

# National Committee on Uniform Traffic Control Devices

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## National Committee on Uniform Traffic Control Devices (NCUTCD) Recommended Changes to Proposed Text for 11<sup>th</sup> Edition of the MUTCD Docket Number: FHWA-2020-0001

**Federal Register Item Number:** 111-114, 116-118, 120-124, 126-130, 135-137, 142-152, 154 (see listing below)

**NPA MUTCD Section Number:** Sections 2C.01- 2C.72

**Legend:** Base text shown in proposal is the NPA “clean” proposed text.

- NCUTCD recommendation for text to be added in final rule.
- ~~NCUTCD recommendation for text to be deleted from rule.~~
- NCUTCD recommendation for text to be moved/relocated in final rule.
- NPA text not previously approved by NCUTCD but now approved.
- Explanatory note: [Note that explains purpose of recommended change.]
- References in 00X-XXX-00 format refer to previous NCUTCD recommendations approve by Council and sent to FHWA, which may be seen on the NCUTCD website at <https://ncutcd.org>.

The following pages present NCUTCD recommendations for changes to the MUTCD NPA proposed text and figures for Chapter 2C. Below is a summary of the NCUTCD position for each section of this chapter. A more detailed summary is provided at the beginning of each section.

- NPA #111, Section 2C.01: NCUTCD agrees with NPA content (no changes recommended)
- NPA #112, Section 2C.02: Changes recommended based on Council action in spring 2021
- NPA #113, Section 2C.03: Changes recommended based on Council action in spring 2021
- NPA #114, Section 2C.04: Changes recommended based on Council action in spring 2021
- NPA #115, Section 2C.05: NCUTCD agrees with NPA content (no changes recommended)
- NPA #116, Section 2C.06: Changes recommended based on Council action in spring 2021
- NPA #117, Section 2C.07: Changes recommended based on Council action in spring 2021
- NPA #118, Section 2C.08: Changes recommended based on Council action in spring 2021
- NPA #118, Section 2C.09: Changes recommended based on Council action in spring 2021
- NPA #120, Section 2C.10: Changes recommended based on Council action in spring 2021
- NPA #121, Section 2C.11: Changes recommended based on Council action in spring 2021
- NPA #122, Section 2C.12: Changes recommended based on Council action in spring 2021
- NPA #123, Section 2C.13: Changes recommended based on Council action in spring 2021
- NPA #124, Section 2C.14: NCUTCD agrees with NPA content (no changes recommended)
- NPA #NA, Section 2C.15: NCUTCD agrees with NPA content (no changes recommended)
- NPA #125, Section 2C.16: Changes recommended based on Council action in spring 2021
- NPA #NA, Section 2C.17: Changes recommended based on Council action in spring 2021
- NPA #126, Section 2C.18: Changes recommended based on Council action in spring 2021

- 41 • NPA #126, Section 2C.19: Changes recommended based on Council action in spring 2021
- 42 • NPA #NA, Section 2C.20: NCUTCD agrees with NPA content (no changes recommended)
- 43 • NPA #NA, Section 2C.21: NCUTCD agrees with NPA content (no changes recommended)
- 44 • NPA #NA, Section 2C.22: NCUTCD agrees with NPA content (no changes recommended)
- 45 • NPA #NA, Section 2C.23: NCUTCD agrees with NPA content (no changes recommended)
- 46 • NPA #127, Section 2C.24: Changes recommended based on Council action in spring 2021
- 47 • NPA #128, Section 2C.25: Changes recommended based on Council action in spring 2021
- 48 • NPA #129, Section 2C.26: Changes recommended based on Council action in spring 2021
- 49 • NPA #NA, Section 2C.27: NCUTCD agrees with NPA content (no changes recommended)
- 50 • NPA #130, Section 2C.28: Changes recommended based on Council action in spring 2021
- 51 • NPA #NA, Section 2C.29: NCUTCD agrees with NPA content (no changes recommended)
- 52 • NPA #131, Section 2C.30: NCUTCD agrees with NPA content (no changes recommended)
- 53 • NPA #NA, Section 2C.31: Changes recommended based on Council action in spring 2021
- 54 • NPA #NA, Section 2C.32: NCUTCD agrees with NPA content (no changes recommended)
- 55 • NPA #NA, Section 2C.33: NCUTCD agrees with NPA content (no changes recommended)
- 56 • NPA #132, Section 2C.34: Changes recommended based on Council action in spring 2021
- 57 • NPA #133, Section 2C.35: Changes recommended based on Council action in spring 2021
- 58 • NPA #134, Section 2C.36: Changes recommended based on Council action in spring 2021
- 59 • NPA #135, Section 2C.37: Changes recommended based on Council action in spring 2021
- 60 • NPA #NA, Section 2C.38: NCUTCD agrees with NPA content (no changes recommended)
- 61 • NPA #136, Section 2C.39: Changes recommended based on Council action in spring 2021
- 62 • NPA #137, Section 2C.40: Changes recommended based on Council action in spring 2021
- 63 • NPA #138, Section 2C.41: Changes recommended based on Council action in spring 2021
- 64 • NPA #139, Section 2C.42: NCUTCD agrees with NPA content (no changes recommended)
- 65 • NPA #140, Section 2C.43: NCUTCD agrees with NPA content (no changes recommended)
- 66 • NPA #141, Section 2C.44: NCUTCD agrees with NPA content (no changes recommended)
- 67 • NPA #142, Section 2C.45: Changes recommended based on Council action in spring 2021
- 68 • NPA #143, Section 2C.46: Changes recommended based on Council action in spring 2021
- 69 • NPA #144, Section 2C.47: Changes recommended based on Council action in spring 2021
- 70 • NPA #145, Section 2C.48: Changes recommended based on Council action in spring 2021
- 71 • NPA #146, Section 2C.49: Changes recommended based on Council action in spring 2021
- 72 • NPA #147, Section 2C.50: Changes recommended based on Council action in spring 2021
- 73 • NPA #NA, Section 2C.51: NCUTCD agrees with NPA content (no changes recommended)
- 74 • NPA #148, Section 2C.52: Changes recommended based on Council action in spring 2021
- 75 • NPA #NA, Section 2C.53: NCUTCD agrees with NPA content (no changes recommended)
- 76 • NPA #149, Section 2C.54: Changes recommended based on Council action in spring 2021
- 77 • NPA #NA, Section 2C.55: NCUTCD agrees with NPA content (no changes recommended)
- 78 • NPA #NA, Section 2C.56: NCUTCD agrees with NPA content (no changes recommended)
- 79 • NPA #NA, Section 2C.57: NCUTCD agrees with NPA content (no changes recommended)
- 80 • NPA #NA, Section 2C.58: Changes recommended based on Council action in spring 2021
- 81 • NPA #150, Section 2C.59: Changes recommended based on Council action in spring 2021
- 82 • NPA #151, Section 2C.60: Changes recommended based on Council action in spring 2021
- 83 • NPA #NA, Section 2C.61: NCUTCD agrees with NPA content (no changes recommended)
- 84 • NPA #NA, Section 2C.62: NCUTCD agrees with NPA content (no changes recommended)
- 85 • NPA #NA, Section 2C.63: NCUTCD agrees with NPA content (no changes recommended)
- 86 • NPA #NA, Section 2C.64: Changes recommended based on Council action in spring 2021

- NPA #NA, Section 2C.65: Changes recommended based on Council action in spring 2021
  - NPA #152, Section 2C.66: Changes recommended based on Council action in spring 2021
  - NPA #153, Section 2C.67: Changes recommended based on Council action in spring 2021
  - NPA #NA, Section 2C.68: Changes recommended based on Council action in spring 2021
  - NPA #NA, Section 2C.69: NCUTCD agrees with NPA content (no changes recommended)
  - NPA #NA, Section 2C.70: NCUTCD agrees with NPA content (no changes recommended)
  - NPA #154, Section 2C.71: NCUTCD agrees with NPA content (no changes recommended)
  - NPA #NA, Section 2C.72: Changes recommended based on Council action in spring 2021
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**Section 2C.01 Comments:** NCUTCD agrees with 2C.01 as presented in the NPA.

## **Section 2C.01 Function and Application of Warning Signs**

### **Standard:**

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

**Warning signs shall be retroreflective or illuminated (see Section 2A.20).**

### **Guidance:**

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

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**Section 2C.02 Comments:** NCUTCD generally agrees with 2C.02 as presented in the NPA, but recommends the following revisions:

- Revise Section 2A.05 reference to 2A.15
- Add Option statement that warning beacon may be used with warning sign per 4S.03
- Minor editorial revisions

## **Section 2C.02 Design of Warning Signs**

### **Standard:**

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

### **Option:**

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:**

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

Section 2A.015 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.

### **Option:**

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.42) in order to approximate the geometric configuration of the intersecting roadway(s).

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

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

Consistent with the provisions of Chapter 4S.03 a Warning Beacon may be used in combination with a standard warning sign.

Warning signs may be enhanced with LEDs that illuminate steadily or flash at acceptable rates (See Section 2A.20) in the sign border ~~matching~~ and that match the background color of the sign.

#### **Standard:**

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

NCUTCD generally agrees with Table 2C-1 as presented in the NPA, but recommends the following revisions:

- Add an asterisk and footnote to the “minimum” column that says “The minimum size shall only be used on low speed roadways, alleys, site roadways open to public travel, and low volume rural roads with operating speeds of 30 mph or lower.” to be consistent with the Standard in Section 2C.03
- Add a new TRAFFIC ENTERING sign (see 2C.37)
- Change the size of the EXCEPT BICYCLES plaque to 24” x 18” in accordance with NCUTCD recommendation 14A-BIK-01
- Resolve the conflict between W9-4 signs in Part 2 and Part 6 in the NPA with the same sign designation - W9-4 in Part 2 is the LANES MERGE word legend sign and W9-4 in Part 6 is the Interior Lane Shift Ahead symbol sign

**Table 2C-1 Warning Sign and Plaque Sizes**

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
Truck Rollover	W1-13	2C.11	36 x 36	36 x 36	36 x 36	48 x 48	—	36 x 36
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.42	30 x 30	30 x 30	36 x 36	—	24 x 24	48 x 48
Traffic Entering When Flashing	W2-10	2C.37	36 x 36	36 x 36	48 x 48	—	—	48 x 48
Watch for Entering Traffic	W2-11	2C.37	36 x 36	36 x 36	48 x 48	—	—	48 x 48

Traffic Approaching When Flashing	W2-12	2C.37	36 x 36	36 x 36	48 x 48	—	—	48 x 48
Stop, Yield, Signal Ahead	W3-1,2,3	2C.36	30 x 30	30 x 30	48 x 48	48 x 48	30 x 30	—
Be Prepared to Stop	W3-4	2C.36	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	—	—
XX MPH Truck Speed Zone Ahead	W3-5c	2C.40	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Draw Bridge	W3-6	2C.28	36 x 36	36 x 36	48 x 48	—	—	60 x 60
Ramp Meter Ahead	W3-7	2C.38	36 x 36	36 x 36	—	—	—	—
Ramp Metered When Flashing	W3-8	2C.38	36 x 36	36 x 36	—	—	—	—
Merging Traffic	W4-1	2C.45	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
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.65	24 x 12	24 x 12	36 x 18	—	—	48 x 24
Traffic From Left (Right) Does Not Stop (plaque)	W4-4aP	2C.65	24 x 12	24 x 12	36 x 18	—	—	48 x 24
Oncoming Traffic Does Not Stop (plaque)	W4-4bP	2C.65	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	—	—	—
No Merge Area (plaque)	W4-5P	2C.45	18 x 24	18 x 24	24 x 30	—	—	—
Entering Roadway Added Lane	W4-6	2C.41	36 x 36	36 x 36	48 x 48	—	—	—
Heavy Merge Left (Right)	W4-7	2C.49	36 x 36	36 x 36	48 x 48	48 x 48	—	48 x 48
Single Lane Transition	W4-8	2C.48	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
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 Three-Lane Roadway	W6-5	2C.52	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Two-Way Traffic Three-Lane Roadway Hill	W6-5a	2C.52	36 x 36	36 x 36	48 x 48	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.63	24 x 18	24 x 18	—	—	—	—
Trucks Use Lower Gear (plaque)	W7-2bP	2C.63	24 x 18	24 x 18	—	—	—	—
XX% Grade (plaque)	W7-3P	2C.63	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.63	24 x 18	24 x 18	—	—	—	—
Runaway Truck Ramp XX Miles	W7-4	2C.15	78 x 48	78 x 48	78 x 48	78 x 48	—	—
Runaway Truck Ramp (with arrow)	W7-4b	2C.15	78 x 60	78 x 60	78 x 60	78 x 60	—	—
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
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.29	36 x 36	36 x 36	48 x 48	—	30 x 30*	—
Soft Shoulder	W8-4	2C.30	36 x 36	36 x 36	48 x 48	48 x 48	24 x 24*	48 x 48
Slippery When Wet	W8-5	2C.31	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.31	24 x 18	24 x 18	30 x 24	36 x 30	—	36 x 30
Ice	W8-5aP	2C.31	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.31	36 x 36	36 x 36	36 x 36	—	24 x 24*	48 x 48
Rough Road	W8-8	2C.31	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Low Shoulder	W8-9	2C.30	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Uneven Lanes	W8-11	2C.31	36 x 36	36 x 36	36 x 36	48 x 48	—	48 x 48
No Center Line	W8-12	2C.33	36 x 36	36 x 36	36 x 36	48 x 48	—	—
Bridge Ices Before Road	W8-13	2C.31	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Fallen Rocks	W8-14	2C.31	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Minimum	Oversized
			Single Lane	Multi-Lane				
Grooved Pavement	W8-15	2C.32	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Motorcycle (plaque)	W8-15P	2C.32	24 x 18	24 x 18	30 x 24	36 x 30	—	36 x 30
Metal Bridge Deck	W8-16	2C.32	30 x 30*	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Shoulder Drop Off (symbol)	W8-17	2C.30	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.30	24 x 18	24 x 18	30 x 24	36 x 30	—	36 x 30
Road May Flood	W8-18	2C.35	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Flood Gauge	W8-19	2C.35	12 x 72	12 x 72	—	—	—	—
Gusty Winds Area	W8-21	2C.35	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Fog Area	W8-22	2C.35	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48

No Shoulder	W8-23	2C.30	36 x 36	36 x 36	36 x 36	48 x 48	24 x 24*	48 x 48
Shoulder Ends	W8-25	2C.30	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	—	—	—	48 x 48
Street Ends	W8-26a	2C.24	30 x 30	36 x 36	—	—	—	48 x 48
Left (Right) 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 Exit Only Ahead	W9-7	2C.50	132 x 72	132 x 72	132 x 72	132 x 72	—	—
Bicycle	W11-1	2C.54	30 x 30	30 x 30	36 x 36	—	24 x 24*	48 x 48
Pedestrian	W11-2	2C.55	30 x 30*	36 x 36	36 x 36	—	24 x 24*	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
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	—	—	—
Horse-Drawn Vehicle	W11-14	2C.54	30 x 30*	36 x 36	36 x 36	—	24 x 24*	48 x 48
Bicycle / Pedestrian	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	—	—	—
Low Clearance	W12-2	2C.25	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Low Clearance Overhead	W12-2a	2C.25	84 x 24	84 x 24	84 x 24	84 x 24	—	—
Low Clearance Overhead	W12-2b	2C.25	102 x 24	102 x 24	102 x 24	102 x 24	—	—
Advisory Speed (plaque)	W13-1P	2C.59	18 x 18	18 x 18	24 x 24	30 x 30	—	30 x 30
Confirmation Advisory Speed (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
Combination Horizontal Alignment/ Advisory Exit or Ramp Speed Loop	W13-6,7,8,9	2C.12	24 x 42	24 x 42	36 x 60	36 x 60	—	48 x 84
Combination Horizontal Alignment/ Advisory Exit or Ramp Speed Turn	W13-10,11	2C.12	30 x 48	30 x 48	42 x 66	42 x 66	—	54 x 72
Combination Truck Rollover/Advisory Exit or Ramp Speed	W13-12,13	2C.12	24 x 42	24 x 42	36 x 60	36 x 60	—	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 8	36 x 8	—	—	—	—
No Passing Zone (pennant)	W14-3	2C.53	48 x 48 x 36	48 x 48 x 36	—	—	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.66	18 x 12	18 x 12	24 x 18	—	—	24 x 18
In Street (plaque)	W16-1aP	2C.66	18 x 12	18 x 12	24 x 18	—	—	24 x 18
XX Feet (plaque)	W16-2P	2C.61	24 x 18	24 x 18	—	—	—	30 x 24
XX Ft (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	30 x 12	30 x 12	—	—	—	—
Next XX Feet (plaque)	W16-4P	2C.61	30 x 24	30 x 24	—	—	—	—
Supplemental Arrow (plaque)	W16-5P,6P	2C.62	24 x 18	24 x 18	—	—	—	—
Downward Diagonal Arrow (plaque)	W16-7P	2C.54, 2C.55	24 x 12	24 x 12	—	—	—	30 x 18
Advance Street Name (1-line plaque)	W16-8P	2C.64	Varies x 8	Varies x 8	—	—	—	—
Advance Street Name (2-line plaque)	W16-8aP	2C.64	Varies x 15	Varies x 15	—	—	—	—
Ahead (plaque)	W16-9P	2C.55	24 x 12	24 x 12	30 x 18	—	—	—
Photo Enforced (symbol plaque)	W16-10P	2C.68	24 x 12	24 x 12	36 x 18	—	—	48 x 24
Photo Enforced (plaque)	W16-10aP	2C.68	24 x 18	24 x 18	36 x 30	—	—	48 x 36
Traffic Circle (plaque)	W16-12P	2C.42	24 x 18	24 x 18	—	—	—	—
Roundabout (plaque)	W16-12aP	2C.42	24 x 12	24 x 12	—	—	—	—
When Flashing (plaque)	W16-13P	2C.55	24 x 18	24 x 18	—	—	—	—
New (plaque)	W16-15P	2C.60	24 x 12	24 x 12	—	—	—	—
Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Minimum	Oversized
			Single Lane	Multi-Lane				
Notice (plaque)	W16-18P	2A.15	24 x 12	24 x 12	—	—	—	—
Except Bicycles (plaque)	W16-20P	2C.67	24 x 12	24 x 12	—	—	—	—
Speed Hump	W17-1	2C.27	30 x 30*	36 x 36	—	—	24 x 24*	48 x 48



No Traffic Signs	W18-1	2C.34	30 x 30*	36 x 36	—	—	24 x 24*	36 x 36
Freeway Ends XX Miles	W19-1	2C.22	—	—	—	144 x 48	—	—
Expressway Ends XX Miles	W19-2	2C.22	—	—	144 x 48	—	—	—
Freeway Ends	W19-3	2C.22	—	—	—	48 x 48	—	—
Expressway Ends	W19-4	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.39	36 x 36	36 x 36	—	—	—	—
New Signal Operation Ahead	W23-2a	2C.39	36 x 36	36 x 36	48 x 48	—	—	—
Watch for Stopped Traffic	W23-3	2C.41	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Traffic Signal Extended Green	W25-1,2	2C.48	24 x 30	24 x 30	—	—	—	—

**Section 2C.03 Comments:** NCUTCD generally agrees with 2C.03 as presented in the NPA, but recommends adding a Standard statement that the minimum sizes apply to low speed roadways, sites open to public travel, and low volume roads.

### Section 2C.03 Size of Warning Signs

#### Standard:

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

#### Support:

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

#### Standard:

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

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

#### Option:

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

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

#### Guidance:

*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.*

*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" by 36".*

*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.*

#### Standard:

The sizes shown in the Minimum columns of Table 2C-1 shall only be used on low speed roadways, alleys, site roadways open to public travel, and low volume rural roads with operating speeds of 30 mph or lower. (add Standard to better define minimum sign size use)

**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	24 x 12	18 x 18
30 x 30				
36 x 36	30 x 18	30 x 24	30 x 18	24 x 24
48 x 48				

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

NCUTCD agrees with Table 2C-2 as presented in the NPA.

**Section 2C.04 Comments:** NCUTCD agrees with Section 2C.04 as presented in the NPA.

#### **Section 2C.04 Placement of Warning Signs**

##### **Support:**

For information on placement of warning signs, see Sections 2A.12 to 2A.17.

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:**

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

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

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

NCUTCD generally agrees with Table 2C-3 as presented in the NPA, but recommends the following changes:

- Change the values in Condition A to agree with the criteria in the Notes
- Revise Condition A notes:
  - Note 1: revise to note that no sign legibility distance has been used for the stop condition
  - Note 2: delete references to a 14.5 second PRT - almost all of the calculations agree with the 14.0 second PRT, and the calculations in column A derive from a 14.0 second PRT so NCUTCD recommends changing the range of 14.0 - 14.5 seconds to 14 seconds



- Note 3: revise the note to consider increased deceleration distances on downgrades and queue lengths at the stop condition
- Note 4: revise the note to explain that distances have been rounded to 25 foot intervals and explain the need to interpolate between values for the missing 5 mph intervals in Category B, as adding 5 mph interval values would make the table large and unwieldy

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

Posted or 85 <sup>th</sup> -Percentile Speed	Advance Placement Distance <sup>1</sup>									
	Condition A: Speed reduction and lane changing in heavy traffic <sup>2</sup>	0 <sup>3</sup>	10 <sup>4</sup>	20 <sup>4</sup>	30 <sup>4</sup>	40 <sup>4</sup>	50 <sup>4</sup>	60 <sup>4</sup>	70 <sup>4</sup>	80 <sup>4</sup>
20 mph	225 ft	115 ft	N/A <sup>5</sup>	---	---	---	---	---	---	---
25 mph	325 ft	155 ft	N/A <sup>5</sup>	N/A <sup>5</sup>	---	---	---	---	---	---
30 mph	<del>460 ft</del> 450 ft	200 ft	N/A <sup>5</sup>	N/A <sup>5</sup>	---	---	---	---	---	---
35 mph	<del>565 ft</del> 550 ft	250 ft	N/A <sup>5</sup>	N/A <sup>5</sup>	N/A <sup>5</sup>	---	---	---	---	---
40 mph	<del>670 ft</del> 650 ft	305 ft	100 ft <sup>6</sup>	100 ft <sup>6</sup>	N/A <sup>5</sup>	---	---	---	---	---
45 mph	<del>775 ft</del> 750 ft	360 ft	125 ft	100 ft <sup>6</sup>	100 ft <sup>6</sup>	N/A <sup>5</sup>	---	---	---	---
50 mph	<del>885 ft</del> 850 ft	425 ft	200 ft	175 ft	125 ft	100 ft <sup>6</sup>	---	---	---	---
55 mph	<del>990 ft</del> 950 ft	495 ft	275 ft	225 ft	200 ft	125 ft	N/A <sup>5</sup>	---	---	---
60 mph	1,100 ft	570 ft	350 ft	325 ft	275 ft	200 ft	100 ft <sup>6</sup>	---	---	---
65 mph	1,200 ft	645 ft	450 ft	400 ft	350 ft	275 ft	200 ft	100 ft <sup>6</sup>	---	---
70 mph	<del>1,250 ft</del> 1,275 ft	730 ft	525 ft	500 ft	450 ft	375 ft	275 ft	150 ft	---	---
75 mph	1,350 ft	820 ft	625 ft	600 ft	550 ft	475 ft	375 ft	250 ft	100 ft <sup>6</sup>	---
80 mph	1,475 ft	910 ft	725 ft	700 ft	625 ft	550 ft	450 ft	350 ft	200 ft	---
85 mph	1,600 ft	1,010 ft	825 ft	800 ft	750 ft	675 ft	575 ft	450 ft	300 ft	150 ft

- The distances are adjusted for a sign legibility distance of 180 for Condition A. The distance for Condition B (with exception of the potential stop condition where no sign legibility distance adjustment has been made) have been adjusted for a sign legibility of 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 or more than four words, a minimum of 100 feet should be added to the advance posting distance to provide adequate legality of the warning sign.
- Typical conditions are locations where the road user must use extra time to adjust speed and change lanes in heavy traffic because of a complex driving situation. Typical signs are Merge and Right Lane Ends. The distances are determined by providing 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. (revise to 14.0 second PRT)
3. Typical condition is the warning of a potential stop condition. Typical signs are the 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 feet/second squared and with no adjustment for sign legibility distance. See Table 3-2 of the 2018 AASHTO Policy for adjustments due to grades. Consider increasing the advance posting distances for significant queues. (consider downgrades)
  4. Typical conditions are where the road user must decrease speed to maneuver through the warned condition. Typical signs are the 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 squared, and adjusted for sign legibility distance of 250 feet. Distances have been rounded to 25 foot intervals. Distances for 5 MPH intervals for the “Posted or 85<sup>th</sup> Percentile Speed” Have been rounded to 25 foot intervals and can be interpolated between adjacent values. (explain interpolation)
  5. No suggested distances are provided for these speeds, as the placement location is dependent on the 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 condition 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.

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**Section 2C.05 Comments:** NCUTCD agrees with 2C.05 as presented in the NPA, as the content is consistent with NCUTCD recommendation 17B-RW-01.

## **Section 2C.05 Horizontal Alignment Warning Signs - General**

### **Support:**

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.13.

### **Option:**

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

- A. Horizontal alignment signs (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), Combination Horizontal Alignment (Advisory Exit or Ramp Speed W13-6 through W13-11) signs.

- B. Advisory Speed Plaque (W13-1P)
- C. Chevrons (W1-8)
- D. Delineators (Chapter 3G)
- E. One Direction Large Arrow (W1-6) sign
- F. Raised Retroreflective Pavement Markers (Section 3B.15 through 3B.16).
- G. Sign or marking conspicuity enhancements (See Section 2A.11)
- H. Wide Edge Lines.
- I. Pavement Word, Symbol and Arrow markings (symbol or words) (Section 3B.20 through 3B.22)
- J. Rumble Strips
- K. Vehicle Speed Feedback Sign (Section 2C.13)
- L. Speed reduction markings (Section 3B.28)

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

Guidance:

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

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.

NCUTCD agrees with Figure 2C-1 as presented in the NPA.

**Section 2C.06 Comments:** NCUTCD generally agrees with 2C.06 as presented in the NPA, since the overall content is consistent with NCUTCD recommendation 17B-RW-01. NCUTCD recommends revising the first Standard paragraph to better clarify how Table 2C-4a and Table 2C-4b are used in conjunction with each other to guide practitioners toward the most likely best device for the location, and delete the term “prevailing speed” as it is no longer defined.

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

#### **Standard:**

**Horizontal alignment warning signs, as indicated in Table 2C-4b, shall be used in advance of horizontal curves in accordance with the criteria shown in Table 2C-4a, except as provided in paragraphs 3, 5, and 6 of this section. The speed differential shall be the difference between**

~~the horizontal curve's advisory speed and the roadway's posted or statutory speed limit or 85th percentile speed, whichever is higher, or the prevailing speed on the approach to the curve.~~  
The criteria shown in Table 2C-4a shall be used to determine the need for devices for changes in horizontal alignment. When device use is indicated by Table 2C-4a; Table 2C-4b 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 Table 2C-4b shall be the difference between the horizontal curve's advisory speed and the higher of the roadway's posted / statutory speed limit or 85th percentile speed, ~~whichever is higher,~~ on the approach to the curve.  
(revise Standard)

Support:

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

Option:

A One Direction Large Arrow (W1-6) sign may be used in place of or to supplement delineators (see Section 3G.03) or Chevrons (W1-8) when geometric conditions limit the number of delineators or chevrons that are visible or when the number of delineators or chevrons that can be installed within the change in horizontal alignment is less than the spacing specified in Sections 2C.08 or 3F.04.

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

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.

Devices for changes in horizontal alignment may be omitted on urban streets with an AADT of 1000 vehicles per day or less on the basis of engineering judgment.

Support:

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 centerline, edge lines, or both are present. See Sections 3B.02 and 3B.09 for centerline and edge line provisions.

NCUTCD generally agrees with Tables 2C-4a and 2C-4b as presented in the NPA, as they are consistent with NCUTCD recommendation 17B-RW-01, but recommends the following revisions:

- Revise the title of Table 2C-4a to “Determination of Need for Devices for Changes in Horizontal Alignment”
- Revise the title of Table 2C-4b to “Selection of Devices for Changes in Horizontal Alignment”

**Table 2C-4a - ~~Selection of Devices for Changes in Horizontal Alignment~~<sup>1</sup>**

[Determination of Need for Devices for Changes in Horizontal Alignment](#)

Roadway Condition	AADT			
	< 1000	1000-2999	3000-3999	>3999
Freeways and Expressways	Required	Required	Required	Required
Arterial or Collector without Pavement Markings	Optional	Recommended	Required	Required
Arterial or Collector with Pavement Markings <sup>2</sup>	Optional	Recommended	Recommended	Required
All other roadways	Optional	Optional	Optional	Optional

<sup>1</sup> Devices as indicated in Table 2C-4b

<sup>2</sup> An arterial or collector are considered to have pavement markings when ~~either~~ a center line, edge line, or both are present.

[Selection of Devices for Changes in Horizontal Alignment](#)

**Table 2C-4b - ~~Application of Devices for Changes in Horizontal Alignment~~**

Speed Differential	Devices for Change in Horizontal Alignment <sup>1</sup>	Use of Advisory Speed Plaque (W13-1P) <sup>4</sup>
5 mph	Pavement markings or advance horizontal alignment warning sign on paved roadways. Advance horizontal alignment warning sign on unpaved roadways. <sup>2</sup>	Optional
10 mph	Advance horizontal alignment warning sign	Recommended
15 mph	Delineators <sup>3</sup> and advance horizontal alignment warning sign	Required
20 mph or more	Chevrons <sup>3</sup> and advance horizontal alignment warning sign	Required

<sup>1</sup> The provisions for the use of Horizontal Alignment warning signs and devices are contained in Section 2C.06 and Table 2C-4a.

<sup>2</sup> A roadway is considered to have pavement markings when ~~either~~ a center line, edge line, or both are present.

<sup>3</sup> See Section 2C.06 for the use of a One Direction Large Arrow (W1-6) sign in place of or to supplement delineators and chevrons.

<sup>4</sup> See Section 2C.59

**Section 2C.07 Comments:** NCUTCD generally agrees with 2C.07 as presented in the NPA with minor editorial revisions.



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

398 **Standard:**

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

402 *Guidance:*

403 *A Turn sign (W1-1) should be used instead of a Curve sign (W1-2) in advance of curves when the*  
404 *advisory speed is half or less of the posted speed or the speed differential is of 25 MPH or more.*

405 (improve wording)

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

410 **Support:**

411 Figure 2C-2 provides an example of warning signs used for a turn.

412 **Option:**

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

416 A NEXT XX MILES (W7-3aP) supplemental distance plaque (see Section 2C.60) may be  
417 installed below the Winding Road sign where continuous roadway curves exist for a specific  
418 distance.

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

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

423 *Guidance:*

424 *When the Hairpin Curve sign or the 270-degree Loop sign is installed, either a One-Direction*  
425 *Large*

426 *Arrow (W1-6) sign or Chevron Alignment (W1-8) signs should be installed on the outside of the turn*  
427 *or curve.*

Figure 2C-2. Example of Warning Signs for a Turn (Sheet 1 of 2)

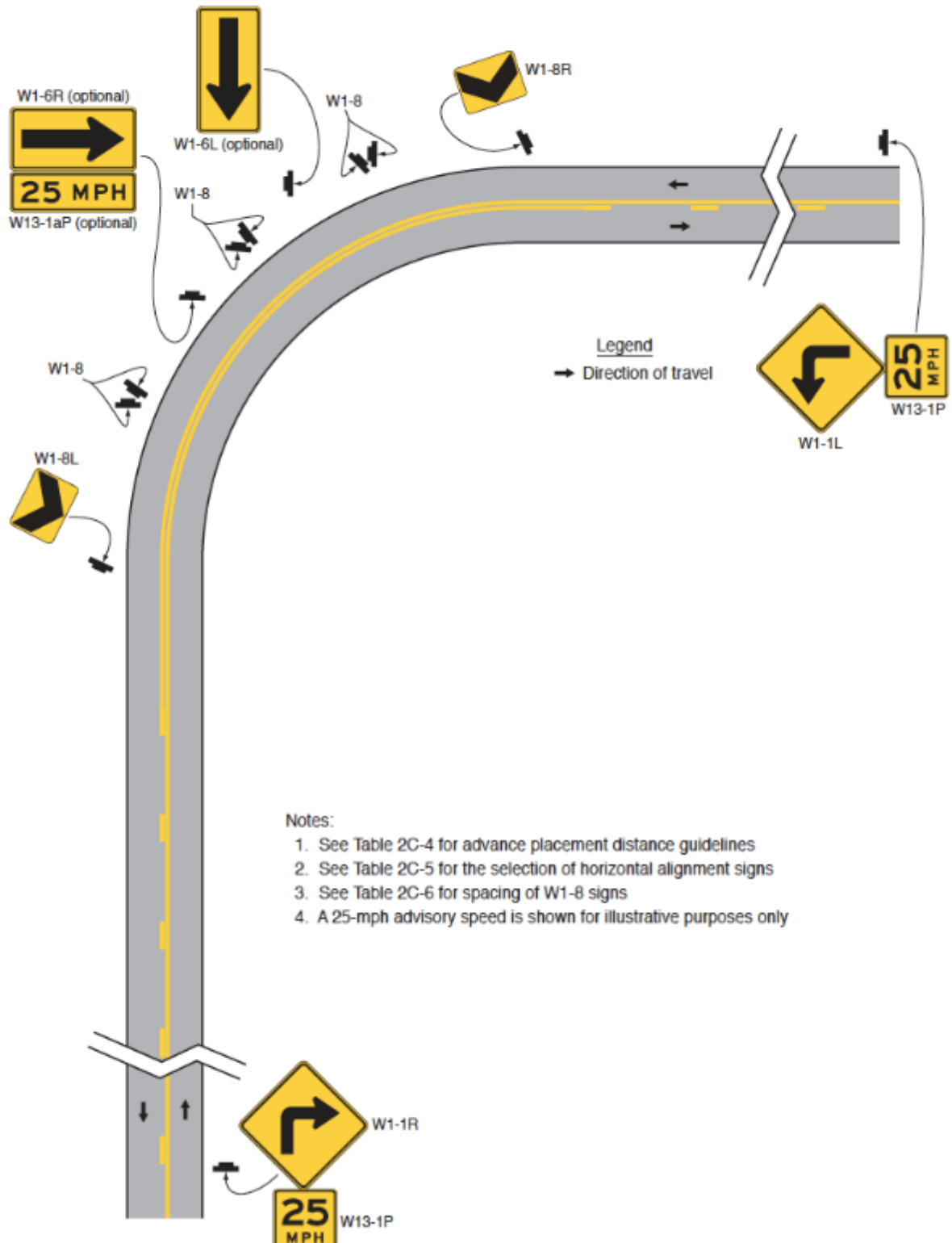
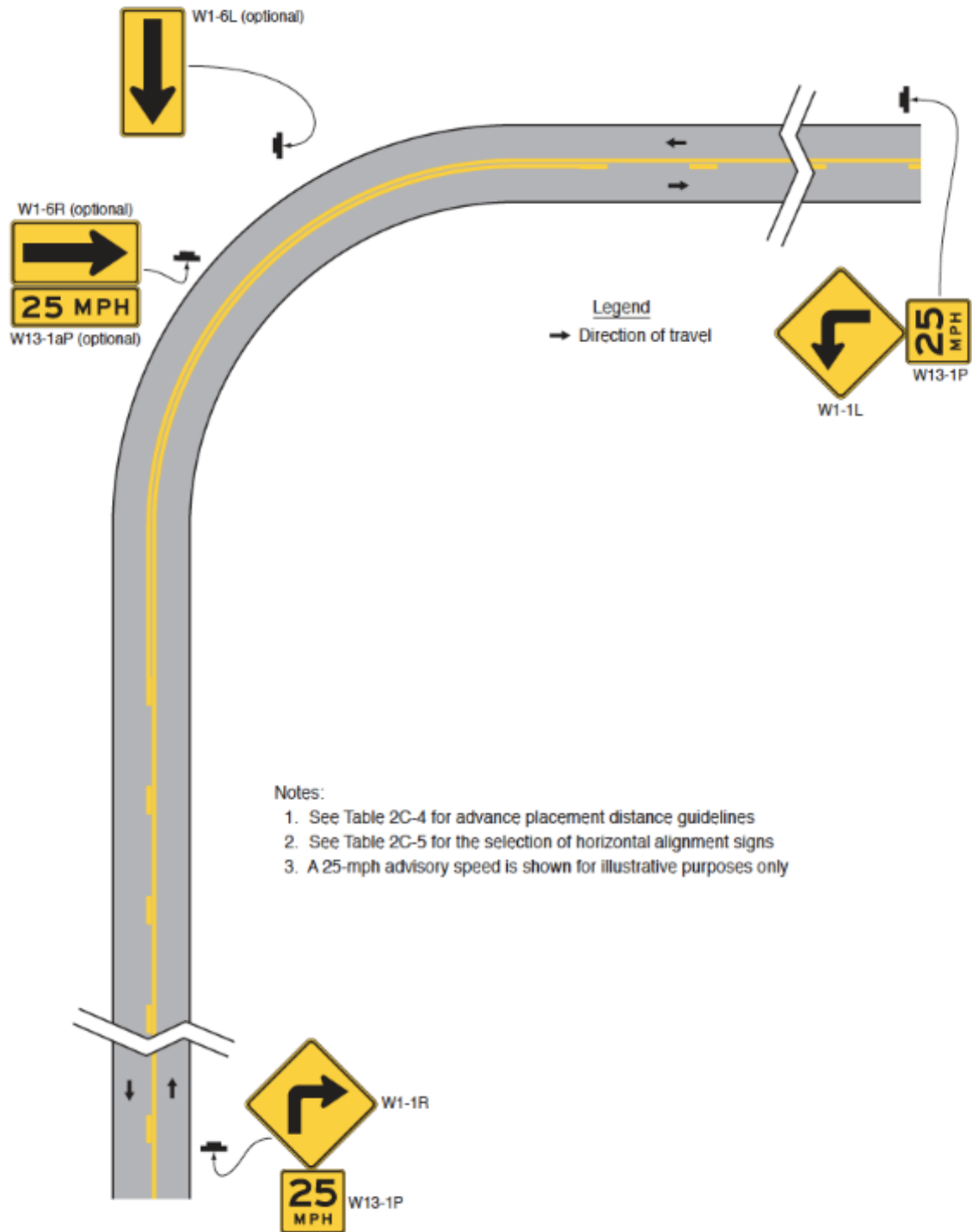


Figure 2C-2. Example of Warning Signs for a Turn (Sheet 2 of 2)



NCUTCD agrees with Figure 2C-2 as presented in the NPA.

**Section 2C.08 Comments:** NCUTCD generally agrees with 2C.08 as presented in the NPA, but recommends revisions to allow sequential flashing patterns for sign LEDs (such as for a sequence of chevron signs) in accordance with NCUTCD recommendations 14A-RW-07 and 20B-RW-03, since safety can be improved by sequential flash patterns that are appropriate for the context.

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

### **Standard:**

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

### **Option:**

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

### **Standard:**

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

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

### *Guidance:*

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

*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.*

### **Option:**

LEDs may be used to enhance the conspicuity of Chevron Alignment signs (See Section 2A.11) and if vehicle activated, the LEDs may be flashed on all signs concurrently or along a series of signs from upstream to downstream. (revise to allow sequential sign flashing)

### **Standard:**

~~LEDs shall not be flashed from one sign to the next along the curve or turn.~~ (revise to allow sequential sign flashing)

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

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

Chevron Alignment signs shall not be used to mark obstructions within or adjacent to the roadway, including the beginning of guardrails or barriers, as this is the function of an object marker (see Section 2C.69).

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

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

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

NCUTCD recommends revising Table 2C-5 to delete the "Curve Radius" column, since the sign spacing should be based on the advisory speed.

**Section 2C.09 Comments:** NCUTCD generally agrees with 2C.09 except to make a Support reference to Section 2C.64 in accordance with NCUTCD recommendation 19B-RW-01.

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

Option:

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:

See Section 2C.64 for the use of an advance street name plaque to identify an intersection road.

*Guidance:*

*Elements of the combination Horizontal Alignment/Intersection sign related to horizontal alignment should comply with the provisions of Section 2C.07, and elements related to intersection configuration should comply with the provisions of Section 2C.42. 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:**

**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 Comments:** NCUTCD generally agrees with 2C.10 as presented in the NPA; however, NCUTCD does not agree with using One-Direction Large Arrow signs in a roundabout, because this sign is used for curves, turns, and changes of alignment and not for direction of traffic. R6-4 series signs should be used in roundabouts in accordance with NCUTCD docket comments on Chapter 2B.

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

**Option:**

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

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

**Standard:**

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

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

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

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

**(restore 2009 MUTCD Standard)**

**~~Option~~**

**~~The One-Direction Large Arrow sign directing traffic to the right may be used in the central island of a roundabout. (delete - do not agree)~~**

**Support:**

Examples of regulatory and warning signs for roundabouts are shown in Figures 2B-21 through 2B-23.

**Guidance:**

*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 Comments:** NCUTCD generally agrees with 2C.11 as presented in the NPA, but recommends clarifying speed differential and allowing border LEDs on truck rollover signs.



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

Option:

A Truck Rollover (W1-13) sign (see Figure 2C-1) may be used in lieu of 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;
- C. Or where the [speed](#) differential (See Section 2C.06) might pose a greater risk for vehicles with high centers of gravity.

Guidance:

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

**Standard:**

**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:

The Truck Rollover sign may be displayed as a static sign, as a static sign supplemented by a warning beacon or border LEDs, or as 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.

A Vehicle Speed Feedback (W13-20) sign (see Section 2C.13) may be used in conjunction with a Truck Rollover ~~Warning~~ sign.

Support:

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

---

**Section 2C.12 Comments:** NCUTCD generally agrees with 2C.12 as presented in the NPA as it is generally consistent with NCUTCD recommendation 17B-RW-01, but recommends the following revisions:

- Change the first Standard to Guidance regarding placement of the advance advisory exit speed sign, since another Standard statement indicates when the sign is required based on speed differential
- Remove advisory exit speed and advisory ramp speed signs from the next Standard statement
- Add Option statement to cover 10 mph and lower differences between mainline and advisory speeds
- Editorial comments, including using “or” in lieu of “and”

**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:**~~ *Guidance*

If used, the Advisory Exit Speed (W13-2) sign should be used in advance of a freeway and expressway exit and the Advisory Ramp Speed (W13-3) sign in advance of a conventional road ramp to another roadway or roadside facility~~shall be used in accordance with the information shown in Table 2C-4b.~~ (change Standard to Guidance)

Option:

The Combination Horizontal Alignment/Advisory Exit Speed (W13-6, W13-8, W13-10, W13-12) signs 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, W13-11, W13-13) signs may be used in lieu of the W13-3 sign.

**Standard:**

Geometries represented on the ~~Advisory Exit Speed, Advisory Ramp Speed, 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. (remove advisory exit speed and advisory ramp speed signs)

The Advisory Exit Speed ~~and~~ or Advisory Ramp Speed signs on turning roadways, exits and ramps 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.

(editorial)

Guidance:

The Advisory Exit Speed ~~and~~ or Advisory Ramp Speed signs on turning roadway ramps 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 ~~or greater~~.

If used, the Advisory Exit Speed sign and the Combination Horizontal Alignment/Advisory Exit Speed sign should be installed along the deceleration lane. See Section 2C.08 for the determination of the displayed advisory speed.

The Advisory Exit Speed ~~and~~ or the Combination Horizontal Alignment/Advisory Exit signs should be visible in time for the road user to decelerate and make an exiting maneuver.

(editorial)

Regulatory Speed Limit signs (see Section 2B.22) 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:

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

Option:

The Advisory Exit Speed or Advisory Ramp Speed signs on turning roadway ramps may 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 10 mph or lower.

(cover 10 mph and lower difference)

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:

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:

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 Plaque (W13-1aP) when the plaque is not used with the Exit Gore (E5-1 series) sign.

*Guidance:*

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: Figure 2C-3 shows an example of advisory speed signing for an exit ramp.

---

NCUTCD agrees with Figure 2C-3 as presented in the NPA.

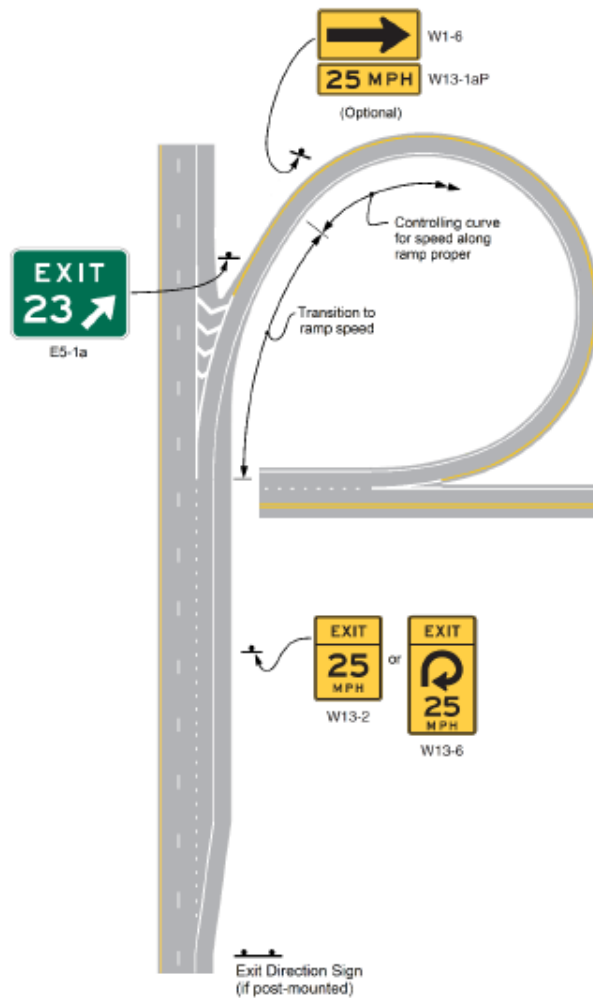
Figure 2C-3. Example of Advisory Speed Signing for an Exit Ramp

Page XXX

Eleventh Edition

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

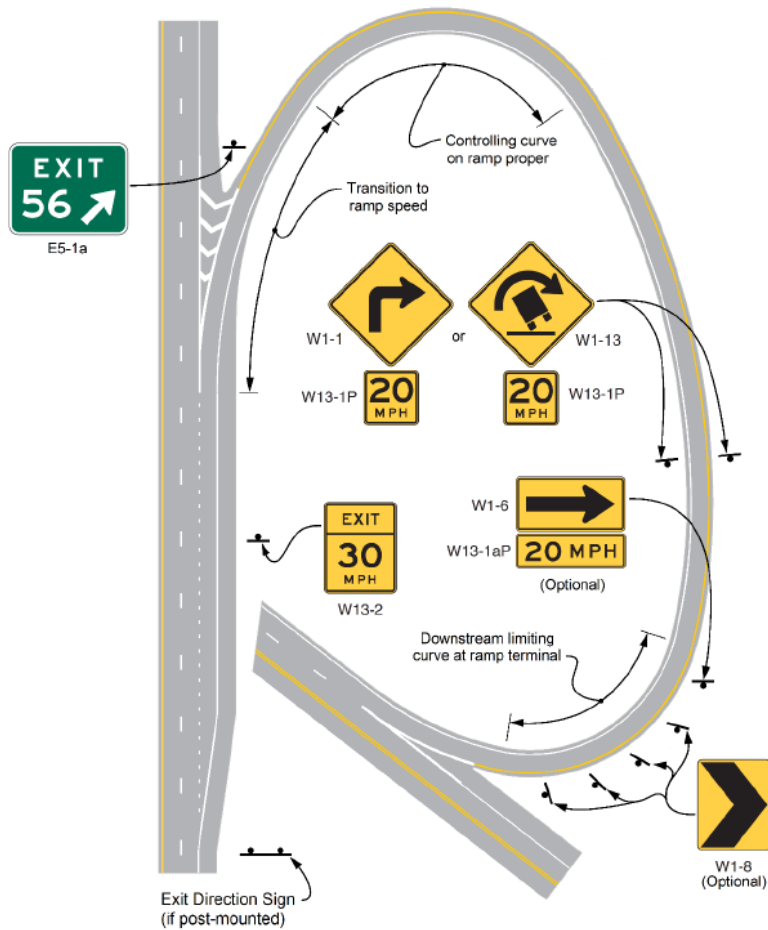
A – Loop ramp with constant controlling curvature along ramp proper



Sect. 2C.XX

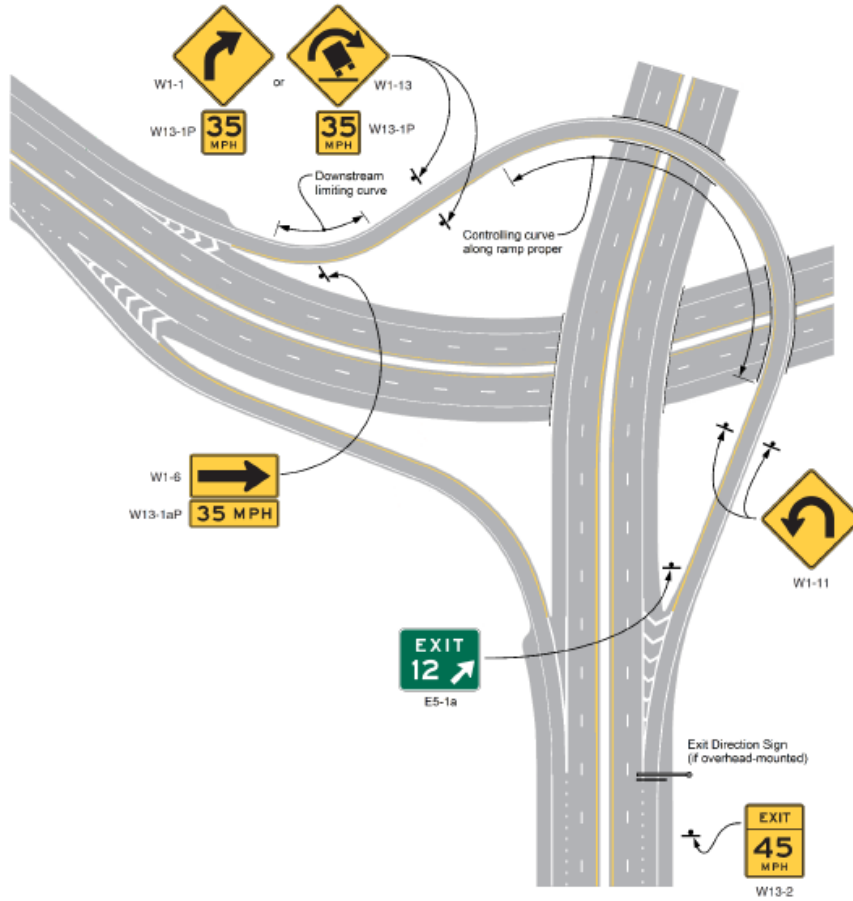
[Month Year]

Figure 2C-3. Example of Exit Ramp Advisory  
Speed and other Warning Signs  
(Sheet 2 of 5)  
B – Loop ramp with downstream limiting curvature



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**Figure 2C-3. Example of Exit Ramp Advisory  
Speed and other Warning Signs**  
(Sheet 3 of 5)  
C – Directional ramp

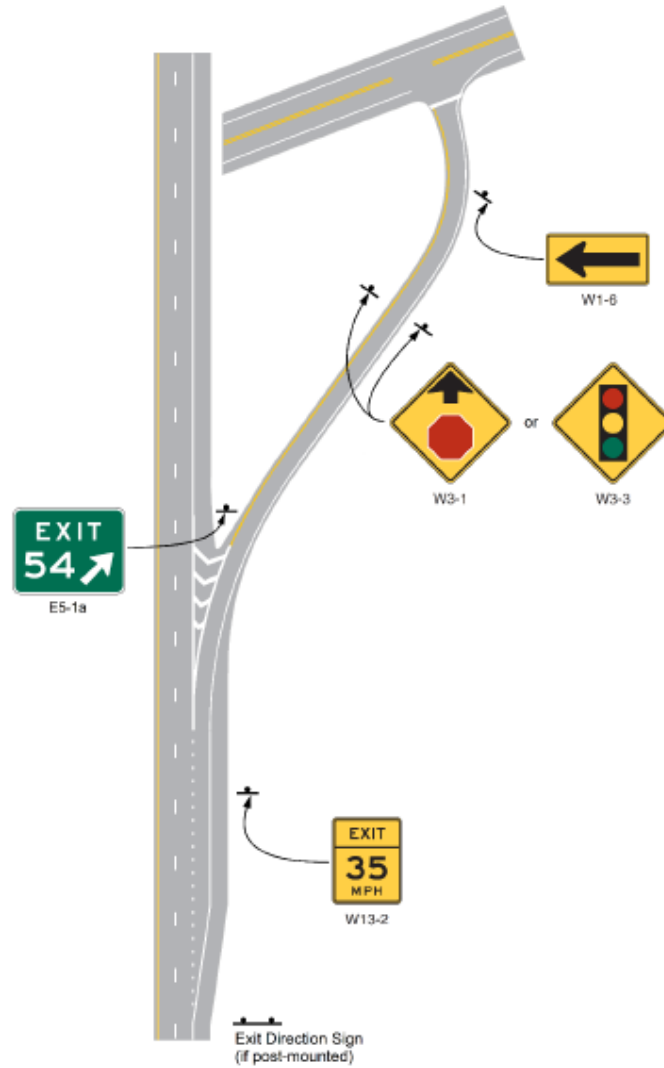


Sect. 2C.XX

[Month Year]



**Figure 2C-3. Example of Exit Ramp Advisory  
Speed and other Warning Signs**  
(Sheet 4 of 5)  
D – Diagonal ramp

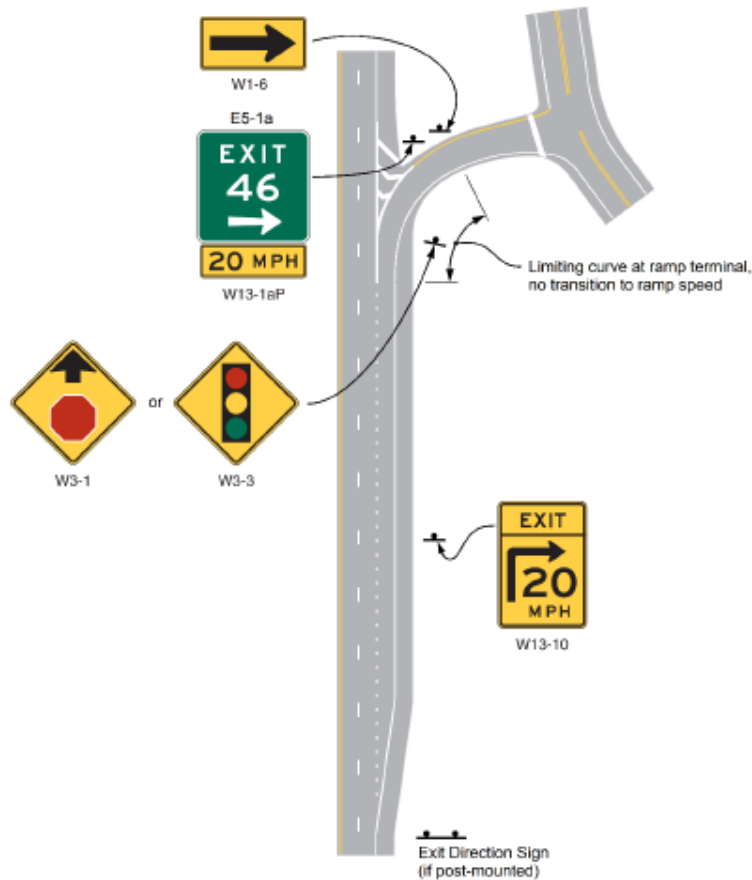


Sect. 2C.XX

[Month Year]

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668

**Figure 2C-3. Example of Exit Ramp Advisory  
Speed and other Warning Signs**  
(Sheet 5 of 5)  
E – Short ramp length with limiting curve near ramp terminal



Sect. 2C.13

[Month Year]

**Section 2C.13 Comments:** NCUTCD recommends revising 2C.13 as follows:

- Add truck rollover sign to be consistent with Section 2C.11.
- The first Standard statement is too restrictive on the use of vehicle speed feedback signs and plaques, unnecessarily limits their use, and is inconsistent with common practice. Revise the Standard and add an Option statement to allow vehicle speed feedback signs and plaques in low speed, area-wide reduced speed zone locations in accordance with NCUTCD recommendations 14A-RW-07, 17B-RW-01 and 20B-RW-03.

- Add an Option statement allowing fluorescent yellow-green background for vehicle speed feedback signs in school zones per Section 7B.06, as they are frequently used in school zones.
- Add an Option statement allowing flashing of numbers or displaying SLOW DOWN or SLOW TO XX legends in accordance with NCUTCD recommendations 14A-RW-07, 17B-RW-01, and 20B-RW-03.
- Change vehicle speed feedback plaque number to W13-20aP.

### Section 2C.13 Vehicle Speed Feedback Sign (W13-20, W13-20aP)

#### Option:

A Vehicle Speed Feedback (W13-20) sign or (W13-20aP) plaque (see Figure 2C-4) that displays the speed of an approaching vehicle back to the vehicle operator may be used to provide warning to drivers of their speed in relation to either a speed limit sign (R2-1), a truck rollover sign (W1-13), or a horizontal alignment warning advisory speed plaque sign. (add truck rollover sign)

#### Standard:

Except as modified in the option below, wWhen used as a warning to a vehicle operator ~~motorist~~ of their speed in relation to the posted speed limit, the Vehicle Speed Feedback Plaque (W13-20aP) shall be mounted below a Speed Limit (R2-1) sign (see Section 2B.23).

When used to supplement a horizontal alignment warning (W1 series) sign with an advisory speed plaque the Vehicle Speed Feedback Sign (W13-20) shall be placed at an independent installation near the point of curvature of a horizontal curve (see Section 2C.06)

(revise Standard)

#### Option:

Based on engineering judgment, a Vehicle Speed Feedback sign (W13-20) may be placed at an independent location within a low speed, area wide reduced speed limit zone to warn motorists of their speed in relation to the posted or statutory speed limit. (allow at other locations)

#### Standard:

The legend YOUR SPEED shall be a black legend on a yellow retroreflective background. The changeable legend displaying the speed of the approaching vehicle shall be a yellow luminous legend on a black opaque background

#### Option:

When used in a school speed zone, the Vehicle Speed Feedback plaque (W13-20aP) may have a fluorescent yellow-green background (see Section 7B.06).

(allow FYG per 7B.06)

#### Standard:

The vehicle speed displayed on the changeable portion of the sign shall not ~~flash or~~ change color. The Vehicle Speed Feedback sign and plaque shall not ~~flash~~, strobe or use other animated ~~dynamic~~ elements integrated into the changeable legend display. When no vehicles are approaching, the changeable display shall not display a legend.

#### Option:

Vehicle speed display numbers (“XX”) may be steady or flash at acceptable rates for excessive speed (see Section 2A.20) or be replaced by the legend “SLOW DOWN” (for hybrid signs) or the legend “SLOW TO XX” (for DMS and where XX is the posted /advisory speeds). (allow flashing numbers or alternate legends)

Guidance:

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.

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

(change plaque number to W13-20aP)

**Figure 2C-4. Vehicle Speed Feedback Signs**



Table 2C-1 should be reviewed to reflect standard highway fonts and sizes in terms of sign size

NCUTCD agrees with Figure 2C-4, but recommends adding a note referring to Table 2C-1 for standard sizes and standard numerals.

---

**Section 2C.14 Comments:** NCUTCD agrees with 2C.14 as presented in the NPA.

## **VERTICAL GRADE WARNING SIGNS AND PLAQUES**

### **Section 2C.14 Hill Signs (W7-1, W7-1a)**

Guidance:

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

The Hill sign and supplemental grade (W7-3P) plaque (see Section 2C.63) used in combination, or the W7-1a sign used alone, should be installed in advance of downgrades for the following conditions:

- A. 5% grade that is more than 3,000 feet in length,
- B. 6% grade that is more than 2,000 feet in length,
- C. 7% grade that is more than 1,000 feet in length,

D. 8% grade that is more than 750 feet in length, or

E. 9% grade that is more than 500 feet in length.

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

Supplemental plaques (see Section 2C.63) and larger signs should be used for emphasis or where special hill characteristics exist. On longer grades, the use of the Hill sign with a distance (W7-3aP) plaque or the combination distance/grade (W7-3bP) plaque at periodic intervals of approximately 1-mile spacing should be considered.

Option:

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.

---

**Section 2C.15 Comments:** NCUTCD agrees with 2C.15 as presented in the NPA.

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

*Guidance:*

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

A RUNAWAY VEHICLES ONLY (R4-10) sign (see Section 2B.43) should be installed near the ramp entrance to discourage other road users from entering the ramp. No Parking (R8-3) signs should be placed near the ramp entrance.

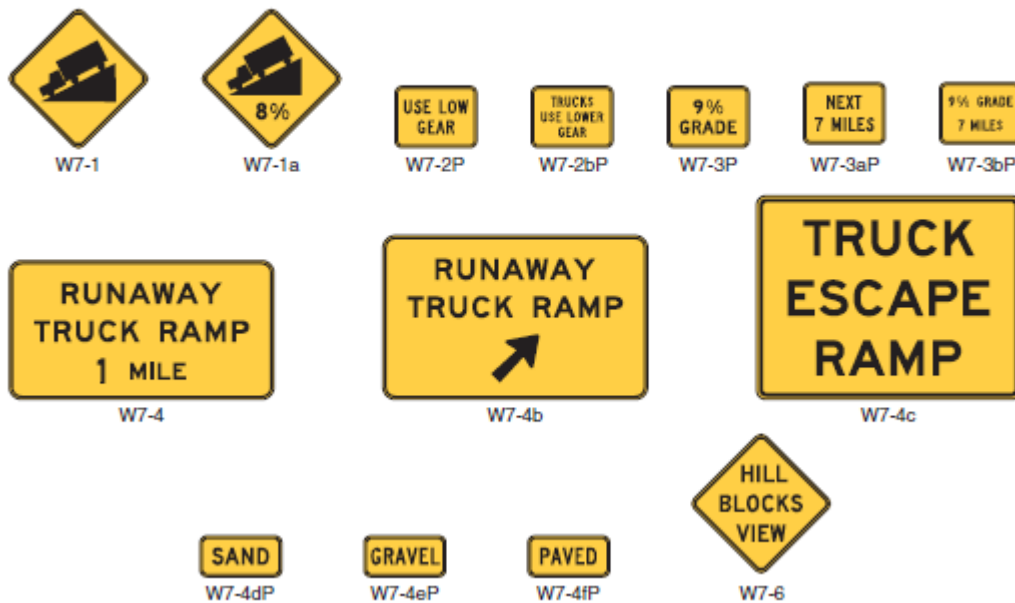
**Standard:**

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

Option:

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.

Figure 2C-5. Vertical Grade Signs and Plaques



NCUTCD agrees with Figure 2C-5 as presented in the NPA.

**Section 2C.16 Comments:** NCUTCD generally agrees with 2C.16 as presented in the NPA, but recommends adding a Support statement listing signs that may be used for conditions beyond the hill crest in accordance with NCUTCD recommendation 19A-RW-02, which adds extra information and clarifies the intent of the Guidance statement.

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

Option:

A HILL BLOCKS VIEW (W7-6) sign 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:

*When a vertical curve results in a sight distance obstruction to a specific condition beyond the crest of the vertical curve, the sign for the specific condition beyond the vertical crest should be used rather than the HILL BLOCKS VIEW (W7-6) sign.*

Support:

Some examples of signs for the specific condition beyond the vertical crest are the Horizontal Alignment Warning signs (W1 series), the Intersection signs (W2 series), the STOP AHEAD signs (W3 series), the Railroad Crossing signs (W10 series), Crosswalk Crossing signs (W11 series), etc.

(add Option)



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

---

811 **Section 2C.17 Comments:** NCUTCD agrees with 2C.17 as presented in the NPA, with a  
812 minor editorial revision to reference Figure 2C-7.

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

815 *Guidance:*

816        *Except as provided in Paragraph 2, a ROAD NARROWS (W5-1) sign (see Figure 2C-7 6)*  
817 *should be used in advance of a transition on two-lane roads where the pavement width is*  
818 *reduced abruptly to a width such that vehicles traveling in opposite directions cannot*  
819 *simultaneously travel through the narrow portion of the roadway without reducing speed.*

820 *Option:*

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

823        Additional emphasis may be provided by the use of object markers and delineators (see  
824 Sections 2C.69 through 2C.72 and Chapter 3G). The Advisory Speed (W13-1P) plaque (see  
825 Section 2C.59) may be used to indicate the recommended speed.

Figure 2C-7. Miscellaneous Warning Signs



828

829 NCUTCD agrees with Figure 2C-7 as presented in the NPA.

830

831 **Section 2C.18 Comments:** NCUTCD generally agrees with 2C.18 as presented in the NPA ,with  
832 minor editorial revisions to reference Figure 2C-7 and Figure 2C-6.  
833

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

835 *Guidance:*

836 *A NARROW BRIDGE (W5-2) sign (see Figure 2C-67) should be used in advance of any*  
837 *bridge or culvert having a two-way roadway clearance width of 16 to 18 feet, or any bridge or*  
838 *culvert having a roadway clearance less than the width of the approach travel lanes. Where*  
839 *these conditions exist for an underpass, a NARROW UNDERPASS (W5-2a) sign should be used.*

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

842 *Option:*

843 *A NARROW BRIDGE sign may be used in advance of a bridge or culvert on which the*  
844 *approach shoulders are narrowed or eliminated. Where these conditions exist for an underpass, a*  
845 *NARROW UNDERPASS (W5-2a) sign may be used (see Figure 2C-6).*

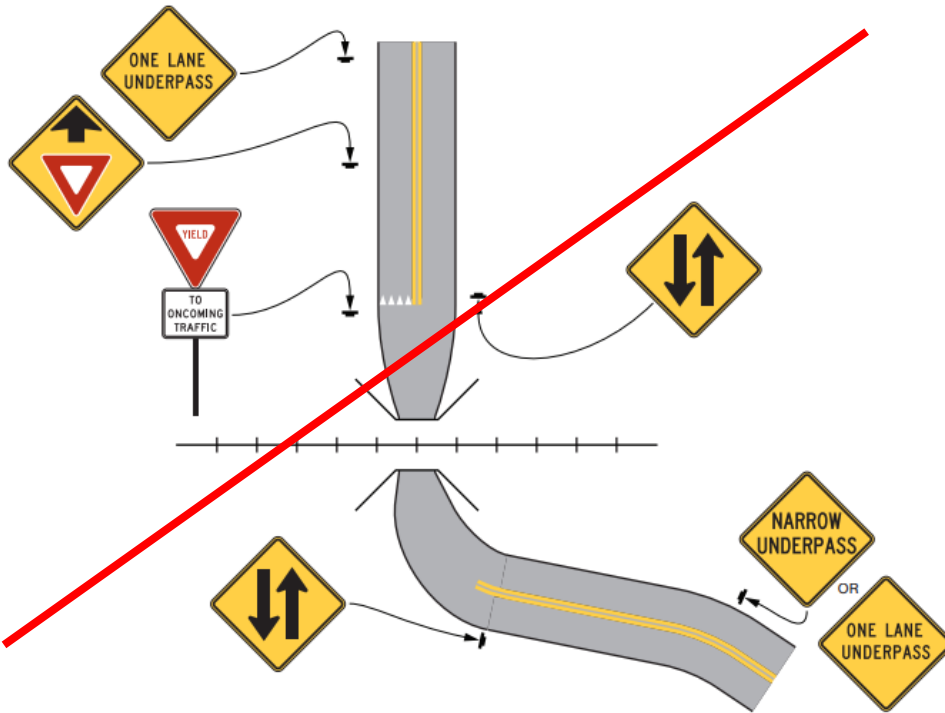
846 *The NARROW BRIDGE or NARROW UNDERPASS sign may be omitted on low-volume*  
847 *rural roads.*

848

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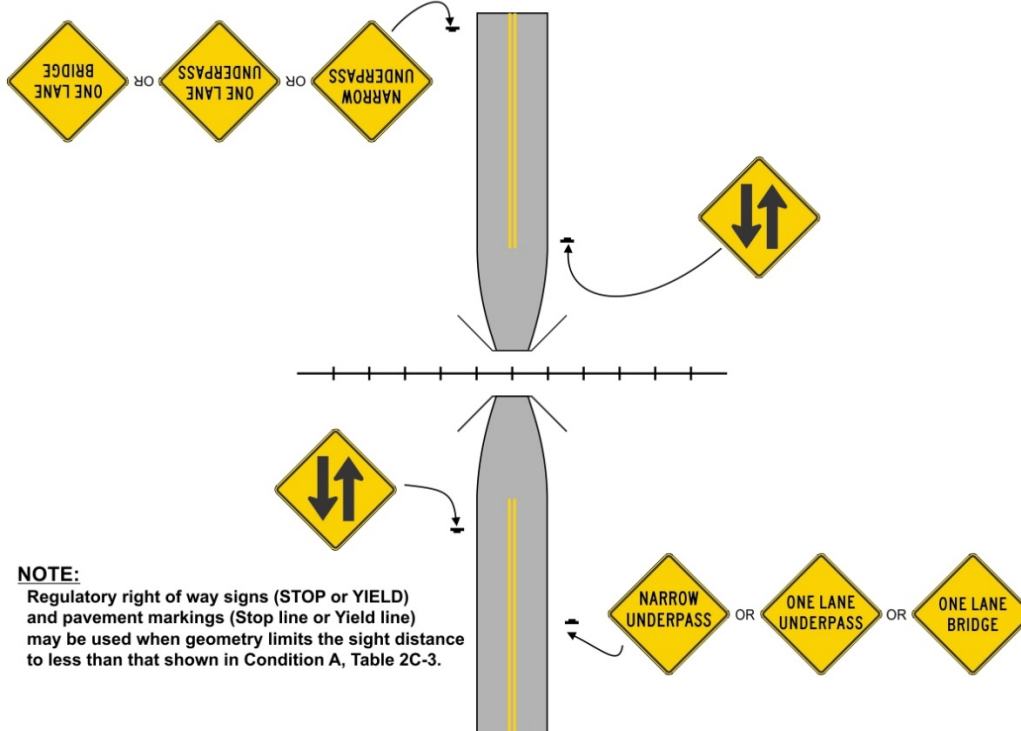
850 NCUTCD recommends deleting Figure 2C-6 as presented in the NPA and substituting a new  
851 Figure 2C-6 to provide for all likely situations and options at narrow or one-lane underpasses,  
852 and adds a note suggesting the use of STOP or YIELD signs or a combination thereof based on  
853 relative sight distance available to approaching traffic where there are sight restrictions that  
854 suggest a need for these signs. To address this, the figure recommended by NCUTCD depicts a  
855 straight roadway approach without a curve.

Figure 2C-6. Example of Signing at Narrow or One-Lane Underpass



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Figure 2C-6. Example of Signing at Narrow or One-Lane Underpass or One-Lane Bridge.



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**Section 2C.19 Comments:** NCUTCD generally agrees with 2C.19 as presented in the NPA, but recommends revising the Guidance and Option material to be consistent with the new NCUTCD-recommended Figure 2C-6.

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

*Guidance:*

*A ONE LANE BRIDGE (W5-3) sign (see Figure 2C-67) should be used on two-way roadways in advance of any bridge or culvert:*

- A. Having a clear roadway width of less than 16 feet, or*
- B. Having a clear roadway width of less than 18 feet when commercial vehicles constitute a high proportion of the traffic, or*
- C. Having a clear roadway width of 18 feet or less where the sight distance is limited to less than that shown in Condition A, Table 2C-3 on ~~the~~ either approach to the structure.*

*Where these conditions exist for an underpass, a ONE LANE UNDERPASS (W5-3a) sign should be used. Additional emphasis should be provided by the use of object markers, delineators, and/or pavement markings.*

Option:

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 or underpass ~~from either approach on both approaches.~~

Regulatory right of way signs (STOP or YIELD) and pavement markings (Stop line or Yield Line) may be used with conditions A, B, or C above apply (See Figure 2C-6).

(revise for consistency with NCUTCD-recommended Figure 2C-6)

**Section 2C.20 Comments:** NCUTCD agrees with 2C.20 as presented in the NPA.

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

*Guidance:*

*A Divided Highway (W6-1) sign (see Figure 2C-7) 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:**

**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 Comments:** NCUTCD agrees with 2C.21 as presented in the NPA.

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

*Guidance:*

*A Divided Highway Ends (W6-2) sign (see Figure 2C-7) 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.*

*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 Comments:** NCUTCD agrees with 2C.22 as presented in the NPA.

### **Section 2C.22 Freeway or Expressway Ends Signs (W19 Series)**

Option:

A FREEWAY ENDS XX MILES (W19-1) sign or a FREEWAY ENDS (W19-3) sign (see Figure 2C-7) may be used in advance of the end of a freeway.

An EXPRESSWAY ENDS XX MILES (W19-2) sign or an EXPRESSWAY ENDS (W19-4) sign (see Figure 2C-7) may be used in advance of the end of an expressway.

The rectangular W19-1 and W19-2 signs may be post-mounted or may be mounted overhead for increased emphasis.

*Guidance:*

*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-7) should be used in addition to the Freeway Ends signs in advance of the downstream end of the freeway.*

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**Section 2C.23 Comments:** NCUTCD agrees with 2C.23 as presented in the NPA.

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

Option:

The Double Arrow (W12-1) sign 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:*

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

*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 obstruction. Where stripe markings are used on the obstruction, they should be discontinued to leave a 3-inch space around the outside of the sign.*

---

**Section 2C.24 Comments:** NCUTCD generally agrees with 2C.24 as presented in the NPA, but recommends adding the word “cul-de-sac” as a common example of a turnaround, revise the Guidance statement for the W8-26 series sign to Option since there are some situations where the use of Type 4 object markers would not apply, and revise a figure reference.

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

Option:

The DEAD END (W14-1) sign (see Figure 2C-7) may be used at the entrance of a single road or street that terminates in a dead end or cul-de-sac (turn-around). The NO OUTLET (W14-2) sign (see Figure 2C-7) may be used at the entrance to a road or road network from which there is no other exit.

DEAD END (W14-1a) or NO OUTLET (W14-2a) signs (see Figure 2C-7) 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.

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

Guidance:

*When the W14-1 or W14-2 sign is used, the sign should be posted as near as practical 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:**

**The DEAD END (W14-1a) or NO OUTLET (W14-2a) signs 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:

The ROAD ENDS XX FT (W8-26) or STREET ENDS XX FT (W8-26a) sign (see Figure 2C-12) may be used on the approach to the end of a conventional road or street that terminates in a dead end or turnaround.

~~Guidance:~~ Option:

If a W8-26 series sign is used on the approach to the end of a road or street, then Type 4 object markers (see Section 2C.72) ~~should~~ may be used to mark the end of the road or street.

(change Guidance to Option for use of end of road object markers)

**Standard:**

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

Support:

Section 2C.22 contains information on signs for use on the approach to the end of a freeway or expressway. (revise figure reference)

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**Section 2C.25 Comments:** NCUTCD generally agrees with 2C.25 as presented in the NPA but recommends minor editorial revisions and revising the final Standard statement to clarify that the dimension on the W12-2a sign or W12-2b sign needs to match the lowest clearance.

**Section 2C.25 Low Clearance Signs (W12-2, W12-2a, W12-2b)**

**Standard:**

The advance Low Clearance ~~Advance~~ (W12-2) sign (see Figure 2C-7) shall be used to warn road users of clearances less than 12 inches above the statutory maximum vehicle height.



Guidance:

The actual clearance should be displayed on the Low Clearance (W12-2, W12-2a, and W12-2b) sign to the nearest 1 inch not exceeding the actual clearance. However, in areas that experience changes in temperature causing frost action, a reduction, not exceeding 3 inches, should be used for this condition.

Clearances should be evaluated periodically, particularly when resurfacing operations have occurred.

W12-2 sign with a supplemental distance 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.

Option:

The Low Clearance Overhead (W12-2a or W12-2b) sign may be installed on the structure to supplement the advance warning sign.

Guidance:

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

Standard:

If used, the Low Clearance Overhead (W12-2b) (See Figure 2C-7) sign shall indicate the portion of the structure with low clearance if the posted clearance does not apply to the entire structure.

The Clearance shown on the W12-2 sign shall match the clearance on the W12-2a sign or match the lowest of the clearances shown on the multiple W12-2b signs (clarify that signs need to match the lowest clearance)

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**Section 2C.26 Comments:** NCUTCD agrees with 2C.26 as presented in the NPA, with a minor editorial revision to reference Figure 2C-8.

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

Guidance:

BUMP (W8-1) and DIP (W8-2) signs (see Figure 2C-8) should be used to give warning of a sharp rise or depression in the profile of the road. (Add/keep the figure reference)

Option:

These signs may be supplemented with an Advisory Speed plaque (see Section 2C.59).

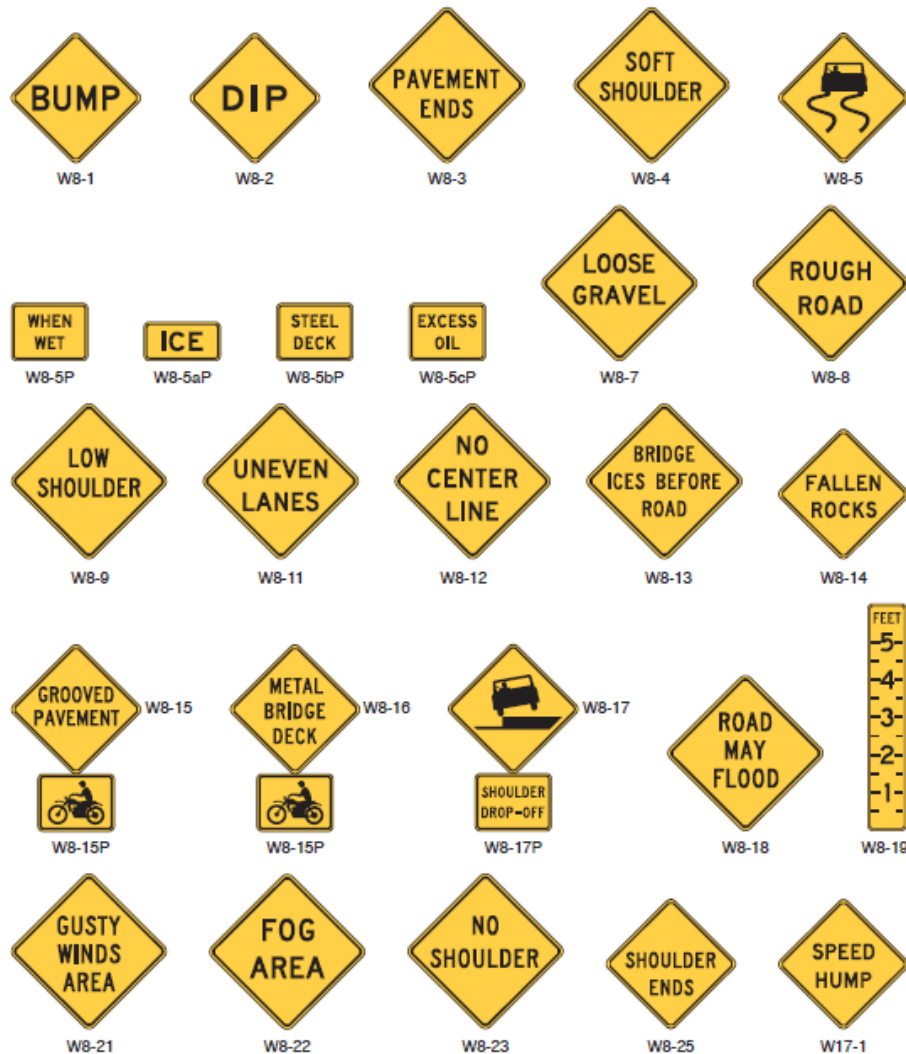
Guidance:

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

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

NCUTCD agrees with Figure 2C-8 as presented in the NPA.

Figure 2C-8. Roadway and Weather Condition Signs and Plaques



Section 2C.27 Comments: NCUTCD agrees with 2C.27 as presented in the NPA.

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

##### Guidance:

The SPEED HUMP (W17-1) sign should be used to give warning of a vertical deflection in the roadway that is designed to limit the speed of traffic.

If used, the SPEED HUMP sign should be supplemented by an Advisory Speed plaque (see Section 2C.59).

##### Option:

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.

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

Support:

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 intersections. However, these differences in engineering terminology are not well known by the public, so for signing purposes these terms are interchangeable

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**Section 2C.28 Comments:** NCUTCD generally agrees with 2C.28 as presented in the NPA, but recommends adding a reference to Figure 2C-9 and adding an Option statement suggesting the use of blank-out or DMS signs to supplement W3-6 signs in accordance with NCUTCD recommendation 20B-RW-03.

#### **Section 2C.28 DRAW BRIDGE Sign (W3-6)**

**Standard:**

A DRAW BRIDGE (W3-6) sign ([see Figure 2C-9](#)) shall be used in advance of movable bridge signals and gates (see Section [4Q.02](#)) to give warning to road users.

Option:

[A blank-out sign or DMS \(see Chapter 2L\) may be used to supplement the DRAW BRIDGE sign to warn when the movable bridge signals and gates are in effect using a ROAD CLOSED AHEAD message. \(add per 20B-RW-03\)](#)

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**Section 2C.29 Comments:** NCUTCD agrees with 2C.29 as presented in the NPA.

#### **Section 2C.29 PAVEMENT ENDS Sign (W8-3)**

*Guidance:*

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

*Option:*

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

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**Section 2C.30 Comments:** NCUTCD agrees with 2C.30 as presented in the NPA.

#### **Section 2C.30 Shoulder Signs (W8-4, W8-9, W8-17, W8-23, W8-25)**

*Option:*

The SOFT SHOULDER (W8-4) sign (see Figure 2C-8) may be used to warn of a soft shoulder condition.

The LOW SHOULDER (W8-9) sign (see Figure 2C-8) may be used to warn of a shoulder condition where there is an elevation difference of less than 3 inches between the shoulder and the travel lane. *Guidance:*

*The Shoulder Drop Off (W8-17) sign (see Figure 2C-8) should be used where an unprotected shoulder drop-off, adjacent to the travel lane, exceeds 3 inches in depth for a significant continuous length along the roadway, based on engineering judgment.*

Option:

A SHOULDER DROP-OFF (W8-17P) supplemental plaque (see Figure 2C-8) may be mounted below the W8-17 sign.

The NO SHOULDER (W8-23) sign (see Figure 2C-8) may be used to warn road users that a shoulder does not exist along a portion of the roadway.

The SHOULDER ENDS (W8-25) sign (see Figure 2C-8) may be used to warn road users that a shoulder is ending.

*Guidance:*

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

---

**Section 2C.31 Comments:** NCUTCD generally agrees with 2C.31 as presented in the NPA, but recommends adding an Option statement suggesting the use of blank-out or DMS signs to supplement surface condition signs in accordance with NCUTCD recommendation 20B-RW-03.

#### **Section 2C.31 Surface Condition Signs (W8-5, W8-7, W8-8, W8-11, W8-13, W8-14)**

Option:

The Slippery When Wet (W8-5) sign (see Figure 2C-8) may be used to warn of unexpected slippery conditions. Supplemental plaques with legends such as ICE, WHEN WET, STEEL DECK, or EXCESS OIL may be used with the W8-5 sign to indicate the reason that the slippery conditions might be present.

The LOOSE GRAVEL (W8-7) sign (see Figure 2C-8) may be used to warn of loose gravel on the roadway surface.

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

An UNEVEN LANES (W8-11) sign (see Figure 2C-8) may be used to warn of a difference in elevation between travel lanes.

The BRIDGE ICES BEFORE ROAD (W8-13) sign (see Figure 2C-8) may be used in advance of bridges to advise bridge users of winter weather conditions. The BRIDGE ICES BEFORE ROAD sign may be removed or covered during seasons of the year when its message is not relevant.

The FALLEN ROCKS (W8-14) sign (see Figure 2C-8) may be used in advance of an area that is adjacent to a hillside, mountain, or cliff where rocks frequently fall onto the roadway.

Where the surface condition is limited by event or condition, a blank-out sign or DMS (see Chapter 2L) may be used with proper detection. (add per 20B-RW-03)

Guidance:

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.32 Comments:** NCUTCD agrees with 2C.32 as presented in the NPA.

**Section 2C.32 Warning Signs and Plaques for Motorcyclists (W8-15, W8-15P, W8-16)**

Support:

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.32, such as Slippery When Wet, LOOSE GRAVEL, or ROUGH ROAD, can also be helpful to motorcyclists if those conditions exist.

Option:

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-8) 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.

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-8) may be used to provide advance warning of this condition to motorcyclists, bicyclists, and other road users. A Motorcycle (W8-15P) plaque (see Figure 2C-8) may be mounted below or above a W8-15 or W8-16 sign if the warning is intended to be directed primarily to motorcyclists

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**Section 2C.33 Comments:** NCUTCD agrees with 2C.33 as presented in the NPA.

**Section 2C.33 NO CENTER LINE Sign (W8-12)**

Option:

The NO CENTER LINE (W8-12) sign (see Figure 2C-8) may be used to warn of a roadway without center line pavement markings.

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**Section 2C.34 Comments:** NCUTCD agrees with 2C.34 as presented in the NPA, with a minor editorial revision to reference Figure 2C-7.

**Section 2C.34 NO TRAFFIC SIGNS Sign (W18-1)**

Option

A W18-1 ([see Figure 2C-7](#)) warning sign with the legend NO TRAFFIC SIGNS 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.

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

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**Section 2C.35 Comments:** NCUTCD agrees with 2C.35 as presented in the NPA, but recommends adding an Option statement suggesting the use of blank-out or DMS signs to supplement weather condition signs in accordance with NCUTCD recommendation 20B-RW-03.

### **Section 2C.35 Weather Condition Signs (W8-18, W8-19, W8-21, and W8-22)**

#### **Option:**

The ROAD MAY FLOOD (W8-18) sign (see Figure 2C-8) may be used to warn road users that a section of roadway is subject to frequent flooding. A Depth Gauge (W8-19) sign (see Figure 2C-8) may also be installed within a roadway section that frequently floods.

#### *Guidance:*

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

#### **Option:**

The GUSTY WINDS AREA (W8-21) sign (see Figure 2C-8) 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 (W7-3a) 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.

The FOG AREA (W8-22) sign (see Figure 2C-8) may be used to warn road users that foggy conditions frequently reduce visibility along a section of highway. A NEXT XX MILES (W7-3a) 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.

[The W8-18, W8-21 and W8-22 signs may be displayed by a blank-out sign or DMS \(see Chapter 2L\) activated by proper detection.](#) (add per 20B-RW-03 with minor edit)

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**Section 2C.36 Comments:** NCUTCD recommends revising 2C.36 as follows:

- Add an exception to the first Standard statement referencing revised Guidance
- Revise the Guidance statement to address STOP or YIELD sign visibility and speed criteria in accordance with NCUTCD recommendation 18A-RW-02.

## ***TRAFFIC CONTROL AND INTERSECTION SIGNS AND PLAQUES***

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

#### **Standard:**



Except as provided in the third Guidance paragraph below, ~~The~~ Advance Traffic Control ~~symbol~~ signs (see Figure 2C-9) ~~including the~~ Stop Ahead (W3-1), Yield Ahead (W3-2), and Signal Ahead (W3-3) ~~signs~~, shall be installed on an approach to a primary traffic control device that is not visible for a sufficient distance to permit the road user to respond to the device (see Table 2C-3).

(add exception per 18A-RW-02)

Support:

Figures 2A-4 and 2A-5a and b show the typical placement of an Advance Traffic Control sign.

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

Guidance:

The visibility criteria for a Stop sign or a Yield sign should be based on having a continuous view of the Stop sign or the Yield sign for the distance specified in Table 2C-X.

(add per 18A-RW-02)

*The visibility criteria for a traffic control signal should be based on having a continuous view of at least two signal faces for the distance specified in Table 4D-2.*

*Where intermittent obstructions occur or when the 85<sup>th</sup> - percentile speed or the posted speed limit is 25 mph or lower engineering judgment should determine ~~the treatment to be implemented~~. need for and the placement of an Advance Traffic Control sign.*

(revise per 18A-RW-02)

Option:

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

Support:

See Section 2C.64 for the use of an advance street name plaque to identify an intersecting road.

Option:

A BE PREPARED TO STOP (W3-4) sign (see Figure 2C-9) may be used to warn of stopped traffic caused by a traffic control signal or in advance of a section of roadway that regularly experiences traffic congestion.

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:**

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

Guidance:

*When the warning beacon or sign border LEDs are 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.*

Support:



Section 2C.47 contains information regarding the use of a NO MERGE AREA (W4-5P) supplemental plaque in conjunction with a Yield Ahead sign.

NCUTCD agrees with Figure 2C-9 as presented in the NPA.

Figure 2C-9. Advance Traffic Control Signs



NCUTCD recommends adding a new Table 2C-X defining minimum sight distances based on speed for Stop Ahead or Yield Ahead signs in accordance with NCUTCD recommendation 18A-RW-02.

**Table 2C-X Minimum Sight Distance for a Stop Ahead (W3-1) or a Yield Ahead (W3-2) Sign**

Speed limit or 85th-Percentile Speed	Minimum Sight Distance
20 mph	115 feet
25 mph	155 feet
30 mph	200 feet
35 mph	250 feet
40 mph	305 feet
45 mph	360 feet
50 mph	425 feet
55 mph	495 feet
60 mph	570 feet
65 mph	645 feet
70 mph	730 feet

Note: The Table is based on 2011 AASHTO Policy on Geometric Design of Highways and Streets, Table 3-1, Stopping Sight Distance on Level Roadways. Distances may be adjusted for queue length or grade. Table 3-2 of the 2011 AASHTO Policy on Geometric Design of Highways and Streets may be used as a guide on grades.

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**Section 2C.37 Comments:** NCUTCD generally agrees with 2C.37 as presented in the NPA, with the following revisions:

- Add a new TRAFFIC ENTERING sign to the list of signs
- Add “uncontrolled” in two locations in the Option statement to clarify where signs are used
- Add “vehicle on a conflicting approach” in the Standard statement to clarify where signs are used
- Additional information regarding Actuated Advance Intersection Signs may be found in NCUTCD recommendation 14B-RW-01

### **Section 2C.37 Actuated Advance Intersection Signs (W2-10 through W2-12)**

#### **Support:**

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

#### **Option:**

The TRAFFIC ENTERING WHEN FLASHING (W2-10) sign, a TRAFFIC ENTERING or a WATCH FOR ENTERING TRAFFIC (W2-11) sign (See Figure 2C-11) 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.

The sign may be in diamond or rectangular shape.

The TRAFFIC APPROACHING WHEN FLASHING (W2-12) sign (See Figure 2C-11) may be used on the side road stop controlled approach to warn of traffic approaching on the uncontrolled through road.

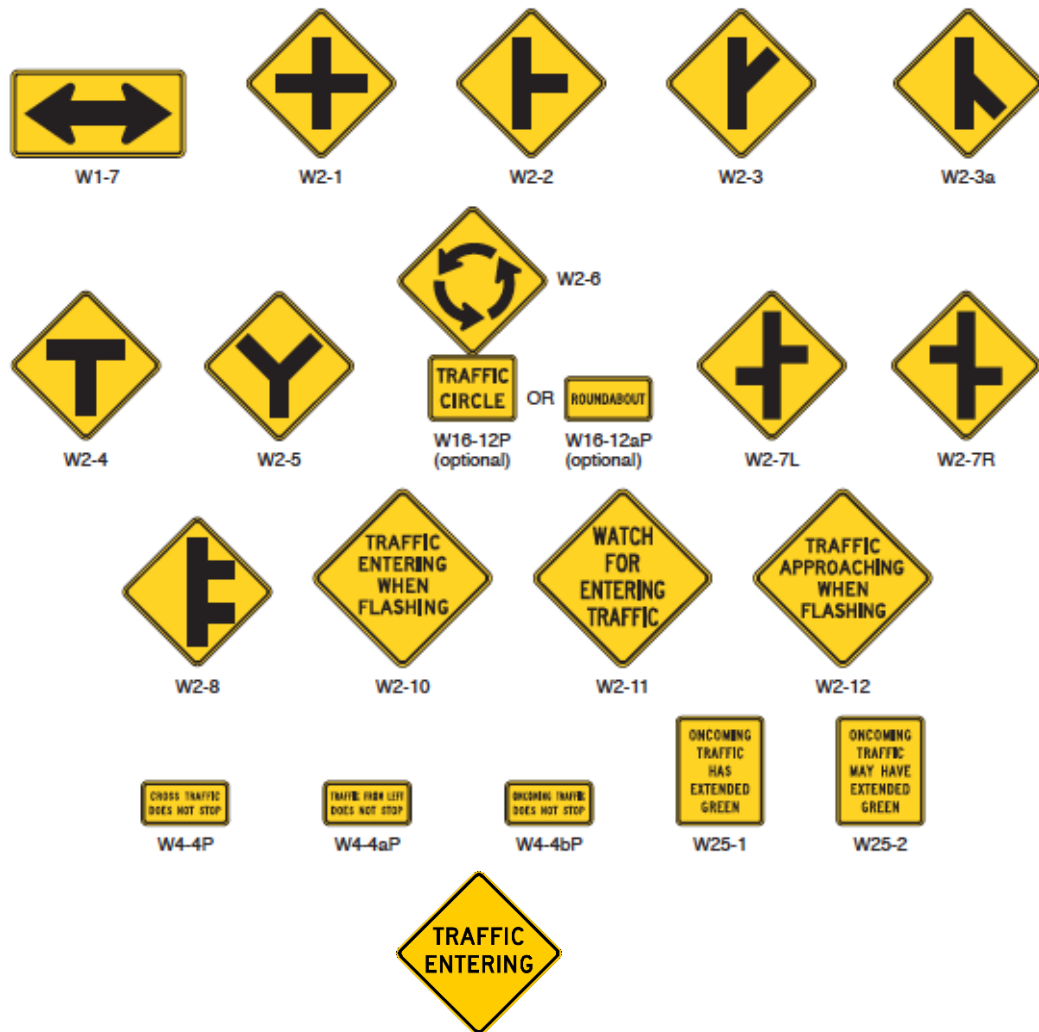
(add a new TRAFFIC ENTERING sign and add “uncontrolled” to clarify where signs are used)

#### **Standard:**

When used, the TRAFFIC ENTERING WHEN FLASHING sign, the TRAFFIC ENTERING, the WATCH FOR ENTERING TRAFFIC sign, and the TRAFFIC APPROACHING WHEN FLASHING sign shall be supplemented with an actuated warning system that activates when a vehicle on a conflicting approach an approaching vehicle is detected.

(add a new TRAFFIC ENTERING sign and add “a vehicle on a conflicting approach” to clarify where signs are used)

Figure 2C-11. Intersection Warning Signs and Plaques



NCUTCD generally agrees with Figure 2C-11 as presented in the NPA, but recommends adding a new TRAFFIC ENTERING sign, as used in several states.

**Section 2C.38 Comments:** NCUTCD agrees with 2C.38 as presented in the NPA.

### Section 2C.38 Advance Ramp Control Signal Signs (W3-7 and W3-8)

Option:

A RAMP METER AHEAD (W3-7) sign (see Figure 2C-9) 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:

*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-9) 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:**

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.

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**Section 2C.39 Comments:** NCUTCD generally agrees with 2C.39 as presented in the NPA, but recommends adding the work “NEW” to the title to match the sign figure message.

**Section 2C.39 NEW TRAFFIC PATTERN and NEW SIGNAL OPERATION AHEAD Signs (W23-2, W23-2a)**

**Option:**

A NEW TRAFFIC PATTERN AHEAD (W23-2) sign (see Figure 2C-9) 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.

A NEW SIGNAL OPERATION AHEAD (W23-2a) sign (see Figure 2C-9) may be used on the approach to a signalized intersection to provide advance warning of a change in signal phasing.

**Guidance:**

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 six months.

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**Section 2C.40 Comments:** NCUTCD generally agrees with 2C.40 as presented in the NPA, but recommend adding the R2-2p plaque along with the R2-1 sign for signs following these W3-5 series signs.

**TRAFFIC CONTROL AND INTERSECTION SIGNS AND PLAQUES**

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

**Guidance:**

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

**Standard:**

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

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

Figure 2C-10. Reduced Speed Limit Ahead Signs



NCUTCD generally agrees with Figure 2C-10 as presented in the NPA, but recommend changing the 20 MPH on the W3-5c sign to XX MPH to match the W3-5a sign.

**Section 2C.41 Comments:** NCUTCD generally agrees with 2C.41 as presented in the NPA, with a minor editorial revision to reference Figure 2C-8.

#### **Section 2C.41 WATCH FOR STOPPED TRAFFIC Sign (W23-3)**

##### Option:

The WATCH FOR STOPPED TRAFFIC (W23-3) sign (see [Figure 2C-08](#) [Figure 2C-9](#)) may be used to warn road users of the possibility of vehicles stopping abruptly in the travel lane due to recurring or expected congested conditions.

**Section 2C.42 Comments:** NCUTCD agrees with 2C.42 as presented in the NPA.

### ***TRAFFIC CONTROL AND INTERSECTION SIGNS AND PLAQUES***

#### **Section 2C.42 Intersection Warning Signs (W2-1 through W2-8)**

##### Option:

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-11) may be used in advance of an intersection to indicate the presence of an intersection and the possibility of turning or entering traffic.

The Circular Intersection (W2-6) sign (see Figure 2C-11) may be installed in advance of a circular intersection (see Figures 2B-21 through 2B-23).

##### Guidance:

*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:

An educational plaque (see Figure 2C-11) with a legend such as ROUNDABOUT (W16-12aP) or TRAFFIC CIRCLE (W16-12P) may be mounted below a Circular Intersection sign.

##### Support:

See Section 2C.64 for the use of an advance street name plaque to identify an intersecting road.

##### Guidance:

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

Intersection Warning signs, other than the Circular Intersection (W2-6) sign, the T-intersection (W2-4) sign, and the Grade Crossing and Intersection Advance Warning (W10-2, W10-3, W10-4, W10-11, and W1012) signs should not be used on approaches controlled by STOP signs, YIELD signs, or signals.

If an Intersection Warning sign is used where the side roads are not opposite of each other, the Offset Side Roads (W2-7) sign (see Figure 2C-11) should be used instead of the Cross Road sign.

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-11) should be used instead of the Side Road sign.

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

Support:

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

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**Section 2C.43 Comments:** NCUTCD agrees with 2C.43 as presented in the NPA.

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

##### **Standard:**

The Two-Direction Large Arrow (W1-7) sign (see Figure 2C-11) shall be a horizontal rectangle.

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

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

##### *Guidance:*

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

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**Section 2C.44 Comments:** NCUTCD agrees with 2C.44 as presented in the NPA.

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

##### **Standard:**

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-11) shall be installed near the left-most signal head.



**Section 2C.45 Comments:** NCUTCD generally agrees with 2C.45 as presented in the NPA, but recommends revising “entering” to “major” roadway in the Guidance statement to clarify which roadway the main arrow stem represents.

## MERGING AND PASSING SIGNS AND PLAQUES

### Section 2C.45 Merge Signs (W4-1, W4-5)

#### Option:

A Merge (W4-1) sign (see Figure 2C-12) 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.

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.

#### Guidance:

*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.*

*Where two roadways of approximately equal importance converge, a Merge sign should be placed on each roadway.*

*When a Merge (W4-1) sign is installed on an entering 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 ~~entering~~ major roadway and the curved stem representing the ~~major~~ entering roadway (see Figure 2C-12). The sign should be located on the side of the entering roadway from which the merge occurs.*

*When a Merge sign is to be 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-12) should be used to better portray the actual geometric conditions to road users on the entering roadway.*

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

#### **Standard:**

**The Merge sign shall not be used in place of a Lane Ends 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.**

#### Option:

An Entering Roadway Merge (W4-5) sign with a NO MERGE AREA (W4-5P) supplemental plaque see Figure 2C-12 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.

A Merge (W4-1) sign with a NO MERGE AREA (W4-5P) 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.

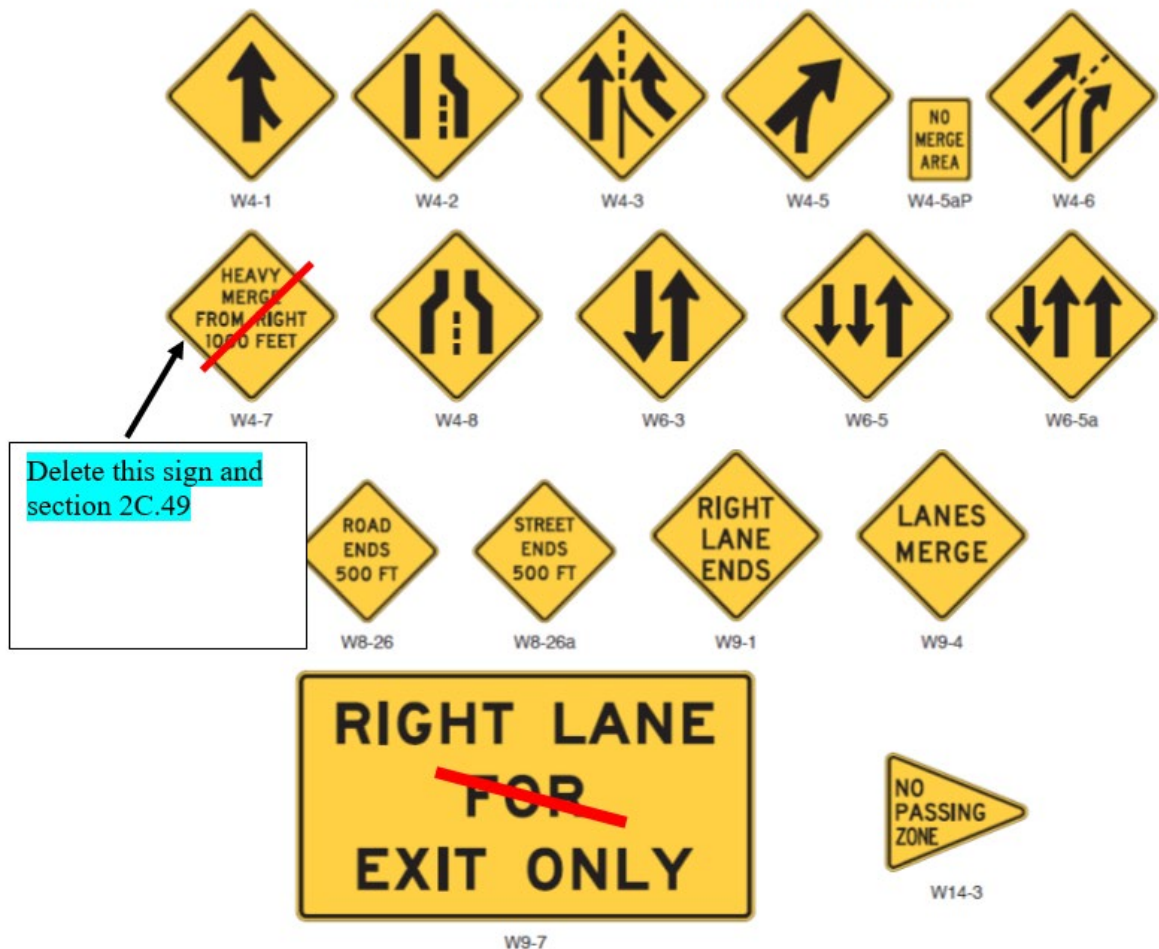
For a yield-controlled channelized right-turn movement onto a roadway without an acceleration lane, a NO MERGE AREA (W4-5P) supplemental plaque may be mounted below a

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.

NCUTCD generally agrees with Figure 2C-12 as presented in the NPA, but recommends the following revisions:

- Resolve the conflict between W9-4 signs in Part 2 and Part 6 in the NPA with the same sign designation - W9-4 in Part 2 is the LANES MERGE word legend sign and W9-4 in Part 6 is the Interior Lane Shift Ahead symbol sign
- Delete the W4-7 sign (see comments on 2C.49)
- Delete the word "FOR" on the W9-7 sign (see comments on 2C.50)

Figure 2C-12. Merging and Passing Signs and Plaques



Delete the word "FOR" above in figure 2C-12 – this relates to comment in Section 2C.50

**Section 2C.46 Comments:** NCUTCD agrees with 2C.46 as presented in the NPA, but recommends revising “entering” to “major” roadway in the Guidance statement to clarify which roadway the main arrow stem represents.

#### **Section 2C.46 Added Lane Signs (W4-3, W4-6)**

*Guidance:*

*The Added Lane (W4-3) sign (see Figure 2C-12) 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.*

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

*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-12) should be used to better portray the actual geometric conditions to road users on the curving roadway.*

---

**Section 2C.47 Comments:** NCUTCD generally agrees with 2C.47 as presented in the NPA, but recommends revising the Option statement to add and reference a new BEYOND INTERSECTION or BEYOND SIGNAL plaque used with a W9-1 sign where advanced placement distances in Table 2C-3 result in a W9-1 sign being placed upstream of a signalized or major unsignalized intersection and the lane reduction occurs downstream of that intersection, to make it clear that the lane reduction occurs beyond the intersection (see Figure 2C-13 sheet 3 as revised by NCUTCD).

#### **Section 2C.47 Lane Ends Signs (W4-2, W9-1)**

*Support:*

*The Lane Ends (W4-2) and RIGHT (LEFT) LANE ENDS (W9-1) signs are used to warn of the reduction in the number of traffic lanes in the direction of travel (see Figure 2C-12).*

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

*Guidance:*

*The Lane Ends (W4-2) sign should be installed at the approximate location of the start of the lane taper.*

*The RIGHT (LEFT) LANE ENDS (W9-1) sign (see Figure 2C-12) should be used in advance of the LANE ENDS (W4-2) sign to warn that a lane is ending and that a merging maneuver will be required. The W9-1 sign should be installed in accordance with Table 2C-3*

*Option:*

*On low-speed roads in urban environments where space is limited at a signalized intersection, the W9-1 sign may be located at the far side of the intersection to indicate the end of an auxiliary lane that is added for intersection capacity, but ends a short distance beyond the intersection and does not accommodate the advance placement distance indicated in Table 2C-3.*

Where a lane reduction occurs a short distance downstream of an intersection (see Figure 2C-13 sheet 3 of 5), the W9-1 sign may be supplemented with a plaque BEYOND INTERSECTION (W16-xxP) or BEYOND SIGNAL (W16-xxP) when placed upstream of the intersection in order to meet the advance placement distance indicated in Table 2C-3.

(add and reference BEYOND INTERSECTION or BEYOND SIGNAL plaque)

Supplemental RIGHT (LEFT) LANE ENDS (W9-1) signs may be installed upstream of the W9-1 that is installed at the advanced placement distance.

*Guidance:*

*If supplemental W9-1 signs are installed, a Distance (W16-2P series or W16-3P series) plaque should be installed below the W9-1 sign.*

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

*Support:*

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

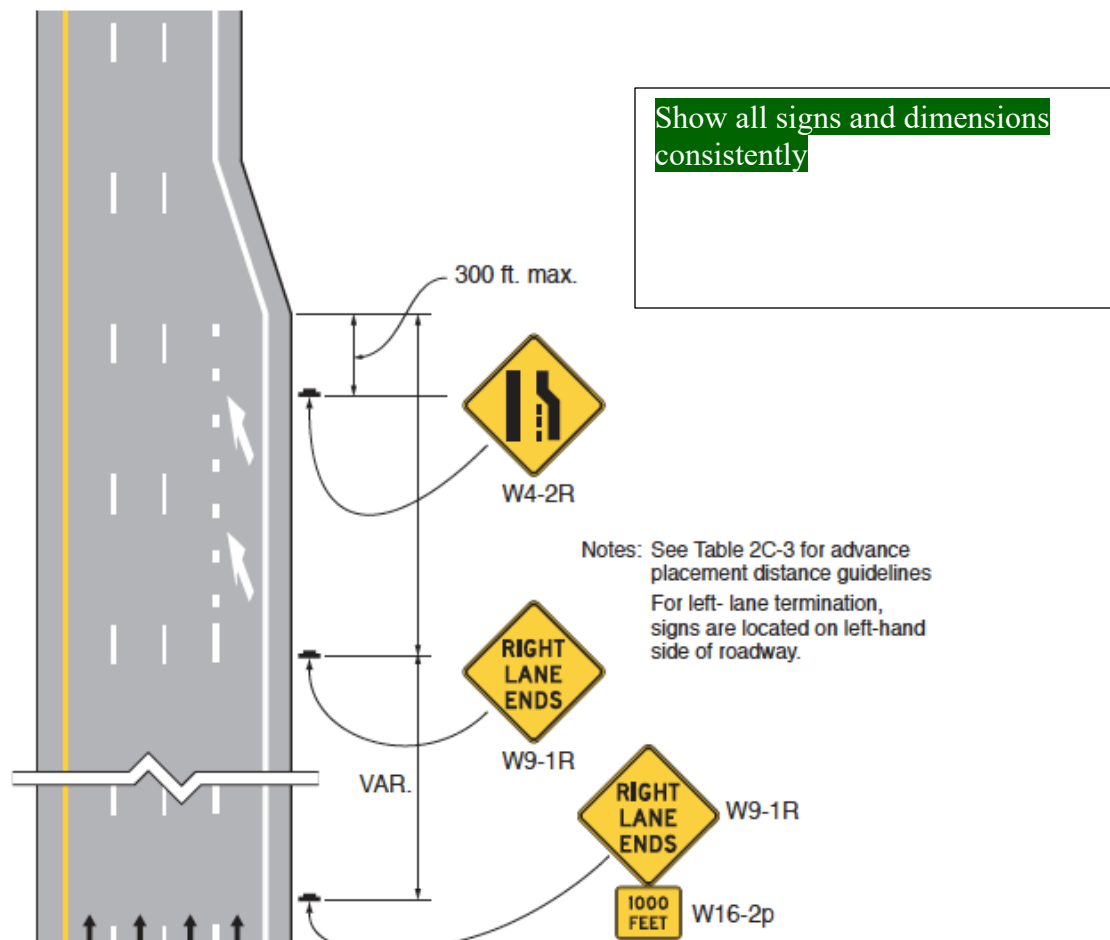
*Guidance:*

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

**Standard:**

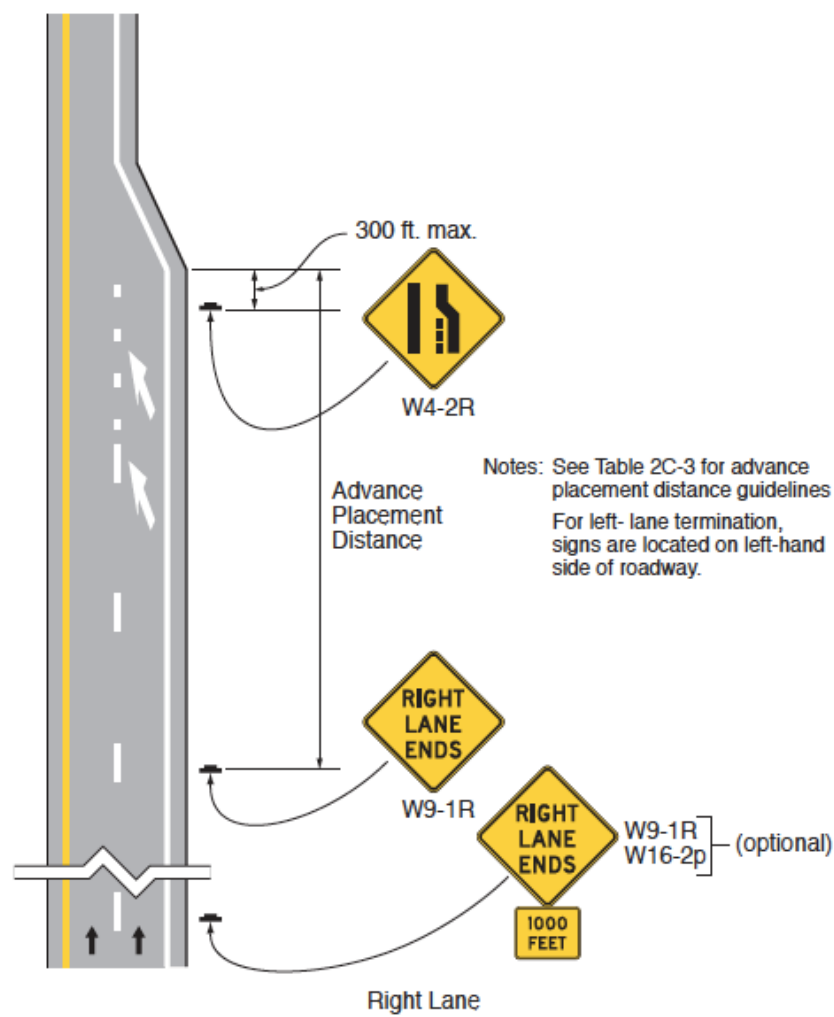
**The W4-2 and W9-1 signs shall not be used in dropped lane situations. In dropped lane situations on conventional roads at intersections, regulatory signs (see Section 2B.30) shall be used to inform road users that a through lane is becoming a mandatory turn lane.**

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



NCUTCD generally agrees with Figure 2C-13 sheet 1 of 5 as presented in the NPA, but recommends showing all signs and dimensions consistently with other Figures in other chapters of the MUTCD related to lane ends signing and markings.

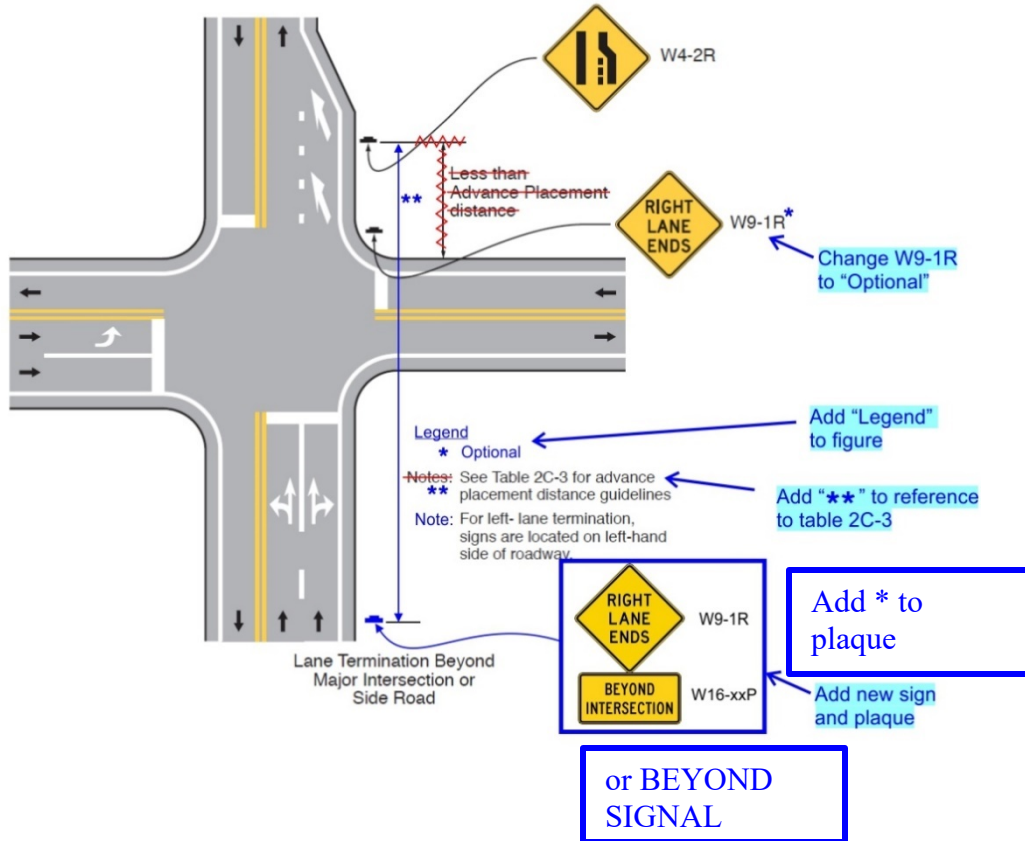
**Figure 2C-13. Example Sequences for Lane Ends and Lane Merge Signs  
Conventional Roads (Sheet 2 of 5)**



NCUTCD generally agrees with Figure 2C-13 sheet 2 of 5 as presented in the NPA, but recommends showing all signs and dimensions consistently with other Figures in other chapters of the MUTCD related to lane ends signing and markings.



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

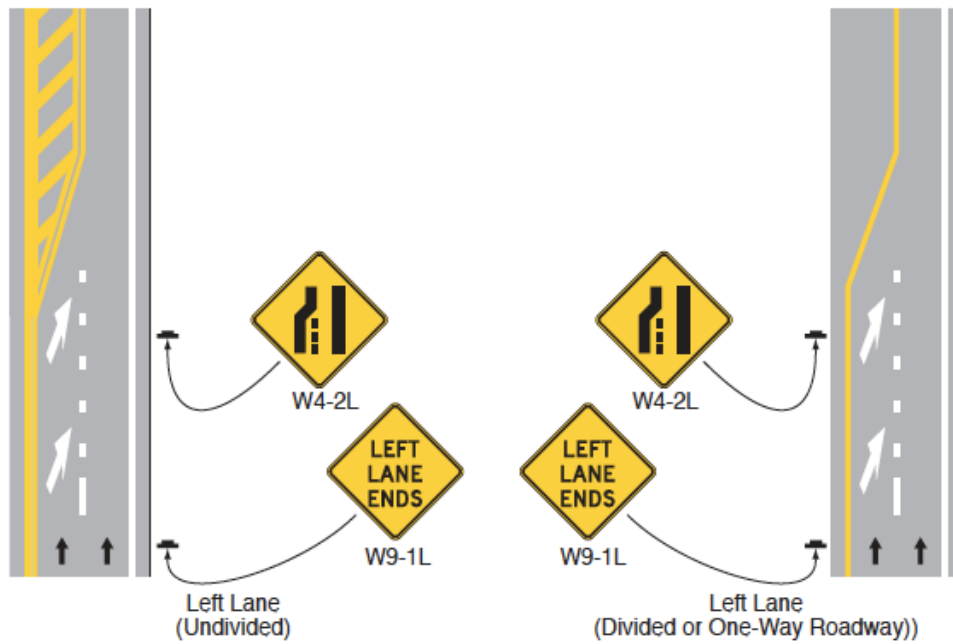


NCUTCD recommends revising Figure 2C-13 sheet 3 of 5 as presented in the NPA as follows:

- Add a W9-1R and BEYOND INTERSECTION or BEYOND SIGNAL plaque assembly upstream of the intersection with a distance determined by Table 2C-3
- Change the W9-1R immediately downstream of the intersection to optional
- Other editorial revisions as needed



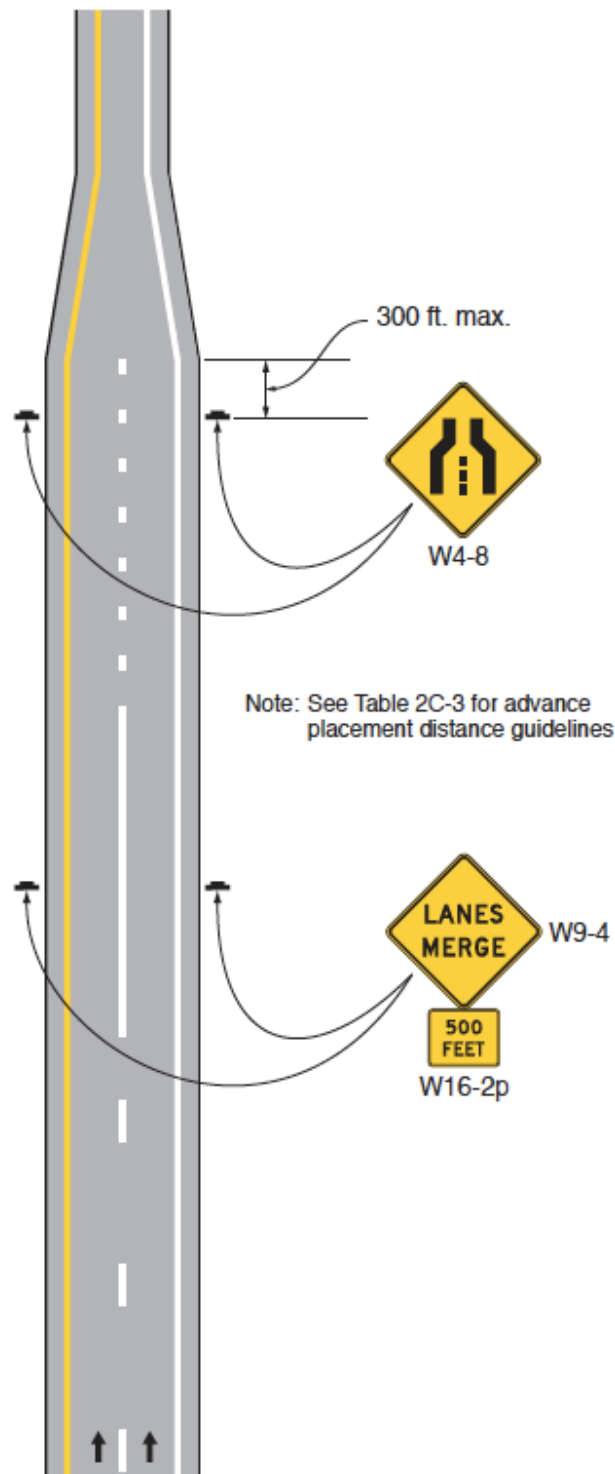
Figure 2C-13. Example Sequences for Lane Ends and Lane Merge Signs  
Conventional Roads (Sheet 4 of 5)



1608  
1609

NCUTCD agrees with Figure 2C-13 sheet 4 of 5 as presented in the NPA.

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

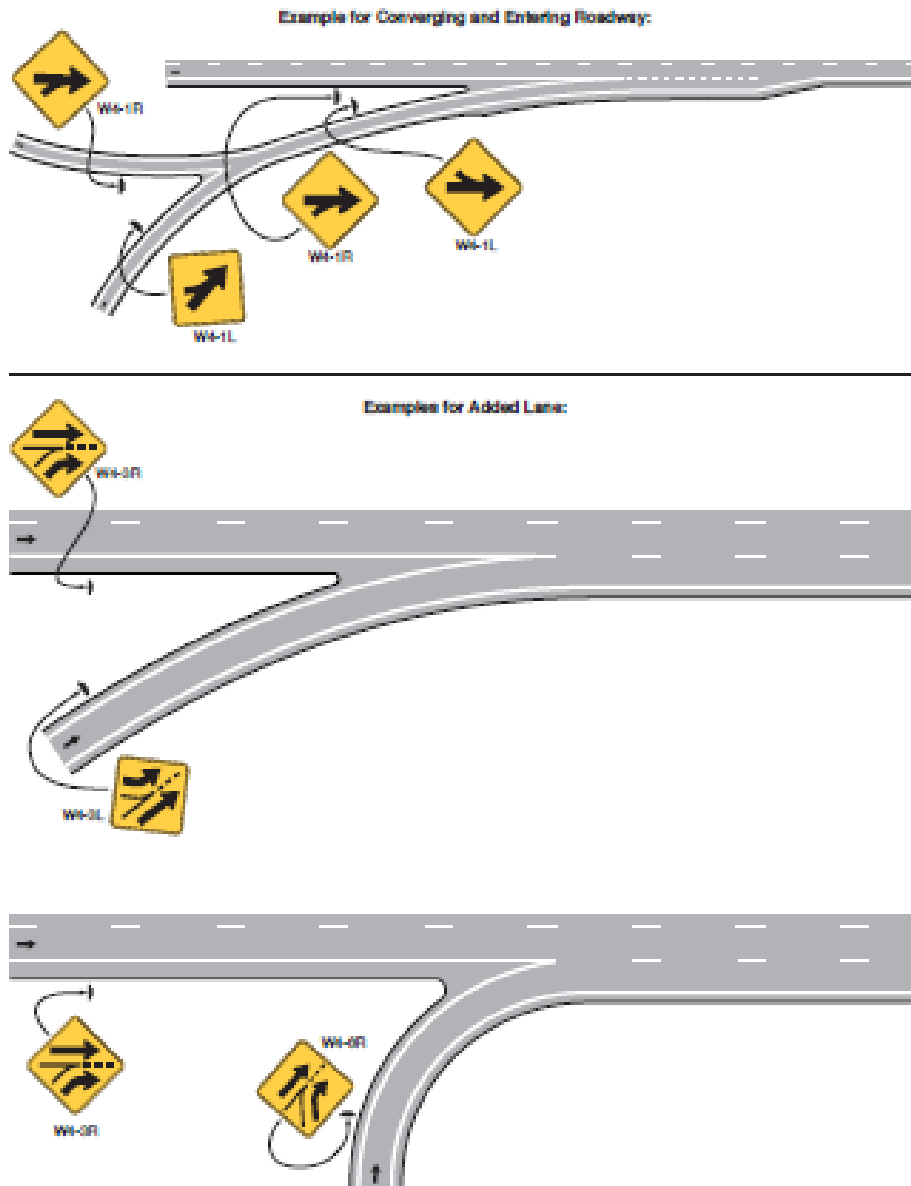


Reduction of Two Lanes to One in the Same Direction of Travel

1610  
1611

NCUTCD agrees with Figure 2C-13 sheet 5 of 5 as presented in the NPA.

Figure 2C-14. Examples of Merge and Added Lane Sign Placement for Entering and Converging Roadways



NCUTCD agrees with Figure 2C-14 as presented in the NPA.

**Section 2C.48 Comments:** NCUTCD generally agrees with 2C.48 as presented in the NPA, but recommends revisions as follows:

- Add an Option statement for supplemental advance lane merge signs
- Add a Guidance statement recommending distance plaques under supplemental advance lane merge signs

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

Support:

The LANES MERGE (W9-4) and Single-Lane Transition (W4-8) signs are used to warn of the reduction of two lanes to one in the same direction of travel (See Figure 2C-12).

Guidance

The Lanes Merge (W9-4) sign should be used warn that the traffic lane is merging with the adjacent lane and a merging maneuver will be required for each lane. The W9-4 sign should be installed in accordance with Table 2C-3. (See Figure 2C-13, sheet 5 of 5)

The Single-Lane Transition (W4-8) sign should be used to indicate the approximate location of the start of the lane taper. (see Figure 2C-13)

Option:

Supplemental LANES MERGE (W9-4) signs may be installed upstream of the W9-4 sign that is installed at the advance placement distance.

Guidance:

If supplemental W9-4 signs are installed, a Distance W16-2P series or W16-3P series plaque should be installed below the supplemental W9-4 sign.

---

**Section 2C.49 Comments:** NCUTCD recommends deleting 2C.49 entirely, because the HEAVY MERGE sign message is ambiguous, the use of this sign would likely be limited, and a practitioner could instead install a word message sign if a sign of this type is needed.

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

~~Option:~~

~~The HEAVY MERGE FROM LEFT (RIGHT) XX FT (W4-7) see Figure 2C-12 sign 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 large volumes of entering traffic.~~

~~Standard:~~

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

---

**Section 2C.50 Comments:** NCUTCD generally agrees with 2C.50 as presented in the NPA, but recommends revisions as follows:

- Remove the word “FOR” from the W9-7 sign, as the word is unneeded, and for design consistency with the R3-33 sign
- Add distance messages with a plaque instead of on the W9-7 sign

### ***TRAFFIC CONTROL AND INTERSECTION SIGNS AND PLAQUES***

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

Option:

The RIGHT (LEFT) LANE ~~FOR~~ EXIT ONLY (W9-7) sign (see Figure 2C-12) 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 on a ramp at the next interchange or intersection.

**(delete FOR from sign)**

Guidance:

*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:

A Distance plaque (W16-3aP) ~~legend~~ 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 1 mile or greater.

**(use a distance plaque instead of placing as sign legend)**

Support:

Section 2B.32 contains information regarding a regulatory sign that can also be used for lane drops at grade-separated interchanges.

Section 2C.61 contains information regarding the use of Distance plaque in conjunction with Warning Signs.

**(add a Support statement for the use of a distance plaque)**

---

**Section 2C.51 Comments:** NCUTCD agrees with 2C.51 as presented in the NPA.

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

Guidance:

*A Two-Way Traffic (W6-3) sign (see Figure 2C-12) 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.*

*A Two-Way Traffic (W6-3) sign with an AHEAD (W16-9P) plaque (see Figure 2C-17) 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-14).*

Option:

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:

Section 6H.17 contains information on an Opposing Lane Traffic Divider Sign (W6-4) for use in temporary traffic control situations.

---

**Section 2C.52 Comments:** NCUTCD generally agrees with 2C.52 as presented in the NPA, with minor editorial revisions.

### ***MERGING AND PASSING SIGNS AND PLAQUES***

#### **Section 2C.52 Two-Way Traffic on a Three-Lane Roadway Sign (W6-5, W6-5a)**

##### **Option:**

The Two-way Traffic on a Three-Lane Roadway (W6-5 and W6-5a) signs (see Figure 2C-12) may be installed along three lane ~~threelane~~ roadways with two lanes in one direction and one in the opposing direction.

##### **Standard:**

**The W6-5 series signs shall match the lane configuration of the roadway.**

---

**Section 2C.53 Comments:** NCUTCD agrees with 2C.53 as presented in the NPA.

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

##### **Standard:**

The NO PASSING ZONE (W14-3) sign (see Figure 2C-12) 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.37 and 3B.03).

---

**Section 2C.54 Comments:** NCUTCD generally agrees with 2C.54 as presented in the NPA, but recommends adding a W11-XX Bus warning sign in accordance with NCUTCD recommendation 20B-RW-02. FHWA may want to consider also adding a BUS supplemental plaque that could be used with the Bus warning sign.

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

##### **Option:**

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

Support:

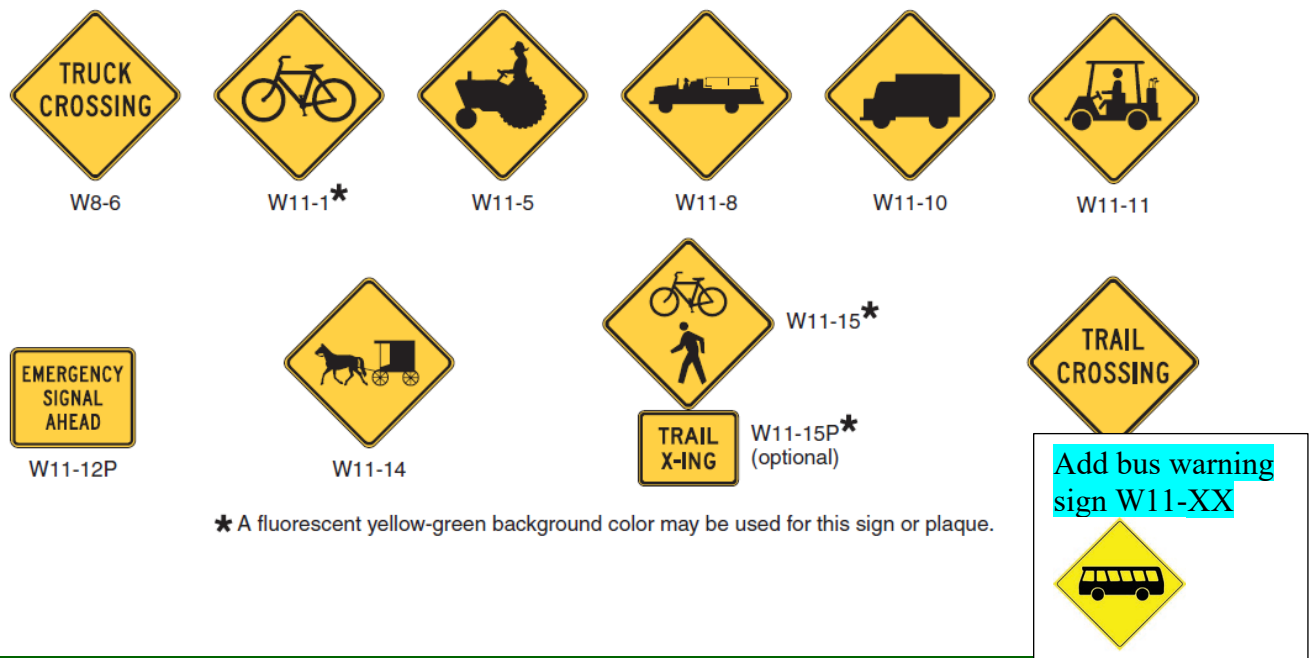
These locations might be relatively confined or might occur randomly over a segment of roadway.

Guidance:

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

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

Figure 2C-15. Vehicular Traffic Warning Signs and Plaques



NCUTCD generally agrees with Figure 2C-15 as presented in the NPA, but recommends adding a W11-XX Bus warning sign in accordance with NCUTCD recommendation 20B-RW-02. FHWA may want to consider also adding a BUS supplemental plaque that could be used with the Bus warning sign.

Option:

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

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

Supplemental plaques (see Section 2C.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:



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

**Standard:**

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

**Option:**

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

**Standard:**

**The Emergency Vehicle (W11-8) sign (see Figure 2C-15) with the EMERGENCY SIGNAL AHEAD (W11-12P) supplemental plaque (see Figure 2C-15) shall be placed in advance of all emergency-vehicle traffic control signals (see Chapter 4M).**

**Option:**

The Emergency Vehicle (W11-8) 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.

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.

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

---

**Section 2C.55 Comments:** NCUTCD agrees with 2C.55 as presented in the NPA.

**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:**

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-16) 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:**

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

**Guidance:**

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

**Standard:**

If a post-mounted W11-2, W11-6, W11-7, or W11-9 sign is placed at the location of the crossing point where pedestrians, snowmobilers, or equestrians might be crossing the roadway, a diagonal downward pointing arrow (W16-7P) plaque (see Figure 2C-17) shall be mounted below the sign. If the W11-2, W11-6, W11-7, or W11-9 sign is mounted overhead, the W16-7P plaque shall not be used.

**Option:**

A Pedestrian Crossing (W11-2) sign may be placed overhead or may be post-mounted with a diagonal downward pointing arrow (W16-7P) plaque at the crosswalk location where Yield Here To (Stop Here For) Pedestrians signs (see Section 2B.20) have been installed in advance of the crosswalk.

**Standard:**

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

**Option:**

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

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

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

**Guidance:**

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

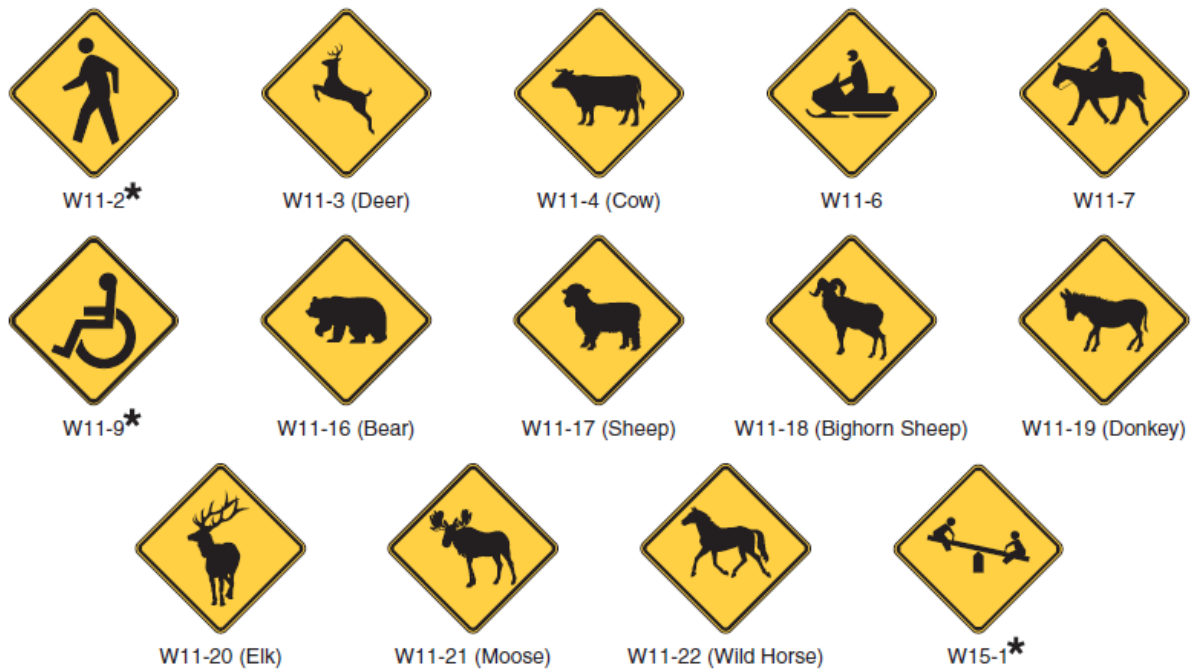
**Option:**

A Warning Beacon (see Section 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.

A supplemental WHEN FLASHING (W16-13P) plaque (see Figure 2C-17) 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.

NCUTCD agrees with Figure 2C-16 as presented in the NPA.

Figure 2C-16. Non-Vehicular Warning Signs



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

Section 2C.56 Comments: NCUTCD agrees with 2C.26 as presented in the NPA.

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

Option:

The Playground (W15-1) sign (see Figure 2C-16) may be used to give advance warning of a designated children's playground that is located adjacent to the road.

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

*Guidance:*

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

**Section 2C.57 Comments:** NCUTCD agrees with 2C.57 as presented in the NPA.

## **Section 2C.57 Use of Supplemental Warning Plaques**

### **Option:**

A supplemental warning plaque (see Figure 2C-17) 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:**

**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.**

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

---

**Section 2C.58 Comments:** NCUTCD generally agrees with 2C.58 as presented in the NPA, but recommends removing the Standard sentence related to regulatory sign plaques since that is not appropriate in the chapter on warning signs.

## **Section 2C.58 Design of Supplemental Warning Plaques**

### **Standard:**

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.~~

**Supplemental warning plaques shall be rectangular**

---

**Section 2C.59 Comments:** NCUTCD generally agrees with 2C.59 as presented in the NPA, but recommends adding a reference to Figure 2C-1 and deleting material on methods of determining advisory speeds for horizontal curves in accordance with NCUTCD recommendation 17B-RW-01, as this is adequately addressed elsewhere in Chapter 2C and in other traffic engineering references.

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

### **Option:**

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

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

### **Standard:**

**The use of the Advisory and Confirmation Advisory Speed plaques for horizontal curves shall be in accordance with Section 2C.06 and Table 2C-4b. 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.

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

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

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

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

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

Support:

The “Traffic Control Devices Handbook” (see Section 1A.05) contains information on established engineering practices for determining advisory speeds. ~~Among the established engineering practices that are appropriate for the determination of the recommended advisory speed for a horizontal curve are the following:~~

- ~~A. Compass method~~
- ~~B. Safety-based method~~
- ~~C. Ball-bank method~~
- ~~D. Design equation method~~
- ~~E. Accelerometer method~~

(delete per 17B-RW-01)

*Guidance:*

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

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

---

**Section 2C.60 Comments:** NCUTCD generally agrees with 2C.60 as presented in the NPA, with a minor editorial revision to reference Figure 2C-17.

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

Option:

A NEW (W16-15P) plaque ([see Figure 2C-17](#)) 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 new traffic regulation.

*Guidance:*

*The NEW plaque should be removed no later than 6 months after it was installed.*

---

**Section 2C.61 Comments:** NCUTCD agrees with 2C.61 as presented in the NPA.

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

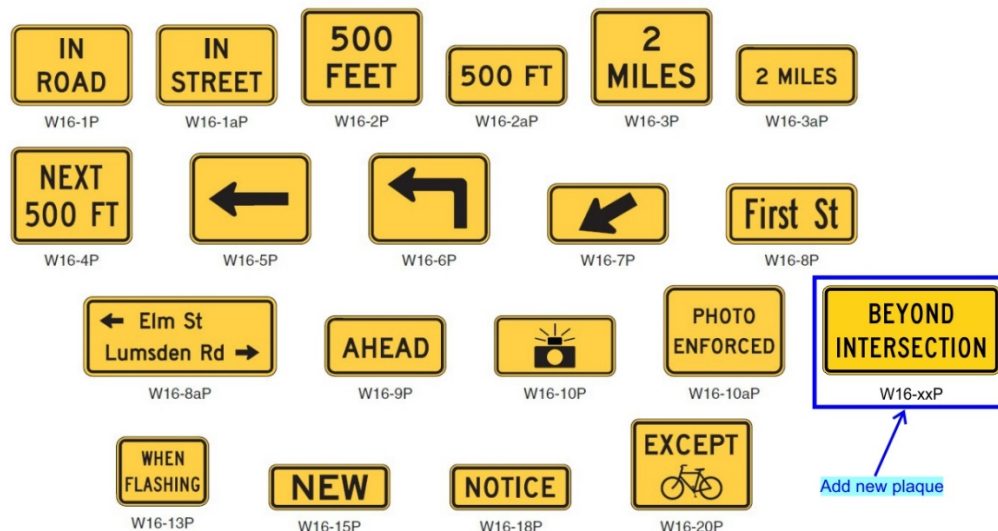
Option:

The Distance Ahead (W16-2 series and W16-3 series) plaques (see Figure 2C-17) may be used to inform the road user of the distance to the condition indicated by the warning sign.

The Next Distance (W7-3aP and W16-4P) plaques (see also Figures 2C-5 and 2C-17) may be used to inform road users of the length of roadway over which the condition indicated by the warning sign exists.

NCUTCD generally agrees with Figure 2C-17 as presented in the NPA, but recommends adding new BEYOND INTERSECTION and BEYOND SIGNAL plaques. FHWA may want to consider also adding a BUS supplemental plaque that could be used with the Bus warning sign.

Figure 2C-17. 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.62 Comments:** NCUTCD agrees with 2C.62 as presented in the NPA.

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

Guidance:

*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-17) should be used below the warning sign.*

**Standard:**



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 Comments:** NCUTCD agrees with 2C.63 as presented in the NPA.

#### **Section 2C.63 Hill-Related Plaques (W7-2 Series, W7-3 Series)**

*Guidance:*

*Hill-Related (W7-2 series, 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.*

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

---

**Section 2C.64 Comments:** NCUTCD generally agrees with 2C.64 as presented in the NPA, but recommends adding figure references and revising how W1-10 series signs are referenced in the section in accordance with NCUTCD recommendation 19B-RW-01.

#### **Section 2C.64 Advance Street Name Plaque (W16-8P, W16-8aP)**

*Option:*

An Advance Street Name (W16-8P or W16-8aP) plaque ([See Figure 2C-17](#)) 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.

*Support:*

See Section 2D.46 for the use of an Advance Street Name sign posted at a separate location in cases where there is a need to provide advance notice of an intersecting street ~~where warning signs other than those listed in Paragraph 1 are used, such as a Combination Horizontal Alignment/Intersection (W1-10 Series) sign.~~

(revise per 19B-RW-01)

**Standard:**

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

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:*

*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-17).*

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**Section 2C.65 Comments:** NCUTCD generally agrees with 2C.65 as presented in the NPA, with a minor editorial revision to reference Figure 2C-11.

#### **Section 2C.65 Traffic Does Not Stop Plaques (W4-4P Series)**

##### **Option:**

The CROSS TRAFFIC DOES NOT STOP (W4-4P) plaque ([see Figure 2C-11](#)) may be used in combination with a STOP sign when engineering judgment indicates that conditions are present that are causing or could cause drivers to misinterpret the intersection as an all-way stop.

Alternative messages (see Figure 2C-11) such as TRAFFIC FROM LEFT (RIGHT) DOES NOT STOP (W4-4aP) or ONCOMING TRAFFIC DOES NOT STOP (W4-4bP) may be used when such messages more accurately describe the traffic controls established at the intersection.

##### **Guidance:**

*Plaques with the appropriate alternative messages of TRAFFIC FROM LEFT (RIGHT) DOES NOT STOP or ONCOMING TRAFFIC DOES NOT STOP 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:**

**If a W4-4P plaque or a plaque with an alternative message is used, it shall be mounted below the STOP sign.**

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**Section 2C.66 Comments:** NCUTCD recommends revising 2C.66 as follows:

- Add pedestrians to the list of slower forms of transportation travelers
- Add a reference to Figure 2C-17
- Delete the Standard statement that says IN ROAD and IN STREET plaques shall not be mounted alone
- Remove the final Option statement since this is covered in Part 9

#### **Section 2C.66 IN ROAD and IN STREET Plaques (W16-1P, W16-1aP)**

##### **Option:**

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) or IN STREET (W16-1aP) plaque ([See Figure 2C-17](#)) may be used.

##### **Standard:**

**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.~~

Option:

~~In situations where there is a need to warn drivers of the presence of bicycles entering the roadway or where bicyclists are expected or preferred to use the full lane a Bicycles May Use Full Lane (R4-11) sign (See Section 9B.14) may be used.~~ (covered in Part 9)

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**Section 2C.67 Comments:** NCUTCD generally agrees with 2C.67 as presented in the NPA, with a minor editorial revision to reference Figure 2C-17.

**Section 2C.67 Except Bicycles Plaque (W16-20P)**

Option:

Where it is desired to notify bicyclists that the conditions depicted by a warning sign are not applicable to bicycles, the Except Bicycles supplemental warning plaque (W16-20P) (See Figure 2C.17) may be mounted below the warning sign.

Support:

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.

Standard:

If used with a warning sign, The Except Bicycles (W16-20P) plaque shall be a rectangle with a black legend and border on a yellow background.

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**Section 2C.68 Comments:** NCUTCD generally agrees with 2C.68 as presented in the NPA, but recommends adding speed limit and grade crossings to list of photo enforcement applications.

**Section 2C.68 Photo Enforced Plaque (W16-10P)**

Option:

A Photo Enforced (W16-10P) plaque or a PHOTO ENFORCED (W16-10aP) word message plaque may be mounted below a warning sign to advise road users that the regulations associated with the condition being warned about (such as a traffic control signal, [speed limit](#), [grade crossing](#), or a toll plaza) are being enforced by photographic equipment. (add other applications of photo enforcement)

Standard:

**If used below a warning sign, the Photo Enforced (W16-10P or W16-10aP) plaque shall be a rectangle with a black legend and border on a yellow background.**

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**Section 2C.69 Comments:** NCUTCD agrees with 2C.69 as presented in the NPA.

## **OBJECT MARKERS**

### **Section 2C.69 Object Marker Design and Placement Height**

**Support:**

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

**Standard:**

**When used, object markers (see Figure 2C-18) 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).**

**Support:**

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).

**Guidance:**

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

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

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

**Option:**

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

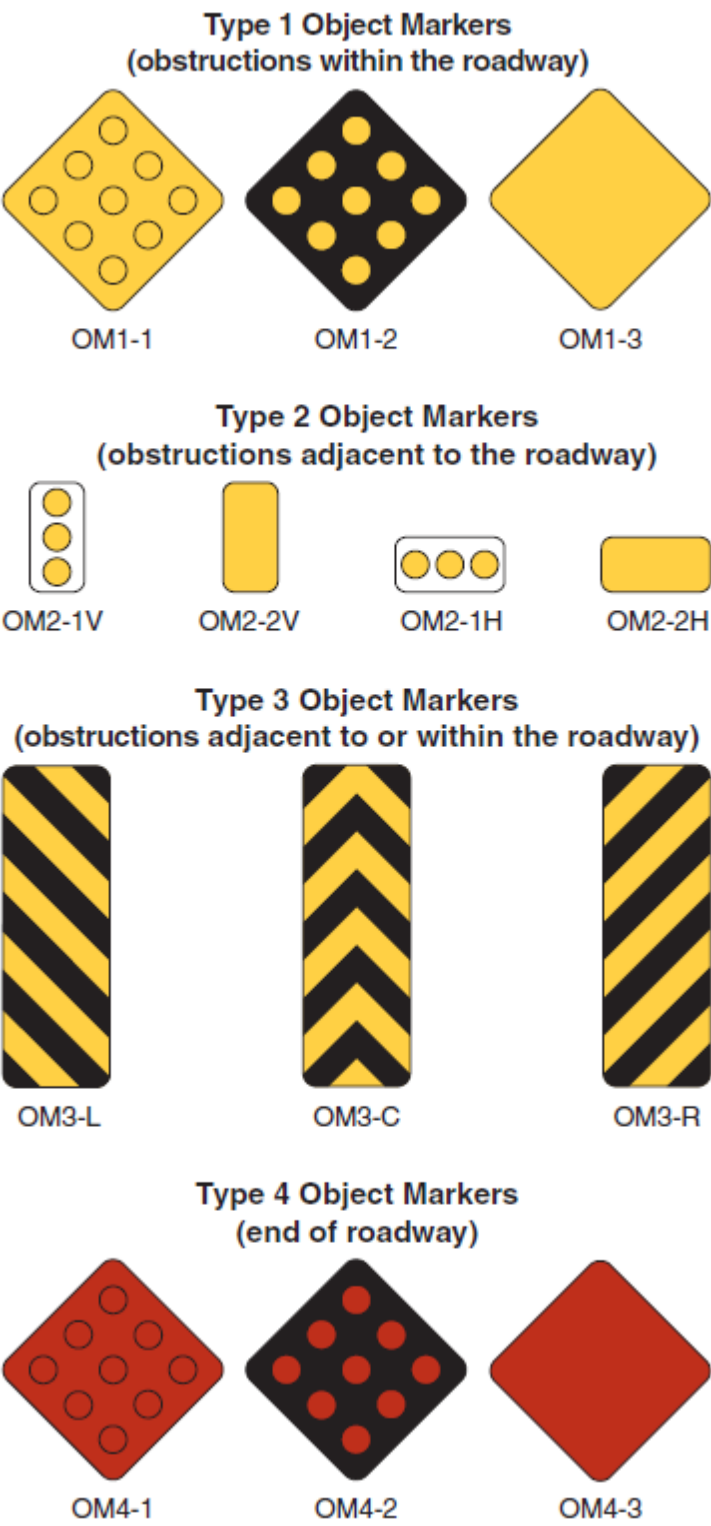
**Support:**

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

2185

NCUTCD agrees with Figure 2C-18 as presented in the NPA.

Figure 2C-18. Object Markers



2186  
2187

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**Section 2C.70 Comments:** NCUTCD agrees with 2C.70 as presented in the NPA.

**Section 2C.70 Object Markers for Obstructions Within the Roadway**

**Standard:**

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

**Option:**

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

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

**Standard:**

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

**Option:**

Appropriate signs (see Sections 2B.32 and 2C.23) directing traffic to one or both sides of the obstruction may be used instead of the object marker.

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**Section 2C.71 Comments:** NCUTCD agrees with 2C.71 as presented in the NPA.

**Section 2C.71 Object Markers for Obstructions Adjacent to the Roadway**

**Support:**

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

**Option:**

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

**Guidance:**

*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.*

*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:**

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

*Guidance:*

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

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**Section 2C.72 Comments:** NCUTCD agrees with 2C.72 as presented in the NPA.

**Section 2C.72 Object Markers for Ends of Roadways**

**Support:**

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

**Standard:**

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

**Option:**

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

Where conditions warrant, more than one marker, or a larger marker with or without a Type 3 Barricade (see Section 2B.76), may be used at the end of the roadway.

**Standard:**

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

*Guidance:*

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