combination, or the W7-1a sign used alone, should be installed in advance of downgrades for the following conditions:*

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

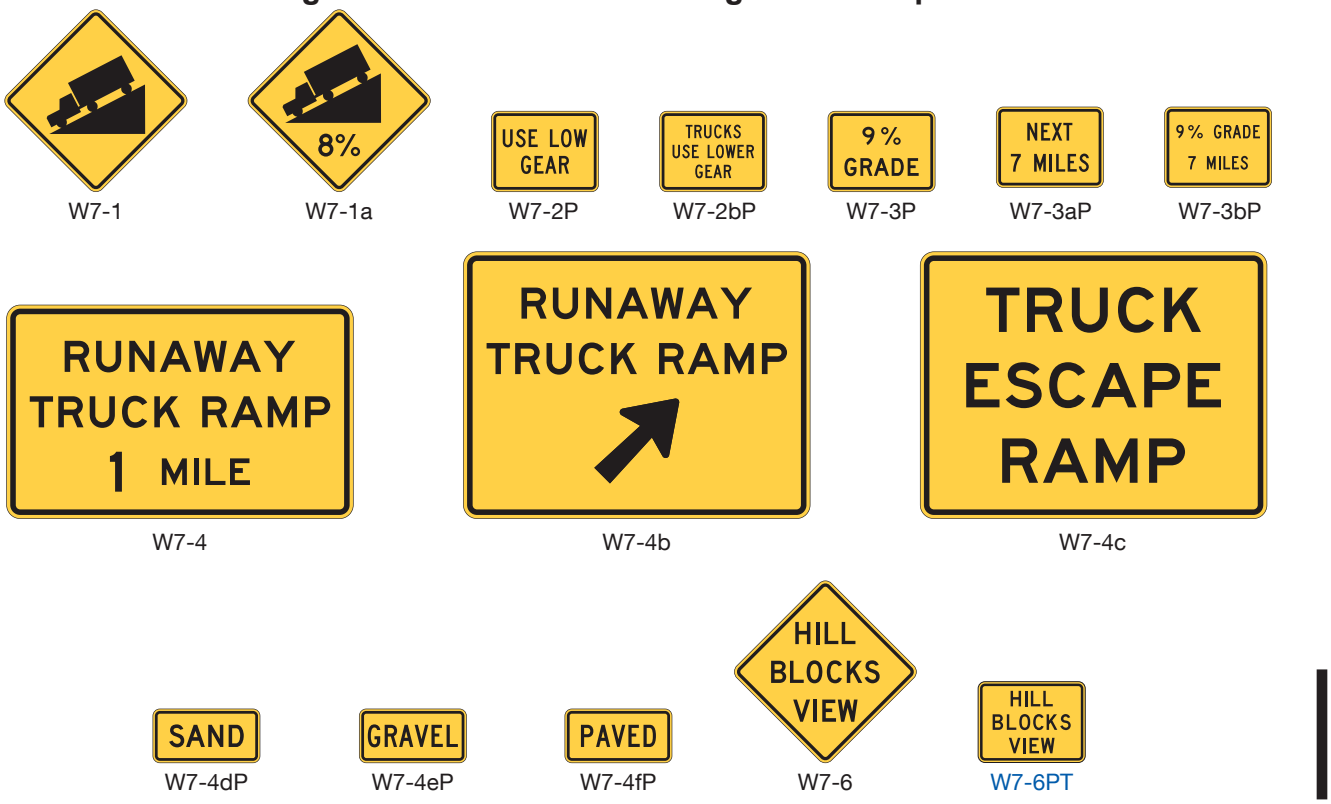
03 *These signs should also be installed for steeper grades or where crash experience and field observations indicate a need.*

04 *Supplemental plaques (see Sections 2C.57 and 2C.64) and larger signs should be used for emphasis or where special hill characteristics exist. On longer grades, the use of the Hill sign with a distance (W7-3aP) plaque or the combination distance/grade (W7-3bP) plaque (see Figure 2C-5) at periodic intervals of approximately 1-mile spacing should be considered.*

Option:

05 A USE LOW GEAR (W7-2P) or TRUCKS USE LOWER GEAR (W7-2bP) supplemental plaque (see Figure 2C-5) may be used to indicate a situation where downshifting as well as braking might be advisable.

Figure 2C-5. Vertical Grade Signs and Plaques



W7-1 W7-1a W7-2P W7-2bP W7-3P W7-3aP W7-3bP

W7-4 W7-4b W7-4c

W7-4dP W7-4eP W7-4fP W7-6 W7-6PT

Section 2C.15 Truck Escape Ramp Signs (W7-4 Series)

Guidance:

01 *Where applicable, truck escape (or runaway truck) ramp advance warning signs (see Figure 2C-5) should be located approximately 1 mile and approximately ½ mile in advance of the grade, and of the escape ramp. An additional W7-4b or W7-4c sign should be placed at the gore.*

02 *A RUNAWAY VEHICLES ONLY (R4-10) sign (see Section 2B.41) should be installed near the escape ramp entrance to discourage other road users from entering the ramp. No Parking (R8-3) signs should be placed near the ramp entrance.*

Standard:

03 **When truck escape ramps are installed, at least one of the W7-4 series signs shall be used.**

Option:

04 A SAND (W7-4dP), GRAVEL (W7-4eP), or PAVED (W7-4fP) supplemental plaque (see Figure 2C-5) may be used to describe the ramp surface. State and local highway agencies may develop appropriate word message signs for the specific situation.

Section 2C.16 HILL BLOCKS VIEW Sign (W7-6)

Option:

01 A HILL BLOCKS VIEW (W7-6) sign (see Figure 2C-5) may be used on the approach to a crest vertical curve where the vertical curvature provides inadequate stopping sight distance at the posted speed limit.

Guidance:

02 *When a vertical curve results in a sight distance obstruction to a specific condition beyond the crest of the vertical curve, the warning sign for the specific condition beyond the vertical crest should be used rather than the HILL BLOCKS VIEW sign.*

03 *When a HILL BLOCKS VIEW sign is used, it should be supplemented by an Advisory Speed (W13-1P) plaque (see Figure 2C-1) indicating the recommended speed for traveling over the hillcrest based on available stopping sight distance.*

Support:

04 Section 2C.64A provides an optional HILL BLOCKS VIEW (W7-6PT) plaque, for use with a horizontal alignment sign.

ROADWAY GEOMETRY WARNING SIGNS

Section 2C.17 ROAD NARROWS Sign (W5-1)

Guidance:

01 *Except as provided in Paragraph 2 of this Section, a ROAD NARROWS (W5-1) sign (see Figure 2C-6) should be used in advance of a transition on two-lane roads where the pavement width is reduced abruptly to a width such that vehicles traveling in opposite directions cannot simultaneously travel through the narrow portion of the roadway without reducing speed.*

Option:

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

03 Additional emphasis may be provided by the use of object markers and delineators (see Sections 2C.70 through 2C.73 and Chapter 3G). The Advisory Speed (W13-1P) plaque (see Figure 2C-1 and Section 2C.59) may be used to indicate the recommended speed.

Section 2C.18 NARROW BRIDGE and NARROW UNDERPASS Signs (W5-2 and W5-2a)

Guidance:

01 *A NARROW BRIDGE (W5-2) sign (see Figure 2C-6) should be used in advance of any bridge or culvert having a two-way roadway horizontal clearance of 16 to 18 feet, or any bridge or culvert having a roadway horizontal clearance less than the width of the approach travel lanes. Where these conditions exist for an underpass, a NARROW UNDERPASS (W5-2a) sign (see Figure 2C-6) should be used.*

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

Option:

03 A NARROW BRIDGE sign may be used in advance of a bridge or culvert on which the approach shoulders are narrowed or eliminated. Where these conditions exist for an underpass, a NARROW UNDERPASS sign may be used.

04 The NARROW BRIDGE or NARROW UNDERPASS sign may be omitted on low-volume rural roads where there is adequate sight distance to the bridge, culvert, or underpass on both approaches.

Figure 2C-6. Miscellaneous Warning Signs



Section 2C.19 ONE LANE BRIDGE and ONE LANE UNDERPASS Signs (W5-3 and W5-3a)

Guidance:

01 *A ONE LANE BRIDGE (W5-3) sign (see Figure 2C-6) should be used on two-way roadways in advance of any bridge or culvert:*

A. Having a roadway horizontal clearance of less than 16 feet, or

B. Having a roadway horizontal clearance of less than 18 feet when commercial vehicles constitute a high proportion of the traffic, or

C. Having a roadway horizontal clearance of 18 feet or less where the sight distance on the approach is less than that shown in Condition A of Table 2C-3.

02 *Where these conditions exist for an underpass, a ONE LANE UNDERPASS (W5-3a) sign (see Figure 2C-6) should be used.*

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

Option:

04 The ONE LANE BRIDGE or ONE LANE UNDERPASS sign may be omitted on low-volume rural roads where there is adequate sight distance to the bridge, culvert, or underpass on both approaches.

05 STOP (R1-1) or YIELD (R1-2) signs (see Sections 2B.04 and 2B.05) and related pavement markings (see Sections 3B.21 and 3B.22) may be used when conditions A, B, or C in Paragraph 1 of this Section apply.

Section 2C.20 Divided Highway Sign (W6-1)

Guidance:

01 *A Divided Highway (W6-1) sign (see Figure 2C-6) should be used on the approaches to a section of highway (not an intersection or junction) where the opposing flows of traffic are separated by a median or other physical barrier.*

Standard:

02 **The Divided Highway (W6-1) sign shall not be used instead of a Keep Right (R4-7 series) sign on the approach end of a median island.**

Section 2C.21 Divided Highway Ends Sign (W6-2)

Guidance:

01 *A Divided Highway Ends (W6-2) sign (see Figure 2C-6) should be used in advance of the end of a section of physically divided highway (not an intersection or junction) as a warning of two-way traffic ahead.*

02 *The Two-Way Traffic (W6-3) sign (see Section 2C.51) should be used to give warning and notice of the transition to a two-lane, two-way section.*

Section 2C.22 Freeway Ends Signs (W19 Series)

Option:

01 A FREEWAY ENDS XX MILES (W19-1) sign or a FREEWAY ENDS (W19-3) sign (see Figure 2C-6) may be used in advance of the end of a freeway.

02 The rectangular W19-1 sign may be post-mounted or may be mounted overhead for increased emphasis.

Guidance:

03 *If the reason that the freeway is ending is that the next portion of the freeway is not yet constructed and as a result all traffic must use an exit ramp to leave the freeway, an ALL TRAFFIC MUST EXIT (W19-5) sign (see Figure 2C-6) should be used in addition to the Freeway Ends signs in advance of the downstream end of the freeway.*

Section 2C.23 Double Arrow Sign (W12-1)

Option:

01 The Double Arrow (W12-1) sign (see Figure 2C-6) may be used to advise road users that traffic is permitted to pass on either side of an island, obstruction, or gore in the roadway. Traffic separated by this sign may either rejoin or change directions.

Guidance:

02 *If used on an island, the Double Arrow sign should be mounted near the approach end.*

03 *If used in front of a pier or obstruction, the Double Arrow sign should be mounted on the face of, or just in front of, the pier or obstruction. Where stripe markings are used on the pier or obstruction, they should be discontinued to leave a 3-inch space around the outside of the Double Arrow sign.*

Section 2C.24 DEAD END, NO OUTLET, and ROAD ENDS Signs (W14-1, W14-1a, W14-2, W14-2a, W8-26, W8-26a, and W8-26T)

Option:

01 The DEAD END (W14-1) sign (see Figure 2C-6) may be used at the entrance to a single road or street that terminates without intersecting another street. The NO OUTLET (W14-2) sign (see Figure 2C-6) may be used at the entrance to a road or road network from which there is no other exit.

02 DEAD END (W14-1a) or NO OUTLET (W14-2a) signs (see Figure 2C-6) may be used in combination with Street Name (D3-1) signs (see Section 2D.45) to warn turning traffic that the cross street ends in the direction indicated by the arrow.

03 At locations where the cross street does not have a name, a W14-1a or W14-2a sign may be used alone in place of a street name sign.

Guidance:

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

Standard:

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

Option:

06 The ROAD ENDS XX FT (W8-26) or STREET ENDS XX FT (W8-26a) sign (see Figure 2C-11) may be used on the approach to the end of a conventional road or street where the terminus is not apparent.

07 The ROAD ENDS (W8-26T) sign (see Figure 2C-11) may be installed upstream of the actual end of a roadway.

08 If a ROAD ENDS (W8-26T) sign is used, a Distance (W16-2P series or W16-3P series) plaque may be installed below the W8-26T sign.

Support:

09 Information about the use of Type 4 object markers to mark the end of the road or street is contained in Section 2C.73.

Standard:

10 **The W8-26 and W8-26a signs shall not be used in place of a W14-1 or W14-2 sign at the entrance to such a road or street.**

Support:

11 Section 2C.22 contains information on signs for use on the approach to the end of a freeway or expressway.

Section 2C.25 Clearance Signs (W12-2, W12-2PT, W12-2a, W12-2b, and W12-4T)

Standard:

01 **The Clearance Advance (W12-2) sign (see Figure 2C-6) shall be used to warn road users of vertical clearances less than 14 feet 6 inches, or vertical clearances less than 12 inches above the statutory maximum vehicle height, whichever is greater.**

Guidance:

02 *On state roadways, the Clearance Advance (W12-2) sign should also be used when clearance is less than or equal to 20 feet 0 inches.*

Support:

03 Vertical clearances greater than 20 feet 0 inches are not required to be signed.

Guidance:

04 *The Clearance Advance (W12-2) sign with a supplementary LOW CLEARANCE (W12-2PT) plaque (see Figure 2C-6), indicating low overhead clearance and showing the clearance at low bridges, underpasses, and other overhead structures—except overhead sign structures—should*

be used only in advance of points when the Clearance Advance (W12-2) sign legend is 14 feet 5 inches or less on state roadways.

05 *In determining the clearance to be shown on clearance signs, the measurement should be the minimum vertical clearance measured between the structure and the pavement surface rounded down to the nearest 1 inch minus 3 inches.*

06 *Clearances should be evaluated periodically to determine if additional low clearance signing is necessary, particularly when resurfacing operations have occurred, on routes onto which over-height vehicles are normally directed under the permit process, and structures that are susceptible to catastrophic failure when struck by over-height vehicles.*

07 *On expressways and freeways, the Clearance Advance (W12-2) sign should be installed far enough in advance of an exit ramp, in advance of the structure, to enable a vehicle or load higher than the vertical signed clearance to detour around the structure, if it is less than 20 feet 0 inches.*

Option:

08 The Clearance Advance (W12-2) sign may be used along with the diagonal arrow (W16-7P) plaque or RAMP (W13-4aPT) plaque (see Figure 2C-6) to warn of a low clearance that will be encountered immediately downstream of a ramp.

Guidance:

09 *The Clearance Advance (W12-2) sign with a supplemental distance (W16-3P, W16-3aP) plaque should also be placed at the nearest intersecting road or wide point in the road at which a vehicle can detour or turn around.*

10 *The LOW CLEARANCE X MILES AHEAD (W12-4T) sign should be used on state highways at such places that will enable a driver to detour to avoid the section of highway with a structure having vertical signed clearance less than 13 feet 6 inches.*

11 *Where the clearance is less than the legal limit of 14 feet 0 inches, a sign to that effect should be placed in advance of the nearest intersecting road or wide point in the road at which a vehicle can detour or turn around.*

Option:

12 The Clearance Overhead (W12-2a or W12-2b) sign (see Figure 2C-6) may be installed on or at the structure to supplement the advance warning sign.

Guidance:

13 *The Clearance Overhead (W12-2a) sign should be used on or at every structure that spans a State maintained roadway, except overhead sign structures, to show the vertical clearance of 20 feet or less.*

Option:

14 When the vertical signed clearance for a structure is higher than that of an upstream structure or structures and there are no points of access between the structures, clearance signing for the higher downstream structure may be omitted.

Guidance:

15 *Clearance signing should be omitted only where it would not be possible for a high load to reach these structures without having passed under a preceding structure with a lower clearance. In such cases, only one advance clearance warning sign is necessary to show the clearance applicable to the lowest structure in the group.*

Support:

16 For purposes of omitting clearance signing on conventional roads, driveways are considered as points of possible access.

Option:

17 In cases where physical conditions on a structure limit the width such that the W12-2a or W12-2b signs are physically unable to fit, a W12-2 sign may be installed overhead on the structure or post-mounted in front of the structure, in addition to the required W12-2 sign at the advance location.

Guidance:

18 *In the case of an arch, or other structure under which the clearance varies greatly, two or more Clearance Overhead (W12-2a or 12-2b) signs should be installed on the structure itself to give information as to the clearances over the low clearance portions of the roadway.*

Support:

19 In locations where an encroachment over the usable shoulder would drastically reduce the vertical clearance, as in the case of an arch or other structure under which the clearance varies greatly, two or more clearances may be shown; typically, one for the main travel lanes and one for the shoulder area. Normally, the lowest clearance posted should be the clearance posted on the Clearance Advance (W12-2) sign.

Standard:

20 **If used, the Clearance Overhead (W12-2b) sign shall be placed over a lane or shoulder to indicate the portion of the structure with low clearance if the posted clearance does not apply to the entire structure.**

Guidance:

21 *The vertical signed clearance shown on the Clearance Advance (W12-2) sign should match the clearance on the W12-2a or W12-2b sign or, if there are multiple W12-2b signs, should match the lowest clearance.*

Standard:

22 **Vertical clearance determination shall apply to the total lateral traveled way under the structure which includes usable flush medians and shoulders.**

Guidance:

23 *Where a rolled curb or elevated shoulder exists, clearances should not usually include the shoulder area.*

ROADWAY AND WEATHER-CONDITION WARNING SIGNS AND PLAQUES

Section 2C.26 BUMP and DIP Signs (W8-1 and W8-2)

Guidance:

01 *BUMP (W8-1) and DIP (W8-2) signs (see Figure 2C-7) should be used in advance of a sharp rise or depression in the profile of the road.*

Option:

02 These signs may be supplemented with an Advisory Speed plaque (see Figure 2C-1 and Section 2C.59).

Guidance:

03 *The DIP sign should not be used in advance of a short stretch of depressed alignment that might momentarily hide a vehicle.*

04 *A short stretch of depressed alignment that might momentarily hide a vehicle should be treated as a no-passing zone when center line striping is provided on a two-lane or three-lane road (see Section 3B.03).*

Section 2C.27 SPEED HUMP Sign (W17-1)

Guidance:

01 *The SPEED HUMP (W17-1) sign (see Figure 2C-7) should be used in advance of a vertical deflection in the roadway that is designed to limit the speed of traffic.*

02 *If used, the SPEED HUMP sign should be supplemented by an Advisory Speed plaque (see Figure 2C-1 and Section 2C.59).*

Option:

03 If a series of speed humps exists in close proximity, an Advisory Speed plaque may be eliminated on all but the first SPEED HUMP sign in the series.

04 The legend SPEED BUMP may be used instead of the legend SPEED HUMP on the W17-1 sign.

Support:

05 Speed humps generally provide more gradual vertical deflection than speed bumps. Speed bumps limit the speed of traffic more severely than speed humps. Other forms of speed humps include speed tables and raised crosswalks or intersections. However, these differences in engineering terminology are not well known by the public, so for signing purposes these terms are interchangeable.

06 Sections 3B.29 and 3B.30 contain information about the use of markings at and in advance of speed humps.

Section 2C.28 PAVEMENT ENDS Sign (W8-3)

Guidance:

01 *A PAVEMENT ENDS (W8-3) sign (see Figure 2C-7) should be used where a paved surface changes to either a gravel treated surface or an earth road surface.*

Option:

02 An Advisory Speed plaque (see Figure 2C-1 and Section 2C.59) may be used when the change in roadway condition requires a reduced speed.

Figure 2C-7. Roadway and Weather Condition Signs and Plaques (Sheet 1 of 2)

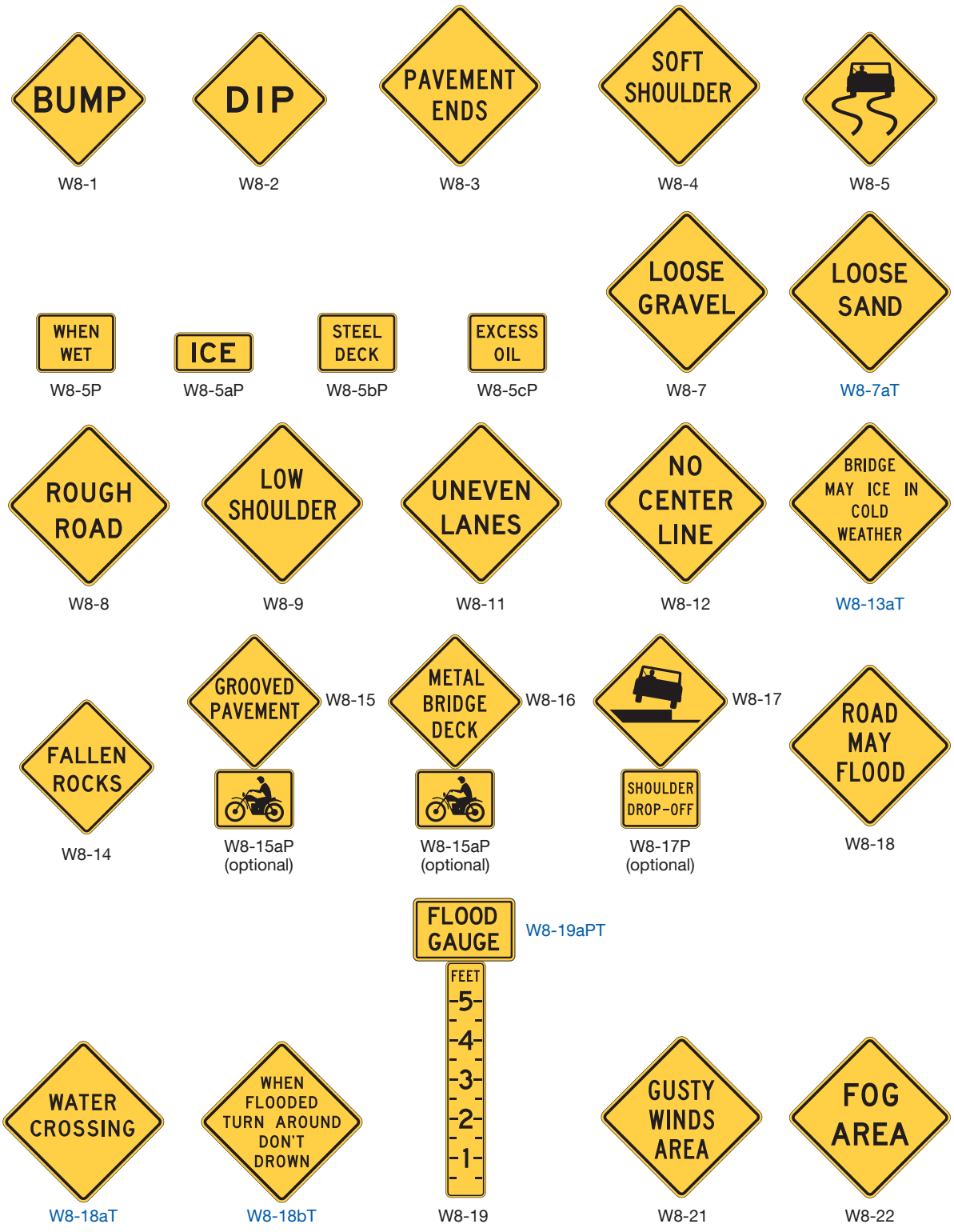
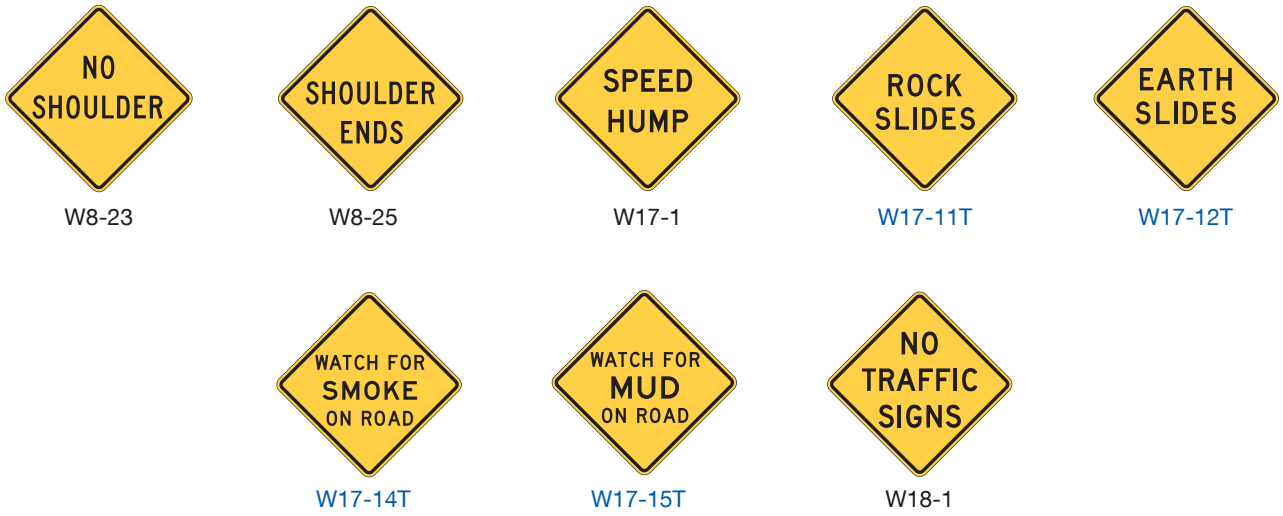


Figure 2C-7. Roadway and Weather Condition Signs and Plaques (Sheet 2 of 2)



Section 2C.29 Shoulder Signs (W8-4, W8-9, W8-17, W8-23, and W8-25)

Option:

01 The SOFT SHOULDER (W8-4) sign (see Figure 2C-7) may be used to warn of a soft shoulder condition.

02 The LOW SHOULDER (W8-9) sign (see Figure 2C-7) may be used to warn of a shoulder condition where there is an elevation difference of 3 inches or less between the shoulder and the travel lane.

Guidance:

03 *The Shoulder Drop Off (W8-17) sign (see Figure 2C-7) should be used where an unprotected shoulder drop-off, adjacent to the travel lane, exceeds 3 inches in depth for a significant continuous length along the roadway, based on engineering judgment.*

Option:

04 A SHOULDER DROP-OFF (W8-17P) supplemental plaque (see Figure 2C-7) may be mounted below the W8-17 sign.

05 The NO SHOULDER (W8-23) sign (see Figure 2C-7) may be used to warn road users that a shoulder does not exist along a portion of the roadway.

06 The SHOULDER ENDS (W8-25) sign (see Figure 2C-7) may be used to warn road users that a shoulder is ending.

Guidance:

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

Section 2C.30 Surface Condition Signs (W8-5, W8-7, W8-7aT, W8-8, W8-11, W8-13aT, W8-14, W17-11T, W17-12T, and W17-15T)

Option:

01 The Slippery When Wet (W8-5) sign (see Figure 2C-7) may be used to warn of unexpected slippery conditions. Supplemental plaques (see Figure 2C-7) with legends such as ICE, WHEN WET, STEEL DECK, or EXCESS OIL may be used with the W8-5 sign to indicate the reason that the slippery conditions might be present.

02 The LOOSE GRAVEL (W8-7) sign (see Figure 2C-7) may be used to warn of loose gravel on the roadway surface.

03 The LOOSE SAND (W8-7aT) sign (see Figure 2C-7) may be used to warn of a location where wind drifted sand may occasionally be encountered on the roadway or where blowing sand is a frequent hazard for drivers. It may also be used at locations where drivers parking off the shoulder of the highway, road, or street would probably encounter loose sand.

04 The WATCH FOR MUD ON ROAD (W17-15T) sign (see Figure 2C-7) may be used to warn of locations where mud may be on the roadway surface. The sign message may be modified to WATCH FOR DEBRIS ON ROAD.

05 The ROUGH ROAD (W8-8) sign (see Figure 2C-7) may be used to warn of a rough roadway surface.

06 An Advisory Speed (W13-1P) plaque (see Figure 2C-1) may be installed below the ROUGH ROAD (W8-8) sign.

07 An UNEVEN LANES (W8-11) sign (see Figure 2C-7) may be used to warn of a difference in elevation between travel lanes.

08 The BRIDGE MAY ICE IN COLD WEATHER (W8-13aT) sign (see Figure 2C-7) may be used in advance of bridges to advise bridge users of winter weather conditions. The BRIDGE MAY ICE IN COLD WEATHER sign may be removed or covered during seasons of the year when its message is not relevant.

09 The FALLEN ROCKS (W8-14) sign (see Figure 2C-7) may be used in advance of an area that is adjacent to a hillside, mountain, or cliff where rocks frequently fall onto the roadway.

10 The ROCK SLIDES (W17-11T) or EARTH SLIDES (W17-12T) signs (see Figure 2C-7), whichever is appropriate, may be used at a rock or earth cut to warn that sliding rock or earth may be encountered.

Guidance:

11 *The ROCK SLIDES and EARTH SLIDES signs should be used only after a study has been conducted to determine the need for its use.*

12 *When used, Surface Condition signs should be placed in advance of the beginning of the affected section (see Table 2C-3), and additional signs should be placed at appropriate intervals along the road where the condition exists.*

Section 2C.31 Warning Signs and Plaque for Motorcyclists (W8-15, W8-15aP, and W8-16)

Support:

01 The signs and plaques described in this Section are intended to give motorcyclists advance notice of surface conditions that might adversely affect their ability to maintain control of their motorcycle under wet or dry conditions. The use of some of the advance surface condition warning signs described in Section 2C.30, such as Slippery When Wet, LOOSE GRAVEL, or ROUGH ROAD, can also be helpful to motorcyclists if those conditions exist.

Option:

02 If a portion of a street or highway features a roadway pavement surface that is grooved or textured instead of smooth, such as a grooved skid resistance treatment for a horizontal curve or a brick pavement surface, a GROOVED PAVEMENT (W8-15) sign (see Figure 2C-7) may be used to provide advance warning of this condition to motorcyclists, bicyclists, and other road users. Alternate legends such as TEXTURED PAVEMENT or BRICK PAVEMENT may also be used on the W8-15 sign.

03 If a bridge or a portion of a bridge includes a metal or grated surface, a METAL BRIDGE DECK (W8-16) sign (see Figure 2C-7) may be used to provide advance warning of this condition to motorcyclists, bicyclists, and other road users.

04 A Motorcycle (W8-15aP) plaque (see Figure 2C-7) may be mounted below or above a W8-15 or W8-16 sign if the warning is intended to be directed primarily to motorcyclists.

Section 2C.32 NO CENTER LINE Sign (W8-12)

Option:

01 The NO CENTER LINE (W8-12) sign (see Figure 2C-7) may be used to warn of a roadway without center line pavement markings.

Section 2C.33 NO TRAFFIC SIGNS Sign (W18-1)

Option:

01 The NO TRAFFIC SIGNS (W18-1) sign (see Figure 2C-7) may be used only on low-volume rural roads to advise road users that no signs are installed along the distance of the road. The sign may be installed at the point where road users would enter the low volume road or where, based on engineering judgment, the road user might need this information.

02 A W7-3aP (see Figure 2C-5), W16-2P (see Figure 2C-16), or W16-9P (see Figure 2C-16) supplemental plaque with the legend NEXT XX MILES, XX FEET, or AHEAD may be installed below the W18-1 sign when appropriate.

Section 2C.34 Weather Condition Signs (W8-18, W8-18aT, W8-18bT, W8-19, W8-19aPT, W8-21, W8-22, and W17-14T)

Option:

01 The ROAD MAY FLOOD (W8-18) sign (see Figure 2C-7) may be used to warn road users that a section of roadway is subject to frequent flooding. A NEXT XX FEET (W16-4P) or NEXT XX MILES (W7-3aP) supplemental plaque (see Figure 2C-16 and 2C-5) may be mounted below the ROAD MAY FLOOD (W8-18) sign to inform road users of the length of roadway that frequently experiences flooding conditions.

02 The WATER CROSSING (W8-18aT) sign may be used to warn of a dip or ford in a roadway that is normally underwater. The WHEN FLOODED TURN AROUND DON'T DROWN (W8-18bT) sign may be used in addition to the W8-18 or W8-18aT sign.

03 A Depth Gauge (W8-19) sign and (W8-19aPT) plaque (see Figure 2C-7) may also be installed within a roadway section that frequently floods.

Guidance:

04 *The WATER CROSSING (W8-18aT) sign should not be used where water only occasionally and temporarily crosses the roadway due to heavy local rains or flash floods.*

05 *If used, the Depth Gauge sign should be used in addition to the ROAD MAY FLOOD, WATER CROSSING, or WHEN FLOODED TURN AROUND DON'T DROWN sign and should be mounted at the appropriate height to indicate the depth of the water at the deepest point on the roadway.*

Option:

06 The GUSTY WINDS AREA (W8-21) sign (see Figure 2C-7) may be used to warn road users that wind gusts frequently occur along a section of highway that are strong enough to impact the stability of trucks, recreational vehicles, and other vehicles with high centers of gravity. A NEXT XX MILES (W7-3aP) supplemental plaque (see Figure 2C-5) may be mounted below the W8-21 sign to inform road users of the length of roadway that frequently experiences strong wind gusts.

07 The FOG AREA (W8-22) sign (see Figure 2C-7) may be used to warn road users that foggy conditions frequently reduce visibility along a section of highway. A NEXT XX MILES (W7-3aP) supplemental plaque (see Figure 2C-5) may be mounted below the W8-22 sign to inform road users of the length of roadway that frequently experiences foggy conditions.

08 The WATCH FOR SMOKE ON ROAD (W17-14T) sign (see Figure 2C-7) may be used to warn of locations where the driver's vision may be temporarily obscured due to smoke or other gases from nearby industry.

Support:

09 Chapter 2L contains provisions for the use of blank-out or changeable message signs that can be activated by detection of the applicable condition.

TRAFFIC CONTROL AND INTERSECTION WARNING SIGNS AND PLAQUES

Section 2C.35 Advance Traffic Control Signs (W3-1, W3-2, W3-3, and W3-4)

Standard:

01 **The Stop Ahead (W3-1), Yield Ahead (W3-2), and Signal Ahead (W3-3) Advance Traffic Control signs (see Figure 2C-8) shall be installed on an approach to a primary traffic control device that is not visible for a sufficient distance to permit the road user to respond to the device (see Table 2C-3). The visibility criteria for a traffic control signal shall be based on having a continuous view of at least two signal faces for the distance specified in Table 4D-2.**

Guidance:

02 *Where intermittent obstructions occur, engineering judgment should determine the treatment to be implemented.*

Support:

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

04 Permanent obstructions causing the limited visibility might include roadway alignment or structures. Intermittent obstructions might include foliage or parked vehicles.

Option:

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

Support:

06 Section 2C.65 contains information about the use of an advance street name plaque to identify an intersecting road.

Option:

07 A BE PREPARED TO STOP (W3-4) sign (see Figure 2C-8) may be used to warn of stopped traffic caused by a traffic control signal.

08 A Warning Beacon (see Section 4S.03) or yellow LEDs within the border of the sign may be used with an Advance Traffic Control or BE PREPARED TO STOP sign.

Standard:

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

Guidance:

10 *When a Warning Beacon is interconnected with a traffic control signal or queue detection system, the BE PREPARED TO STOP sign should be supplemented with a WHEN FLASHING (W16-13P) plaque (see Figure 2C-16).*

Support:

11 Section 2C.45 contains information regarding the use of a NO MERGE AREA (W4-5aP) supplemental plaque in conjunction with a Yield Ahead sign.

Figure 2C-8. Advance Traffic Control Signs



W3-1 W3-2 W3-3 W3-4 W3-6

W3-7 W3-8 W23-2 W23-2a W26-1

Section 2C.36 DRAW BRIDGE Sign (W3-6)

Standard:

01 **A DRAW BRIDGE (W3-6) sign (see Figure 2C-8) shall be used in advance of movable bridge signals and gates (see Section 4Q.02) to give warning to road users.**

Section 2C.37 Advance Ramp Control Signal Signs (W3-7 and W3-8)

Option:

01 A RAMP METER AHEAD (W3-7) sign (see Figure 2C-8) may be used to warn road users that a freeway entrance ramp is metered and that they will encounter a ramp control signal (see Chapter 4P).

Guidance:

02 *When the ramp control signals are operated only during certain periods of the day, a RAMP METERED WHEN FLASHING (W3-8) sign (see Figure 2C-8) should be installed in advance of the ramp control signal near the entrance to the ramp, or on the arterial on the approach to the ramp, to alert road users to the presence and operation of ramp meters.*

Standard:

03 **The RAMP METERED WHEN FLASHING sign shall be supplemented with a Warning Beacon (see Section 4S.03) that flashes when the ramp control signal is in operation.**

Section 2C.38 NEW TRAFFIC PATTERN and NEW SIGNAL OPERATION AHEAD Signs (W23-2 and W23-2a)

Option:

01 A NEW TRAFFIC PATTERN AHEAD (W23-2) sign (see Figure 2C-8) may be used on the approach to an intersection or along a section of roadway to provide advance warning of a change in traffic patterns, such as revised lane usage or roadway geometry.

02 A NEW SIGNAL OPERATION AHEAD (W23-2a) sign (see Figure 2C-8) may be used on the approach to a signalized intersection to provide advance warning of a change in signal phasing.

Guidance:

03 *The NEW TRAFFIC PATTERN or NEW SIGNAL OPERATION AHEAD sign should be removed when the traffic pattern returns to normal, when the changed pattern is no longer considered to be new, or within 12 months.*

Section 2C.39 WATCH FOR STOPPED TRAFFIC Sign (W26-1)

Option:

01 The WATCH FOR STOPPED TRAFFIC (W26-1) sign (see Figure 2C-8) may be used to warn road users of the possibility of vehicles stopping abruptly in the travel lane due to recurring congested conditions.

Section 2C.40 Reduced Speed Limit Ahead and Speed Zone Signs (W3-5, W3-5a, and W3-5b)

Guidance:

01 *A Reduced Speed Limit Ahead (W3-5 or W3-5a) sign (see Figure 2C-9) should be used to inform road users of a reduced speed zone where the speed limit is being reduced by more than 10 mph, or where engineering judgment indicates the need for advance notice to comply with the posted speed limit ahead.*

02 *A VARIABLE SPEED ZONE AHEAD (W3-5b) sign (see Figure 2C-9) should be used to inform road users of a zone where the speed limit is varied by time of day or as conditions change.*

Standard:

03 **If used, Reduced Speed Limit or Variable Speed Zone Ahead signs shall be followed by a Speed Limit (R2-1) sign (see Figure 2B-3), installed at the beginning of the zone where the speed limit applies.**

04 **The speed limit displayed on the W3-5 and W3-5a signs shall be identical to the speed limit displayed on the subsequent Speed Limit sign.**

Figure 2C-9. Reduced Speed Limit Ahead and Speed Zone Signs



W3-5 W3-5a W3-5b

Section 2C.41 Intersection Warning Signs (W2-1 through W2-8)

Option:

01 A Cross Road (W2-1), Side Road (W2-2, W2-3, or W2-3a), T-Intersection (W2-4), or Y-Intersection (W2-5) sign (see Figure 2C-10) may be used in advance of an intersection to indicate the presence of an intersection and the possibility of turning or entering traffic.

02 The Circular Intersection (W2-6) sign (see Figure 2C-10) may be installed in advance of a circular intersection (see Figures 2B-21 through 2B-23).

Guidance:

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

Option:

04 An educational plaque (see Figure 2C-10) with a legend such as TRAFFIC CIRCLE (W16-12P) or ROUNDABOUT (W16-12aP) may be mounted below a Circular Intersection sign.

Support:

05 Section 2C.65 contains information about the use of an advance street name plaque to identify an intersecting road.

Guidance:

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

07 *Intersection Warning signs, other than the Circular Intersection (W2-6) sign, the T-intersection (W2-4) sign, and the Grade Crossing and Intersection Advance Warning (W10-2, W10-3, W10-4, W10-11, and W10-12) signs (see Figure 8B-4) should not be used on approaches controlled by STOP signs, YIELD signs, or signals.*

08 *If an Intersection Warning sign is used where the side roads are not opposite of each other, the Offset Side Roads (W2-7) sign (see Figure 2C-10) should be used instead of the Cross Road sign.*

09 *If an Intersection Warning sign is used where two closely-spaced side roads are on the same side of the highway, the Double Side Roads (W2-8) sign (see Figure 2C-10) should be used instead of the Side Road sign.*

10 *No more than two side roads should be depicted on the same side of the highway on a W2-7 or W2-8 sign, and no more than three side roads should be depicted on a W2-7 or W2-8 sign.*

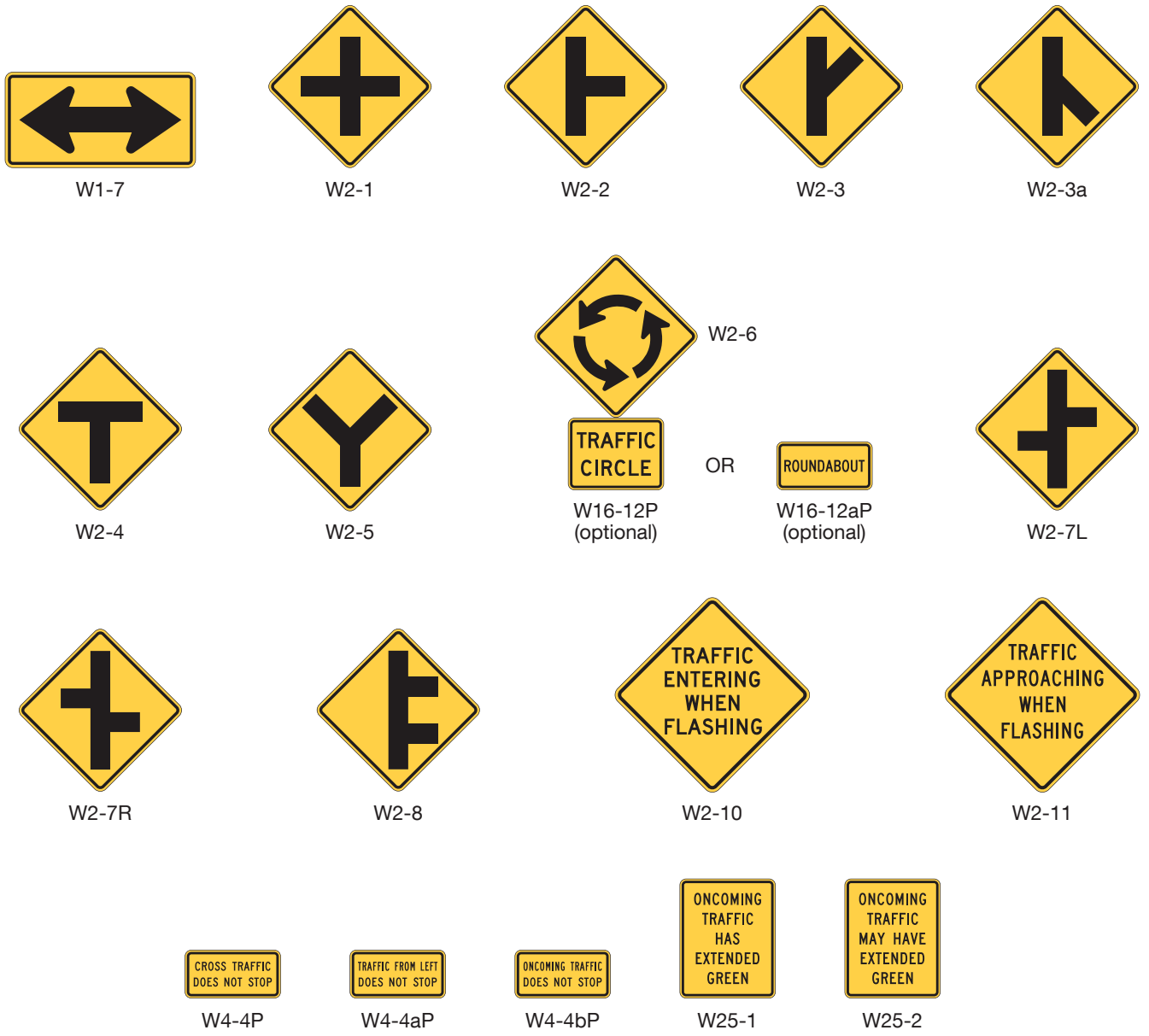
Option:

11 When at least one side road is shown, the stem of an additional side road representing a significantly lower relative volume may be depicted using a line that is two-thirds the width of the through road based on engineering judgment.

Support:

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

Figure 2C-10. Intersection Warning Signs and Plaques



Section 2C.42 Actuated Advance Intersection Signs (W2-10 and W2-11)

Support:

01 Actuated Advance Intersection signs are typically associated with restricted sight distance and gap selection at stop-controlled intersections.

Option:

02 The TRAFFIC ENTERING WHEN FLASHING (W2-10) sign (see Figure 2C-10) may be used on the uncontrolled through roadway approach to a side or cross road stop-controlled intersection to warn of entering traffic from the side or cross road.

03 The TRAFFIC APPROACHING WHEN FLASHING (W2-11) sign (see Figure 2C-10) may be used on the side road stop-controlled approach to warn of traffic approaching on the uncontrolled through road.

Standard:

04 **When used, the TRAFFIC ENTERING WHEN FLASHING sign, and the TRAFFIC APPROACHING WHEN FLASHING sign shall be supplemented with a Warning Beacon (see Section 4S.03) that activates when a vehicle on a conflicting approach is detected.**

Section 2C.43 Two-Direction Large Arrow Sign (W1-7)

Standard:

01 **The Two-Direction Large Arrow (W1-7) sign (see Figure 2C-10) shall be a horizontal rectangle.**

02 **If used, the Two-Direction Large Arrow sign shall be installed on the far side of a T-intersection in line with, and at approximately a right angle to, traffic approaching from the stem of the T-intersection.**

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

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

Guidance:

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

Section 2C.44 Traffic Signal Oncoming Extended Green Signs (W25-1 and W25-2)

Standard:

01 **At locations where either a W25-1 or a W25-2 sign is required based on the provisions in Section 4F.01, the W25-1 or W25-2 sign (see Figure 2C-10) shall be installed near the left-most signal face for the approach.**

MERGING, TWO-WAY TRAFFIC, AND NO PASSING WARNING SIGNS AND PLAQUES

Section 2C.45 Merge Signs and Plaque (W4-1, W4-1aT, W4-5, and W4-5aP)

Option:

01 A Merge (W4-1) sign (see Figure 2C-11) may be used to warn road users on the major roadway that merging movements might be encountered in advance of a point where lanes from two separate roadways converge as a single traffic lane and no turning conflict occurs.

02 A Merge sign may also be installed on the side of the entering roadway to warn road users on the entering roadway of the merge condition.

03 The THRU TRAFFIC MERGE LEFT (RIGHT) (W4-1aT) sign (see Figure 2C-11) may be used on a divided highway, road, or street, where one or more of the approach lane(s) do not continue straight through the interchange or intersection.

Guidance:

04 *The Merge sign should be installed on the side of the major roadway where merging traffic will be encountered and in such a position as to not obstruct the road user's view of entering traffic.*

05 *When a Merge sign is installed on a major roadway, the symbol should be oriented right or left as appropriate to depict the side from which the merge occurs, with the arrow representing the major roadway and the curved stem representing the entering roadway (see Figure 2C-11)*

06 *When a Merge sign is installed on an entering roadway that curves before merging with the major roadway, such as a ramp with a curving horizontal alignment as it approaches the major roadway, the Entering Roadway Merge (W4-5) sign (see Figure 2C-11) should be used to better portray the actual geometric conditions to road users on the entering roadway.*

07 *Where two roadways of approximately equal importance converge and merging movements are required, a Merge sign should be placed on each roadway.*

08 *The Merge sign should not be used where two roadways converge and merging movements are not required.*

Standard:

09 **The Merge sign shall not be used in place of a Lane Ends (W4-2) sign (see Section 2C.47) where lanes of traffic moving on a single roadway must merge because of a reduction in the actual or usable pavement width.**

10 **The THRU TRAFFIC MERGE LEFT (RIGHT) (W4-1aT) sign shall not be used in advance of the end of an acceleration or deceleration lane.**

Guidance:

11 *The THRU TRAFFIC MERGE LEFT (RIGHT) (W4-1aT) sign should normally be installed approximately 250 feet in advance of the lane divergence in urban districts and approximately 750 feet in advance of the lane divergence in rural districts, subject to adjustment to local conditions.*

12 *The THRU TRAFFIC MERGE LEFT (RIGHT) (W4-1aT) sign may be duplicated on both sides of the road for additional emphasis. On high speed highways, roads, or streets, the advance warning distance may be as great as 1500 feet.*

Option:

13 An Entering Roadway Merge (W4-5) sign with a NO MERGE AREA (W4-5aP) supplemental plaque (see Figure 2C-11) mounted below it may be used to warn road users on an entering roadway that they will encounter an abrupt merging situation without an acceleration lane at the downstream end of the ramp.

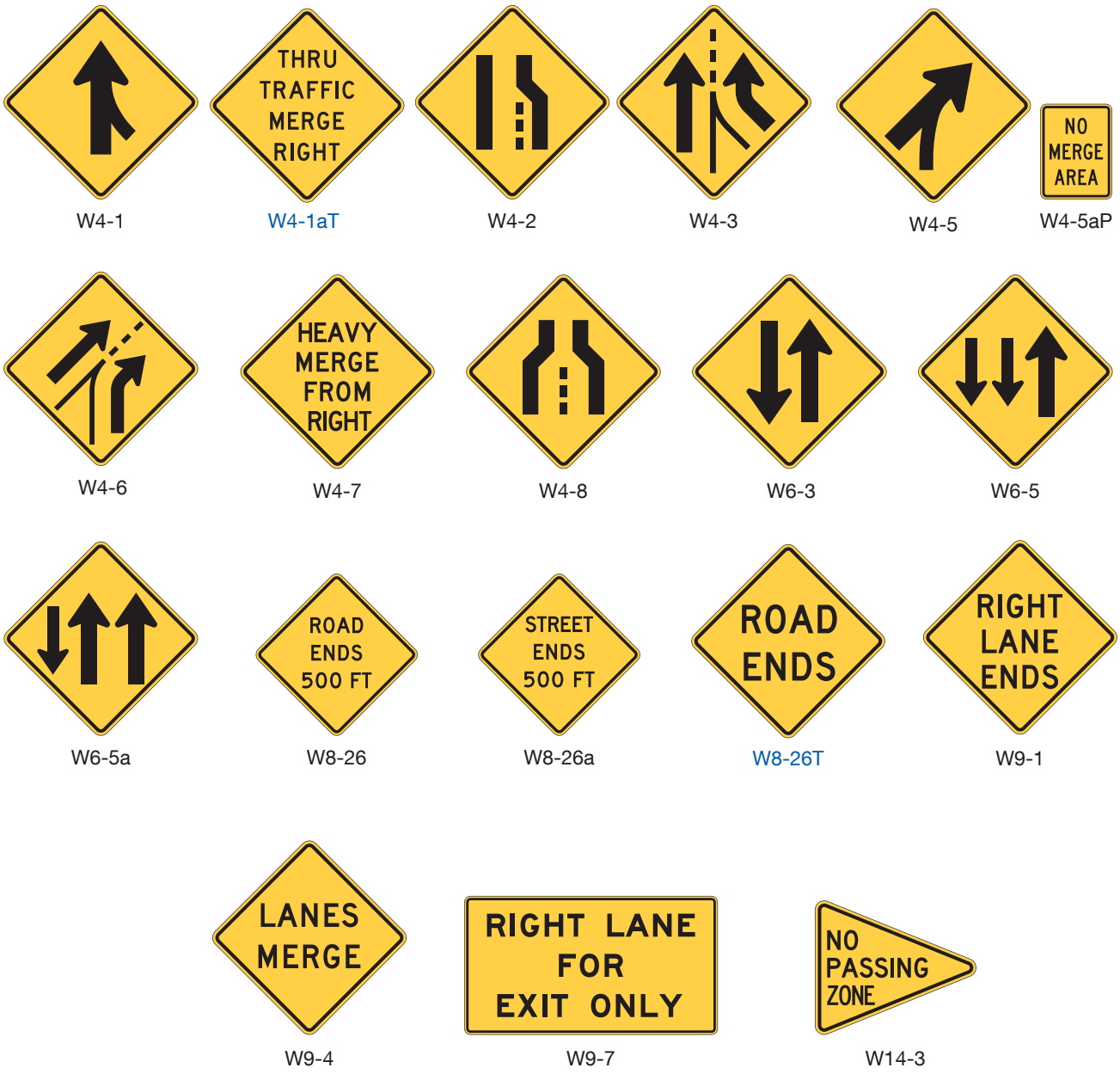
14 A Merge (W4-1) sign with a NO MERGE AREA (W4-5aP) supplemental plaque mounted below it may be used to warn road users on the major roadway that traffic on an entering roadway will encounter an abrupt merging situation without an acceleration lane at the downstream end of the ramp.

15 For a yield-controlled channelized right-turn movement onto a roadway without an acceleration lane, a NO MERGE AREA (W4-5aP) supplemental plaque may be mounted below a Yield Ahead (W3-2) sign and/or below a YIELD (R1-2) sign when engineering judgment indicates that road users would expect an acceleration lane to be present.

Support:

16 Examples of the use of Merge (W4-1) signs are shown in Drawing A in Figure 2C-12.

Figure 2C-11. Merging and Passing Signs and Plaques



W4-1 W4-1aT W4-2 W4-3 W4-5 W4-5aP

W4-6 W4-7 W4-8 W6-3 W6-5

W6-5a W8-26 W8-26a W8-26T W9-1

W9-4 W9-7 W14-3

Section 2C.46 Added Lane Signs (W4-3 and W4-6)

Guidance:

01 *The Added Lane (W4-3) sign (see Figure 2C-11) should be installed in advance of a point where two roadways converge and merging movements are not required. When possible, the Added Lane sign should be placed such that it is visible from both roadways; if this is not possible, an Added Lane sign should be placed on the side of each roadway.*

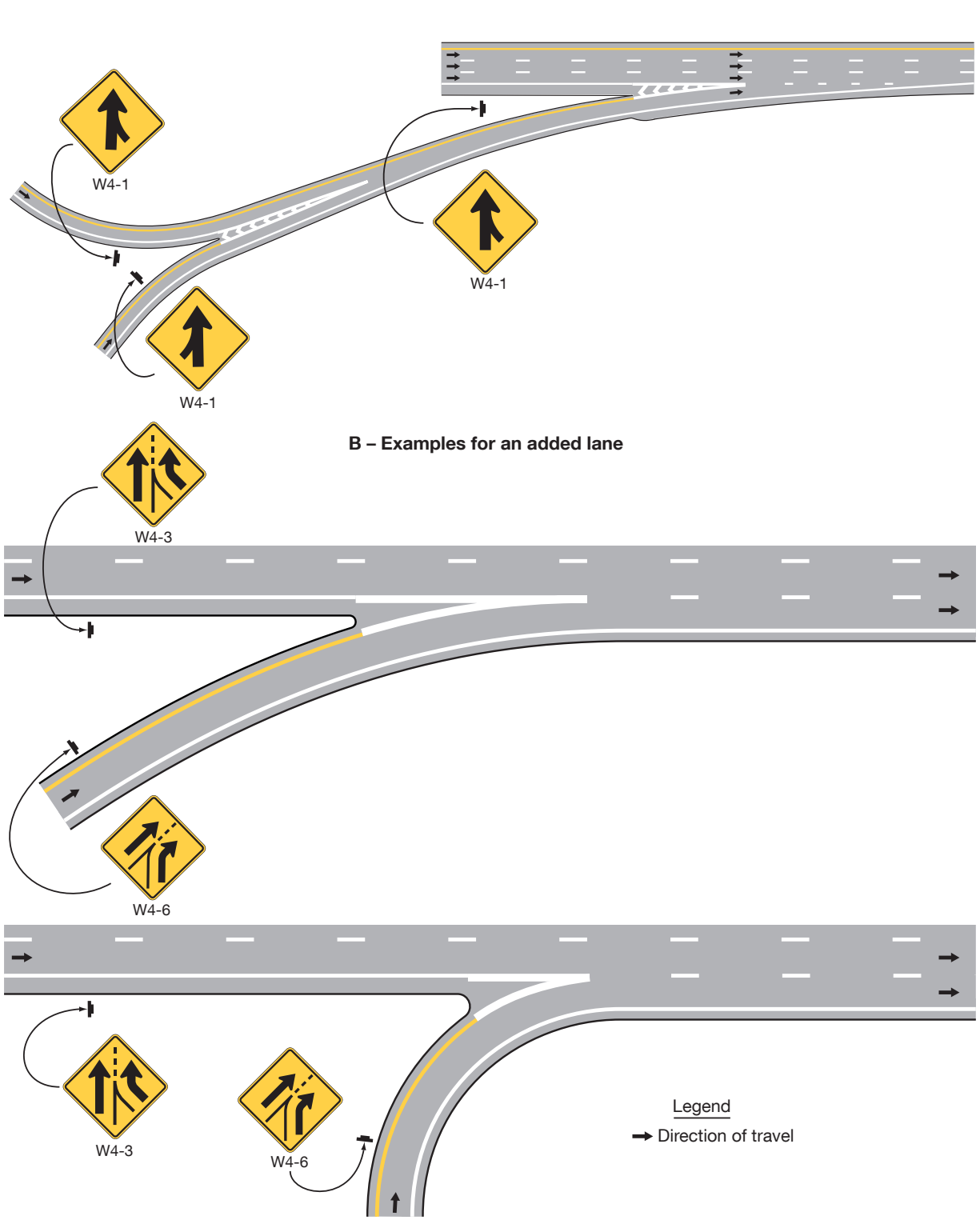
02 *When an Added Lane (W4-3) sign is installed on a major roadway, the symbol should be oriented right or left as appropriate to depict the side from which the entering roadway converges, with the straight arrow representing the major roadway and the curved arrow representing the entering roadway. The sign should be located on the side of the major roadway from which the entering roadway converges.*

03 *When an Added Lane sign is to be installed on a roadway that curves before converging with another roadway that has a tangent alignment at the point of convergence, the Entering Roadway Added Lane (W4-6) sign (see Figure 2C-11) should be used to better portray the actual geometric conditions to road users on the curving roadway.*

Support:

04 Examples of the use of Added Lane (W4-3) and Entering Roadway Added Lane (W4-6) signs are shown in Drawing B in Figure 2C-12.

Figure 2C-12. Examples of Merge and Added Lane Sign Placement for Entering and Converging Roadways



Section 2C.47 Lane Ends Signs (W4-2 and W9-1)

Support:

01 The Lane Ends (W4-2) and RIGHT (LEFT) LANE ENDS (W9-1) signs (see Figure 2C-11) are used to warn of the reduction in the number of traffic lanes in the direction of travel.

02 The sequence of the W4-2 and W9-1 signs is illustrated in Figure 2C-13.

Guidance:

03 *The Lane Ends (W4-2) sign should be installed at the advance placement distance in accordance with Table 2C-3.*

Option:

04 A RIGHT (LEFT) LANE ENDS (W9-1) sign may be installed in advance of the Lane Ends sign to provide additional warning that a lane is ending and that a merging maneuver will be required.

Guidance:

05 *If a W9-1 sign is installed, a Distance (W16-2P series or W16-3P series) plaque (see Figure 2C-16) should be installed below the W9-1 sign.*

06 *On one-way streets or on divided highways where the left-hand lane is ending and the width of the median will permit, the W9-1 and W4-2 signs should be placed facing approaching traffic on the left-hand side or median.*

Option:

07 Where a lane ends a distance beyond the intersection that is less than the advance placement distance indicated in Table 2C-3, the W4-2 sign may be located at the far side of the intersection (see Sheet 4 of Figure 2C-13).

Guidance:

08 *When the W4-2 sign is located at the far side of the intersection in accordance with Paragraph 7 of this Section, the W9-1 sign should be placed upstream of the intersection with the appropriate distance plaque.*

Support:

09 Section 3B.12 contains information regarding the use of pavement markings in conjunction with a lane reduction.

Guidance:

10 *Lane Ends signs should not be installed in advance of the downstream end of an acceleration lane.*

Standard:

11 **The W4-2 and W9-1 signs shall not be used in dropped lane situations. In dropped lane situations on conventional roads at intersections, regulatory signs (see Section 2B.28) shall be used to inform road users that a through lane becomes a mandatory turn lane.**

Figure 2C-13. Example Sequences for Lane Ends and Lane Merge Signs (Sheet 1 of 5)

A – Freeway or expressway - lane ends

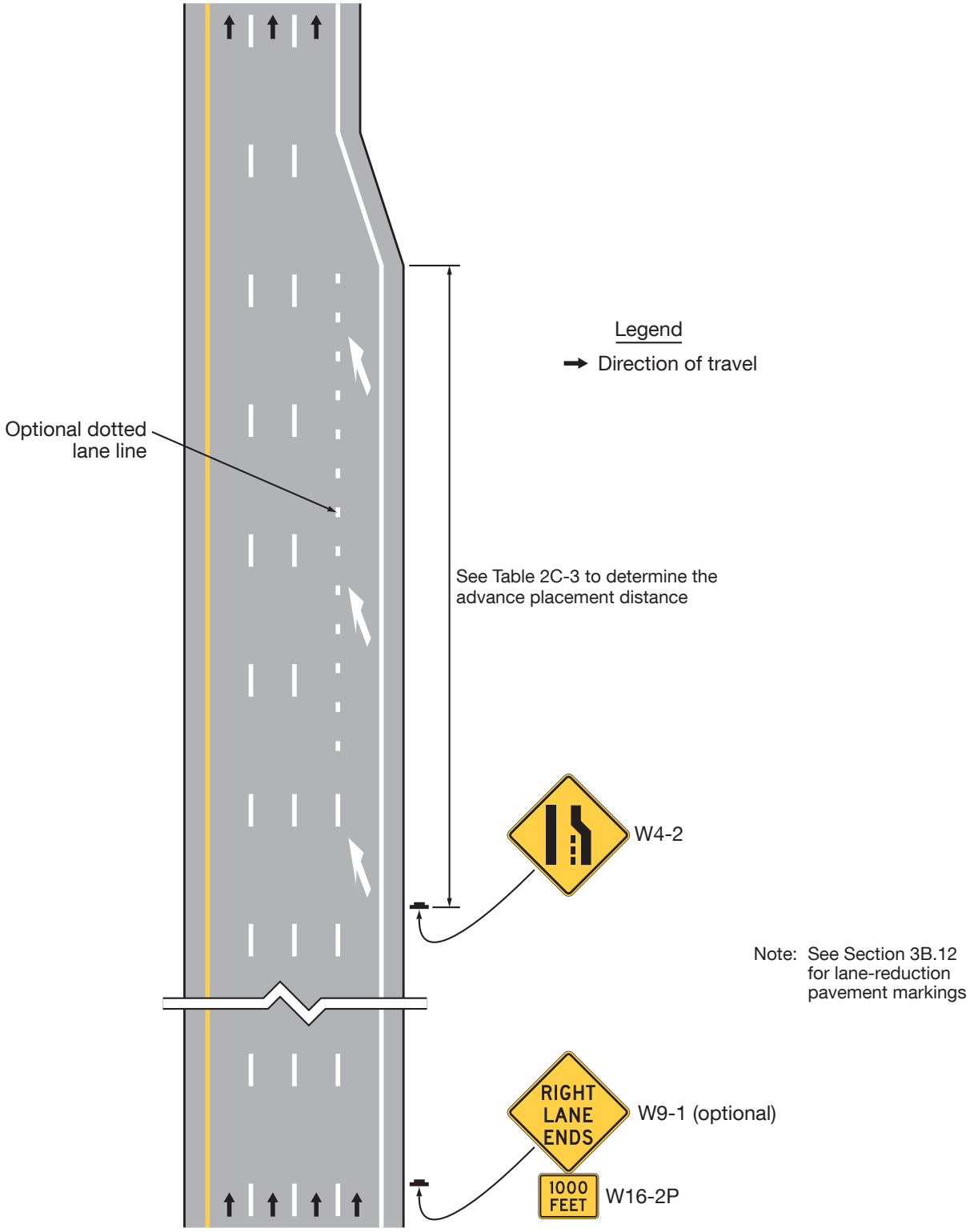
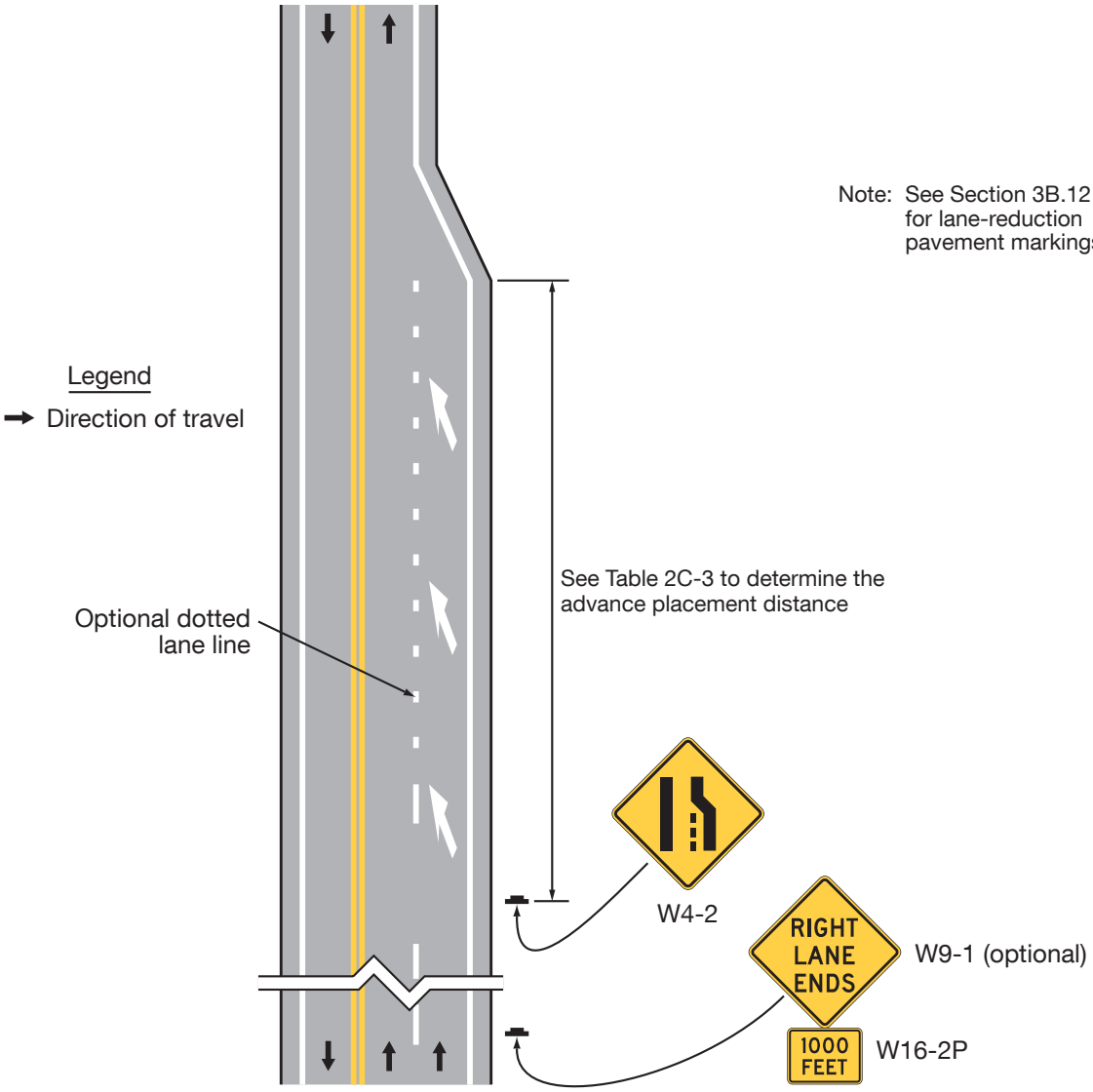


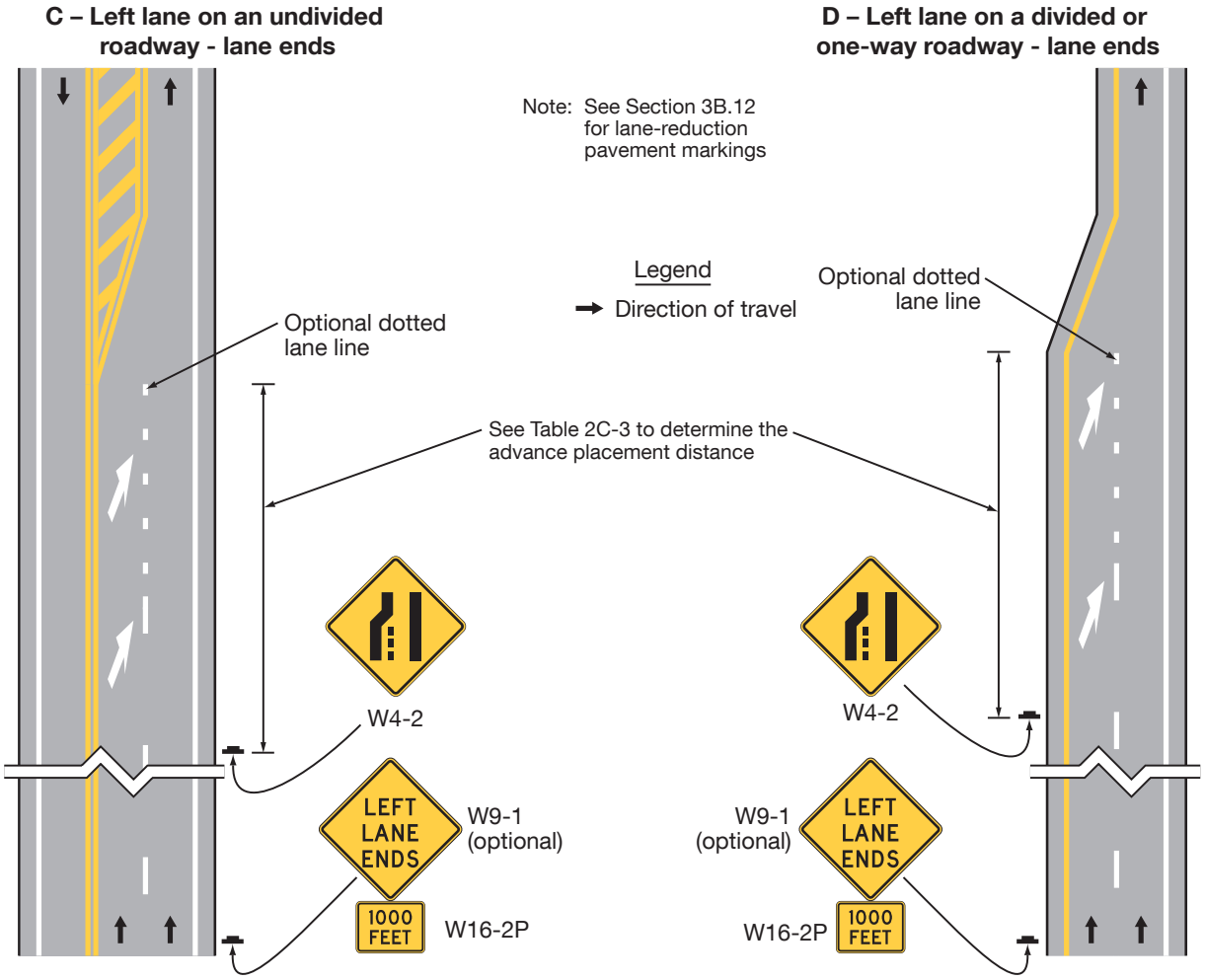
Figure 2C-13. Example Sequences for Lane Ends and Lane Merge Signs (Sheet 2 of 5)

B – Right lane on conventional road - lane ends



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Figure 2C-13. Example Sequences for Lane Ends and Lane Merge Signs (Sheet 3 of 5)



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Figure 2C-13. Example Sequences for Lane Ends and Lane Merge Signs (Sheet 4 of 5)

E – Lane ends beyond major intersection or side road

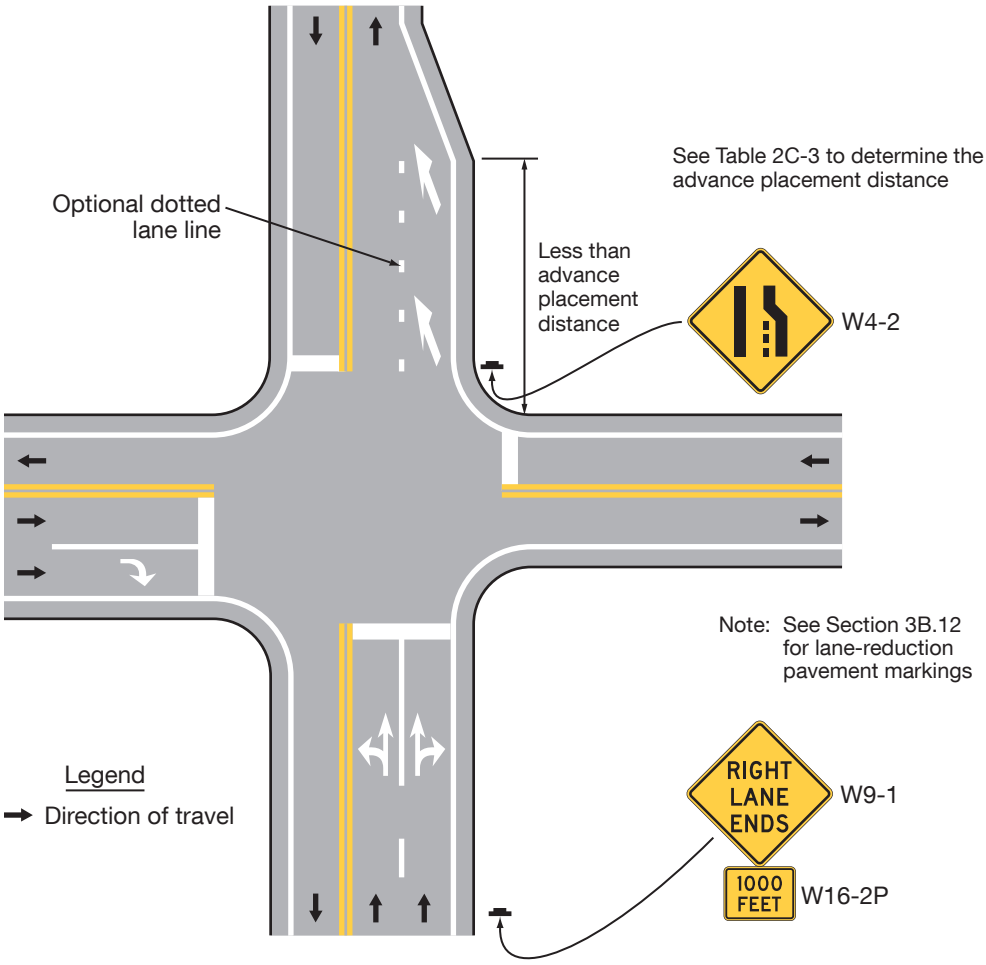
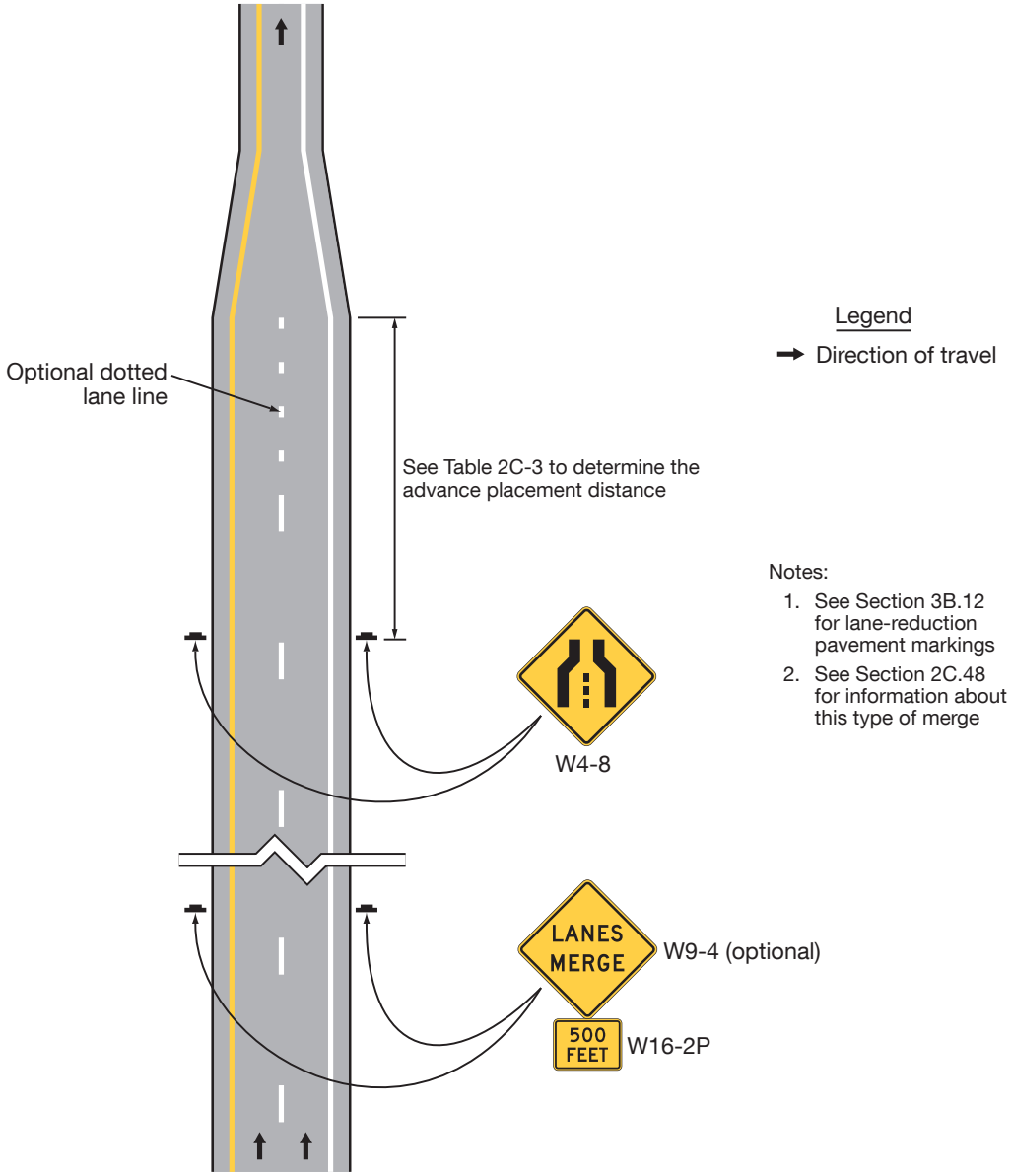


Figure 2C-13. Example Sequences for Lane Ends and Lane Merge Signs (Sheet 5 of 5)

F – Reduction of two lanes to one lane in the same direction of travel with merging maneuvers for each lane



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Section 2C.48 Lanes Merge Signs (W9-4 and W4-8)

Support:

01 The LANES MERGE (W9-4) and Single-Lane Transition (W4-8) signs (see Figure 2C-11) are used to warn of a merge of two lanes to one in the same direction of travel with a merging maneuver required for each lane (see Sheet 5 of Figure 2C-13). This type of merge is for a geometric condition where both approach lanes merge into a single lane, not where one lane merges into the other. Section 6H.08 contains information about the use of the late merge sign.

Guidance:

02 *The Single-Lane Transition (W4-8) sign should be located at the advance placement distance in accordance with Table 2C-3.*

Option:

03 The Lanes Merge (W9-4) sign may be used in advance of the W4-8 sign to provide additional warning that both lanes form a single lane and that a merging maneuver is needed for the traffic in each lane.

Section 2C.49 HEAVY MERGE FROM LEFT (RIGHT) Sign (W4-7)

Option:

01 The HEAVY MERGE FROM LEFT (RIGHT) (W4-7) sign (see Figure 2C-11) may be used to supplement a W4-1 sign at multilane approaches to congested areas to inform road users that it is desirable for through traffic to move out of a lane that will be occupied by a high volume of entering traffic. If used, the W4-7 sign may be supplemented with a W16-2P series or W16-3P series plaque (see Section 2C.61).

Standard:

02 **If used, the W4-7 sign shall be installed at a location upstream from the location of the W4-1 sign.**

Section 2C.50 RIGHT (LEFT) LANE FOR EXIT ONLY Sign (W9-7)

Option:

01 The RIGHT (LEFT) LANE FOR EXIT ONLY (W9-7) sign (see Figure 2C-11) may be used to provide advance warning to road users that traffic in the right-hand (left-hand) lane of a roadway will be required to depart the roadway at the next exit.

Guidance:

02 *If used, the W9-7 sign should be installed upstream from the first overhead guide sign that contains an EXIT ONLY sign panel or upstream from the first RIGHT (LEFT) LANE MUST EXIT (R3-33) regulatory sign, if used, whichever is farther upstream from the exit.*

Option:

03 A legend or plaque displaying the distance may be added to the W9-7 sign where the distance along the dropped lane between the sign and the exit ramp is greater than 1 mile.

Support:

04 Section 2B.31 contains information regarding a regulatory sign that can be used for lane drops at grade-separated interchanges.

Section 2C.51 Two-Way Traffic Sign (W6-3)

Guidance:

01 *A Two-Way Traffic (W6-3) sign (see Figure 2C-11) should be used to warn road users of a transition from a multi-lane divided section of roadway to a two-lane, two-way section of roadway.*

02 *A Two-Way Traffic (W6-3) sign with an AHEAD (W16-9P) plaque (see Figure 2C-16) should be used to warn road users of a transition from a one-way street to a two-lane, two-way section of roadway (see Figure 2B-18).*

Option:

03 The Two-Way Traffic sign may be used at intervals along a two-lane, two-way roadway and may be used to supplement the Divided Highway (Road) Ends (W6-2) sign discussed in Section 2C.21.

Support:

04 Section 6H.17 contains information on a Narrow Two-Way Traffic (W6-4) sign for use in temporary traffic control situations.

Section 2C.52 Two-Way Traffic on a Three-Lane Roadway Signs (W6-5 and W6-5a)

Option:

01 The Two-Way Traffic on a Three-Lane Roadway (W6-5 and W6-5a) signs (see Figure 2C-11) may be installed along three-lane roadways with two lanes in one direction and one in the opposing direction.

Standard:

02 **The W6-5 and W6-5a signs shall match the lane configuration of the roadway.**

Section 2C.53 NO PASSING ZONE Sign (W14-3)

Standard:

01 **The NO PASSING ZONE (W14-3) sign (see Figure 2C-11) shall be a pennant-shaped isosceles triangle with its longer axis horizontal and pointing to the right. When used, the NO PASSING ZONE sign shall be installed on the left-hand side of the roadway at the beginning of no-passing zones identified by pavement markings or DO NOT PASS signs or both (see Sections 2B.36 and 3B.03).**

MISCELLANEOUS WARNING SIGNS AND PLAQUES

Section 2C.54 Vehicular Traffic Warning Signs (W8-6, W11-1, W11-5, W11-8, W11-10, W11-11, W11-12P, W11-12T, W11-14, W11-15, and W11-15a)

Option:

01 Vehicular Traffic Warning (W8-6, W11-1, W11-5, W11-8, W11-10, W11-11, W11-12P, W11-14, W11-15, and W11-15a) signs (see Figure 2C-14) may be used to alert road users to locations where unexpected entries into the roadway by trucks, bicycles, farm vehicles, emergency vehicles, golf carts, horse-drawn vehicles, or other vehicles might occur. The TRUCK CROSSING (W8-6) word message sign may be used as an alternate to the Truck (W11-10) symbol sign.

Support:

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

Guidance:

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

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

Option:

05 The Trail Crossing (W11-15) sign may be used where both bicyclists and pedestrians might be crossing the roadway, such as at an intersection with a shared-use path. A TRAIL X-ING (W11-15P) supplemental plaque (see Figure 2C-14) may be mounted below the W11-15 sign. The TRAIL CROSSING (W11-15a) sign may be used to warn of shared-use path crossings where pedestrians, bicyclists, and other user groups might be crossing the roadway.

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

07 Supplemental plaques (see Figure 2C-16 and Section 2C.57) with legends such as AHEAD, XX FEET, NEXT XX MILES, IN STREET, or IN ROAD may be mounted below Vehicular Traffic Warning signs to provide advance notice to road users of unexpected entries.

Guidance:

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

Standard:

09 **If a post-mounted W11-1, W11-11, W11-15, or W11-15a sign is placed at the location of the crossing point where golf carts, pedestrians, bicyclists, or other shared-use path users might be crossing the roadway, a diagonal downward-pointing arrow (W16-7P) plaque (see Figure 2C-16 and Section 2C.63) shall be mounted below the sign. If the W11-1, W11-11, W11-15, or W11-15a sign is mounted overhead, the W16-7P supplemental plaque shall not be used.**

10 **A Vehicular Traffic Warning sign assembly shall not be installed on an approach controlled by a STOP or a YIELD sign, except as provided in Paragraphs 11 and 12 of this Section.**

Option:

11 The Vehicular Traffic Warning sign assembly may be installed on an approach to a circular intersection controlled by a YIELD sign where the crosswalk is at least 20 feet in advance of the yield point at the entrance to the circulatory roadway.

12 At a signalized or stop-controlled intersection the Vehicular Traffic Warning sign assembly may be installed on an approach to a channelized right-turn lane controlled by a YIELD sign where the crosswalk is at least 20 feet in advance of the yield point.

13 The crossing location identified by a W11-1, W11-11, W11-15, or W11-15a sign may be defined with crosswalk markings (see Chapter 3C).

Standard:

14 **The Emergency Vehicle (W11-8) sign (see Figure 2C-14) with the EMERGENCY SIGNAL AHEAD (W11-12P) supplemental plaque (see Figure 2C-14) shall be placed in advance of all emergency-vehicle traffic control signals (see Chapter 4M).**

Option:

15 The Emergency Vehicle (W11-8) sign, WATCH FOR EMERGENCY VEHICLES (W11-12T) sign, or a word message sign indicating the type of emergency vehicle (such as rescue squad), may be used in advance of the emergency-vehicle station when no emergency-vehicle traffic control signal is present.

Support:

16 The WATCH FOR EMERGENCY VEHICLES (W11-12T) sign is an alternative for emergency-vehicle stations that do not include fire trucks.

Option:

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

18 A supplemental WHEN FLASHING (W16-13P) plaque (see Figure 2C-16) may be used with any Vehicular Traffic Warning sign that is supplemented with a Warning Beacon to indicate specific periods when the condition or activity is present or is likely to be present.

Figure 2C-14. Vehicular Traffic Warning Signs and Plaques



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

Section 2C.55 Non-Vehicular Warning Signs (W11-2, W11-3, W11-4, W11-6, W11-7, W11-9, and W11-16 through W11-22)

Option:

01 Non-Vehicular Warning (W11-2, W11-3, W11-4, W11-6, W11-7, W11-9, and W11-16 through W11-22) signs (see Figure 2C-15) may be used to alert road users in advance of locations where unexpected entries into the roadway might occur or where shared use of the roadway by pedestrians, animals, or equestrians might occur.

Support:

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

Guidance:

03 *If used in advance of a pedestrian, snowmobile, or equestrian crossing, the W11-2, W11-6, W11-7, and W11-9 signs should be supplemented with plaques (see Figure 2C-16 and Section 2C.61) with the legend AHEAD or XX FEET to inform road users that they are approaching a point where crossing activity might occur.*

Standard:

04 **If a post-mounted W11-2, W11-6, W11-7, or W11-9 sign is placed at the location of the crossing point where pedestrians, snowmobilers, or equestrians might be crossing the roadway, a diagonal downward-pointing arrow (W16-7P) plaque (see Figure 2C-16 and Section 2C.63) shall be mounted below the sign. If the W11-2, W11-6, W11-7, or W11-9 sign is mounted overhead, the W16-7P plaque shall not be used.**

05 **A Non-Vehicular Warning sign assembly shall not be installed on an approach controlled by a STOP or a YIELD sign, except as provided in Paragraphs 6 and 7 of this Section.**

Option:

06 The Non-Vehicular Warning sign assembly may be installed on an approach to a circular intersection controlled by a YIELD sign where the crosswalk is at least 20 feet in advance of the yield point at the entrance to a circulatory roadway.

07 At a signalized or stop-controlled intersection the Non-Vehicular Warning sign assembly may be installed on an approach to a channelized right turn lane controlled by a YIELD sign where the crosswalk is at least 20 feet in advance of the yield point.

08 A Pedestrian Crossing (W11-2) sign may be placed overhead or may be post-mounted with a diagonal downward-pointing arrow (W16-7P) plaque at the crosswalk location where Yield Here To (Stop Here For) Pedestrians signs (see Section 2B.19) have been installed in advance of the crosswalk.

Standard:

09 **If a W11-2 sign has been post-mounted at the crosswalk location where a Yield Here To (Stop Here For) Pedestrians sign is used on the approach, the Yield Here To (Stop Here For) Pedestrians sign shall not be placed on the same post as the W11-2 sign.**

Option:

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

11 The crossing location identified by a W11-2, W11-6, W11-7, or W11-9 sign may be defined with crosswalk markings (see Chapter 3C).

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

Guidance:

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

Option:

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

15 A supplemental WHEN FLASHING (W16-13P) plaque (see Figure 2C-16) may be used with any Non-Vehicular Warning sign that is supplemented with a Warning Beacon to indicate specific periods when the condition or activity is present or is likely to be present.

Figure 2C-15. Non-Vehicular Warning Signs



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

Section 2C.56 Playground Sign (W15-1)

Option:

01 The Playground (W15-1) sign (see Figure 2C-15) may be used to give advance warning of a designated children's playground that is located adjacent to the road.

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

Guidance:

03 *If the access to the playground area requires a roadway crossing, the application of crosswalk pavement markings (see Chapter 3C) and a Non-Vehicular Warning sign (see Section 2C.55) should be considered.*

SUPPLEMENTAL WARNING PLAQUES

Section 2C.57 Use of Supplemental Warning Plaques

Option:

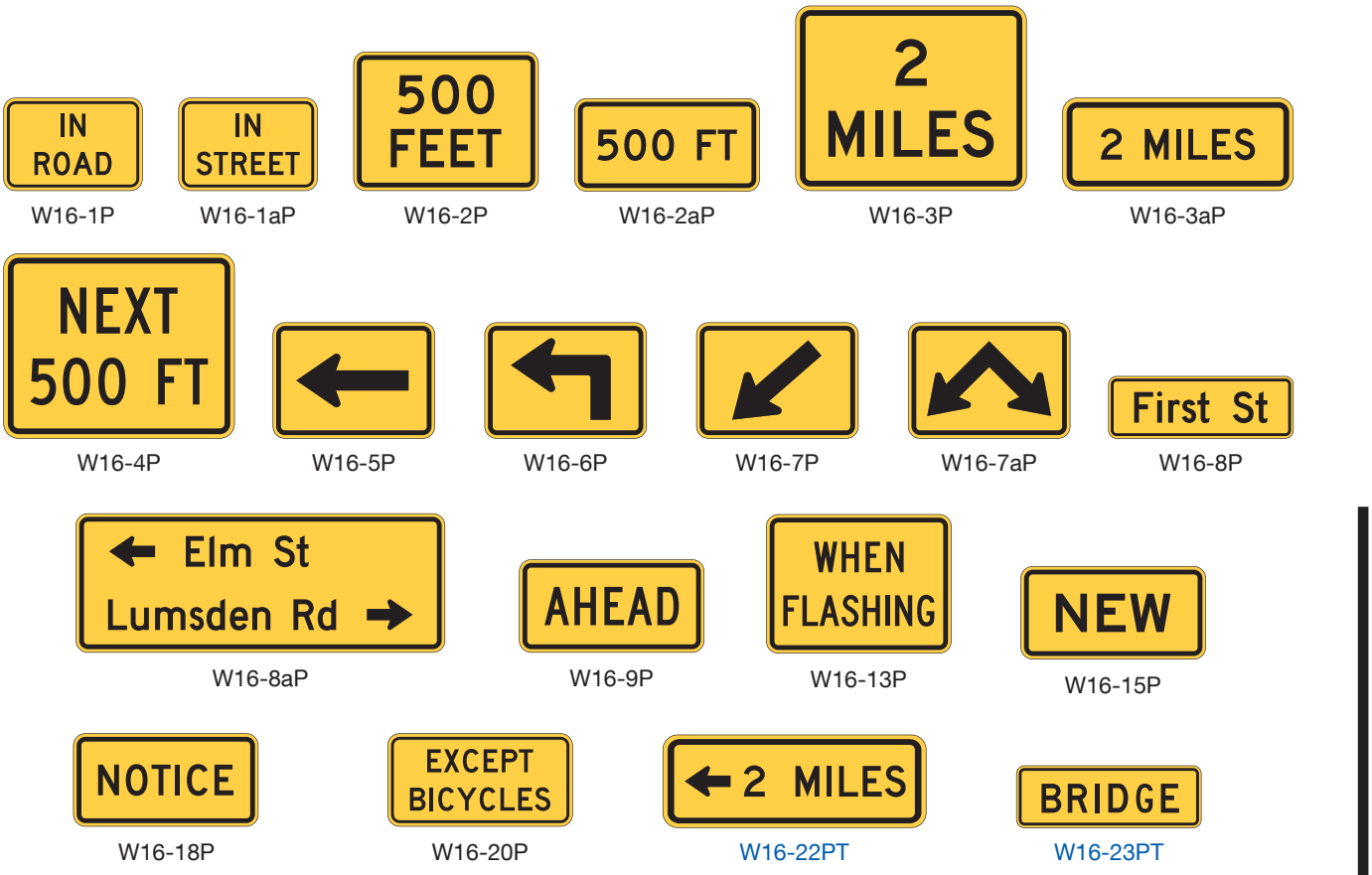
01 A supplemental warning plaque (see Figure 2C-16) may be displayed with a warning or regulatory sign when engineering judgment indicates that road users require additional warning information beyond that contained in the main message of the warning or regulatory sign.

Standard:

02 **Supplemental warning plaques shall be used only in combination with and installed on the same post(s) as warning or regulatory signs. They shall not be mounted alone or displayed alone.**

03 **Unless otherwise provided in this Manual for a particular plaque, supplemental warning plaques shall be mounted below the sign they supplement.**

Figure 2C-16. Supplemental Warning Plaques



Note: The background color (yellow or fluorescent yellow-green) shall match the color of the warning sign that it supplements.

Section 2C.58 Design of Supplemental Warning Plaques

Standard:

01 **A supplemental warning plaque used with a warning sign shall have the same legend, border, and background color as the warning sign with which it is displayed. A supplemental warning plaque used with a regulatory sign shall have a black legend and border on a yellow background.**

02 **Supplemental warning plaques shall be square or rectangular.**

Section 2C.59 Advisory Speed Plaque (W13-1P) and Confirmation Advisory Speed Plaque (W13-1aP)

Option:

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

02 The Confirmation Advisory Speed (W13-1aP) plaque (see Figure 2C-1) may be used to supplement a One-Direction Large Arrow (W1-6) sign on the outside of a turn or curve in line with and at approximately a right angle to approaching traffic.

Standard:

03 **The use of the Advisory Speed and Confirmation Advisory Speed plaques for horizontal curves shall be in accordance with Section 2C.06 and Table 2C-4. The speed differential in Table 2C-4 shall be the difference between the advisory speed for the horizontal curve and the posted speed limit, statutory speed limit, or the 85th percentile speed on the approach to the curve. The Advisory Speed plaque shall also be used where an engineering study indicates a need to advise road users of the advisory speed for other roadway conditions.**

04 **The speed displayed on the Advisory Speed and Confirmation Advisory Speed plaques shall be a multiple of 5 mph.**

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

06 **The Advisory Speed plaque shall only be used to supplement an advance warning sign. The Advisory Speed plaque or the Confirmation Advisory Speed plaque shall not be installed as a separate sign installation.**

Guidance:

07 *The Advisory Speed plaque, if used with a sign that is also supplemented with another plaque, such as an Advance Street Name plaque (see Section 2C.65), should be mounted immediately below the primary warning sign with any other plaque mounted below the Advisory Speed plaque.*

Standard:

08 **The Confirmation Advisory Speed plaque shall only be used to supplement a One-Direction Large Arrow (W1-6) sign (see Section 2C.10) or an Exit Gore (E5-1 series) sign (see Section 2E.26) and shall not be installed as a separate sign installation.**

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

Guidance:

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

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

Support:

12 The 2nd Edition of the "Traffic Control Devices Handbook," 2013, Institute of Transportation Engineers contains engineering practices for the determination of the recommended advisory speed for a horizontal curve including following: Rev. 1

A. Compass method
B. Safety-based method
C. Accelerometer method
D. Design equation method
E. Ball-bank method using the following criteria:
    1. 16 degrees of ball-bank for speeds of 20 mph or less
    2. 14 degrees of ball-bank for speeds of 25 to 30 mph
    3. 12 degrees of ball-bank for speeds of 35 mph and higher
F. Any of the methods outlined in the "Procedures for Establishing Speed Zones" manual Rev. 1

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

Section 2C.60 NEW Plaque (W16-15P)

Option:

01 A NEW (W16-15P) plaque (see Figure 2C-16) may be mounted above a regulatory sign when a new regulation takes effect in order to alert road users to the new traffic regulation. A NEW plaque may also be mounted above an advance warning sign (such as a Signal Ahead sign for a newly-installed traffic control signal) for a warning of a new traffic condition.

Guidance:

02 *The NEW plaque should be removed no later than 12 months after it was installed.*

Section 2C.61 Distance Plaques (W16-2 Series, W16-3 Series, W16-4P, and W7-3aP)

Option:

01 The Distance Ahead (W16-2 series and W16-3 series) plaques (see Figure 2C-16) may be used to inform the road user of the distance to the condition indicated by the warning sign.

02 The Next Distance (W7-3aP and W16-4P) plaques (see Figures 2C-5 and 2C-16) may be used to inform road users of the length of roadway over which the condition indicated by the warning sign exists.

Section 2C.62 Supplemental Arrow Plaques (W16-5P and W16-6P)

Guidance:

01 *If the condition indicated by a warning sign is located on an intersecting road and the distance between the intersection and condition is not sufficient to provide adequate advance placement of the warning sign, a Supplemental Arrow (W16-5P or W16-6P) plaque (see Figure 2C-16) should be used below the warning sign.*

Standard:

02 **Supplemental Arrow plaques shall have the same legend design as the Advance Turn Arrow and Directional Arrow auxiliary signs (see Sections 2D.26 and 2D.28) except that they shall have a black legend and border on a yellow or fluorescent yellow-green background, as appropriate.**

Section 2C.63 Diagonal Downward-Pointing Arrow Plaques (W16-7P and W16-7aP)

Support:

01 Diagonal downward-pointing arrow (W16-7P and W16-7aP) plaques (see Figure 2C-16) are used with certain Vehicular Traffic Warning signs (see Section 2C.54) and certain Non-Vehicular Warning signs (see Section 2C.55), and School Crossing signs (see Section 7B.03) to indicate the specific location of a crossing point.

02 The W16-7P plaque contains a single arrow pointing diagonally down to the right or left, toward the roadway, depending on which side of the roadway it is located.

Option:

03 A W16-7aP plaque may be used with a single crossing sign located on a narrow median separating two roadways with traffic in the same direction where the crossing traverses both roadways.

Section 2C.64 Hill-Related Plaques (W7-2 Series and W7-3 Series)

Guidance:

01 *Hill-Related (W7-2 series and W7-3 series) plaques (see Figure 2C-5) or other appropriate legends and larger signs should be used for emphasis or where special hill characteristics exist.*

02 *On longer grades, the use of a distance (W7-3aP or W7-3bP) plaque (see Figure 2C-5) at periodic intervals of approximately 1-mile spacing should be considered.*

Section 2C.64A HILL BLOCKS VIEW and CURVE BLOCKS VIEW Supplemental Plaques (W7-6PT and W1-11PT)

Option:

01 A HILL BLOCKS VIEW (W7-6PT) or CURVE BLOCKS VIEW (W1-11PT) supplemental plaque (see Figure 2C-1 and Figure 2C-5) may be installed below a horizontal alignment sign, if engineering judgment justifies the need.

Section 2C.65 Advance Street Name Plaques (W16-8P and W16-8aP)

Option:

01 An Advance Street Name (W16-8P or W16-8aP) plaque (see Figure 2C-16) may be used with any Intersection (W1-10 series, W2 series, W10-2, W10-3, or W10-4) or Advance Traffic Control (W3 series) sign to identify the name of the intersecting street.

Standard:

02 **The lettering on Advance Street Name plaques shall be composed of a combination of lower-case letters with initial upper-case letters.**

03 **If two street names are used on the Advance Street Name plaque, a directional arrow pointing in the direction of the street shall be placed next to each street name. Arrows pointing to the left shall be placed to the left of the street name, and arrows pointing to the right shall be placed to the right of the street name.**

Guidance:

04 *If two street names are used on the Advance Street Name plaque, the street names and associated arrows should be displayed in the following order:*

A. For a single intersection, the name of the street to the left should be displayed above the name of the street to the right; or

B. For two sequential intersections, such as where the plaque is used with an Offset Side Roads (W2-7) or a Double Side Road (W2-8) sign, the name of the first street encountered should be displayed above the name of the second street encountered, and the arrow associated with the second street encountered should be an advance arrow, such as the arrow shown on the W16-6P arrow plaque (see Figure 2C-16).

Section 2C.66 Traffic Does Not Stop Plaques (W4-4P Series)

Option:

01 The CROSS TRAFFIC DOES NOT STOP (W4-4P) plaque (see Figure 2C-10) may be used in combination with a STOP sign when engineering judgment indicates that conditions are present that are causing or could cause road users to misinterpret the intersection as an all-way stop.

02 The TRAFFIC FROM LEFT (RIGHT) DOES NOT STOP (W4-4aP) or ONCOMING TRAFFIC DOES NOT STOP (W4-4bP) plaque may be used when such messages more accurately describe the traffic controls established at the intersection.

Guidance:

03 *The W4-4aP and W4-4bP plaques should be used at intersections where STOP signs control all but one approach to the intersection, unless the only non-stopped approach is from a one-way street.*

Standard:

04 **If a W4-4P series plaque is used, it shall be mounted below the STOP sign.**

Support:

05 Section 9C.06 contains information for Bicycle Cross Traffic warning plaques that can be used below STOP signs on crossroads or driveways that intersect with bicycle facilities.

Section 2C.67 IN ROAD and IN STREET Plaques (W16-1P and W16-1aP)

Option:

01 In situations where there is a need to warn drivers to watch for other slower forms of transportation traveling along the highway, such as bicycles, pedestrians, golf carts, horse-drawn vehicles, or farm machinery, an IN ROAD (W16-1P) plaque or IN STREET (W16-1aP) plaque (see Figure 2C-16) may be used.

Standard:

02 **The background color of the W16-1P or W16-1aP plaque shall match the background color of the warning sign with which it is displayed. If a W16-1P or W16-1aP plaque is used, it shall be mounted below either a Vehicular Traffic Warning sign (see Section 2C.54) or a Non-Vehicular Warning sign (see Section 2C.55), and shall not be mounted alone.**

Support:

03 Section 9B.14 contains information about the use of a Bicycles Allowed Use of Full Lane (R9-20) sign to inform drivers of the presence of bicycles in the roadway or where bicyclists are expected or preferred to use the full lane.

Section 2C.68 EXCEPT BICYCLES Plaque (W16-20P)

Option:

01 Where it is desired to notify bicyclists that the conditions depicted by a warning sign are not applicable to bicycles, the EXCEPT BICYCLES (W16-20P) supplemental warning plaque (see Figure 2C-16) may be mounted below the warning sign.

Support:

02 Examples of warning signs with which an EXCEPT BICYCLES (W16-20P) plaque can be mounted include DEAD END (W14-1) or NO OUTLET (W14-2) signs.

Section 2C.69 ~~Photo Enforced Plaques (W16-10P and W16-10aP)~~ DELETED

OBJECT MARKERS

Section 2C.70 Object Marker Design and Placement Height

Support:

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

Standard:

02 **When used, object markers (see Figure 2C-17) shall not have a border and shall consist of an arrangement of one or more of the following types:**

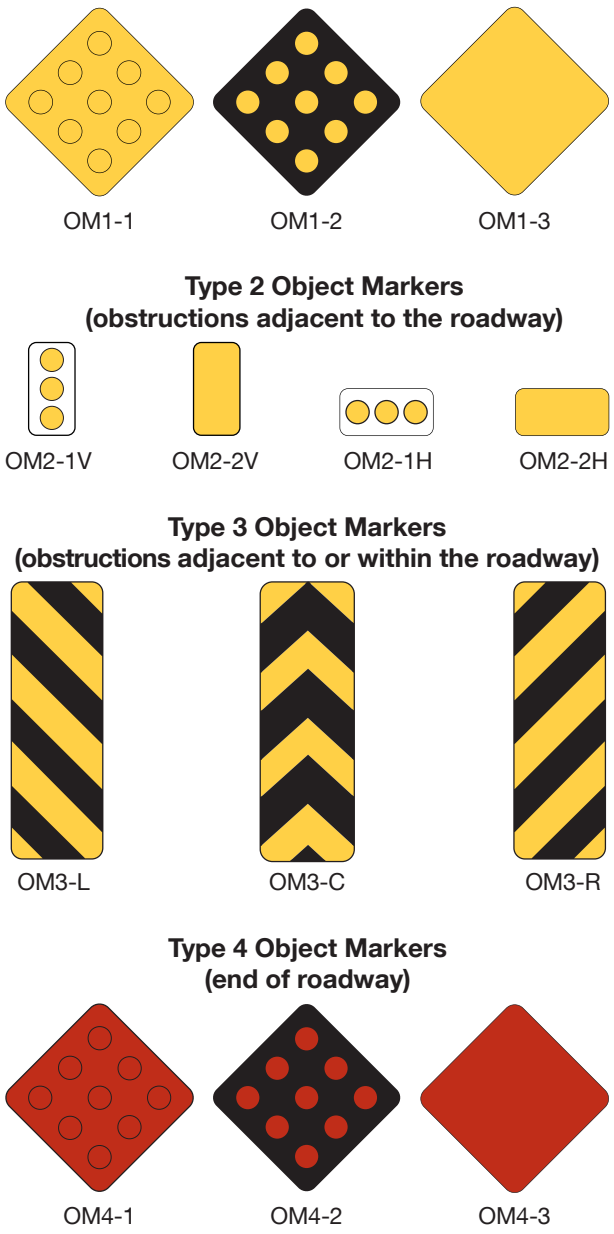
Type 1—a diamond-shaped sign, at least 18 inches on a side, consisting of either a yellow (OM1-1) or black (OM1-2) sign with nine yellow retroreflective devices, each with a minimum diameter of 3 inches, mounted symmetrically on the sign, or an all-yellow retroreflective sign (OM1-3).

Type 2—either a marker (OM2-1V or OM2-1H) consisting of three yellow retroreflective devices, each with a minimum diameter of 3 inches, arranged either horizontally or vertically on a white sign measuring at least 6 x 12 inches; or an all-yellow horizontal or vertical retroreflective sign (OM2-2V or OM2-2H), measuring at least 6 x 12 inches.

Type 3—a striped marker, 12 x 36 inches, consisting of a vertical rectangle with alternating black and retroreflective yellow stripes sloping downward at an angle of 45 degrees toward the side of the obstruction on which traffic is to pass. The minimum width of the yellow and black stripes shall be 3 inches.

Type 4—a diamond-shaped sign, at least 18 inches on a side, consisting of either a red (OM4-1) or black (OM4-2) sign with nine red retroreflective devices, each with a minimum diameter of 3 inches, mounted symmetrically on the sign, or an all-red retroreflective sign (OM4-3).

Figure 2C-17. Object Markers



Support:

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

Guidance:

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

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

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

Option:

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

Support:

08 Section 9C.09 contains information regarding the use of object markers on shared-use paths.

Section 2C.71 Object Markers for Obstructions and Sign Supports within the Roadway

Standard:

01 **Obstructions within the roadway shall be marked with a Type 1 or Type 3 object marker. In addition to markers on the face of the obstruction, warning of approach to the obstruction shall be given by appropriate pavement markings (see Section 3B.13).**

Option:

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

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

04 Sign supports, such as those installed in a median island, may be marked with a Type 1 object marker.

05 To provide additional emphasis, sign supports may alternatively have a strip of retroreflective material wrapped omni-directionally around them to identify the support as an object within the roadway.

Guidance:

06 *If used, the omni-directionally retroreflective wrap should be approximately 12 inches in height, visible in all directions, and should be placed approximately 4 feet above the edge of the roadway. The color of the wrap should be yellow, unless the sign is a YIELD, STOP, DO NOT ENTER, or WRONG WAY sign, then the color of the wrap should be red.*

Standard:

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

Option:

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08 Appropriate signs (see Sections 2B.39 and 2C.23) directing traffic to one or both sides of the obstruction may be used instead of the object marker.

Section 2C.72 Object Markers for Obstructions and Sign Supports Adjacent to the Roadway

Support:

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

Option:

02 Type 2 or Type 3 object markers may be used to mark an obstruction adjacent to the roadway.

Guidance:

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

04 *When a marker is applied to the approach ends of guardrail or crash cushion terminals it should have the appearance of a Type 3 object marker and should be directly affixed, without a substrate, to the approach end of*

the guardrail or crash cushion and generally conform to the size and shape of the approach end of the guardrail or crash cushion.

Standard:

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

Guidance:

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

Option:

07 A strip of retroreflective material may be wrapped around a sign support to omni-directionally identify the support as an object adjacent to the roadway, if approaching traffic can not see the sign face (e.g., a sign facing the cross street at an intersection with another road or a fold-up sign) and the support is installed near the traveled way in an area with low light conditions.

Guidance:

08 *If used, the omni-directionally retroreflective wrap should be approximately 12 inches in height, visible in all directions, and should be placed approximately 4 feet above the edge of the roadway. The color of the wrap should be yellow, unless the sign is a YIELD, STOP, DO NOT ENTER, or WRONG WAY sign, then the color of the wrap should be red.*

Section 2C.73 Object Markers for Ends of Roadways

Support:

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

Standard:

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

Option:

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

04 Where conditions warrant, more than one marker, or a larger marker with or without a Type 3 Barricade (see Section 2B.75), may be used at the end of the roadway.

Standard:

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

Guidance:

06 *Appropriate advance warning signs in this Chapter should be used.*