

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

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PART 1

GENERAL

CHAPTER 1A. GENERAL

Section 1A.01 Purpose of the MUTCD

Support:

- 01 The purpose of the MUTCD is to establish uniform national criteria for the use of traffic control devices that meet the needs and expectancy of road users on all streets, highways, pedestrian and bicycle facilities, and site roadways open to public travel.
- 02 This purpose is achieved through the following objectives:
 - A. Promote safety, inclusion, and mobility for all users of the road network;
 - B. Promote efficiency through creating national uniformity in the meaning and appearance of traffic control devices;
 - C. Promote national consistency in the use, installation, and operation of traffic control devices; and
 - D. Provide basic principles for traffic engineers and [transportation professionals](#) to use in making decisions regarding the use, installation, operation, maintenance, and removal of traffic control devices.
- 03 Uniformity of the meaning of traffic control devices is vital to their effectiveness. Uniformity means treating similar situations in a similar way. Uniformity of devices simplifies the task of the road user because it aids in recognition and understanding, thereby reducing perception/reaction time. Uniformity assists road users, law enforcement officers, and traffic courts by giving everyone the same interpretation. Uniformity assists public highway officials through efficiency in manufacture, installation, maintenance, and administration.
- 04 The use of uniform traffic control devices also requires uniform and appropriate application.
- 05 The applicability of the MUTCD to facilities open to public travel is independent of the type of ownership or jurisdiction (public or private) and the source of funding (Federal, State, local, or private).
- 06 This Manual presumes the user of the MUTCD has sufficient working knowledge, professional training and experience, and education in the principles of traffic engineering. Other resources can be consulted to understand the basis for decisions that are made in which engineering study or judgment will be applied.

Section 1A.01.05 Purpose of the Indiana Edition

Support:

- 01 This Edition of the Indiana Manual on Uniform Traffic Control Devices (IMUTCD), has been established and the contents contained herein shall be used by state and local officials in determining the necessity for any traffic control device in their respective jurisdictions. It also applies to private roadways and parking areas open to the public where the use of traffic control devices are needed.
- 02 Indiana specific content in the IMUTCD is shown in blue type.
- 03 It is the intent, in the adoption of the IMUTCD, to meet the various requirements of the statutes of the State of Indiana. In particular, the following statutes are considered to be enabling legislation which allows for the promulgation of the Indiana Manual on Uniform Traffic Control Devices for Streets and Highways: Indiana Code 4- 22-2, 9-21-2, 9-21-3, and 9-21-4, and specifically in sections:
 - IC 9-21-2-1 Sec. 1. "The Indiana department of transportation shall adopt rules under IC 4-22-2 to create the Indiana Manual on Uniform Traffic Control Devices for Streets and Highways."
 - IC 9-21-2-2 Sec. 2. "The Indiana Manual on Uniform Traffic Control Devices for Streets and Highways must substantially conform with the Manual on Uniform Traffic Control Devices for Streets and Highways, 1961 Edition, and the Manual for Signing and Pavement Marking for the National System for Interstate and Defense Highways, 1962 Edition, and all other manuals and revisions to the manuals that have the approval of the Federal Highway Administrator."
 - IC 9-21-2-3 Sec. 3. "All manuals (including revisions to the manuals) described in section 2 of this chapter may be considered to become a part of the Indiana Manual on Uniform Traffic Control Devices for Streets and Highways if the following conditions exist: (1) The Indiana department of transportation concurs in the revisions. (2) The Indiana department of transportation adopts the manuals (including revisions) by order of the commissioner of the Indiana department of transportation
 - IC 9-21-2-4 Sec. 4. "The Indiana department of transportation may add control devices to the state manual in those areas where the federal standards are silent."
 - IC 9-21-4-1 Sec. 1. "A governmental agency in Indiana that is responsible for the signing, marking, and erection of traffic control devices on streets and highways within Indiana shall follow the Indiana Manual on Uniform Traffic Control Devices for Streets and Highways."
- 04 Revisions to the IMUTCD will be accomplished as specified in IC 9-21-2-3 after receiving concurrence from FHWA.

Section 1A.02 Traffic Control Devices – General Description

Support:

- 01 As defined in Section 1C.02 of this Manual, traffic control devices include all signs, signals, markings, channelizing devices, or other devices that use colors, shapes, symbols, words, sounds, and/or tactile information for the primary purpose of communicating a regulatory, warning, or guidance message to road users on a street, highway, pedestrian facility, bikeway, pathway, or site roadway open to public travel.
- 02 Infrastructure elements that restrict the road user's travel paths or vehicle speeds, such as islands, curbs, speed humps, and other raised roadway surfaces, are not traffic control devices. Transverse or longitudinal rumble strips are also not traffic control devices. Operational devices associated with the application of traffic control strategies such as fencing, roadway lighting, barriers, and attenuators are shown in this Manual for context, but their design, application, and usage are not specified since they are not traffic control devices.
- 03 Certain types of signs and other devices that do not have any traffic control purpose are sometimes placed within the highway right-of-way by or with the permission of the public agency or the official having jurisdiction over the street or highway. These signs and other devices are not considered to be traffic control devices and provisions regarding their design and use are not included in this Manual. Among these signs and other devices are the following:
- A. Devices whose purpose is to assist highway maintenance personnel, such as markers to guide snowplow operators, devices that identify culvert and drop inlet locations, and devices that precisely identify highway locations for maintenance or mowing purposes;
 - B. Devices whose purpose is to assist fire or law enforcement personnel, such as markers that identify fire hydrant locations, signs that identify fire or water district boundaries, speed measurement pavement markings, small indicator lights to assist in enforcement of red light violations, and photo enforcement systems;
 - C. Devices whose purpose is to assist utility company personnel and highway contractors, such as markers that identify underground utility locations;
 - D. Signs posting local non-traffic ordinances; and
 - E. Signs giving civic organization meeting information.

Section 1A.03 Target Road Users

Support:

- 01 Traffic control devices can be targeted at operators of motor vehicles, including driving automation systems, and at vulnerable road users.
- 02 Targeted operators of motor vehicles include motorists, public transportation operators, truck drivers, and motorcyclists. Targeted users also include vulnerable road users **and horse-drawn vehicles**, who have little to no protection from crash forces. **Vulnerable road** users are defined in Title 23, U.S.C. 148(a). They include bicyclists and pedestrians, including persons with disabilities. Pedestrians with disabilities might be blind or vision-impaired, have mobility limitations, or other impairments. Protection of vulnerable users is a priority in this Manual as directed in Section 11135 of the Infrastructure Investment and Jobs Act.
- 03 Operators of motor vehicles and vulnerable road users are both likely to be present on roadways where adjacent land use suggests that trips could be served by varied modes. Application of traffic control devices on these roadways requires careful consideration of measures to set and design for appropriate speeds; separation of various users in time and space; improvement of connectivity and access for pedestrians, bicyclists, and transit riders, including for people with disabilities; and implementation of safety countermeasures.

Section 1A.04 Use of the MUTCD

Support:

- 01 Traffic control device principles in the MUTCD are developed for and used by individuals who are duly authorized and qualified to conduct traffic control device activities.

Standard:

- 02 **Where the content of this Manual requires a decision for implementation, such decisions shall be made by an engineer, or an individual under the supervision of an engineer, who has the appropriate levels of experience and expertise in traffic engineering to make the traffic control device decision. Those decisions shall be made using engineering judgment or engineering study, as required by the MUTCD provision.**

Support:

- 03 Section 1C.02 contains definitions of “engineering study” and “engineering judgment.”

Guidance:

- 04 *In making traffic control device decisions, individuals should consider the impacts of the decision on the following: safety and operational efficiency (mobility) of all road users at that location, the effective use of agency resources, cost-effectiveness, and enforcement and education aspects of traffic control devices.*

Support:

- 05 Throughout this Manual the headings Standard, Guidance, Option, and Support, the meanings of which are defined in Section 1C.01, are used to classify the nature of the text that follows. Figures and tables, including the notes contained therein, supplement the text and might constitute a Standard, Guidance, Option, or Support. The user needs to refer to the appropriate text to classify the nature of the figure, table, or note contained therein.

Section 1B.03 Compliance of Devices

Standard:

- 01 The U.S. Secretary of Transportation, under authority granted by the Highway Safety Act of 1966, decreed that traffic control devices on all streets and highways open to public travel in accordance with 23 U.S.C. 109(d) and 402(a) in each State shall be in substantial conformance with the Standards issued or endorsed by the FHWA.

Support:

- 02 23 CFR 655.603 also requires traffic control devices on all streets, highways, bikeways, and site roadways open to public travel in each State be in substantial conformance with standards issued or endorsed by the Federal Highway Administrator.

Standard:

- 03 After the effective date of a new edition of the MUTCD or a revision thereto, or after the adoption thereof by the State, whichever occurs later, new or reconstructed devices installed shall comply with the new edition or revision, as required by 23 CFR 655.603.

- 04 In cases involving Federal-aid projects for new construction, reconstruction, resurfacing, restoration, or rehabilitation of a facility to which this Manual applies, the traffic control devices installed (temporary or permanent) shall comply with the most recent edition of the National MUTCD before that highway is opened or re-opened to the public for unrestricted travel [23 CFR 655.603(d)(2) and (d)(3)].

- 05 Unless a particular device is no longer serviceable (see definition in Section 1C.02), non-compliant devices on existing highways and bikeways shall be brought into compliance with the current edition of the National MUTCD as part of the systematic upgrading of substandard traffic control devices (and installation of new required traffic control devices) required pursuant to the Highway Safety Program, 23 U.S.C. §402(a).

Support:

- 06 The FHWA has the authority to establish other target compliance dates for implementation of particular changes to the MUTCD [23 CFR 655.603(d)(1)].

Standard:

- 07 The target compliance dates established by the FHWA shall be as shown in Table 1B-1.

- 08 Design, application, and placement of traffic control devices other than those adopted in this Manual shall be prohibited unless the provisions of Sections 1B.04 through 1B.08 are followed regarding official interpretations, experiments, changes to the MUTCD, and interim approvals granted by the FHWA.

Support:

- 09 Many of the provisions in this Manual that are explicitly prohibitive have been included to address practices that have been shown to be ineffective, unsafe, or inconsistent with uniformity. A provision of mandatory or recommended practice represents the accepted and established practice that promotes uniformity and consistency. The absence of a provision in this Manual that explicitly prohibits a particular practice, use, design, application, operation, or other aspect of a traffic control device does not, in itself, constitute acceptability or permission to use the device in a manner not provided for in this Manual.

Table 1B-1. Target Compliance Dates Established by the FHWA

MUTCD Section(s)	Subject Area	Specific Provision	Compliance Date*
2B.64	Weight Limit Signs	Paragraph 14 - requirement for additional Weight Limit sign with the advisory distance or directional legend in advance of applicable section of highway or structure	5 years from the effective date of this edition of the MUTCD
2C.25	Low Clearance Signs (W12-2)	Paragraph 1 - Required posting of the Low Clearance Advance (W12-2) sign in advance of the structure	5 years from the effective date of this edition of the MUTCD
2C.25	Low Clearance Signs (W12-2a, W12-2b)	Paragraph 8 - Recommended posting of Low Clearance Overhead (W12-2a or 12-2b) signs on an arch or other structure under which the clearance varies greatly	5 years from the effective date of this edition of the MUTCD
3A.05	Maintaining Minimum Retroreflectivity	Implementation and continued use of a method that is designed to maintain retroreflectivity of longitudinal pavement markings (see Paragraph 1 of Section 3A.05)	September 6, 2026
8B.16	High-Profile Grade Crossings	Paragraphs 3 and 7 - Recommended installation of Low Ground Clearance and/or Vehicle Exclusion signs and detour signs for vehicles with low ground clearances that might hang up on high-profile grade crossings at locations with a known history	5 years from the effective date of this edition of the MUTCD
8D.09 through 8D.12	Highway Traffic Signals at or Near Grade Crossings	Assessment and determination of appropriate treatment to achieve compliance (preemption, movement prohibition, pre-signals, queue cutter signals)	10 years from the effective date of this edition of the MUTCD

Note: the effective date of this edition of the MUTCD refers to the National MUTCD, which has an effective date of January 18, 2024.

13 **Where a standard sign provided in this Manual or the “Standard Highway Signs” publication (see Section 1A.05) is applicable, an alternative legend sign or alternative sign design shall not be allowed in place of the standardized legend or design except as provided in this Manual.**

14 **Where a standard sign provided in this Manual or the “Standard Highway Signs” publication (see Section 1A.05) is applicable, but the legend is variable, such as for destination names, an alternative sign design or dimensions shall not be allowed in place of the standardized design for the non-variable elements except as provided in this Manual.**

Option:

15 State and local highway agencies and owners of site roadways open to public travel may develop special word legend signs **in accordance with the sign design principles in this Manual** in situations where engineering judgment determines roadway conditions make it necessary to provide road users with additional regulatory, warning, or guidance information, such as when road users need to be notified of special regulations or warned about a situation that might not be readily apparent. Unlike colors that have not been assigned or symbols that have not been approved for signs, new word legend signs may be used without the need for experimentation.

Support:

16 The message conveyed by some special word legend signs might be unclear to the road user. Although experimentation is not required for such word legends, they might still warrant an evaluation to determine comprehension or possible misinterpretation of the intended message by the road user.

17 Scanning graphics are graphics designed for scanning by machine, and include bar codes, quick-response (QR) codes or other matrix bar-code formats, or similar graphics.

Standard:

18 **Unless otherwise provided in this Manual for a specific sign or as provided in Paragraph 19 of this Section, telephone numbers, Internet addresses, e-mail addresses, domain names, uniform resource locators (URL), metadata tags (“hash-tags”), and scanning graphics (see Paragraph 17 of this Section) for the purpose of obtaining information (other than those for maintenance or inventory purposes per the provisions of Paragraphs 21 through 23 of this Section) shall not be displayed on any sign, plaque, sign panel, or changeable message sign.**

Option:

19 Internet addresses, e-mail addresses, telephone numbers, scanning graphics, or other graphics for the purpose of conveying information may be displayed on the face of signs, plaques, sign panels, and changeable message signs that are oriented away from or otherwise not readily visible to operators of motor vehicles but rather are intended for viewing only by pedestrians, occupants of parked vehicles, and driving automation systems.

Standard:

20 **Pictographs (see definition in Section 1C.02) shall not be displayed on signs except as specifically provided in this Manual for a particular type of sign. Pictographs shall be simple, dignified, and devoid of any advertising and shall not contain any scanning graphics (see Paragraph 17 of this Section) for the purpose of conveying information. When used to represent a political jurisdiction (a State, county, or municipal corporation) the pictograph shall be the official designation adopted by the jurisdiction, except as provided otherwise in this Manual. When used to represent any other type of jurisdiction, the pictograph shall be the official designation adopted by the jurisdiction. When used to represent a college or university, the pictograph shall be the official seal adopted by the institution. College or university pictographs shall not include pictorial representations of university or college programs, or athletic mascots.**

21 **No items other than official traffic control signs, inventory stickers or decals, sign installation dates, manufacturer name, sign sizes, sign designations, anti-vandalism stickers, inventory or maintenance codes, and maintenance-related scanning graphics shall be mounted on the back of a sign.**

Option:

22 The date of fabrication, sign designation, sign size, and/or manufacturer name may be displayed on the front of a sign face in accordance with the provisions of Paragraph 23 of this Section.

Standard:

23 **If displayed on the sign face, the date of fabrication, sign designation, sign size, manufacturer name, or similar maintenance and inventory information shall be completely within the border or inset along the bottom edge of the sign. The letter height or scanning graphic shall not exceed $\frac{3}{4}$ of the width of the border or inset or, if no border is used, shall not exceed 1.75 inches and shall be within 2 inches of the edge of the sign. The color of the lettering within the border shall be the same as the color of the sign background. The color of the lettering or scanning graphic within the inset shall be the same as the color of the sign border. For changeable message signs or blank-out signs, such information, if displayed, shall be embossed in a non- contrasting color in the housing of the sign.**

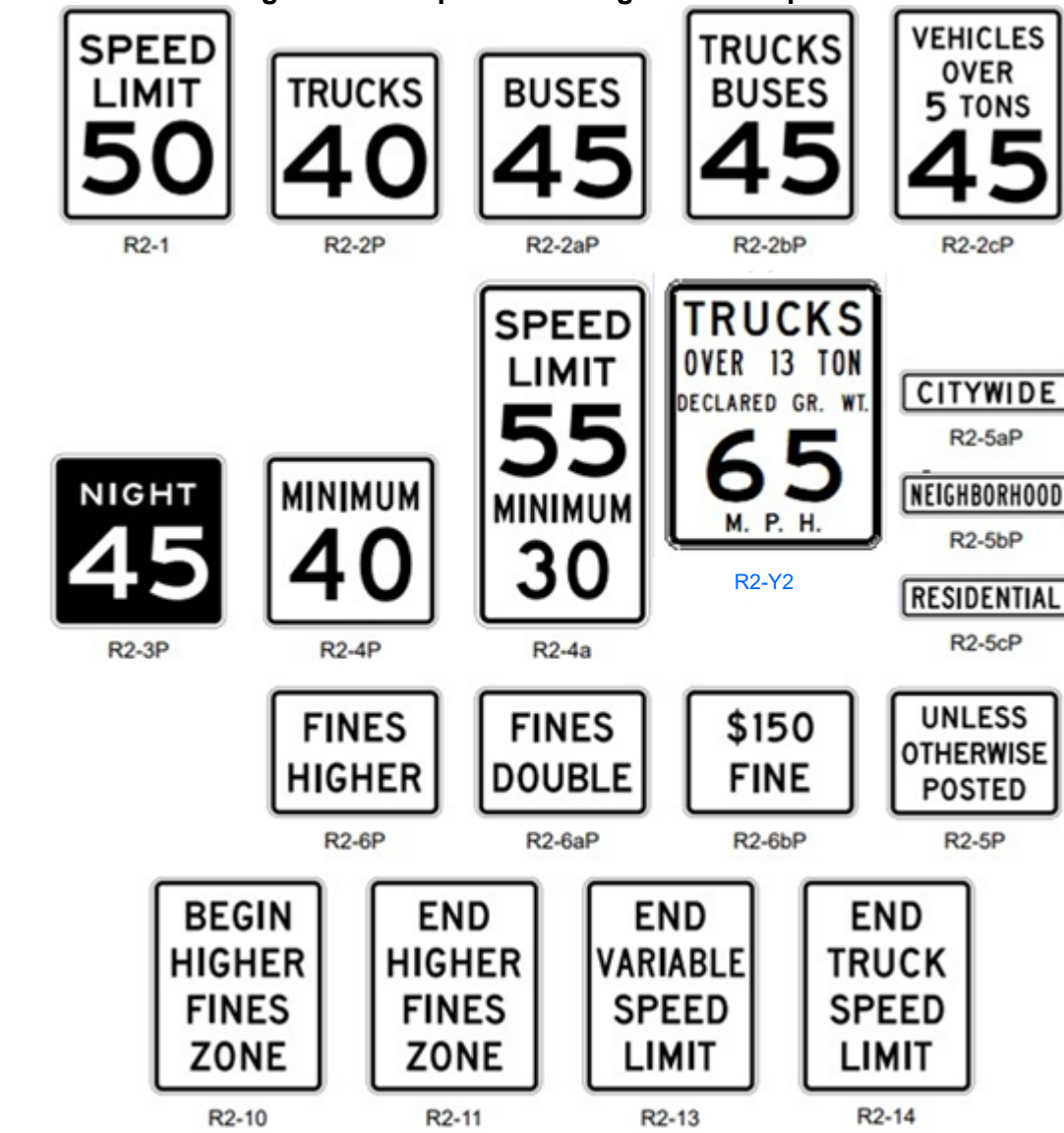
Table 2B-1. Regulatory Sign and Plaque Sizes (Sheet 6 of 6)

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Minimum	Oversized
			Single Lane	Multi-Lane				
Stop on Red - Yield on Flashing Red After Stop	R10-23a	2B.59	24 x 30	24 x 30	—	—	—	—
Push Button For Warning Lights - Wait for Gap in Traffic	R10-25	2B.58	9 x 12	9 x 12	—	—	—	—
Left Turn Yield on Flashing Red Arrow After Stop	R10-27	2B.59	30 x 36	30 x 36	—	—	—	—
XX Vehicles per Green	R10-28	2B.61	24 x 30	24 x 30	—	—	—	—
XX Vehicles per Green Each Lane	R10-29	2B.61	36 x 24	36 x 24	—	—	—	—
Right Turn on Red Must Yield to U-Turn	R10-30	2B.60	30 x 36	30 x 36	—	—	—	—
At Signal (plaque)	R10-31P	2B.59	24 x 9	24 x 9	—	—	—	—
Push Button for 2 Seconds for Extra Crossing Time	R10-32P	2B.58	9 x 12	9 x 12	—	—	—	—
Keep Off Median	R11-1	2B.62	24 x 30	24 x 30	—	—	—	—
Road Closed	R11-2,2a, 2b,2c	2B.63	48 x 30	48 x 30	—	—	—	—
Road Closed - Local Traffic Only	R11-3,3a, 3b,4	2B.63	60 x 30	60 x 30	—	—	—	—
Weight Limit	R12-1, 2	2B.64	24 x 30	24 x 30	36 x 48	—	—	36 x 48
Weight Limit - Axle, Gross	R12-4	2B.64	36 x 24	36 x 24	—	—	—	—
Weight Limit	R12-5	2B.64	24 x 36	24 x 36	36 x 48	48 x 60	—	—
Weight Limit - Specialized Hauling Vehicles	R12-6	2B.64	30 x 42	36 x 48	36 x 48	48 x 60	—	48 x 60
Weight Limit - Emergency Vehicles	R12-7	2B.64	30 x 36	30 x 36	48 x 60	48 x 60	—	48 x 60
Weight Limit - Emergency Vehicles (plaque)	R12-7aP	2B.64	30 x 30	30 x 30	48 x 48	48 x 48	—	48 x 48
Weigh Station	R13-1	2B.65	72 x 54	72 x 54	96 x 72	132 x 90	—	—
Truck Route	R14-1	2B.66	24 x 18	24 x 18	—	—	—	—
Hazardous Material	R14-2,3	2B.67	24 x 24	24 x 24	30 x 30	36 x 36	—	42 x 42
National Network	R14-4,5	2B.68	30 x 30	30 x 30	36 x 36	36 x 36	—	42 x 42
Move Over or Reduce Speed	R16-3	2B.71	—	60 x 48	84 x 60	102 x 72	—	84 x 60
Minor Crashes Move Vehicles from Travel Lanes	R16-4	2B.70	—	60 x 42	84 x 54	96 x 60	—	84 x 54
Lights On When Using Wipers or Raining	R16-5,6	2B.73	24 x 30	24 x 30	36 x 48	48 x 60	—	36 x 48
Turn On Headlights Next XX Miles	R16-7	2B.73	60 x 18	60 x 18	96 x 30	132 x 36	—	96 x 30
Turn On, Check Headlights	R16-8,9	2B.73	42 x 18	42 x 18	60 x 30	78 x 36	—	60 x 30
Begin, End Daytime Headlight Section	R16-10,11	2B.73	60 x 18	60 x 18	96 x 30	120 x 36	—	96 x 30
No Hand-Held Phone Use By Driver	R16-15	2B.72	—	—	72 x 48	72 x 48	—	—
No Hand-Held Phone Use By Driver	R16-15a	2B.72	30 x 42	30 x 42	—	—	—	—
Truck Speed Limit Sign	R2-Y2	2B.22	—	—	—	48 x 60	—	—
Truck U-Turn Prohibition Sign	R3-Y4b	2B.26	24 x 30	24 x 30	36 x 48	—	—	36 x 48
Trucks And Vehicles With Trailers Use Right Lane	R4-Y9	2B.38	—	—	—	120 x 48	—	—
Trucks And Vehicles With Trailers Use Right Two Lanes	R4-Y10	2B.38	—	—	—	120 x 48	—	—
No Stopping Standing or Parking	R8-Y9	2B.53	—	30 x 36	—	48 x 60	—	—
Wait Delayed Signal	R10-Y14	2B.59	30 x 36	30 x 36	48 x 60	—	—	48 x 60

* See Table 9A-1 for minimum size required for signs on bicycle facilities

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

Figure 2B-3. Speed Limit Signs and Plaques



- 25 Two types of Speed Limit signs may be used: one to designate passenger car speeds, including any nighttime information or maximum or minimum speed limit that might apply; and the other to show any special speed limits for trucks and other vehicles.

Guidance:

- 26 *No more than three speed limits should be displayed on any one Speed Limit sign or assembly.*

Option:

- 27 A variable speed limit sign that changes the speed limit for traffic and ambient conditions may be installed provided that the appropriate speed limit is displayed at the proper times and locations in accordance with Paragraphs 9 and 10 of this Section.

Standard:

- 28 **The variable speed limit sign legend “SPEED LIMIT” shall be a black legend on a white retroreflective background. The variable speed limit legend shall be displayed in white LEDs on an opaque black background.**

Option:

- 28A Color full-matrix CMS with pixel pitches of 20 millimeters or less may be used for variable speed limit signs. See Figure 2L-1.

Support:

- 29 Section 2C.13 contains information about the use of a Vehicle Speed Feedback plaque mounted below a Speed Limit sign that displays to approaching drivers the speed at which they are traveling.
- 30 Advisory speed signs and plaques are discussed in Sections 2C.12 and 2C.59. Temporary traffic control zone speed signs are discussed in Part 6. The WORK ZONE (G20-5aP) plaque intended for installation above a Speed Limit sign is discussed in Section 6G.08. School Speed Limit signs are discussed in Section 7B.05.

Section 2B.22 Vehicle Speed Limit Signs and Plaques (R2-Y2, R2-2P Series)**Standard:**

- 01 **Where a special speed limit applies to certain classes of vehicles, the Truck Speed Limit (R2-2P) plaque, Bus Speed Limit (R2-2aP) plaque, Truck-Bus Speed Limit (R2-2bP) plaque, or Vehicles over X Tons Speed Limit (R2-2cP) plaque (see Figure 2B-3) shall be displayed below the Speed Limit (R2-1) sign, except as provided in Paragraph 2 of this Section.**
- 01A **Where a special speed limit applies to vehicles other than buses on a freeway outside an urbanized area, the Truck Speed Limit (R2-Y2) sign shall be installed adjacent to the Speed Limit (R2-1) sign.**

Option:

- 02 The legend of a Vehicle Speed Limit (R2-2P series) plaque may be combined in a single sign and displayed below the SPEED LIMIT XX legend, similar to the Combined Maximum and Minimum Speed Limits (R2-4a) sign (see Section 2B.24).
- 03 A different vehicle class legend may be substituted on the R2-2P series plaque for other classes of vehicles not included in Paragraph 1 of this Section.

Section 2B.23 Night Speed Limit Plaque (R2-3P)**Standard:**

- 01 **Where different speed limits are prescribed for day and night, both limits shall be posted.**

Guidance:

- 02 *A Night Speed Limit (R2-3P) plaque (see Figure 2B-3) should be reversed using a white retroreflective legend and border on a black background.*

Option:

- 03 A Night Speed Limit plaque may be combined with or installed below the standard Speed Limit (R2-1) sign.

Section 2B.24 Minimum Speed Limit Plaque (R2-4P) and Combined Maximum and Minimum Speed Limits Sign (R2-4a)**Standard:**

- 01 **A Minimum Speed Limit (R2-4P) plaque (see Figure 2B-3) shall be displayed only in combination with a Speed Limit sign. Where used, the R2-4P plaque shall be mounted below a Speed Limit (R2-1) sign.**

Option:

- 02 Where engineering judgment determines that slow speeds on a highway might impede the normal and reasonable movement of traffic, the Minimum Speed Limit (R2-4P) plaque may be installed below a Speed Limit (R2-1) sign to indicate the minimum legal speed. In lieu of a sign assembly with the R2-1 sign and R2-4P plaque, the Combined Maximum and Minimum Speed Limits (R2-4a) sign may be used.

Section 2B.25 Higher Fines Signs and Plaque (R2-6P, R2-10, and R2-11)**Standard:**

- 01 **Except as provided in Paragraph 3 of this Section, if increased fines are imposed for traffic violations within a designated zone of a roadway, a BEGIN HIGHER FINES ZONE (R2-10) sign (see Figure 2B-3) or a FINES HIGHER (R2-6P) plaque (see Figure 2B-3) shall be used to provide notice to road users.**
- 02 **If an R2-10 sign or an R2-6P plaque is posted to provide notice of increased fines for traffic violations, an END HIGHER FINES ZONE (R2-11) sign (see Figure 2B-3) shall be installed at the downstream end of the zone to provide notice to road users of the termination of the increased fines zone.**

Option:

- 03 The BEGIN HIGHER FINES ZONE (R2-10) sign or FINES HIGHER (R2-6P) plaque may be omitted where the higher fines zone is established by statute.

Guidance:

- 04 *The BEGIN HIGHER FINES ZONE sign or FINES HIGHER plaque should be located at the beginning of the temporary traffic control zone, school zone, or other applicable designated zone and just beyond any interchanges, major intersections, or other major traffic generators.*

MOVEMENT AND LANE CONTROL SIGNS AND PLAQUES

Section 2B.26 Movement Prohibition Signs (R3-1 through R3-4, R3-18, and R3-27)

Standard:

- 01 **Movement Prohibition signs (see Figure 2B-4) shall be installed where specific movements are prohibited at an intersection approach except as provided in Paragraphs 13 and 17 of this Section.**

Guidance:

- 02 *Movement Prohibition signs should only be used to prohibit a turn or through movement from an entire approach and should not be used to designate movements that are required or permitted from a specific lane or lanes on a multi-lane approach.*
- 03 *Movement Prohibition signs should be placed where they will be most easily seen by road users who might be intending to make the movement.*
- 04 *If a No Right Turn (R3-1) sign (see Figure 2B-4) is used, at least one should be placed either over the roadway or at a right-hand corner of the intersection.*
- 05 *If a No Left Turn (R3-2) sign (see Figure 2B-4) is used, at least one should be placed over the roadway, at the far left corner of the intersection, on a median, or in conjunction with the STOP sign or YIELD sign located on the near right corner.*
- 06 *Except as provided in Item C in Paragraph 11 of this Section for signalized locations, if a NO TURNS (R3-3) sign (see Figure 2B-4) is used, two signs should be used, one at a location specified for a No Right Turn sign and one at a location specified for a No Left Turn sign.*
- 07 *If a No U-Turn (R3-4) sign (see Figure 2B-4) or a combination No U or Left Turn (R3-18) sign (see Figure 2B-4) is used, at least one should be used at a location specified for a No Left Turn sign.*
- 08 *If both left turns and U-turns are prohibited, the combination No U or Left Turn (R3-18) sign should be used instead of separate R3-2 and R3-4 signs.*

Support:

- 09 Sections 2B.27 through 2B.30 contain information regarding lane control signs that indicate the required or permitted movements from individual lanes.

Guidance:

- 10 *If a No Straight Through (R3-27) sign (see Figure 2B-4) is used, at least one should be placed either over the roadway or at a location where it can be seen by road users who might be intending to travel straight through the intersection.*
- 11 *If turn prohibition signs are installed in conjunction with traffic control signals:*
- A. *The No Right Turn sign should be installed adjacent to a signal face viewed by road users in the right-hand lane.*
 - B. *The No Left Turn (or No U-Turn or combination No U or Left Turn) sign should be installed adjacent to a signal face viewed by road users in the left-hand lane.*
 - C. *A NO TURNS sign should be placed adjacent to a signal face viewed by all road users on that approach, or two signs should be used.*

Option:

- 12 *If turn prohibition signs are installed in conjunction with traffic control signals, an additional turn prohibition sign may be post-mounted to supplement the sign mounted overhead.*
- 13 *Where ONE WAY signs are used (see Section 2B.49), No Left Turn and No Right Turn signs may be omitted.*
- 14 *Where the movement restriction applies to certain vehicle classes, signs incorporating a supplementary legend, modified as appropriate, may be used to indicate the specific vehicle class restriction (R3-1b through R3-1d) or exception (R3-1e and R3-1f and R3-Y4b) (see Figure 2B-4). When the movement restriction applies during certain time periods only, the following Movement Prohibition signing alternatives may be used and are listed in order of preference:*
- A. *A blank-out or changeable message sign (see Chapter 2L) that displays the prohibited movement only during the time that the movement prohibition is applicable, especially at signalized intersections.*
 - B. *Permanently-mounted signs incorporating a supplementary legend showing the hours and days during which the prohibition is applicable (R3-1g and R3-1h) (see Figure 2B-4).*
 - C. *Portable signs, installed by proper authority, located off the roadway at each corner of the intersection. The portable signs are only to be used during the time that the movement prohibition is applicable.*

Figure 2B-4. Movement Prohibition and Lane Control Signs and Plaques (Sheet 1 of 2)

★ The diamond symbol may be used instead of the "HOV" word message. The minimum vehicle occupancy level may vary, such as 2+, 3+, 4+. The words "LANE" or "ONLY" may be used with this sign when appropriate.

PASSING, KEEP RIGHT, AND SLOW TRAFFIC SIGNS

Section 2B.36 DO NOT PASS Sign (R4-1)

Option:

- 01 The Do Not Pass (R4-1) sign (see Figure 2B-10) may be used in addition to pavement markings (see Section 3B.03) to emphasize the restriction on passing. The Do Not Pass sign may be used at the beginning of, and at intervals within, a zone through which sight distance is restricted or where other conditions make overtaking and passing inappropriate.
- 02 If signing is needed on the left-hand side of the roadway for additional emphasis, NO PASSING ZONE (W14-3) signs may be used (see Section 2C.53).

Support:

- 03 Standards for determining the location and extent of no-passing zone pavement markings are set forth in Section 3B.03.

Section 2B.37 PASS WITH CARE Sign (R4-2)

Guidance:

- 01 The PASS WITH CARE (R4-2) sign (see Figure 2B-10) should be installed at the downstream end of a no-passing zone if a Do Not Pass sign has been installed at the upstream end of the zone.

Section 2B.38 KEEP RIGHT EXCEPT TO PASS Sign (R4-16), SLOWER TRAFFIC KEEP RIGHT Sign (R4-3), and TRUCKS USE RIGHT LANE Sign (R4-5)

Option:

- 01 The KEEP RIGHT EXCEPT TO PASS (R4-16) sign (see Figure 2B-10) may be used on roadways where there are two lanes in one direction of travel to direct drivers to stay in the right-hand lane except when they are passing another vehicle.

Guidance:

- 02 If used, the KEEP RIGHT EXCEPT TO PASS sign should be installed at or just beyond the beginning of a two-lane section of roadway and at selected locations along two-lane roadways where additional emphasis is needed.

Option:

- 03 The SLOWER TRAFFIC KEEP RIGHT (R4-3) or the TRUCKS USE RIGHT LANE (R4-5) sign (see Figure 2B-10) may be used on multi-lane through roadways to improve capacity or reduce unnecessary lane changing due to the presence of slower vehicles that impede the normal flow of traffic. The TRUCKS AND VEHICLES WITH TRAILERS USE RIGHT LANE (R4-Y9) sign may be used on interstate routes with two lanes in the direction of travel, or the TRUCKS AND VEHICLES WITH TRAILERS USE RIGHT TWO LANES (R4-Y10) sign may be used on interstates with three or more lanes in the direction of travel, to provide notice to drivers of these vehicles of the State law regarding lane usage on interstates.

Guidance:

- 04 If used, the SLOWER TRAFFIC KEEP RIGHT sign, or the TRUCKS USE RIGHT LANE sign should be installed at or just beyond the beginning of a multi-lane roadway section or at the beginning of an extra lane provided for trucks and/or other slow-moving traffic, and at selected locations where there is a tendency on the part of some road users to drive in the left-hand lane(or lanes) below the normal speed of traffic. These signs should not be used on the approach to an interchange or through an interchange area where traffic is entering or exiting, or along deceleration or acceleration lanes.

Option:

- 05 The TRUCKS USE RIGHT LANE sign may be used as a supplement to the SLOWER TRAFFIC KEEP RIGHT sign.

Guidance:

- 06 If an extra lane has been provided for trucks and other slow-moving traffic, a Lane Ends sign (see Section 2C.47) should be installed in advance of the point where the extra lane ends. Appropriate pavement markings should be installed at both the upstream and downstream ends of the extra lane (see Section 3B.12 and Figure 3B-14).

Section 2B.39 Keep Right and Keep Left Signs (R4-7 Series and R4-8 Series)

Option:

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

Figure 2B-10. Passing, Keep Right, and Slow Traffic Signs

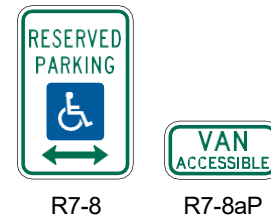


**Figure 2B-25. Parking, Standing, and Stopping Signs and Plaques
(R7 and R8 Series) (Sheet 2 of 2)**

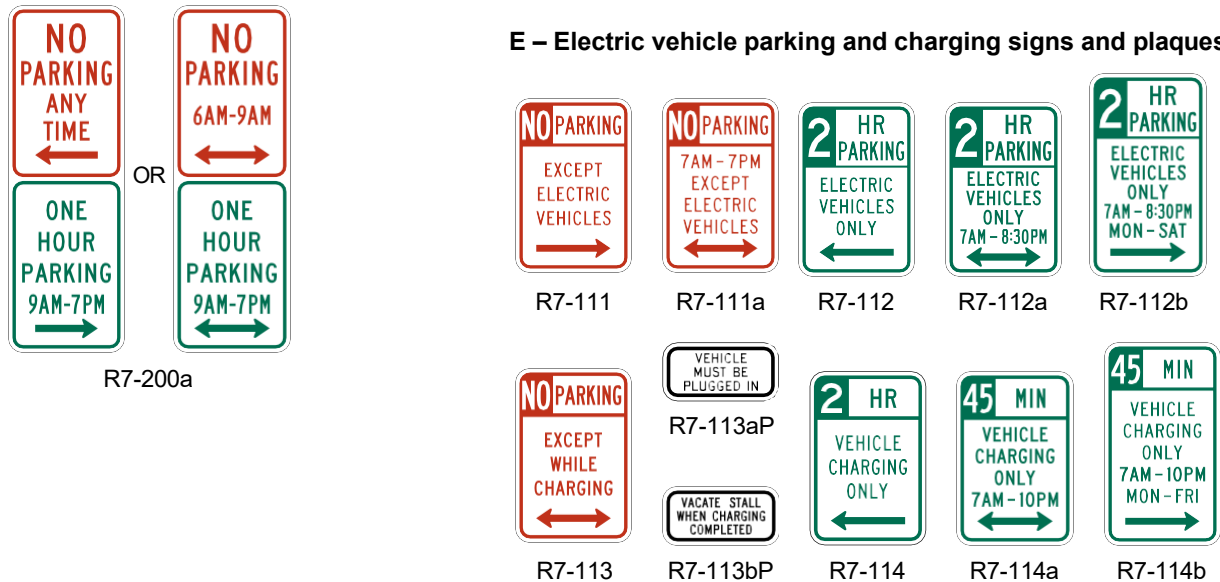
C – Combination parking signs



D – Accessible parking signs and plaques



E – Electric vehicle parking and charging signs and plaques



Standard:

- 08 The times and days for which the parking regulations are in effect shall be posted if they are not in effect at all times of day or all days of the week.

Option:

- 09 As an alternate to the use of arrows to show designated restriction zones, the following word messages may be used: BEGIN, END, HERE TO CORNER, HERE TO ALLEY, and THIS SIDE OF SIGN.
- 10 The R8 series signs (see Drawing A in Figure 2B-25) may be used where sufficient notice of a parking prohibition is satisfied by the use of single signs and are not needed to designate the beginning and end of a zone in which parking is prohibited or restricted [such as the NO STOPPING STANDING OR PARKING \(R8-Y9\) sign](#). In rural and certain other areas the legends NO PARKING ON PAVEMENT (R8-1) or NO STOPPING ON PAVEMENT (R8-5) are generally suitable and may be used where parking or stopping is allowed on an unpaved shoulder or border adjacent to the paved portion of the road. If a roadway has an adjacent paved shoulder on which parking or stopping is allowed, the legend NO PARKING EXCEPT ON SHOULDER (R8-2) or NO STOPPING EXCEPT ON SHOULDER (R8-6) may be used. The R8-3 symbol sign or the word message NO PARKING may be used to prohibit any parking along a roadway. Word legend supplemental plaques may be mounted below the NO PARKING signs or the word legend may be incorporated within signs whose sizes are increased accordingly. The R8-3 series signs may include word legends such as ON PAVEMENT (R8-3c), ON BRIDGE (R8-3d), ON TRACKS (R8-3e), and EXCEPT ON SHOULDERS (R8-3f).

Guidance:

- 11 Where special parking restrictions are imposed during heavy snowfall or a declared snow emergency, a Snow Emergency Route (R7-203) sign (see Drawing A in Figure 2B-25) should be installed. The legend should be modified to display the specific regulations. The upper section of the sign should display the designation as a snow emergency route in a white legend and border on a red background.
- 12 If a fee is charged for on-street parking and payments are made at a multi-space parking meter, instead of individual parking meters for each parking space, Metered Parking (R7-21 and R7-22) signs (see Drawing B in Figure 2B-25) should be used to define the area where the multi-space parking meter applies. The Multi-Space Parking Meter (R7-20) sign (see Drawing B in Figure 2B-25) should be used at the meter location to direct road users to the meter.

TRAFFIC SIGNAL SIGNS AND PLAQUES

Section 2B.59 Traffic Signal Signs and Plaques (R10-5 through R10-30)

Option:

- 01 To supplement traffic signal control, traffic signal (R10-5 through R10-30) signs (see Figure 2B-28) may be used to regulate road users.
- 02 Traffic signal signs may be installed at certain locations to clarify signal control. Among the legends that may be used for this purpose are:
- A. LEFT (RIGHT) ON GREEN ARROW ONLY (R10-5),
 - B. STOP HERE ON RED (R10-6 or R10-6a) for observance of stop lines,
 - C. DO NOT BLOCK INTERSECTION (R10-7) for avoidance of traffic obstructions,
 - D. USE LANE(S) WITH GREEN ARROW (R10-8) for obedience to lane-use control signals (see Chapter 4T),
 - E. LEFT (RIGHT) TURN SIGNAL (R10-10),
 - F. U TURN SIGNAL (R10-10a) for exclusive control of a U-turn movement,
 - G. U TURN YIELD TO RIGHT TURN (R10-16),
 - H. LEFT (RIGHT) TURN YIELD ON GREEN (symbolic circular green) (R10-12),
 - I. LEFT (RIGHT) TURN YIELD ON FLASHING YELLOW ARROW (R10-12a), and
 - J. LEFT (RIGHT) TURN YIELD ON FLASHING RED ARROW AFTER STOP (R10-27).
 - K. WAIT DELAYED SIGNAL (R10-Y14) for left-turn lanes at signalized intersections with split phasing. If used, the WAIT DELAYED SIGNAL sign may be located overhead at the intersection on either side of the left-turn signal face.

Guidance:

- 03 If used, the LEFT ON GREEN ARROW ONLY sign, the LEFT TURN SIGNAL sign, the LEFT TURN YIELD ON GREEN (symbolic circular green) sign, the LEFT TURN YIELD ON FLASHING YELLOW ARROW sign, or the LEFT TURN YIELD ON FLASHING RED ARROW AFTER STOP sign should be located adjacent to the left-turn signal face.
- 04 If used, the RIGHT ON GREEN ARROW ONLY sign, the RIGHT TURN SIGNAL sign, the RIGHT TURN YIELD ON FLASHING YELLOW ARROW sign, or the RIGHT TURN YIELD ON FLASHING RED ARROW AFTER STOP sign should be located adjacent to the right-turn signal face.
- 05 A U TURN YIELD TO RIGHT TURN (R10-16) sign should be installed near the left-turn signal face if U-turns are allowed on a protected left-turn movement on an approach from which a right-turn GREEN ARROW signal indication is simultaneously being displayed to drivers making a right turn from the conflicting approach to their left.

Option:

- 06 If used, a U TURN SIGNAL (R10-10a) sign may be installed adjacent to the signal face that exclusively controls a U-turn movement.
- 07 If needed for additional emphasis, an additional LEFT TURN YIELD ON GREEN (symbolic circular green) (R10-12) sign with an AT SIGNAL (R10-31P) supplemental plaque (see Figure 2B-28) may be installed in advance of the intersection.
- 08 In situations where traffic control signals are coordinated for progressive timing, the Traffic Signal Speed (I1-1) sign may be used (see Section 2H.04).

Standard:

- 09 The CROSSWALK—STOP ON RED (symbolic circular red) (R10-23) and STOP ON STEADY RED-YIELD ON FLASHING RED AFTER STOP (R10-23a) signs (see Figure 2B-28) shall only be used in conjunction with pedestrian hybrid beacons (see Section 4J.02).
- 10 The EMERGENCY SIGNAL (R10-13) sign (see Figure 2B-28) shall be used in conjunction with emergency-vehicle traffic control signals (see Section 4M.02).
- 11 The EMERGENCY SIGNAL—STOP ON FLASHING RED (R10-14 or R10-14a) sign (see Figure 2B-28) shall be used in conjunction with emergency-vehicle hybrid beacons (see Section 4N.02).

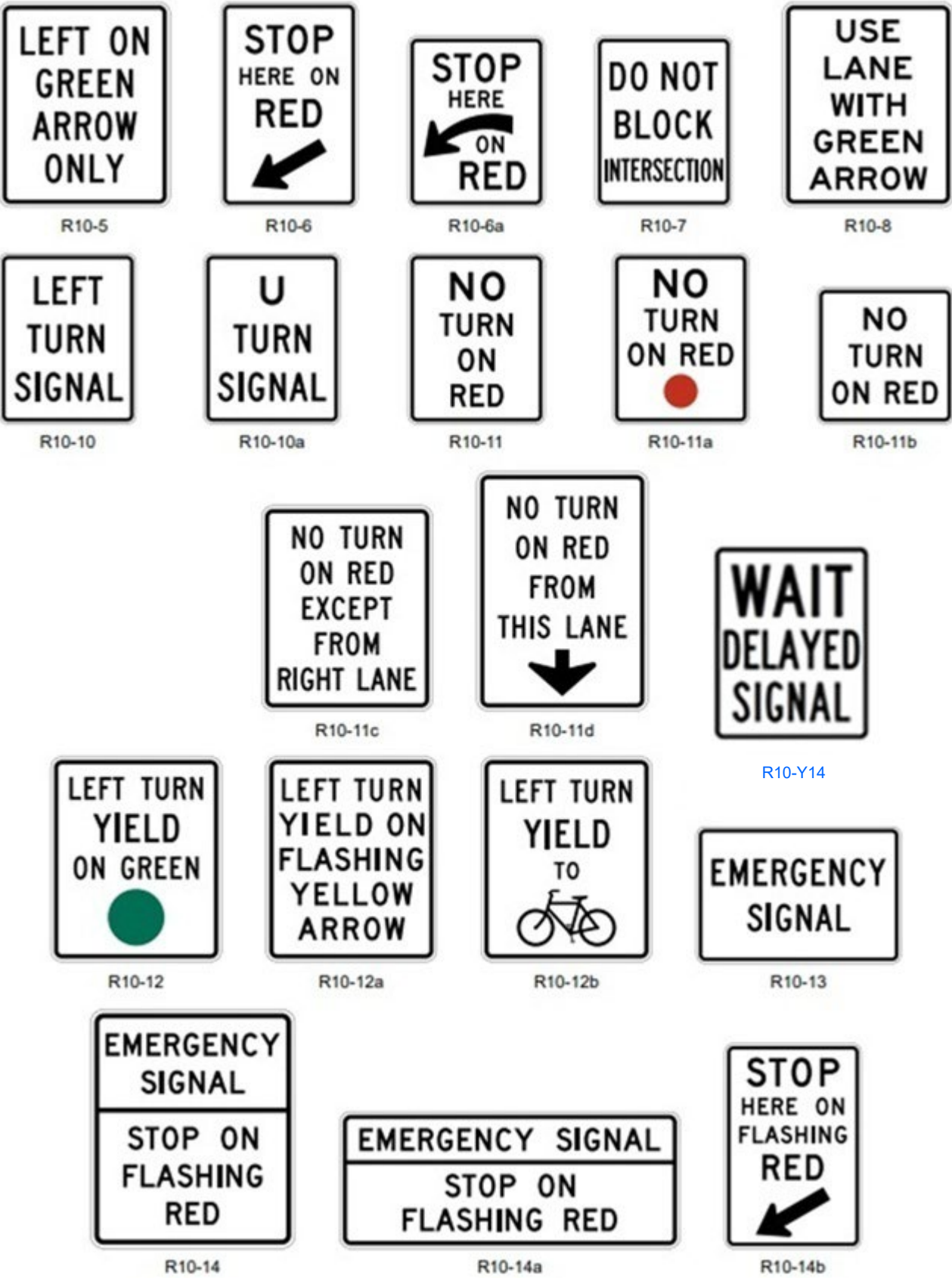
Option:

- 12 If needed for extra emphasis, a STOP HERE ON FLASHING RED (R10-14b) sign may be installed with an emergency-vehicle hybrid beacon.

Standard:

- 13 The Left Turn Yield to Bicycles (R10-12b) sign shall be limited to applications where the conflicting bicyclist movement would be unexpected in direction, location, or similar condition that would tend to violate the expectation of a turning motorist.

Figure 2B-28. Traffic Signal Signs and Plaques (Sheet 1 of 2)



OTHER REGULATORY SIGNS AND PLAQUES

Section 2B.69 Photo Enforced Signs and Plaques (R10-18, R10-18a, R10-19P, R10-19aP)

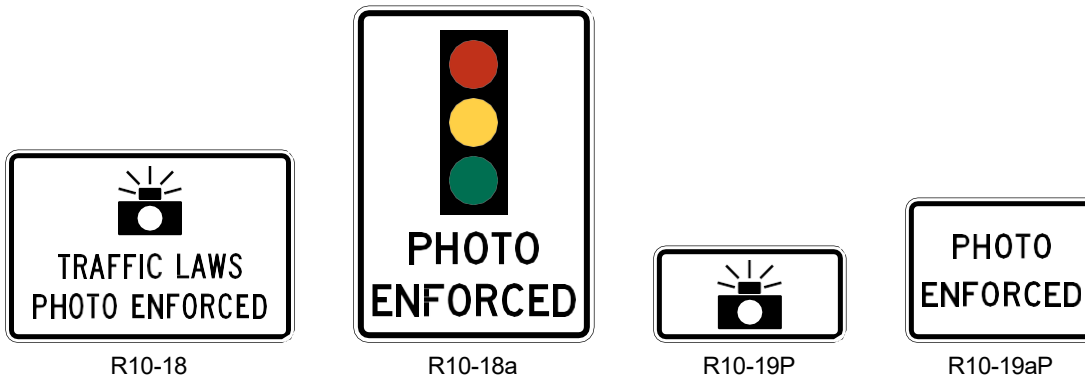
Support:

00 Until such time that Indiana statutes allow use of photo enforcement at locations other than worksite speed limits in the pilot program, this Section is for information only.

Option:

- 01 A Traffic Laws Photo Enforced (R10-18) sign (see Figure 2B-32) may be installed at a jurisdictional boundary to advise road users that some of the traffic regulations within that jurisdiction are being enforced by photographic equipment.
- 02 A Traffic Signal Photo Enforced (R10-18a) sign (see Figure 2B-32) may be installed in advance of or at a traffic signal to advise road users that compliance with the signal is enforced by photographic equipment. A Signal Ahead (W3-3) sign and a Traffic Signal Photo Enforced (R10-18a) sign may be used on the same approach provided that they are on separate supports.
- 03 A Photo Enforced (R10-19P) plaque or a PHOTO ENFORCED (R10-19aP) word message plaque (see Figure 2B-32) may be mounted below a regulatory sign to advise road users that the regulation is being enforced by photographic equipment.

Figure 2B-32. Photo Enforcement Signs and Plaques



Standard:

- 04 The Traffic Signal Photo Enforced (R10-18a) sign shall not be installed on approaches to signalized locations where red-light cameras are not present on any of the approaches to the signalized location.
- 05 A Traffic Signal Photo Enforced (R10-18a) sign shall not be installed on the same support in combination with a Signal Ahead (W3-3) sign.
- 06 If used below a regulatory sign, the Photo Enforced (R10-19P or R10-19aP) plaque shall be a rectangle with a black legend and border on a white background.

Section 2B.70 Move Vehicles from Travel Lanes Sign (R16-4)

Option:

- 01 A STATE LAW MINOR CRASHES MOVE VEHICLES FROM TRAVEL LANES (R16-4) sign (see Figure 2B-33) may be installed in accordance with the provisions of Section 2A.01 to require motorists to move their vehicle out of the travel lanes if they have been involved in a crash.
- 02 If the specific requirements of a State law vary, the word legend of the R16-4 sign may be modified to reflect the appropriate law.

Figure 2B-33. Other Regulatory Signs

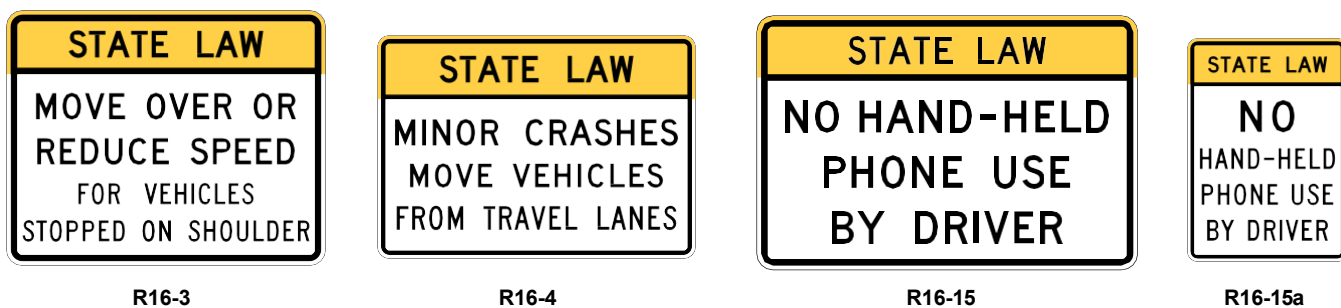


Table 2C-1. Warning Sign and Plaque Sizes (Sheet 1 of 4)

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	—	48 x 48
270-degree Curve	W1-15	2C.07	30 x 30	30 x 30	36 x 36	48 x 48	—	48 x 48
Intersection Warning	W2-1,2,3,3a,4,5,6,7,8	2C.41	30 x 30	30 x 30	36 x 36	—	24 x 24	48 x 48
Traffic Entering When Flashing	W2-10	2C.42	36 x 36	36 x 36	48 x 48	—	—	—
Traffic Approaching When Flashing	W2-11	2C.42	36 x 36	36 x 36	48 x 48	—	—	—
Stop, Yield, Signal Ahead	W3-1,2,3	2C.35	30 x 30	30 x 30	48 x 48	48 x 48	30 x 30	—
Be Prepared to Stop	W3-4	2C.35	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30	—
Reduced Speed Limit Ahead	W3-5	2C.40	36 x 36	36 x 36	48 x 48	48 x 48	—	—
XX MPH Speed Zone Ahead	W3-5a	2C.40	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Variable Speed Zone Ahead	W3-5b	2C.40	36 x 36	36 x 36	48 x 48	48 x 48	—	—
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.36	36 x 36	36 x 36	48 x 48	—	—	60 x 60
Ramp Meter Ahead	W3-7	2C.37	36 x 36	36 x 36	—	—	—	—
Ramp Metered When Flashing	W3-8	2C.37	36 x 36	36 x 36	—	—	—	—
Merge	W4-1	2C.45	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Lane Ends	W4-2	2C.47	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Added Lane	W4-3	2C.46	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Cross Traffic Does Not Stop (plaque)	W4-4P	2C.66	24 x 12	24 x 12	36 x 18	—	—	48 x 24
Traffic From Left And Right Does Not Stop	W4-Y4P	2C.66	30 x 12	30 x 12	42 x 18	—	—	54 x 24
Traffic From Left (Right) Does Not Stop (plaque)	W4-4aP	2C.66	24 x 12	24 x 12	36 x 18	—	—	48 x 24
Oncoming Traffic Does Not Stop (plaque)	W4-4bP	2C.66	24 x 12	24 x 12	36 x 18	—	—	48 x 24
Entering Roadway Merge	W4-5	2C.45	36 x 36	36 x 36	48 x 48	48 x 48	—	—
No Merge Area (plaque)	W4-5aP	2C.45	18 x 24	18 x 24	24 x 30	24 x 30	—	—
Entering Roadway Added Lane	W4-6	2C.46	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Heavy Merge from Right (Left)	W4-7	2C.49	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Single Lane Transition	W4-8	2C.48	36 x 36	36 x 36	36 x 36	48 x 48	—	48 x 48
Road Narrows	W5-1	2C.17	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Narrow Bridge	W5-2	2C.18	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Narrow Underpass	W5-2a	2C.18	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
One Lane Bridge	W5-3	2C.19	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
One Lane Underpass	W5-3a	2C.19	36 x 36	36 x 36	48 x 48	48 x 48	30 x 30*	—
Divided Highway	W6-1	2C.20	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Divided Highway Ends	W6-2	2C.21	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Two-Way Traffic	W6-3	2C.51	36 x 36	36 x 36	48 x 48	48 x 48	—	—
Two-Way Traffic (3-Lane)	W6-5	2C.52	36 x 36	36 x 36	48 x 48	—	—	—
Two-Way Traffic (3-Lane)	W6-5a	2C.52	36 x 36	36 x 36	48 x 48	—	—	—
Hill	W7-1	2C.14	30 x 30*	36 x 36	36 x 36	36 x 36	24 x 24*	48 x 48
Hill with Grade	W7-1a	2C.14	30 x 30*	36 x 36	36 x 36	36 x 36	24 x 24*	48 x 48

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

Standard:

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

Guidance:

- 02 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 *or snowpack*, a reduction, not exceeding 3 inches, should be used for this condition.
- 03 Clearances should be evaluated periodically to determine if additional low clearance signing is necessary, particularly when resurfacing operations have occurred, on routes onto which over-height vehicles are normally directed under the permit process, and structures that are susceptible to catastrophic failure when struck by over-height vehicles.
- 04 The 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.
- 05 Where there is a need to warn of a low clearance on an intersecting road or off a freeway or expressway exit, a rectangular warning sign with an appropriate word legend should be used rather than a W12-2 sign.

Option:

- 06 The Low Clearance Overhead (W12-2a or W12-2b) sign (see Figure 2C-6) may be installed on the structure to supplement the advance warning sign.
- 07 In cases where physical conditions on a structure limit the width such that the W12-2a or W12-2b signs are physically unable to fit, a W12-2 sign may be installed overhead on the structure or post-mounted in front of the structure, in addition to the required W12-2 sign at the advance location.

Guidance:

- 08 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:

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

Guidance:

- 10 The clearance shown on the Low Clearance Advance sign should match the clearance on the W12-2a or W12-2b sign or, if there are multiple W12-2b signs, should match the lowest clearance.

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

Section 2C.34 Weather Condition Signs (W8-18, W8-19, W8-21, and W8-22)

Option:

- 01 The ROAD MAY FLOOD (W8-18) sign (see Figure 2C-7) may be used to warn road users that a section of roadway is subject to frequent flooding. A Depth Gauge (W8-19) sign (see Figure 2C-7) may also be installed within a roadway section that frequently floods. *An additional sign, with an advisory distance or directional legend, may be located in advance of the applicable section of highway or structure so that vehicles can detour or turn around prior to the segment with frequent flooding.*

Guidance:

- 02 *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:

- 03 The GUSTY WINDS AREA (W8-21) sign (see Figure 2C-7) may be used to warn road users that wind gusts frequently occur along a section of highway that are strong enough to impact the stability of trucks, recreational vehicles, and other vehicles with high centers of gravity. A NEXT XX MILES (W7-3aP) supplemental plaque (see Figure 2C-5) may be mounted below the W8-21 sign to inform road users of the length of roadway that frequently experiences strong wind gusts.
- 04 The FOG AREA (W8-22) sign (see Figure 2C-7) may be used to warn road users that foggy conditions frequently reduce visibility along a section of highway. A NEXT XX MILES (W7-3aP) supplemental plaque (see Figure 2C-5) may be mounted below the W8-22 sign to inform road users of the length of roadway that frequently experiences foggy conditions.

Support:

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

Guidance:

- 04 *If two street names are used on the Advance Street Name plaque, the street names and associated arrows should be displayed in the following order:*
- A. *For a single intersection, the name of the street to the left should be displayed above the name of the street to the right; or*
 - B. *For two sequential intersections, such as where the plaque is used with an Offset Side Roads (W2-7) or a Double Side Road (W2-8) sign, the name of the first street encountered should be displayed above the name of the second street encountered, and the arrow associated with the second street encountered should be an advance arrow, such as the arrow shown on the W16-6P arrow plaque (see Figure 2C-16).*

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

- 01 The CROSS TRAFFIC DOES NOT STOP (W4-4P) or TRAFFIC FROM THE LEFT AND RIGHT DOES NOT STOP (W4-Y4P) plaque (see Figure 2C-10) may be used in combination with a STOP sign when engineering judgment indicates that conditions are present that are causing or could cause road users to misinterpret the intersection as an all-way stop.
- 02 The TRAFFIC FROM LEFT (RIGHT) DOES NOT STOP (W4-4aP) or ONCOMING TRAFFIC DOES NOT STOP (W4-4bP) plaque may be used when such messages more accurately describe the traffic controls established at the intersection.

Guidance:

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

Standard:

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

Support:

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

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

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

Standard:

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

Support:

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

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

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

Support:

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

Section 2C.69 Photo Enforced Plaques (W16-10P and W16-10aP)*Support:*

- 00 *Until such time that Indiana statutes allow use of photo enforcement at locations other than worksite speed limits in the pilot program, this Section is for information only.*

Option:

- 01 A Photo Enforced (W16-10P) plaque or a PHOTO ENFORCED (W16-10aP) word message plaque (see Figure 2C-16) 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 or a toll plaza) are being enforced by photographic equipment.

Table 2D-1. Conventional Road Guide Sign and Plaque Sizes (Sheet 2 of 2)

Sign or Plaque	Designation	Section	Conventional Road	Minimum	Oversized
Destination (3 lines)	D1-3	2D.36	Varies x 42	—	—
Destination and Distance (3 lines)	D1-3a	2D.36	Varies x 42	—	—
Circular Intersection Destination (3 lines)	D1-3d	2D.39	Varies x 42	—	—
Circular Intersection Diagrammatic Destination	D1-5	2D.39	Varies x 72*	—	—
Circular Intersection Diagrammatic Destination, Right-Turn Bypass	D1-5a	2D.39	Varies x 78*	—	—
Indirect Left-Turn Diagrammatic Destination	D1-Y5b	2D.41	96 x 48	48 x 24	—
Distance (1 line)	D2-1	2D.43	Varies x 18	—	—
Distance (2 lines)	D2-2	2D.43	Varies x 30	—	—
Distance (3 lines)	D2-3	2D.43	Varies x 42	—	—
Street Name (1 line)	D3-1,1a	2D.45	Varies x 12	Varies x 8	Varies x 18
Overhead Street Name (1 line)	D3-1,1a	2D.45	Varies x 24	—	—
Street Name (2 lines)	D3-1,1a	2D.45	Varies x 24	Varies x 15	Varies x 33
Overhead Street Name (2 lines)	D3-1,1a	2D.45	Varies x 48	—	—
Advance Street Name (2 lines)	D3-2	2D.46	Varies x 30	—	—
Advance Street Name (3 lines)	D3-2	2D.46	Varies x 42	—	—
Advance Street Name (4 lines)	D3-2	2D.46	Varies x 54	—	—
Parking Area Directional	D4-1	2D.47	30 x 24	18 x 15	—
Park - Ride	D4-2	2D.48	30 x 36	24 x 30	36 x 48
Advance Weigh Station Distance	D8-1	2D.51	78 x 60	60 x 48	96 x 72
Weigh Station Ahead	D8-1a	2D.51	66 x 48	48 x 36	—
Weigh Station Advance Direction	D8-2	2D.51	84 x 72	66 x 54	108 x 90
Weigh Station Entrance Direction	D8-3	2D.51	66 x 60	48 x 42	84 x 78
Crossover	D13-1,2	2D.52	60 x 30	—	78 x 42
Freeway Entrance	D13-3	2D.50	48 x 30	—	—
Freeway Entrance (Directional)	D13-3a	2D.50	48 x 42	—	—
Combination Lane Use / Destination	D15-1	2D.38	Varies x 96	—	—
Next Truck Lane	D17-1	2D.53	42 x 48	—	60 x 66
Advance Truck Lane	D17-2	2D.53	42 x 42	—	60 x 54
Next Passing Lane	D17-3	2D.53	42 x 48	—	60 x 66
Advance Passing Lane	D17-4	2D.53	42 x 42	—	60 x 54
Advance Emergency Turn-Out	D17-5	2D.54	60 x 36	—	78 x 54
Emergency Turn-Out (Directional)	D17-6	2D.54	60 x 36	—	78 x 60
Advance Slow Vehicle Turn-Out	D17-7	2D.54	72 x 36	—	96 x 54

*The size shown is for a typical sign. The size should be determined based on the amount of legend required for the sign.

Notes: 1. Larger signs may be used when appropriate

2. Dimensions in inches are shown as width x height

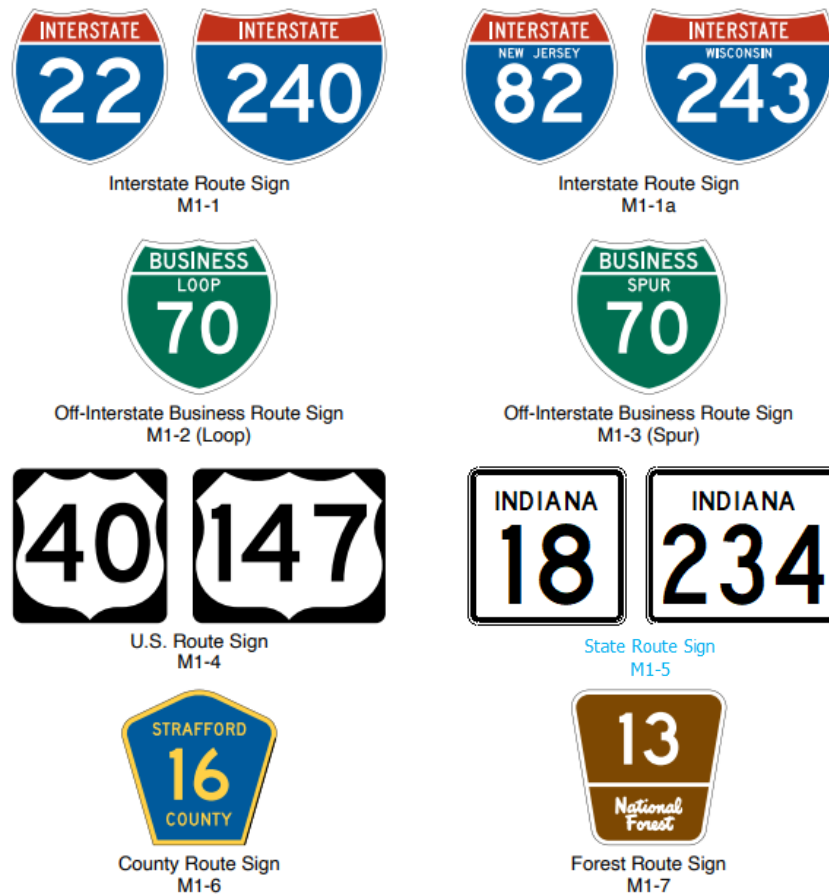
Section 2D.05 Size of Lettering

Support:

- 01 Sign legibility is a direct function of letter size and spacing. Legibility distance has to be sufficient to give road users enough time to read and comprehend the sign. Under optimum conditions, a guide sign message can be read and understood in a brief glance. The legibility distance takes into account factors such as inattention, blocking of view by other vehicles, unfavorable weather, inferior eyesight, or other causes for delayed or slow reading. Where conditions permit, repetition of guide information on successive signs gives the road user more than one opportunity to obtain the information needed.

Standard:

- 02 Design layouts for conventional road guide signs showing interline spacing, edge spacing, and other specification details shall be as shown in the “Standard Highway Signs” publication (see Section 1A.05).

Figure 2D-4. Route Signs

03 Except as otherwise provided in this Manual, a 24 x 24-inch minimum sign size shall be used for Interstate route numbers with one or two digits, and a 30 x 24-inch minimum sign size shall be used for Interstate route numbers having three digits.

Option:

04 When the Interstate Route sign is used in a Route Sign assembly (see Section 2D.29), the M1-1a sign, containing the State name in white upper-case letters on a blue background as detailed in the "Standard Highway Signs" publication (see Section 1A.05), may be used in place of the M1-1 sign.

Standard:

05 Use of the M1-1a sign shall be limited to Route Sign assemblies.

06 Off-Interstate Business Route (M1-2 and M1-3) signs (see Figure 2D-4) shall consist of a cutout shield displaying the number of the connecting Interstate route and the words BUSINESS and either LOOP (when the route rejoins the same Interstate route) or SPUR (when the route leaves the corresponding Interstate route and does not rejoin) in upper-case letters. The legend and border shall be white on a green background, and the shield shall be the same shape and dimensions as the Interstate Route sign. In no instance shall the word INTERSTATE appear on the Off-Interstate Business Route sign.

Option:

07 The Off-Interstate Business Route sign may be used on a major highway that is not a part of the Interstate system, but one that serves the business area of a city from an interchange on the system.

Standard:

- 04 **The Combination Lane-Use/Destination (D15-1) overhead guide sign shall be used only where the designated lane is a mandatory movement lane. The D15-1 sign shall not be used for lanes with optional movements.**
- 05 **The D15-1 sign shall have a green background with a white border. As shown in Figure 2D-9, the lane-use sign (see Chapter 2B) shall be placed near the bottom of the sign and the destination information shall be placed near the top of the sign. The D15-1 sign shall be located over the approximate center of the lane to which it applies.**

Section 2D.39 Destination Signs at Circular Intersections**Standard:**

- 01 **Destination signs that are used at circular intersections shall comply with the provisions of Section 2D.36, except as provided in this Section.**

Option:

- 02 Exit Destination (D1-1d and D1-1e) signs (see Figure 2D-11) with diagonal upward-pointing arrows or Directional assemblies (see Section 2D.32) may be used to designate a particular exit from a circular intersection.
- 03 Destination (D1-2d and D1-3d) signs (see Figure 2D-11) with curved-stem arrows may be used on approaches to circular intersections to represent the left-turn movements.
- 04 Curved-stem arrows on circular intersection destination signs may point in diagonal directions to depict the location of an exit relative to the approach roadway and entry into the intersection.
- 05 An Overhead Arrow-per-Lane Destination sign (see Section 2D.37) with curved-stem arrows may be used on multi-lane approaches to circular intersections that have an option lane.
- 06 A Destination (D1-5 or D1-5a) sign (see Figure 2D-11) with a diagram of the circular intersection may be used on approaches to circular intersections.

Guidance:

- 07 *If curved-stem arrows are used on destination signs, then this arrow type should also be used consistently on any regulatory lane-use signs (see Chapter 2B), Directional assemblies (see Section 2D.32), and pavement markings (see Part 3) for a particular destination or movement.*

Support:

- 08 Figure 2D-12 shows examples of guide signing for circular intersections.
- 09 Circular Intersection Diagrammatic (D1-5 or D1-5a) signs might be preferable where space is available and where the geometry of the circular intersection is non-typical, such as where more than four legs are present or where the legs are not at approximately 90-degree angles to each other. In such cases, minimizing the amount of legend for each destination and designing the sign so that the arrows for each destination clearly align with the roadway geometry will aid road user understanding of the sign and navigation through the area.

Standard:

- 10 **If used, the Circular Intersection Diagrammatic signs shall not depict the number of lanes within the circulatory roadway of the intersection, or on its approaches or exits, through the use of lane lines, multiple arrow shafts for the same movement, or other methods.**

Support:

- 11 Chapter 2B contains information regarding regulatory signs at circular intersections, Chapter 2C contains information regarding warning signs at circular intersections, and Chapter 3D contains information regarding pavement markings at circular intersections.

Section 2D.40 Destination Signs at Jughandles**Standard:**

- 01 **Destination signs that are used at jughandles shall comply with the provisions of Section 2D.36.**

Support:

- 02 Section 2B.35 contains information regarding regulatory signs for jughandle turns. Figure 2B-9 shows examples of regulatory and destination guide signing for various types of jughandle turns.

Section 2D.41 Destination Signs at Intersections with Indirect Turning Movements**Guidance:**

- 01 *A system of guide signs along with associated lane markings should be used to direct traffic through intersections with indirect turning movements.*

Support:

- 02 Figure 2D-13 shows examples of destination guide signing for intersections with indirect turning movements.

Option:

- 03 *The Indirect Left-Turn, Diagrammatic Destination (D1-Y5b) sign may be used on the approach(es) to an intersection with indirect left-turns (see Drawing B in Figure 2B-13).*

Support:

- 04 *Intersections with indirect left-turns are also known as reduced conflict intersections, boulevard lefts, and restricted crossing U-turn intersections.*

STREET NAME AND PARKING SIGNS

Section 2D.45 Street Name Signs (D3-1 and D3-1a)

Support:

- 01 Street Name signs at intersections and along roadways provide road users with important navigation information. Section 2H.10 contains information about signs used to identify the names of grade-separated streets, railways, bikeways, or other transportation facilities.

Guidance:

- 02 *Street Name (D3-1 or D3-1a) signs (see Figure 2D-14) should be installed in urban areas at all street intersections regardless of other route signs that might be present and should be installed in rural areas to identify important roads that are not otherwise signed.*
- 03 *To minimize wrong-way movements onto freeway or expressway exit ramps, Street Name signs should not be used at the intersection of a freeway or expressway exit ramp with the crossroad to display the name of the freeway or expressway to traffic on the crossroad.*

Support:

- 03A Ground mounted street name signs on U.S. or State Routes are typically installed by the city, town, or county for consistency with other street name signs in the vicinity. These signs are authorized to be placed at all intersections regardless of other route markings that may be present.

Option:

- 04 For streets that are part of a U.S., State, or county numbered route, a D3-1a Street Name sign (see Figure 2D-14) that incorporates a route shield may be used to assist road users who might not otherwise be able to associate the name of the street with the route number.

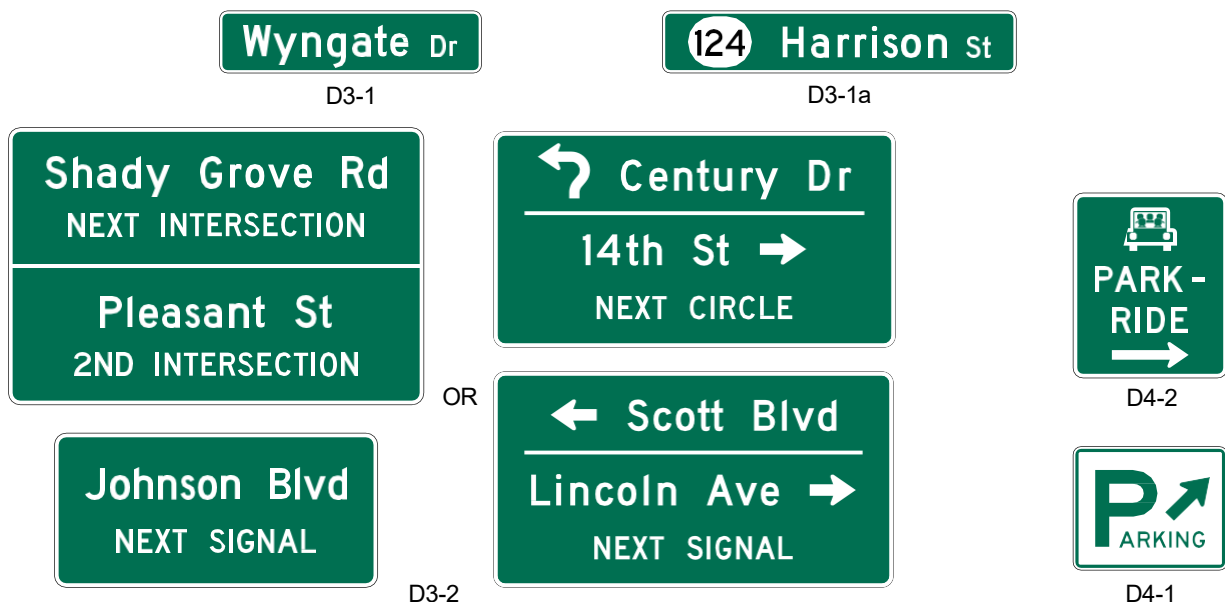
Standard:

- 05 **The lettering for names of streets and highways on Street Name signs shall be composed of a combination of lower-case letters with initial upper-case letters (see Section 2A.08).**

Guidance:

- 06 *The determination of letter heights to be used on Street Name signs should be based on, but not limited to, the following considerations:*
- A. *Use of Advance Street Name signs (see Section 2D.46);*
 - B. *Number of lanes on the intersection approach;*
 - C. *Length of turn lanes;*
 - D. *Distance the Street Name sign is located across the intersection (if a sign is not provided on the near side of the intersection).*
- 07 *Letter heights on street name signs should be as shown in Table 2D-6.*

Figure 2D-14. Street Name and Parking Signs



SIGN DESIGN

Section 2E.08 General

Support:

- 01 Effective signs are legible to road users approaching them, and are readable and comprehensible in the viewing time provided to permit proper responses. Desired design characteristics include: (a) long visibility distances; (b) large lettering, symbols, and arrows; and (c) short legends.

Section 2E.09 Color of Guide Signs

Standard:

- 01 **Guide signs on freeways and expressways, except as otherwise provided in this Manual, shall have white letters, symbols, arrows, and borders on a green background.**

Support:

- 02 Color requirements for route signs and trailblazers; for signs with blank-out or changeable messages; for signs for services, rest areas, park and recreational areas; and for certain miscellaneous signs are provided in the individual Sections dealing with the particular sign or sign group.

Section 2E.10 Retroreflection or Illumination

Standard:

- 01 **Letters, numerals, symbols, arrows, and borders of all guide signs shall be retroreflective. The background of all guide signs that are not independently illuminated shall be retroreflective.**

Support:

- 02 Where there is no serious interference from extraneous light sources, retroreflective post-mounted signs usually provide adequate nighttime visibility.
- 03 On freeways and expressways where much driving at night is done with low-beam headlights, the amount of headlight illumination incident to an overhead sign display is relatively small.

Guidance:

- 04 *Overhead sign installations should be illuminated (see Section 2A.21) unless an engineering study shows that retroreflection alone will perform effectively. The type of illumination chosen should provide effective and reasonably uniform illumination of the sign face and message.*

Support

- 05 *An engineering study on sign lighting has been conducted by the Indiana Department of Transportation and the agency can be contacted for findings and recommendations.*

Section 2E.11 Interchange Classification

Support:

- 01 For signing purposes, interchanges are classified as major, intermediate, and minor. Minimum letter and numeral sizes based on interchange classification are contained in Tables 2E-2 and 2E-4. Descriptions of these classifications are as follows:
- A. Major interchanges are subdivided into two categories: (a) interchanges with other expressways or freeways, or (b) interchanges with high-volume multi-lane highways, principal urban arterials, or major rural routes where the volume of interchanging traffic is heavy or includes many road users unfamiliar with the area.
 - B. Intermediate interchanges are those with urban and rural routes not in the category of major or minor interchanges.
 - C. Minor interchanges include those where traffic is local and very light, such as interchanges with land service access roads. Where the sum of exit volumes is estimated to be lower than 100 vehicles per day in the design year, the interchange is classified as minor.

Section 2E.12 Size of Signs and Letters

Standard:

- 01 **Except as provided in Section 2A.07, the sizes of freeway and expressway guide signs that have standardized designs shall be as shown in Table 2E-1.**

Support:

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

Option:

- 03 Signs larger than those shown in Table 2E-1 may be used (see Section 2A.07).

INSTALLATION

Section 2E.19 Overhead Sign Installations

Support:

- 01 Specifications for the design and construction of structural supports for signs have been standardized by the American Association of State Highway and Transportation Officials (AASHTO). Overcrossing structures can often serve for the support of overhead signs, and might in some cases be the only practical location that will provide adequate viewing distance. Use of these structures as sign supports will eliminate the need for additional sign supports along the roadside. Conditions that might warrant the installation of overhead signs are given in Section 2A.14 and throughout this Chapter. Vertical clearance of overhead signs is discussed in Section 2A.15.

Section 2E.20 Lateral Offset

Standard:

- 01 Except where shielded by a rigid traffic barrier, the minimum lateral offset outside the usable roadway shoulder for post-mounted freeway and expressway signs or for overhead sign supports, either to the right-hand or left-hand side of the roadway, shall be 6 feet. This minimum clearance shall also apply outside of a curb. If located within the clear zone, the signs shall be mounted on crashworthy (see definition in Section 1C.02) supports or shielded by appropriate crashworthy barriers.

Guidance:

- 02 Where practicable, a sign should not be less than 10 feet from the edge of the nearest traffic lane. Large guide signs especially should be farther removed, preferably 30 feet or more from the nearest traffic lane.
- 03 Where an expressway median is 12 feet or less in width, consideration should be given to spanning both roadways without a center support.
- 04 Where an overhead sign support cannot be placed sufficiently far away from the line of traffic, it should either be designed to minimize the impact forces, or be adequately shielded by a traffic barrier of suitable design.

Support:

- 04A The proper placement of overhead sign structures adjacent to guardrail takes into account lateral deflection of the guardrail.

Standard:

- 05 Butterfly-type sign supports and other overhead non-crashworthy sign supports shall not be installed in gores or other unshielded locations within the clear zone.

Option:

- 06 Lesser clearances, but not generally less than 6 feet, may be used on connecting roadways or ramps at interchanges.

with Collector-Distributor Roadways (Sheet 1 of 2)



Table 2I-1. General Service Sign and Plaque Sizes (Sheet 1 of 2)

Sign or Plaque	Sign Designation	Section	Conventional Road	Freeway or Expressway
Rest Area Advance	D5-1	2I.05	78 x 36*	132 x 60* (F) 114 x 48* (E)
Rest Area Advance Direction	D5-1a	2I.05	78 x 36*	132 x 60* (F) 114 x 48* (E)
Rest Area Entrance Direction	D5-2	2I.05	78 x 36*	132 x 66* (F) 114 x 60 (E)
Rest Area Gore	D5-2a	2I.05	42 x 48*	78 x 78* (F) 66 x 72* (E)
Rest Area Directional	D5-5	2I.05	42 x 48*	—
Next Rest Area	D5-6	2I.05	78 x 54*	132 x 78* (F) 108 x 66* (E)
Rest Area Tourist Info Center Advance	D5-7	2I.08	90 x 72*	156 x 108* (F) 132 x 96* (E)
Rest Area Tourist Info Center Advance Direction	D5-7a	2I.08	90 x 72*	156 x 108* (F) 132 x 96* (E)
Rest Area Tourist Info Center Entrance Direction	D5-8	2I.08	84 x 72*	138 x 108* (F) 120 x 96* (E)
Parking Area Advance	D5-9	2I.05	96 x 36*	162 x 60* (F) 138 x 48* (E)
Parking Area Entrance Direction	D5-9a	2I.05	96 x 36*	162 x 60* (F) 138 x 54* (E)
Parking Area Gore	D5-9b	2I.05	62 x 48*	108 x 78* (F) 88 x 66* (E)
Vending Machines	D5-Y9	2I.05	—	96 x 24
Picnic Area (Roadside Table, Roadside Park) Advance	D5-10	2I.05	84 x 36*	144 x 60* (F) 120 x 48* (E)
Picnic Area (Roadside Table, Roadside Park) Entrance Direction	D5-10a	2I.05	84 x 36*	144 x 60* (F) 120 x 54* (E)
Picnic Area (Roadside Table, Roadside Park) Gore	D5-10b	2I.05	54 x 48*	92 x 78* (F) 76 x 66* (E)
Scenic Area (Scenic View, Scenic Overlook) Advance	D5-11	2I.05	84 x 36*	144 x 60* (F) 120 x 48* (E)
Scenic Area (Scenic View, Scenic Overlook) Entrance Direction	D5-11a	2I.05	84 x 36*	144 x 60* (F) 120 x 54* (E)
Scenic Area (Scenic View, Scenic Overlook) Gore	D5-11b	2I.05	54 x 48*	92 x 78* (F) 76 x 66* (E)
Interstate Oasis	D5-12	2I.04	—	198 x 60 (F) 162 x 48 (E)
Interstate Oasis (plaque)	D5-12aP	2I.04	—	114 x 48
Interstate Oasis Directional	D5-12b	2I.04	—	48 x 36
Brake Check Area Advance	D5-13	2I.06	96 x 54	132 x 66
Brake Check Area Entrance Direction	D5-14	2I.06	96 x 54	132 x 78
Chain-Up Area Advance	D5-15	2I.07	72 x 54	102 x 66
Chain-Up Area Entrance Direction	D5-16	2I.07	72 x 54	102 x 78
Point of Interest	D5-Y17	2I.08	30 x 24	—
Historical Marker	D5-Y18	2I.08	30 x 24	—
Telephone	D9-1	2I.02	24 x 24	30 x 30
Hospital	D9-2	2I.02	24 x 24	30 x 30
Camping	D9-3	2I.02	24 x 24	30 x 30
Litter Container	D9-4	2I.02	24 x 30	36 x 48
International Symbol of Accessibility	D9-6	2I.02	24 x 24	30 x 30
Van Accessible (plaque)	D9-6P	2I.02	18 x 9	—
Gas	D9-7	2I.02	24 x 24	30 x 30
Food	D9-8	2I.02	24 x 24	30 x 30
Lodging	D9-9	2I.02	24 x 24	30 x 30
Tourist Information	D9-10	2I.02	24 x 24	30 x 30
Diesel Fuel	D9-11	2I.02	24 x 24	30 x 30
Alternative Fuel - Compressed Natural Gas	D9-11a	2I.02	24 x 24***	30 x 30***
Electric Vehicle Charging	D9-11b	2I.02	24 x 24***	30 x 30***
Electric Vehicle Charging (plaque)	D9-11bP	2I.02	24 x 18	30 x 24
Alternative Fuel - Ethanol	D9-11c	2I.02	24 x 24	30 x 30

Standard:

06 If Specific Service signs containing the OASIS legend as a part of the business identification sign panel(s) are not used on the ramp and if the Interstate Oasis is not clearly visible and identifiable from the exit ramp, an Interstate Oasis Directional (D5-12b) sign shall be provided on the exit ramp to indicate the direction and distance to the Interstate Oasis.

07 If needed, additional trailblazer guide signs shall be used along the crossroad to guide road users to an Interstate Oasis.

Section 2I.05 Rest Area and Other Roadside Area Signs (D5-1 through D5-11 Series)**Standard:**

01 Rest Area signs (see Figure 2I-5) shall have a retroreflective white legend and border on a blue background.

02 Signs that include the legend REST AREA shall be used only where parking and restroom facilities are available.

Guidance:

03 A roadside area that does not contain restroom facilities should be signed to indicate the major road user service that is provided. For example, the sign legends for an area with only parking should use the words PARKING AREA (D5-9 series) instead of REST AREA. The sign legends for an area with only picnic tables and parking should use words such as PICNIC AREA, ROADSIDE TABLE, or ROADSIDE PARK (D5-10 series) instead of REST AREA.

04 Rest areas that have tourist information and welcome centers should be signed as provided in Section 2I.08.

05 Scenic area signing should be consistent with that provided for rest areas, except that the legends should use words such as SCENIC AREA, SCENIC VIEW, or SCENIC OVERLOOK (D5-11 series) instead of REST AREA.

06 If a rest area or other roadside area is provided on a conventional road, a D5-1 and/or D5-1a sign should be installed in advance of the rest area or other roadside area to permit the driver to reduce speed in preparation for leaving the highway. A D5-5 sign (or a D5-2 sign if an exit ramp is provided) should be installed at the turn-off point where the driver needs to leave the highway to access the rest area or other roadside area.

07 If a rest area or other roadside area is provided on a freeway or expressway, a D5-1 sign should be placed 1 mile and/or 2 miles in advance of the rest area.

Standard:

08 A D5-2a sign shall be placed at the rest area or other roadside area exit gore.

Option:

09 A D5-1a sign may be placed between the D5-1 sign and the exit gore on a freeway or expressway. A second D5-1 sign may be used in place of the D5-1a sign with a distance to the nearest ½ or ¼ mile displayed as a fraction rather than a decimal for distances of less than 1 mile.

10 To provide the road user with information on the location of succeeding rest areas, a Next Rest Area (D5-6) sign (see Figure 2I-5) may be installed independently or as a supplemental sign mounted below one of the REST AREA advance guide signs.

Standard:

11 All signs on freeways and expressways for rest and other roadside areas shall have letter and numeral sizes that comply with the minimum requirements of Tables 2E-2 through 2E-5. The sizes for General Service signs that have standardized designs shall be as shown in Table 2I-1.

Option:

12 If the rest area has facilities for persons with disabilities (see Section 2I.02), the International Symbol of Accessibility (D9-6) sign (see Figure 2I-1) may be placed with or beneath an advance guide sign for the rest area.

13 If telecommunication devices for the deaf (TDD) are available at the rest area, the TDD (D9-21) symbol sign (see Figure 2I-1) may be used to supplement the advance guide signs for the rest area.

14 If wireless Internet services are available at the rest area, the Wireless Internet (D9-22) symbol sign (see Figure 2I-1) may be used to supplement the advance guide signs for the rest area.

15 If the rest area has vending machines a supplemental plaque may be used on the advance guide signs for the rest area as shown in Figure 2I-5 (D5-Y9).

Section 2I.06 Brake Check Area Signs (D5-13 and D5-14)**Guidance:**

01 If an area has been provided for drivers to pull off of the roadway to check the brakes on their vehicle, a Brake Check Area Advance (D5-13) sign (see Figure 2I-6) should be installed in advance of the brake check area, and a D5-14 sign (see Figure 2I-6) should be placed at the entrance to the brake check area.

Figure 2I-5. Rest Area and Other Roadside Area Signs



Figure 2I-6. Brake Check Area and Chain-Up Area Signs



Section 2I.07 Chain-Up Area Signs (D5-15 and D5-16)

Guidance:

- 01 If an area has been provided for drivers to pull off of the roadway to install chains on their tires, a Chain-Up Area Advance (D5-15) sign (see Figure 2I-6) should be installed in advance of the chain-up area, and a D5-16 sign (see Figure 2I-6) should be placed at the entrance to the chain-up area.

Section 2I.08 Tourist Information and Welcome Center Signs (D5-7 Series and D5-8)

Support:

- 01 Tourist information and welcome centers have been constructed within rest areas on freeways and expressways and are operated by either a State or a private organization. Others have been located within close proximity to these facilities and operated by civic clubs, chambers of commerce, or private enterprise.

Guidance:

- 02 The number of supplemental sign panels installed with Tourist Information or Welcome Center signs should be limited to three so as not to impose an undue informational load on the road user.

Standard:

- 03 Tourist Information or Welcome Center signs (see Figure 2I-7) shall have a white legend and border on a blue background. Continuously staffed or unstaffed operation at least 8 hours per day, 7 days per week, shall be required.
- 04 If operated only on a seasonal basis, the Tourist Information or Welcome Center signs shall be removed or covered during the off seasons.

Guidance:

- 05 For freeway or expressway rest area locations that also serve as tourist information or welcome centers, the following signing criteria should be used:
- A. The locations for tourist information and welcome center Advance Guide, Exit Direction, and Exit Gore signs should meet the General Service signing requirements described in Section 2I.03.
 - B. If the signing for the tourist information or welcome center is to be accomplished in conjunction with the initial signing for the rest areas, the message on the Rest Area Tourist Info Center Advance (D5-7) sign should be REST AREA, TOURIST INFO CENTER, XX MILES or REST AREA, STATE NAME (optional), WELCOME CENTER XX MILES. On the Rest Area Tourist Info Center Entrance Direction (D5-8) sign the message should be REST AREA, TOURIST INFO CENTER with a diagonally upward-pointing directional arrow (or NEXT RIGHT), or REST AREA, STATE NAME (optional), WELCOME CENTER with a diagonally upward-pointing directional arrow (or NEXT RIGHT).
 - C. If the initial rest area Advance Guide and Exit Direction signing is in place, these signs should include, on supplemental signs, the legend TOURIST INFO CENTER or STATE NAME (optional), WELCOME CENTER.
 - D. The Exit Gore sign should contain only the legend REST AREA with the arrow and should not be supplemented with any legend pertaining to the tourist information center or welcome center.

Option:

- 06 As an alternative to the supplemental TOURIST INFO CENTER legend, the Tourist Information (D9-10) sign (see Figure 2I-1) may be appended beneath the REST AREA advance guide sign.
- 07 Advance signage for points of interest (D5-Y17) and historical markers (D5-Y18) may also be utilized as conditions permit. If used, the point of interest and historical marker signs are typically placed in advance of the site.

Figure 2I-7. Examples of Tourist Information and Welcome Center Signs



Note: Alternate legends may be substituted for the TOURIST INFO CENTER legend, such as WELCOME CENTER and (State Name) WELCOME CENTER.

CHAPTER 2J. SPECIFIC SERVICE SIGNS

Section 2J.01 Eligibility

Support:

- 00 Until such time that the Indiana Administrative Code allows the use of EV charging as an eligible service category, the provisions in this chapter regarding the EV charging service category are for information only.

Standard:

- 01 **Specific Service signs shall be defined as guide signs that provide road users with business identification and directional information for eligible services. Eligible service categories shall be limited to gas, food, lodging, camping, attractions, and electric vehicle (EV) charging.**

Guidance:

- 02 *The use of Specific Service signs should be limited to areas primarily rural in character with adequate space for all signs to be properly accommodated.*

Support:

- 03 When services at an interchange are abundant, this is an indication that the character of the area is no longer primarily rural and General Service signs would be more appropriate.

Option:

- 04 Where an engineering study determines a need, Specific Service signs may be used on any class of highway, including freeways, expressways, and conventional roads, *if permitted by statute*.

Guidance:

- 05 *Specific Service signs should not be installed at an interchange where the road user cannot conveniently reenter the freeway or expressway and continue in the same direction of travel.*

Standard:

- 06 **Eligible service facilities shall comply with laws concerning the provisions of public accommodations without regard to race, religion, color, age, sex, or national origin, and laws concerning the licensing and approval of service facilities.**

- 07 **The attraction services shall include only facilities that have the primary purpose of providing amusement, historical, cultural, or leisure activities to the public.**

Guidance:

- 08 *Except as provided in Paragraph 9 of this Section, distances to eligible services should not exceed 3 miles in any direction.*

Option:

- 09 If, within the 3-mile limit, facilities for the services being considered are not available or choose not to participate in the program, the limit of eligibility may be extended in 3-mile increments until one or more facilities for the services being considered chooses to participate, or until 15 miles is reached, whichever comes first.

Standard:

- 10 **If State or local agencies elect to provide Specific Service signing, there shall be a statewide policy for such signing and criteria for the eligibility and availability of the various types of services.**

Guidance:

- 11 *The criteria for the statewide policy should consider the following:*
- A. *To qualify for a GAS business identification sign panel, a business should have:*
 1. *Vehicle services including gasoline, oil, and water;*
 2. *Continuous operation at least 16 hours per day, 7 days per week for freeways and expressways, and continuous operation at least 12 hours per day, 7 days per week for conventional roads; and*
 3. *Modern sanitary facilities and drinking water.*
 - B. *To qualify for a FOOD business identification sign panel, a business should have:*
 1. *Licensing or approval, where required;*
 2. *Continuous operations to serve at least 2 meals per day, at least 6 days per week; and*
 3. *Modern sanitary facilities.*
 - C. *To qualify for a LODGING business identification sign panel, a business should have:*
 1. *Licensing or approval, where required;*
 2. *Adequate sleeping accommodations; and*
 3. *Modern sanitary facilities.*
 - D. *To qualify for a CAMPING business identification sign panel, a business should have:*
 1. *Licensing or approval, where required;*
 2. *Adequate parking accommodations; and*
 3. *Modern sanitary facilities and drinking water.*
 - E. *To qualify for an ATTRACTION business identification sign panel, a facility should have:*
 1. *Regional significance, in compliance with the provisions of Paragraph 7 of this Section; and*
 2. *Adequate parking accommodations.*

Option:

- 03 Where more than six businesses of a specific service type are eligible for business identification sign panels at the same interchange, additional business identification sign panels of that same specific service type may also be displayed in accordance with the provisions of Paragraph 4 of this Section. The additional business identification sign panels may be displayed either by placing more than one specific service type on the same sign (see Paragraph 13 of Section 2J.02) or by using a second Specific Service sign of that specific service type if the additional sign can be added without exceeding the limit of four Specific Service signs at an interchange or intersection approach (see Paragraph 3 of Section 2J.02).

Standard:

- 04 Where business identification sign panels for more than six businesses of a specific service type are displayed at the same interchange or intersection approach, the following provisions shall apply:
- A. No more than 12 business identification sign panels of a specific service type shall be displayed on no more than two Specific Service signs or sign assemblies;
 - B. No more than six business identification sign panels shall be displayed on a single Specific Service sign; and
 - C. No more than four Specific Service signs shall be displayed on the approach.

Support:

- 05 Section 2J.08 contains information regarding Specific Service signs for double-exit interchanges.
- 06 Section 2J.09 contains information regarding Specific Service signs for multiple interchanges that are accessed from collector-distributor roadways rather than from the highway mainline.

Standard:

- 07 Each business identification sign panel attached to a Specific Service sign shall be a horizontally-oriented rectangle with a width longer than the height. A business identification sign panel on signs for freeways and expressways shall not exceed 60 inches in width and 36 inches in height (see Table 2J-2). A business identification sign panel on signs for conventional roads and freeway and expressway ramps shall not exceed 30 inches in width and 18 inches in height (see Table 2J-2). The vertical and horizontal spacing between business identification sign panels shall not exceed 8 inches and 12 inches, respectively.

Table 2J-2. Maximum Business Identification Sign Panel Sizes by Roadway Classification

Roadway Classification	Sign Panel Size
Freeway or Expressway	60 x 36
Conventional Road or Ramp	30 x 18

Note: Sizes are shown in inches as width x height

Support:

- 08 Sections 2A.10, 2E.13, and 2E.14 contain information regarding borders, interline spacing, and edge spacing.

Section 2J.05 Size of Lettering

Standard:

- 01 All Specific Service signs and business identification sign panels shall have letter and numeral sizes that comply with the minimum requirements of Table 2J-1.

Guidance:

- 02 Any legend on a business identification graphic/trademark should be proportional to the size of the graphic trademark.

Section 2J.06 Signs at Interchanges

Standard:

- 01 The Specific Service signs shall be installed between the preceding interchange and at least 800 feet in advance of the Exit Direction sign at the interchange from which the services are available (see Figure 2J-2).
- 02 Specific Service signs shall not be used at freeway-to-freeway interchanges (see Section 2E.37), except where the exit ramp also provides direct access to a conventional road within that interchange (see Figure 2J-5).

Guidance:

- 03 There should be at least an 800-foot spacing between the Specific Service signs, except for Specific Service ramp signs. Excessive spacing should not be used between Specific Service signs, as this is not desirable either. When spacing permits, all Specific Service signs should be installed before the Exit One (1) Mile Advance Guide sign with the first specific service sign no more than two miles before the exit direction sign.

on the ramp signs. Business identification sign panels on Specific Service ramp signs shall be duplicates of those displayed on the Specific Service signs located in advance of the interchange, but shall be reduced in size (see Paragraph 7 of Section 2J.04).

Guidance:

- 03 *Specific Service ramp signs **should** display distances (see Paragraphs 14 and 15 of Section 2A.08) to a service facility when the facility is not visible from **the** ramp intersection with crossroad **or is more than one mile from the ramp**.*
- 04 *Distances of less than $\frac{1}{4}$ mile, when displayed, should be displayed to the nearest $\frac{1}{10}$ mile.*

Section 2J.08 Double-Exit Interchanges

Guidance:

- 01 *At double-exit interchanges, the Specific Service signs should consist of two sections, one for each exit (see Figure 2J-1).*

Standard:

- 02 **At a double-exit interchange, the top section shall display the business identification sign panels for the first exit and the bottom section shall display the business identification sign panels for the second exit. At numbered interchanges, the name of the service type and the exit number shall be displayed above the business identification sign panels in each section. At unnumbered interchanges, the word message NEXT RIGHT (LEFT) and SECOND RIGHT (LEFT) shall be used in place of the exit number. The number of business identification sign panels on the sign (total of both sections) or the sign assembly shall be limited to six.**

Guidance:

- 03 *At a double-exit interchange, where a service type is displayed on two Specific Service signs in accordance with the provisions of Section 2J.04, one of the signs should display the business identification sign panels for that service type for the businesses that are accessible from one of the two exits and the other sign should display the business identification sign panels for that service type for the businesses that are accessible from the other exit.*

Option:

- 04 *At a double-exit interchange where there are four business identification sign panels to be displayed for one of the exits and one or two business identification sign panels to be displayed for the other exit, the business identification sign panels may be arranged in three rows with two business identification sign panels per row.*
- 05 *At a double-exit interchange, where a service is to be signed for only one exit, one section of the Specific Service sign may be omitted, or a single exit interchange sign may be used.*
- 06 *Signs on ramps and crossroads as described in Section 2J.07 may be used at a double-exit interchange.*

Section 2J.09 Collector-Distributor Roadways for Successive Interchanges

Support:

- 01 *Examples of Specific Service signs used in advance of interchanges for collector-distributor roadways that provide access to multiple interchanges are shown in Figure 2J-6.*

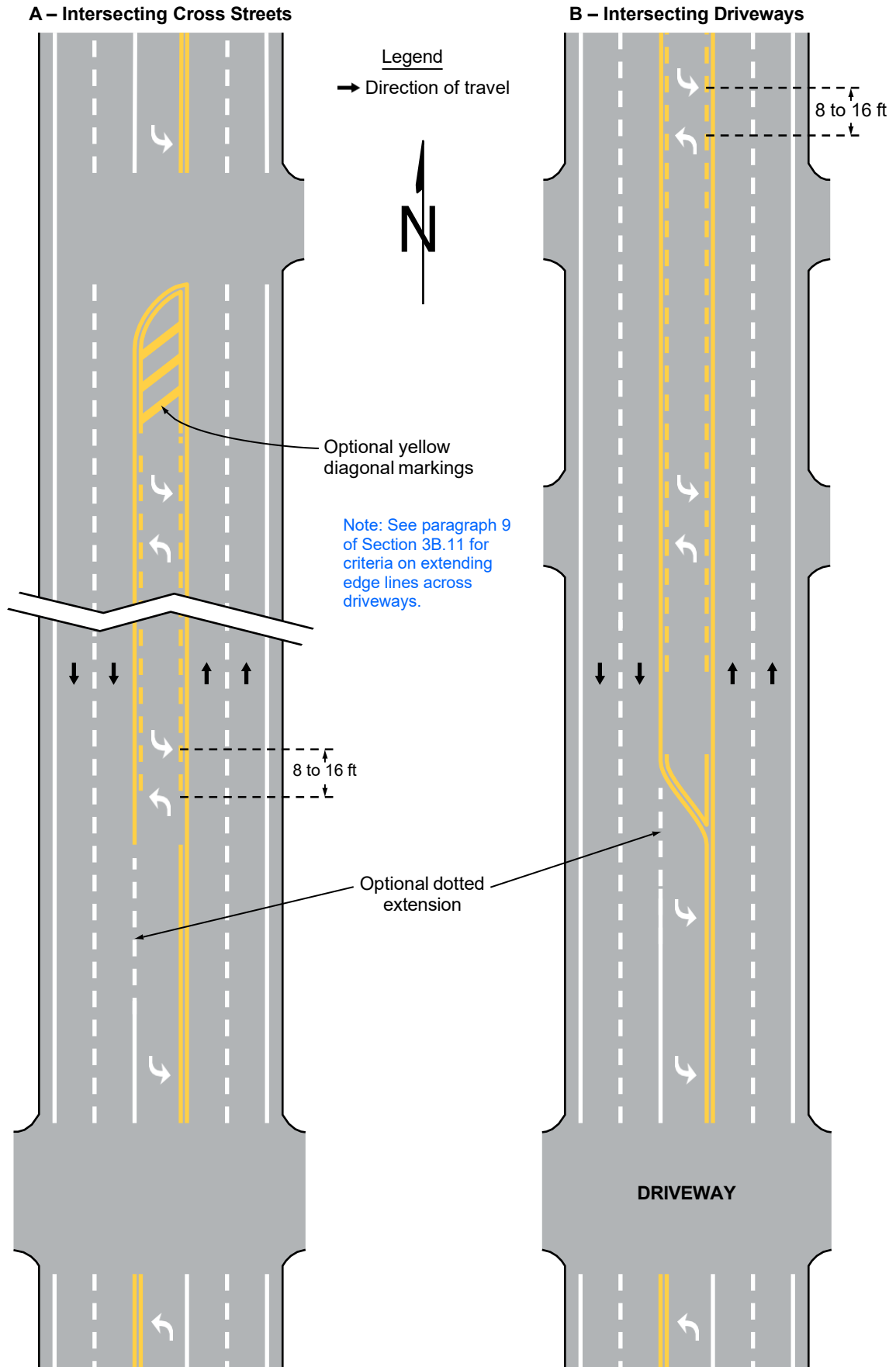
Option:

- 02 *If services are available from more than one of the interchanges along the collector-distributor roadway and those services are signed with Specific Service signs as described in Paragraph 4 of this Section, then Specific Service signs may be used on the mainline in conformance with the provisions of this Chapter.*

Standard:

- 03 **No more than four Specific Service signs shall be displayed on a highway mainline approach to a collector-distributor roadway.**
- 04 **If Specific Service signs are located on the highway mainline for services accessed from the collector-distributor roadway, then the business identification sign panels displayed on the collector-distributor roadway shall be only duplicates of those displayed on the highway mainline.**
- 05 **If more than four Specific Services signs would be required on the mainline in advance of the collector-distributor roadway in order to display all the business identification sign panels used on Specific Service signs in advance of the collector-distributor roadway exits, then General Service signs shall be used on the mainline to identify the types of services displayed on Specific Service signs on the collector-distributor roadway.**

Figure 3B-7. Examples of Two-Way Left-Turn Lane Marking Applications



CHAPTER 3C. CROSSWALK MARKINGS

Section 3C.01 General

Support:

- 01 Crosswalk markings provide guidance for pedestrians who are crossing roadways by defining and delineating paths on approaches to and within signalized intersections, and on approaches to other intersections where traffic stops.
- 02 In conjunction with signs and other measures, crosswalk markings help to alert road users of a designated pedestrian crossing point across roadways at locations that are not controlled by traffic control signals or STOP or YIELD signs.
- 03 At non-intersection locations, crosswalk markings legally establish the crosswalk.
- 04 Detectable warning surfaces mark boundaries between pedestrian and vehicular ways where there is no raised curb. Detectable warning surfaces are typically installed where curb ramps are constructed at the junction of sidewalks and the roadway or shoulder, for marked and unmarked crosswalks. Detectable warning surfaces contrast visually with adjacent walking surfaces, either light-on-dark, or dark-on-light. The U.S. Department of Justice 2010 ADA Standards for Accessible Design, September 15, 2010, 28 CFR 35 and 36, Americans with Disabilities Act of 1990 contains specifications for the design of detectable warning surfaces.

Section 3C.02 Application of Crosswalk Markings

Guidance:

- 01 *At locations controlled by traffic control signals, crosswalk markings should be installed.*

Option:

- 02 Crosswalk markings may be omitted if engineering judgment indicates they are not needed to direct pedestrians to the proper crossing path(s).

Guidance:

- 03 *On approaches controlled by STOP or YIELD signs, crosswalk markings should be installed where engineering judgment indicates they are needed to direct pedestrians to the proper crossing path(s).*
- 04 *At uncontrolled approaches, an engineering study should be performed before a marked crosswalk is installed. The following criteria should be considered:*
 - A. *Total number of approach lanes,*
 - B. *The presence of a median,*
 - C. *The distance from adjacent signalized intersections or other controlled crossings,*
 - D. *Projected pedestrian and bicyclist volumes,*
 - E. *Pedestrian and bicyclist paths of travel,*
 - F. *Pedestrian ages and abilities,*
 - G. *Pedestrian and bicyclist delays,*
 - H. *Location or frequency of public transit stops,*
 - I. *Average daily traffic (ADT),*
 - J. *Speed limit or the 85th-percentile speed,*
 - K. *The horizontal and vertical geometry of the crossing location,*
 - L. *The possible consolidation of multiple crossing points,*
 - M. *The availability of street lighting,*
 - N. *The presence and configuration of diagonal curb ramps or blended transition curb ramps, and*
 - O. *Other appropriate factors.*

Standard:

- 05 **Crosswalk markings shall be provided at legally established crosswalks at non-intersection locations.**

Guidance:

- 06 *The installation of other traffic control devices and other measures designed to reduce traffic speeds, shorten crossing distances, enhance driver awareness of the crossing, and/or provide active warning of pedestrian presence, should be considered in addition to a new marked crosswalk and signs across an uncontrolled roadway where any of the following conditions exist:*
 - A. *The roadway has four or more lanes of travel without a raised median or pedestrian refuge island and an ADT of 12,000 vehicles per day or greater; or*
 - B. *The roadway has four or more lanes of travel with a raised median or pedestrian refuge island and an ADT of 15,000 vehicles per day or greater; or*
 - C. *The posted speed limit is 40 mph or greater; or*
 - D. *A crash study reveals that multiple-threat crashes are the predominant crash type on a multi-lane approach; or*
 - E. *When adequate visibility cannot be provided by parking prohibitions.*

Section 4D.05 Number of Signal Faces on an Approach

Standard:

- 01 The signal faces for each approach to an intersection or a midblock location shall be provided as follows:

- A. If a signalized motor vehicle through movement exists on an approach, a minimum of two primary signal faces shall be provided for the through movement. Except for single lane approaches, if a signalized motor vehicle through movement does not exist on an approach, a minimum of two primary signal faces shall be provided for the signalized motor vehicle turning movement that is considered to be the major movement from the approach (also see Section 4F.16).
- B. See Sections 4F.02 through 4F.08 for left-turn (and U-turn to the left) signal faces.
- C. See Sections 4F.09 through 4F.15 for right-turn (and U-turn to the right) signal faces.

Option:

- 02 Where a movement (or a certain lane or lanes) at the intersection never conflicts with any other signalized vehicular or pedestrian movement, a continuously-displayed single-section GREEN ARROW signal indication may be used to inform road users that the movement is free-flow and does not need to stop.

Support:

- 03 In some circumstances where the through movement never conflicts with any other signalized vehicular or pedestrian movement at the intersection, such as at T-intersections with appropriate geometrics and/or pavement markings and signing, an engineering study might determine that the through movement (or certain lanes of the through movement) can be free-flow and not signalized.

Guidance:

- 04 *If two or more left-turn lanes are provided for a separately-controlled left-turn movement, or if a left-turn movement represents the major movement from an approach, two or more primary left-turn signal faces should be provided.*
- 05 *If two or more right-turn lanes are provided for a separately-controlled right-turn movement, or if a right-turn movement represents the major movement from an approach, two or more primary right-turn signal faces should be provided.*

Support:

- 06 Locating primary signal faces overhead on the far side of the intersection has been shown to provide safer operation by reducing intersection entries late in the yellow interval and by reducing red signal violations, as compared to post-mounting signal faces at the roadside or locating signal faces overhead within the intersection on a diagonally-oriented mast arm or span wire.

Guidance:

- 06A *On approaches with two or more lanes for the through movement, one signal face per through lane should be provided, centered over each through lane.*

- 07 *If the posted or statutory speed limit or the 85th-percentile speed on an approach to a signalized location is 45 mph or higher, signal faces should be provided as follows for all new or reconstructed signal installations (see Figure 4D-1):*

- A. *The minimum number and location of primary (non-supplemental) signal faces for through traffic should be provided in accordance with Table 4D-1.*
- B. *If the number of overhead primary signal faces for through traffic is equal to the number of through lanes on an approach, one overhead signal face should be located approximately over the center of each through lane.*
- C. *Except for shared left-turn and right-turn signal faces, any primary signal face required by Sections 4F.02 through 4F.16 for a mandatory turn lane should be located overhead approximately over the center of each mandatory turn lane.*
- D. *All primary signal faces should be located on the far side of the intersection.*
- E. *In addition to the primary signal faces, one or more supplemental pole-mounted or overhead signal faces should be considered to provide added visibility for approaching traffic that is traveling behind large vehicles.*
- F. *All signal faces should have backplates.*

- 08 *This layout of signal faces should also be considered for any major urban or suburban arterial street with four or more lanes and for other approaches with speeds of less than 45 mph.*

Option:

- 05 If the temporary traffic control signal is capable of being operated in a semi-actuated mode, such that green signal indications are continually shown to major-street traffic except when responding to a minor-street approach vehicle call, it may be operated in a semi-actuated mode instead of being placed in a flashing mode.

Guidance:

- 06 *A temporary traffic control signal should be used only if engineering judgment indicates that installing the signal will improve the overall safety and/or operation of the location.*
- 07 *The use of temporary traffic control signals by a work crew on a regular basis in their work area should be subject to the approval of the jurisdiction having authority over the roadway.*
- 08 *A temporary traffic control signal should not operate longer than 30 days unless associated with a longer-term temporary traffic control zone project.*
- 09 *Section 6L.01 contains information about the use of temporary traffic control signals in temporary traffic control zones.*

Standard:

- 10 **A portable traffic control signal shall be defined as a temporary traffic control signal that is designed so that it can be easily transported and reused at different locations. A portable traffic control signal shall be used only for one of the following purposes:**
- A. To maintain one-lane, two-way traffic in a temporary traffic control zone that is of a long term stationary, intermediate term stationary, or short term stationary work duration (see Section 6N.01).**
 - B. To temporarily function for a permanent signal where:**
 - 1. Power has been lost.**
 - 2. A structural support or the controller has been damaged so that the permanent faces or signal is not functional.**
 - C. To provide access to a site that will have a permanent signal in the near future, provided that the permanent signal has been approved by the agency or official having jurisdiction.**
 - D. For a work zone detour where the additional traffic on the detour requires signalization of one or more intersections on the detour.**
- 11 **When a portable signal is functioning for a permanent signal, to avoid conflicts between the permanent and the portable signal face, the permanent signal faces shall be covered. The portable traffic signal shall be deactivated and removed immediately upon the permanent signal becoming operational.**
- 12 **Only portable traffic control signal models that have been tested and approved by the Indiana Department of Transportation shall be used upon the roadway.**

PART 6

TEMPORARY TRAFFIC CONTROL

CHAPTER 6A. GENERAL

Section 6A.01 General

Support:

- 01 Whenever the acronym “TTC” is used in Part 6, it refers to “temporary traffic control.”
- 01A Whenever the term “roadway” is used in Part 6, it may include the sidewalk or shoulder if present.

Standard:

- 02 **The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, or on a site roadway open to public travel (see definition in Section 1C.02), including persons with disabilities) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.**

Support:

- 03 When the normal function of the roadway, or a site roadway open to public travel, is suspended, TTC planning provides for continuity of the movement of motor vehicle, bicycle, and pedestrian traffic (including accessible passage); transit operations; and access (and accessibility) to property and utilities.
- 04 The primary function of TTC is to facilitate movement of road users through or around TTC zones while protecting road users, workers, responders to traffic incidents, and equipment.
- 05 Of equal importance to the public traveling through the TTC zone is the safety of workers performing the many varied tasks within the work space. TTC zones present constantly changing conditions that are unexpected by the road user. This creates an even higher degree of vulnerability for the workers and incident management responders on or near the roadway (see Section 6C.04). At the same time, the TTC zone provides for the efficient completion of whatever activity interrupted the normal use of the roadway.
- 06 Consideration for road user safety, worker and responder safety, and the efficiency of road user flow is an integral element of every TTC zone, from planning through completion. A concurrent objective of the TTC is the efficient construction and maintenance of the highway and the efficient resolution of traffic incidents.
- 07 No one set of TTC devices can satisfy all conditions for a given project or incident. At the same time, defining details that would be adequate to cover all applications is impractical. Instead, Part 6 displays typical applications that depict common applications of TTC devices. The TTC selected for each situation depends on the type of highway, road user conditions, the duration of operation, physical constraints, and the nearness of the work space or incident management activity to road users.
- 08 The TTC needs on low-volume and special purpose roads will sometimes be minimal, especially for **short durations and short-term stationary** durations and for lower-speed roads. The use of maintenance vehicle warning flashers, a limited number of signs, or a single flagger could be adequate for these situations, **but careful consideration should be given before eliminating any advance signage.**
- 09 Improved road user performance might be realized through a well-prepared public relations effort that covers the nature of the work, the time and duration of its execution, the anticipated effects upon road users, and possible alternate routes and modes of travel. Such programs have been found to result in a significant reduction in the number of road users traveling through the TTC zone, which reduces the possible number of conflicts.
- 10 Operational improvements might be realized by using intelligent transportation systems (ITS) in work zones. The use in work zones of ITS technology, such as portable camera systems, highway advisory radio, variable speed limits, ramp metering, traveler information, merge guidance, warning systems for vehicles exiting the work space, and queue detection information, is aimed at increasing safety for both workers and road users and helping to ensure a more efficient traffic flow. The use in work zones of ITS technologies has been found to be effective in providing traffic monitoring and management, data collection, and traveler information.

Standard:

- 11 **TTC plans and devices shall be the responsibility of the public body or official or the owners of site roadways open to public travel having jurisdiction for guiding road users.**

Guidance:

- 12 *There should be adequate statutory authority for the implementation and enforcement of needed road user regulations, parking controls, speed zoning, and the management of traffic incidents. Such statutes should provide sufficient flexibility in the application of TTC to meet the needs of changing conditions in the TTC zone.*

Support:

- ¹³ The provisions of Part 6 apply to both rural and urban areas. A rural highway is normally characterized by lower volumes, higher speeds, fewer turning conflicts, and less conflict with pedestrians or other vulnerable road users. An urban street is typically characterized by relatively low speeds, wide ranges of road user volumes, narrower roadway lanes, frequent intersections and driveways, significant vulnerable road user activity, and more businesses and houses.
- ¹⁴ The determination as to whether a particular facility at a particular time of day can be considered to be a high-volume roadway or can be considered to be a low-volume roadway is made by the public agency or official having jurisdiction.
- ¹⁵ Special plans preparation and coordination with transit, other highway agencies, law enforcement and other emergency units, utilities, schools, trucking associations, and railroad companies might be needed to reduce unexpected and unusual road user operation situations.

Section 6A.02 Fundamental Principles of Temporary Traffic Control*Guidance:*

- ⁰¹ *Road user and worker safety and accessibility in TTC zones should be an integral and high-priority element of every project from planning through design and construction. Similarly, maintenance and utility work should be planned and conducted with the safety and accessibility of all motorists, bicyclists, pedestrians (including those with disabilities), and workers being considered at all times. If the TTC zone includes a grade crossing, early coordination with the railroad company or light rail transit agency should take place.*
- ⁰² *The following are the seven fundamental principles of TTC:*
- A. General plans or guidelines should be developed to provide safety for motorists, bicyclists, pedestrians, workers, enforcement/emergency officials, and equipment, with the following factors being considered:*
 - 1. The basic safety principles governing the design of permanent roadways and roadsides should also govern the design of TTC zones. The goal should be to route road users through such zones using roadway geometrics, roadside features, and TTC devices as nearly as possible comparable to those for normal highway situations.*
 - 2. A TTC plan, in detail appropriate to the complexity of the work project or incident, should be prepared and understood by all responsible parties before the site is occupied. Any changes in the TTC plan should be approved by an official who is knowledgeable (for example, trained and/or certified) in proper TTC practices.*
 - 3. Construction access points should be located and designed to minimize impacts to traffic operations.*
 - B. Road user movement should be inhibited as little as practical, based on the following considerations:*
 - 1. TTC at work and incident sites should be designed on the assumption that drivers will only reduce their speeds if they clearly perceive a need to do so (see Section 6B.01).*
 - 2. Frequent and abrupt changes in geometrics such as lane narrowing, dropped lanes, or main roadway transitions that require rapid maneuvers, should be avoided.*
 - 3. Work should be scheduled in a manner that minimizes the need for lane closures or alternate routes, while still getting the work completed quickly and the lanes or roadway open to traffic as soon as possible.*
 - 4. Attempts should be made to reduce the volume of traffic using the roadway or freeway to match the restricted capacity conditions. Road users should be encouraged to use alternative routes. When the roadway capacity is reduced because of lane closures, the demand could exceed the available capacity, which might result in either a lengthy stopped or slow moving queue of vehicles that might extend past the normal location of the signs shown in the typical advance warning area. An assessment of the expected queue length, which should be a part of the TTC plan design process, might result in adjustments to the sign spacing and number of signs as well as the use of more conspicuous devices to increase the distance and conspicuity of the advance warning area. For high-volume roadways and freeways, the closure of selected entrance ramps or other access points and the use of signed diversion routes should be evaluated.*
 - 5. Bicyclists and pedestrians, including those with disabilities, should be provided with access and passage through the TTC zone.*
 - 6. If work operations permit, lane closures on high-volume streets and highways should be scheduled during off-peak hours. Night work should be considered if the work can be accomplished with a series of short-term operations.*
 - 7. Early coordination with officials having jurisdiction over the affected cross streets and providing emergency services should occur if significant impacts to roadway operations are anticipated.*

Section 6A.03 TTC Devices

Guidance:

- 01 *The design and application of TTC devices used in TTC zones should consider the needs of all road users (motorists, bicyclists, and pedestrians), including those with disabilities.*

Standard:

- 02 **Traffic control devices shall be defined as all signs, signals, markings, channelizing devices, or other devices that use colors, shapes, symbols, words, sounds, or tactile information for the primary purpose of communicating a regulatory, warning, or guidance message to road users on a street, highway, pedestrian facility, bikeway, pathway, or site roadway open to public travel.**
- 03 **All traffic control devices used for construction, maintenance, utility, or incident management operations on a street, highway, pedestrian facility, bikeway, pathway, or site roadway open to public travel shall comply with the applicable provisions of this Manual.**
- 04 **All TTC devices shall be removed as soon as practical when they are no longer needed. When work is suspended for short periods of time, TTC devices that are no longer appropriate shall be removed or covered.**

Section 6A.04 Crashworthiness of TTC Devices

Support:

- 01 Various Sections of the MUTCD require certain traffic control devices, their supports, and/or related appurtenances to be crashworthy (see definition in Section 1C.02). Such MUTCD crashworthiness provisions apply to all streets, highways, and site roadways open to public travel.

Section 6A.05 Night Work

Support:

- 01 Conducting highway construction and maintenance activities during night hours could provide an advantage when traditional daytime traffic control strategies cannot achieve an acceptable balance between worker and public safety, traffic and community impact, and constructability. The two basic advantages of working at night are reduced traffic congestion and less involvement with business activities. However, the two basic conditions that must normally be met for night work to offer any advantage are reduced traffic volumes and easy set up and removal of the traffic control patterns on a nightly basis.
- 02 Shifting work activities to night hours, when traffic volumes are lower and normal business is less active, might offer an advantage in some cases, as long as the necessary work can be completed and the worksite restored to essentially normal operating conditions to carry the higher traffic volume during non-construction hours.
- 03 Although working at night might offer advantages, it also includes safety issues. Reduced visibility inherent in night work impacts the performance of both drivers and workers. Because traffic volumes are lower and congestion is minimized, speeds are often higher at night necessitating greater visibility at a time when visibility is reduced. Finally, the incidence of impaired (alcohol or drugs), fatigued, or drowsy drivers might be higher at night.
- 04 Working at night also involves other factors, including construction productivity and quality, social impacts, economics, and environmental issues. A decision to perform construction or maintenance activities at night normally involves some consideration of the advantages to be gained compared to the safety and other issues that might be impacted.
- 05 Section 6N.18 contains specific provisions on TTC for work during nighttime hours. [See Section 6M.08 for information on lighting for night work.](#)

CHAPTER 6B. TEMPORARY TRAFFIC CONTROL ELEMENTS

Section 6B.01 Temporary Traffic Control Plans

Support:

- 01 Each TTC zone is different. Many variables, such as location of work, highway type, geometrics, vertical and horizontal alignment, intersections, interchanges, road user volumes, road user mix (motorists, bicyclists, and pedestrians), road vehicle mix (buses, trucks, and cars), and road user speeds affect the needs of each zone. The goal of TTC in work zones is safety with minimum disruption to road users. The key factor in promoting TTC zone safety is proper judgment.
- 02 A TTC plan describes TTC measures to be used for facilitating road users through a work zone or an incident area. TTC plans play a vital role in facilitating road user flow when a work zone, incident, or other event temporarily disrupts normal road user flow. Provisions that cannot conveniently be specified on project plans can easily be incorporated into Special Provisions within the TTC plan.
- 03 TTC plans range in scope from being very detailed to simply referencing typical drawings contained in this Manual, standard approved highway agency drawings and manuals, or specific drawings contained in the contract documents. The degree of detail in the TTC plan depends entirely on the nature and complexity of the situation.
- 04 During TTC activities, commercial vehicles might need to follow a different route from passenger vehicles because of bridge, weight, clearance, or geometric restrictions. Also, vehicles carrying hazardous materials might need to follow a different route from other vehicles. The Hazardous Materials and National Network signs are included in Sections 2B.67 and 2B.68, respectively.

Guidance:

- 05 *A TTC plan should be developed for planned activities that will affect road users. A TTC plan should be developed for unplanned and emergency situations where practicable.*
- 06 *The TTC plan should start in the planning phase and continue through the design, construction, and restoration phases. The TTC plans and devices should follow the principles set forth in Part 6. The management of traffic incidents should follow the principles set forth in Chapter 6O.*
- 06.A *The extent of details in the TTC plan should be commensurate with the needs of the project phase.*
- 07 *TTC plans should be prepared by persons knowledgeable (for example, trained and/or certified) about the fundamental principles of TTC and work activities to be performed. The design, selection, and placement of TTC devices for a TTC plan should be based on engineering judgment.*
- 08 *Coordination should be made between adjacent or overlapping projects to check that duplicate signing is not used and to check compatibility of traffic control between adjacent or overlapping projects.*
- 09 *Traffic control planning should be completed for all highway construction, utility work, maintenance operations, and incident management including minor maintenance and utility projects prior to occupying the TTC zone. Planning for all road users should be included in the process.*
- 10 *For any planned special event that will have an impact on the traffic on any street or highway, a TTC plan should be developed in conjunction with and be approved by the agency or agencies that have jurisdiction over the affected roadways.*
- 11 *Provisions for effective continuity of accessible circulation paths for pedestrians should be incorporated into the TTC plan.*

Option:

- 12 Provisions may be incorporated into the project bid documents that enable contractors to develop an alternate TTC plan, with any changes communicated back to the project stakeholders that developed the original plan.
- 13 Modifications of TTC plans may be necessary because of changed conditions or a determination of better methods of safely and efficiently handling road users.

Guidance:

- 14 *This alternate or modified plan should have the approval of the responsible highway agency or owner of site roadways open to public travel prior to implementation.*
- 15 *Provisions for effective continuity of transit service should be incorporated into the TTC planning process because often public transit buses cannot efficiently be detoured in the same manner as other vehicles (particularly for short-term maintenance projects). Where applicable, the TTC plan should provide for features such as accessible temporary bus stops, pull-outs, and satisfactory waiting areas for transit patrons, including persons with disabilities (see Section 8A.13 for additional light rail transit issues to consider for TTC).*
- 16 *Provisions for effective continuity of railroad service and acceptable access to abutting property owners and businesses should also be incorporated into the TTC planning process.*

Section 6B.03 Components of Temporary Traffic Control Zones

Support:

- 01 A TTC zone is often divided into four areas as needed, based on engineering judgment: the advance warning area, the transition area, the activity area, and the termination area. Figure 6B-1 illustrates the four areas typically included in a TTC zone. These four areas are described in Sections 6B.04 through 6B.07.

Section 6B.04 Advance Warning Area

Support:

- 01 The advance warning area is the section of highway where road users are informed about the upcoming transition and activity areas or incident area.

Option:

- 02 The advance warning area may vary from a single sign or high-intensity rotating, flashing, oscillating, or strobe lights on a vehicle to a series of signs in advance of the TTC zone activity area.

Guidance:

- 03 *Typical distances for placement of advance warning signs on freeways and expressways should be longer because drivers are conditioned to uninterrupted flow. Therefore, the advance warning sign placement should extend on these facilities as far as ½ mile or more.*
- 04 *On urban streets, the effective placement of the nearest warning sign to the TTC zone, in feet, should range from 4 to 8 times the speed limit in mph, with the high end of the range being used when speeds are relatively high. When two or more advance warning signs are used on higher-speed streets, such as major arterials, the advance warning area should extend a greater distance (see Table 6B-1).*

Option:

- 05 When a single advance warning sign is used (in cases such as low-speed residential streets), the advance warning area may be as short as 100 feet.

Guidance:

- 06 *Since rural highways are normally characterized by higher speeds, the effective placement of the first warning sign in feet should be substantially longer—from 8 to 12 times the speed limit in mph. Since two or more advance warning signs are normally used for these conditions, the advance warning area should extend 1,500 feet or more for open highway conditions (see Table 6B-1).*
- 07 *The distances contained in Table 6B-1 are approximate, are intended for guidance purposes only, and should be applied with engineering judgment. These distances should be adjusted for field conditions, if necessary, by increasing or decreasing the recommended distances.*

Support:

- 08 The need to provide additional reaction time for a condition is one example of justification for increasing the sign spacing. Conversely, decreasing the sign spacing might be justified in order to place a sign immediately downstream of an intersection or major driveway such that traffic turning onto the roadway in the direction of the TTC zone will be warned of the upcoming condition.

Option:

- 09 Advance warning may be eliminated when the activity area is sufficiently removed from the road users' path so that it does not interfere with the normal flow.

Section 6B.05 Transition Area

Support:

- 01 The transition area is that section of highway where road users are redirected out of their normal path. Transition areas usually involve strategic use of tapers, which because of their importance are discussed separately in detail.

Standard:

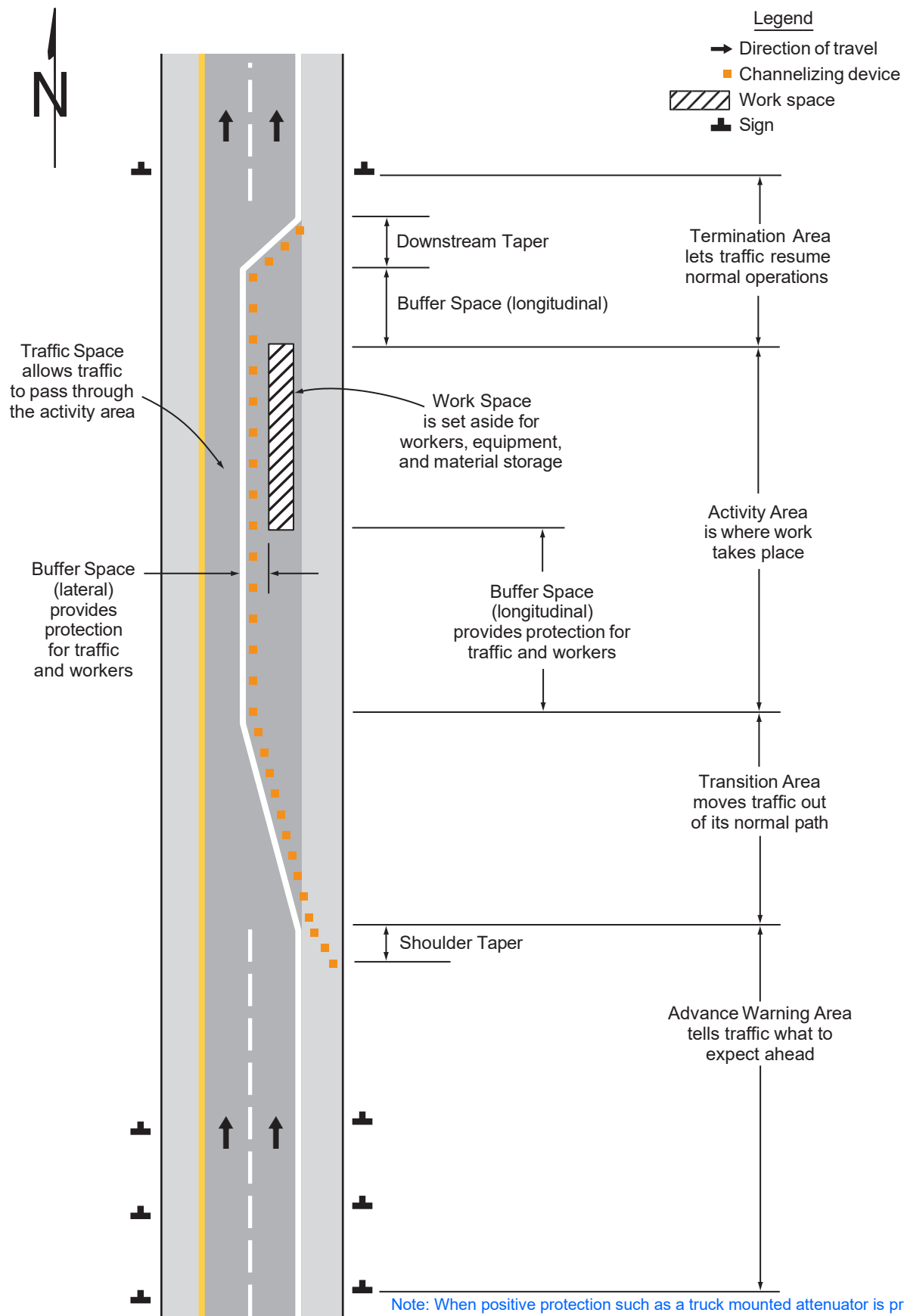
- 02 **Except for mobile operations, when redirection of the road users' normal path is required, road users shall be directed from the normal path to a new path with appropriate channelizing devices, traffic control devices, and/or TTC methods.**

Option:

- 03 Because it is impracticable in mobile operations to redirect the road users' normal path with stationary channelization, more dominant vehicle-mounted traffic control devices, such as arrow boards, portable changeable message signs, and high-intensity rotating, flashing, oscillating, or strobe lights, may be used instead of channelizing devices to establish a transition area, [see Figures 6P-17 and 6P-35](#).

Support:

- 04 [For complex transition areas such as temporary crossovers on high speed, high-volume routes, due to the extra burden on the motorist to perform complex maneuvers, additional advance messaging and delineation of lanes and barriers going into, through and coming out of transition areas may be provided.](#)

Figure 6B-1. Component Parts of a Temporary Traffic Control Zone

Note: When positive protection such as a truck mounted attenuator is provided, the longitudinal buffer space location will need to be adjusted. See the typical applications in Chapter 6P for additional information.

Support:

- 07 The most desirable way to provide information to pedestrians with vision disabilities that is equivalent to visual signing for notification of sidewalk closures is a speech message provided by an audible information device. Devices that provide speech messages in response to passive pedestrian actuation are the most desirable. Other devices that continuously emit a message, or that emit a message in response to use of a pushbutton, are also acceptable. Audible information devices might not be needed if detectable channelizing devices make an alternate route of travel evident to pedestrians with vision disabilities.

Guidance:

- 08 *If a pushbutton is used to provide equivalent TTC information to pedestrians with vision disabilities, the pushbutton should be equipped with a locator tone to notify pedestrians with vision disabilities that a special accommodation is available, and to help them locate the pushbutton.*

Section 6C.04 Worker Safety Considerations**Support:**

- 01 Equally as important as the safety of road users traveling through the TTC zone is the safety of workers. TTC zones present temporary and constantly changing conditions that are unexpected by road users. This creates an even higher degree of vulnerability for workers on or near the roadway.
- 02 Maintaining TTC zones with road user flow inhibited as little as possible, and using TTC devices that get the road users' attention and provide positive direction are of particular importance. Likewise, equipment and vehicles moving within the activity area create a risk to workers on foot. When possible, the separation of moving equipment and construction vehicles from workers on foot provides the operators of these vehicles with a greater separation clearance and improved sight lines to minimize exposure to the hazards of moving vehicles and equipment.

Guidance:

- 03 *The following are the key elements of worker safety and TTC management that should be considered to improve worker safety:*
- A. *Training—all workers should be trained on how to work next to motor vehicle traffic in ways that minimize their vulnerability. Workers having specific TTC responsibilities should be trained in TTC techniques, device usage, and placement.*
 - B. *Temporary Traffic Barriers—temporary traffic barriers should be placed along the work space depending on factors such as lateral clearance of workers from adjacent traffic, speed of traffic, duration and type of operations, time of day, and volume of traffic.*
 - C. *Speed Management—reducing the speed of vehicular traffic, mainly through regulatory speed zoning, funneling, lane reduction, and/or the use of speed safety cameras, uniformed law enforcement officers, or flaggers should be considered.*
 - D. *Activity Area—operations entering and departing the work space, and within the work space, should be planned to minimize backing maneuvers by construction vehicles and equipment to minimize the risk of run-over and back-over crashes.*
 - E. *Worker Safety Planning—a trained person designated by the employer should conduct a basic hazard assessment for the worksite and job classifications required in the activity area. This safety professional should determine whether engineering, administrative, or personal protection measures should be implemented. This plan should be in accordance with the Occupational Safety and Health Act of 1970, as amended, "General Duty Clause" Section 5(a)(1) - Public Law 91-596, 84 Stat. 1590, December 29, 1970, as amended, and with the requirement to assess worker risk exposures for each job site and job classification, as per 29 CFR 1926.20 (b)(2) of "Occupational Safety and Health Administration Regulations, General Safety and Health Provisions."*

Option:

- 04 The following are additional elements of TTC management that may be considered to improve worker safety:
- A. **Shadow Vehicle**—in the case of mobile and constantly moving operations, such as pothole patching and striping operations, a shadow vehicle, equipped with appropriate lights and warning signs, may be used to protect the workers from impacts by errant vehicles. The shadow vehicle may be equipped with a rear-mounted impact attenuator.
 - B. **Road Closure**—if alternate routes are available to handle road users, the road may be closed temporarily to facilitate project completion and thus further reduce worker vulnerability.
 - C. **Law Enforcement Use**—in highly vulnerable work situations, particularly those of relatively short-duration, law enforcement units may be **utilized** to heighten the awareness of passing vehicular traffic and to improve safety through the TTC zone.
 - D. **Lighting**—for nighttime work, the TTC zone and approaches may be lighted.

CHAPTER 6F. TEMPORARY TRAFFIC CONTROL ZONE SIGNS – GENERAL

Section 6F.01 General Characteristics of TTC Zone Signs

Support:

- 01 TTC zone signs convey both general and specific messages by means of words, symbols, and/or arrows and have the same three categories as all road user signs: regulatory, warning, and guide.

Option:

- 02 Where the color orange is required, the fluorescent orange color may also be used.

Support:

- 03 The fluorescent version of orange provides higher conspicuity than standard orange, especially during twilight.

Option:

- 04 Standard orange flags, flashing beacons, and/or flashing warning lights may be used in conjunction with signs.

Standard:

- 05 **When standard orange flags, flashing beacons, and/or flashing warning lights are used in conjunction with a sign, they shall not block the sign face.**

- 06 **Except as provided in Section 2A.07, the sizes for TTC signs and plaques shall be as shown in Tables 6G-1, 6H-1, and 6I-1. The sizes in the minimum column shall only be used on low-volume rural roads, local streets, or roadways where the operating speed is 30 mph or less.**

Option:

- 07 The dimensions of signs and plaques shown in Tables 6G-1, 6H-1, and 6I-1 may be increased wherever necessary for greater legibility or emphasis.

Support:

- 07A When use of larger size signs and plaques is being considered, the crashworthiness of the support system for the signs and plaques should also be considered- adjustments may be needed to accommodate the larger sign area.

Guidance:

- 08 *Deviations from standard sizes as prescribed in this Manual should be in 6-inch increments.*

Support:

- 09 Sign design details are contained in the “Standard Highway Signs” publication (see Section 1A.05).

- 10 Section 2A.04 contains additional information regarding the design of signs, including an Option allowing the development of special word message signs if a standard word message or symbol sign is not available to convey the necessary regulatory, warning, or guidance information.

Standard:

- 11 **All signs used at night shall be either retroreflective or illuminated to show the same shape and similar color both day and night.**

- 12 **The requirement for sign illumination shall not be considered to be satisfied by street, highway, or strobe lighting.**

Option:

- 13 Sign illumination may be either internal or external.

- 14 Signs may be made of rigid or flexible material.

Section 6F.02 Sign Placement

Guidance:

- 01 *Signs should be located on the right-hand side of the roadway unless otherwise provided in this Manual.*

Option:

- 02 Where special emphasis is needed, signs may be placed on both the left-hand and right-hand sides of the roadway. Signs mounted on portable supports may be placed within the roadway itself. Signs may also be mounted on or above barricades.

Support:

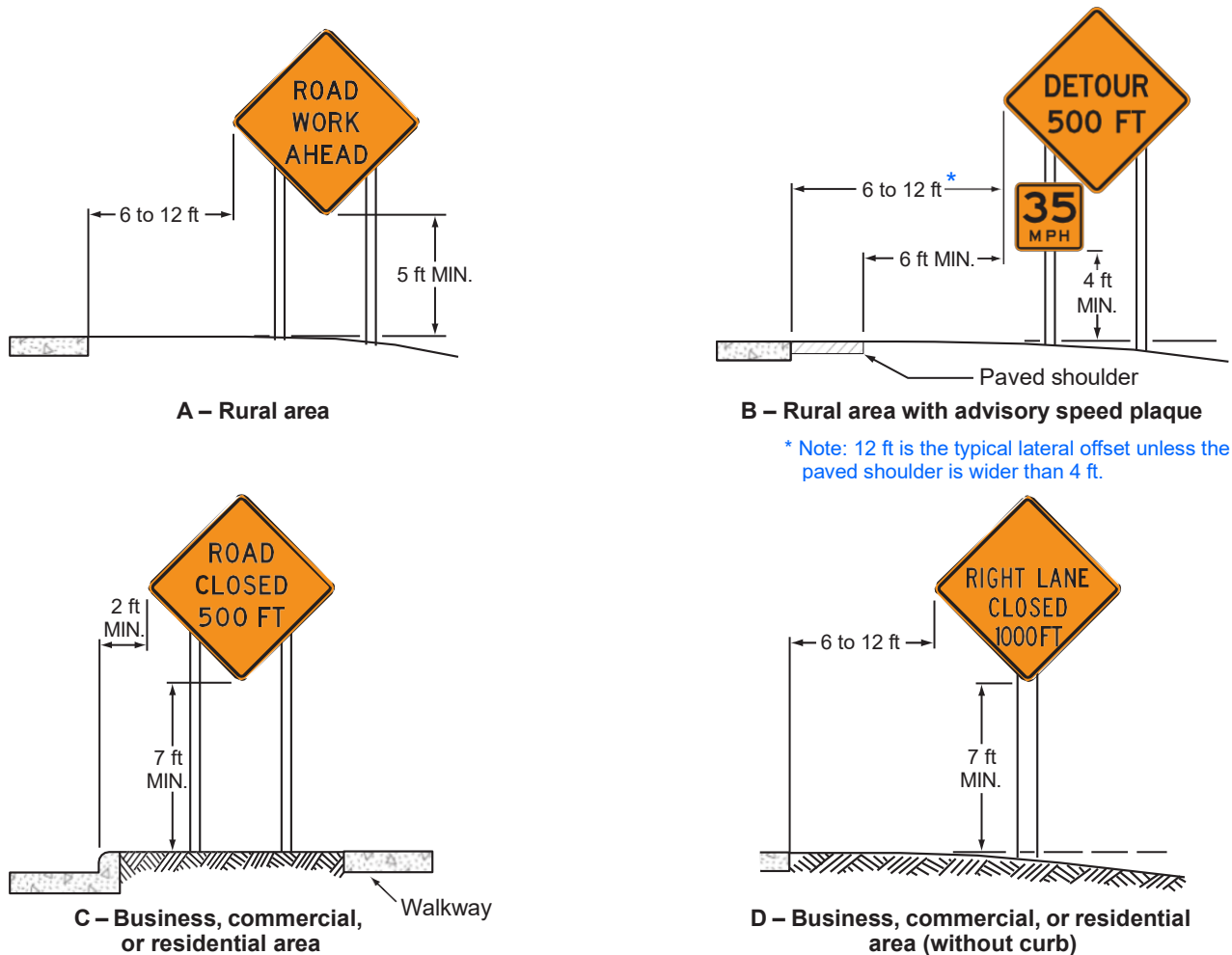
- 03 The provisions of this Section regarding mounting height apply unless otherwise provided for a particular sign elsewhere in this Manual.

Standard:

- 04 **The minimum height, measured vertically from the bottom of the sign to the elevation of the near edge of the pavement, of signs installed at the side of the road in rural areas shall be 5 feet (see Figure 6F-1).**

- 05 The minimum height, measured vertically from the bottom of the sign to the top of the curb, or in the absence of curb, measured vertically from the bottom of the sign to the elevation of the near edge of the traveled way, of signs installed at the side of the road in business, commercial, or residential areas where parking or pedestrian movements are likely to occur, or where the view of the sign might be obstructed, shall be 7 feet (see Figure 6F-1).
- 06 The minimum height, measured vertically from the bottom of the sign to the sidewalk, of signs installed above sidewalks shall be 7 feet.
- 07 The bottom of a sign mounted on a barricade, or other portable support, shall be at least 1 foot above the traveled way.
- Option:
- 08 The height to the bottom of a secondary sign mounted below another sign may be 1 foot less than the height provided in Paragraphs 4 through 6 of this Section.
- Guidance:
- 09 Neither portable nor permanent sign supports should be located on sidewalks, bicycle facilities, or areas designated for pedestrians or bicyclists.
- Standard:
- 10 Signs shall be mounted and placed in accordance with Section 307 of the U.S. Department of Justice 2010 ADA Standards for Accessible Design, September 15, 2010, 28 CFR 35 and 36, Americans with Disabilities Act of 1990.
- Guidance:
- 11 Except as provided in Paragraph 12 of this Section, signs mounted on portable sign supports that do not meet the minimum mounting heights provided in Part 2 should not be used for a duration of more than 7 days.

Figure 6F-1. Height and Lateral Location of Signs—Typical Installations



CHAPTER 6G. TTC ZONE REGULATORY SIGNS

Section 6G.01 Regulatory Sign Authority

Support:

- 01 Regulatory signs such as those shown in Figure 6G-1 inform road users of traffic laws or regulations and indicate the applicability of legal requirements that would not otherwise be apparent.

Standard:

- 02 Regulatory signs shall be authorized by the public agency or official having jurisdiction and shall conform with Chapter 2B.

Section 6G.02 Regulatory Sign Design and Size

Standard:

- 01 TTC regulatory signs shall comply with the Standards for regulatory signs presented in Part 2 and in the FHWA's "Standard Highway Signs" publication (see Section 1A.05).
- 02 The sizes for TTC regulatory signs shall be as shown in Table 6G-1.

Support:

- 03 See Section 2A.07 for information on the applicability of the minimum dimensions for sign sizes.

Section 6G.03 Regulatory Sign Applications

Standard:

- 01 If a TTC zone requires regulatory measures different from those existing, the existing permanent regulatory devices shall be removed or covered and superseded by the appropriate temporary regulatory signs. This change shall be made in compliance with applicable ordinances or statutes of the jurisdiction.

Section 6G.04 Road Closed Signs (R11-2 Series)

Guidance:

- 01 The ROAD CLOSED (R11-2) sign (see Figure 6G-1) should be used when the roadway is closed to all road users except contractors' equipment or officially authorized vehicles. The R11-2 sign should be accompanied by appropriate warning and detour signing.

Option:

- 02 STREET CLOSED (R11-2a), BRIDGE OUT (R11-2b), or PATH CLOSED (R11-2c) signs may be substituted for Road Closed signs where applicable.

Guidance:

- 03 Road Closed signs should be installed at or near the center of the roadway on or above a Type 3 Barricade that closes the roadway (see Section 6K.07).

Standard:

- 04 Road Closed signs shall not be used where road user flow is maintained through the TTC zone with a reduced number of lanes on the existing roadway or where the actual closure is some distance beyond the sign.

Section 6G.05 Local Traffic Only Signs (R11-3 Series and R11-4)

Guidance:

- 01 The Local Traffic Only signs (see Figure 6G-1) should be used where road user flow detours to avoid a closure some distance beyond the sign, but where local road users can use the roadway to the point of closure. These signs should be accompanied by appropriate warning and detour signing.
- 02 In rural applications, the Local Traffic Only sign should have the legend ROAD CLOSED XX MILES AHEAD, LOCAL TRAFFIC ONLY (R11-3).

Option:

- 03 A ROAD (STREET) CLOSED TO THRU TRAFFIC (R11-4) sign or the legend ROAD CLOSED, LOCAL TRAFFIC ONLY may be used.

- 04 A word message that includes the name of an intersecting street name or well-known destination may be substituted for the words XX MILES AHEAD on the R11-3 sign where applicable.

- 04A In urban areas, the Local Traffic Only sign may have the legend ROAD CLOSED XX MILES AHEAD, LOCAL TRAFFIC ONLY (R11-3).

- 05 A STREET CLOSED (R11-3a) or BRIDGE OUT (R11-3b) sign may be substituted for an R11-3 sign, where applicable.

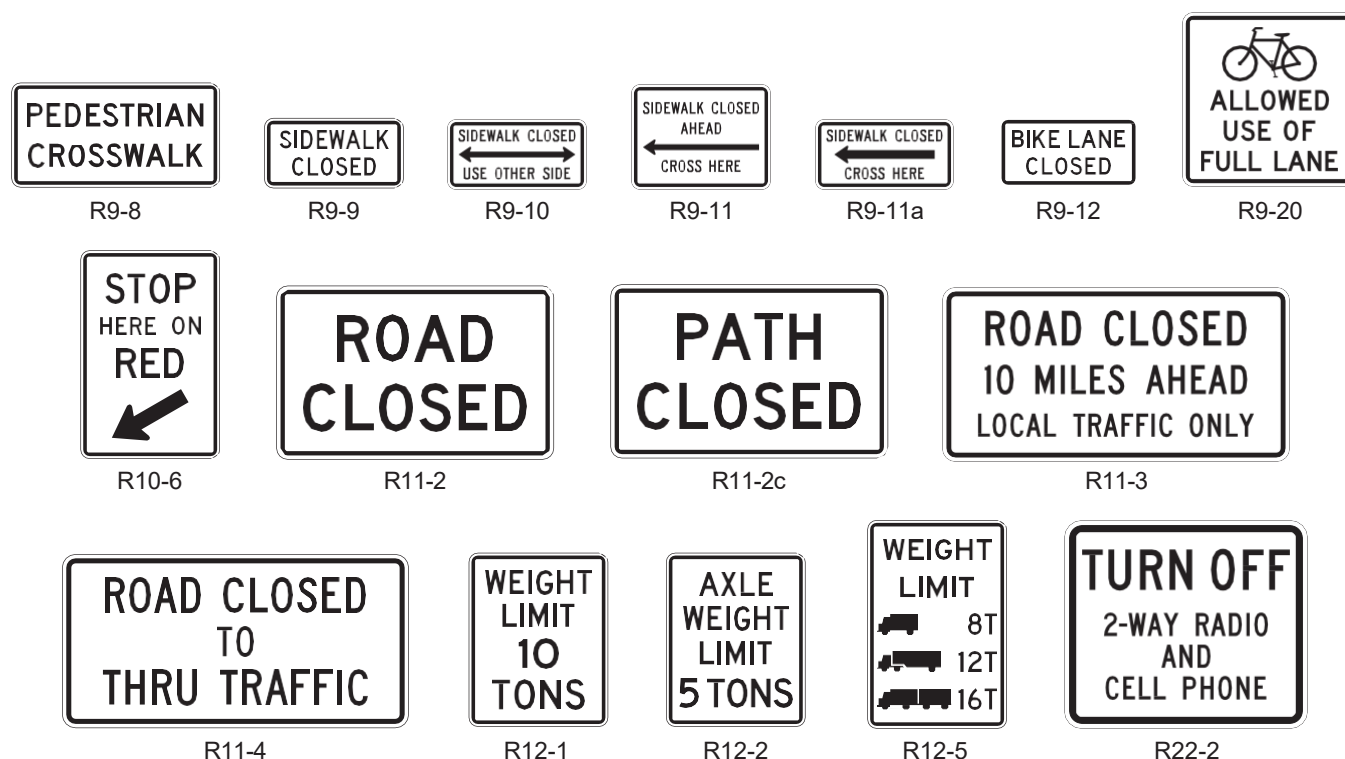
- 06 The words BRIDGE OUT, BRIDGE CLOSED, or STREET CLOSED may be substituted for the words ROAD CLOSED on the R11-4 sign where applicable.

Figure 6G-1. Regulatory Signs and Plaques
in Temporary Traffic Control Zones (Sheet 1 of 2)



Note: See Chapter 2B for information on the application of these signs.

**Figure 6G-1. Regulatory Signs and Plaques
in Temporary Traffic Control Zones (Sheet 2 of 2)**



Note: See Chapter 2B for information on the application of these signs.

Section 6G.06 Weight Limit Signs (R12-1, R12-2, and R12-5)

Standard:

- 01 A Weight Limit sign (see Figure 6G-1), which shows the gross weight or axle weight that is permitted on the roadway or bridge, shall be consistent with State or local regulations and shall not be installed without the approval of the authority having jurisdiction over the highway.
- 02 When weight restrictions are imposed because of the activity in a TTC zone, a marked detour shall be provided for vehicles weighing more than the posted limit.

Section 6G.07 STAY IN LANE Signs (R4-9 and R4-9a)

Option:

- 01 A STAY IN LANE (R4-9) sign (see Figure 6G-1) may be used where a multi-lane shift has been incorporated as part of the TTC on a highway to direct road users around road work that occupies part of the roadway on a multi-lane highway.

Guidance:

- 02 A STAY IN LANE TO MERGE POINT (R4-9a) sign (see Figure 6G-1) should be used during late merge operations (see Section 6N.19) to direct traffic to use all available lanes until the merge point is reached.

Section 6G.08 Work Zone and Higher Fines Signs and Plaques

Option:

- 01 A WORK ZONE (G20-5aP) or WORKSITE (XG20-5P) plaque (see Figure 6G-1) may be mounted above a Speed Limit sign to emphasize that a reduced speed limit is in effect within a TTC zone. An END WORK ZONE SPEED LIMIT (R2-12) sign (see Figure 6G-1) may be installed at the downstream end of the reduced speed limit zone.

Guidance:

- 02 A BEGIN HIGHER FINES ZONE (R2-10) sign (see Figure 6G-1) should be installed at or near the beginning of a TTC zone where increased fines are imposed for traffic violations, and an END HIGHER FINES ZONE (R2-11) sign (see Figure 6G-1) should be installed at or near the downstream end of the TTC zone.

Table 6G-1. Temporary Traffic Control Zone Regulatory Sign and Plaque Sizes

Sign or Plaque	Sign Designation	Section	Conventional Road	Freeway or Expressway	Minimum
Stop	R1-1	6G.02	30 x 30*	—	—
Stop (on Stop/Slow Paddle)	R1-1	6D.02	18 x 18	—	—
Yield	R1-2	6G.02	36 x 36 x 36*	—	30 x 30 x 30
To Oncoming Traffic (plaque)	R1-2aP	6G.02	36 x 30	48 x 36	24 x 18
Wait on Stop	R1-7	6L.03	24 x 30	24 x 30	—
Wait on Stop - Go on Slow	R1-7a	6G.03	30 x 36	30 x 36	—
Go on Slow	R1-8	6L.03	24 x 30	24 x 30	—
Speed Limit	R2-1	6G.08	24 x 30*	36 x 48	—
Fines Higher (plaque)	R2-6P	6G.08	24 x 18	36 x 24	—
Fines Double (plaque)	R2-6aP	6G.08	24 x 18	36 x 24	—
\$XX Fine (plaque)	R2-6bP	6G.08	24 x 18	36 x 24	—
Begin Higher Fines Zone	R2-10	6G.08	24 x 30	36 x 48	—
End Higher Fines Zone	R2-11	6G.08	24 x 30	36 x 48	—
End Work Zone Speed Limit	R2-12	6G.08	24 x 36	36 x 54	—
Movement Prohibition	R3-1,2,3,4	6G.02	24 x 24*	36 x 36	—
Mandatory Movement Lane Control - Turn Only	R3-5	6G.02	30 x 36	—	—
Optional Movement Lane Control - Thru and Turn	R3-6	6G.02	30 x 36	—	—
Right (Left) Lane Must Turn Right (Left)	R3-7	6G.02	30 x 30*	—	—
Advance Intersection Lane Control (2 lanes)	R3-8	6G.02	30 x 30	—	—
Movement Prohibition - No U or Left Turn	R3-18	6G.02	24 x 24*	36 x 36	—
Movement Prohibition - No Straight Through	R3-27	6G.02	24 x 24*	36 x 36	—
Do Not Pass	R4-1	6G.02	24 x 30	36 x 48	—
Pass With Care	R4-2	6G.02	24 x 30	36 x 48	—
Keep Right	R4-7	6G.02	24 x 30	36 x 48	—
Narrow Keep Right	R4-7c	6G.02	18 x 30	—	—
Stay in Lane	R4-9	6G.07	24 x 30	36 x 48	—
Stay In Lane To Merge Point	R4-9a	6G.07	36 x 48	36 x 48	—
Do Not Enter	R5-1	6G.02	30 x 30*	36 x 36	—
Wrong Way	R5-1a	6G.02	36 x 24*	42 x 30	—
One Way	R6-1	6G.02	36 x 12*	48 x 18	—
One Way	R6-2	6G.02	24 x 30*	36 x 48	—
No Parking (symbol)	R8-3	6G.02	24 x 24*	36 x 36	—
Pedestrian Crosswalk	R9-8	6G.09	36 x 18	—	—
Sidewalk Closed	R9-9	6G.10	24 x 12	—	—
Sidewalk Closed, Use Other Side	R9-10	6G.10	24 x 12	—	—
Sidewalk Closed Ahead, Cross Here	R9-11	6G.10	24 x 18	—	—
Sidewalk Closed, Cross Here	R9-11a	6G.10	24 x 12	—	—
Bike Lane Closed	R9-12	6P.01	24 x 12	—	—
Stop Here on Red	R10-6	6L.04	24 x 36	—	—
Road Closed	R11-2, 2a, 2b, 2c	6G.04	48 x 30	—	—
Road Closed - Local Traffic Only	R11-3, 3a, 3b, 4	6G.05	60 x 30	—	—
Weight Limit	R12-1, 2	6G.06	24 x 30	36 x 48	—
Weight Limit	R12-5	6G.06	24 x 36	36 x 48	—
Turn Off 2-Way Radio and Cell Phone	R22-2	6G.11	42 x 36	42 x 36	—
Work Zone (plaque)	G20-5aP	6G.08	24 x 18	30 x 24	—
Worksite (plaque)	XG20-5P	6G.08	48 x 16	78 x 24	48 x 16
Speeding Max \$1000 Reckless Driving Max 6 Yrs	R2-Y6	6G.12	78 x 42	78 x 42	60 x 36
Speeding Max \$1000	R2-Y6a	6G.12	36 x 18	48 x 24	36 x 18
Reckless Driving Max 6 Yrs	R2-Y6b	6G.12	36 x 24	48 x 30	36 x 24

* See Table 2B-1 for minimum size required for signs facing traffic on multi-lane conventional roads Notes:

1. Larger signs may be used wherever necessary for greater legibility or emphasis
2. Dimensions are shown in inches and are shown as width x height
3. See Section 2A.07 for information on the applicability of the minimum dimensions for sign sizes

Option:

- 03 Alternate legends such as BEGIN (or END) DOUBLE FINES ZONE may also be used for the R2-10 and R2-11 signs.
- 04 A FINES HIGHER, FINES DOUBLE, or \$XX FINE plaque (see Section 2B.25 and Figure 6G-1) may be mounted below the Speed Limit sign if increased fines are imposed for traffic violations within the TTC zone.
- 05 Individual signs and plaques for work zone speed limits and higher fines may be combined into a single sign or may be displayed as an assembly of signs and plaques.

Section 6G.09 PEDESTRIAN CROSSWALK Sign (R9-8)

Option:

- 01 The PEDESTRIAN CROSSWALK (R9-8) sign (see Figure 6G-1) may be used to indicate where a temporary crosswalk has been established.

Standard:

- 02 **If a temporary crosswalk is established, it shall be accessible to pedestrians with disabilities in accordance with Section 6C.03.**

Section 6G.10 SIDEWALK CLOSED Signs (R9-9, R9-10, R9-11, and R9-11a)

Guidance:

- 01 *SIDEWALK CLOSED signs (see Figure 6G-1) should be used where pedestrian flow is restricted. Bicyclist/ Pedestrian Detour (M4-9a) signs or Pedestrian Detour (M4-9b) signs should be used where pedestrian flow is rerouted (see Section 6I.02).*
- 02 *The SIDEWALK CLOSED (R9-9) sign should be installed at the beginning of the closed sidewalk, at the intersections preceding the closed sidewalk, and elsewhere along the closed sidewalk as needed.*
- 03 *The SIDEWALK CLOSED, (ARROW) USE OTHER SIDE (R9-10) sign should be installed at the beginning of the restricted sidewalk when a parallel sidewalk exists on the other side of the roadway.*
- 04 *The SIDEWALK CLOSED AHEAD, (ARROW) CROSS HERE (R9-11) sign should be used to indicate to pedestrians that sidewalks beyond the sign are closed and to direct them to open crosswalks, sidewalks, or other travel paths.*
- 05 *The SIDEWALK CLOSED, (ARROW) CROSS HERE (R9-11a) sign should be installed just beyond the point to which pedestrians are being redirected.*

Support:

- 06 These signs are typically mounted on a detectable barricade to encourage compliance and to communicate with pedestrians that the sidewalk is closed. Printed signs are not useful to many pedestrians with vision disabilities. A barrier or barricade detectable by a person with a vision disability is sufficient to indicate that a sidewalk is closed. If the barrier is continuous with detectable channelizing devices for an alternate route, accessible signing might not be necessary.

Section 6G.11 TURN OFF 2-WAY RADIO AND CELL PHONE Sign (R22-2)

Standard:

- 01 **The TURN OFF 2-WAY RADIO AND CELL PHONE (R22-2) sign (see Figure 6G-1) shall be used to require road users to turn off mobile radio transmitters and cellular telephones where blasting operations occur.**

Support:

- 02 Section 6H.25 contains information about the full sequence of signs for blasting zones and the specific requirements for location of this regulatory sign.

Section 6G.12 Other Regulatory Signs

Option:

- 01 Regulatory word message signs other than those classified and specified in this Manual and the “Standard Highways Signs” publication (see Section 1A.05) may be developed and used based on engineering judgment to aid the enforcement of other laws or regulations in TTC zones.

Guidance:

- 02 *Special regulatory signs should comply with the general requirements of color, shape, and alphabet size and series. The sign message should be brief, legible, and clear.*

Standard:

- 03 **To inform drivers of potentially increased penalties for speeding and reckless driving sign R2-Y6, or signs R2-Y6a and R2-Y6b shall be posted on a highway work zone by: the Indiana Department of Transportation; a political subdivision; or a contractor of either that is working at the highway work zone ahead of the first Road Work/Construction warning sign distance C (see Table 6B-1).**
- 04 **Signs XW2-6a and XW2-6b shall only be used in series where the right-of-way does not accommodate the larger signs or for moving operations where construction signs are set and removed daily for changing work locations.**
- 05 **Signs XW2-6, XW2-6a, and XW2-6b are not required for work zones of a short duration.**
- 06 **A Worksite (XG20-5P) plaque shall be mounted on top of the R2-Y6, R2-Y6a, or R2-Y6b sign.**

CHAPTER 6H. TTC ZONE WARNING SIGNS

Section 6H.01 Warning Sign Function, Design, and Application

Support:

- 01 TTC zone warning signs (see Figure 6H-1) notify road users of specific situations or conditions on or adjacent to a roadway that might not otherwise be apparent.

Standard:

- 02 TTC warning signs shall comply with the Standards for warning signs presented in Part 2 and in the FHWA's "Standard Highway Signs" publication (see Section 1A.05).
- 03 The sizes for TTC warning signs shall be as shown in Table 6H-1.

Support:

- 03A See Section 2A.07 for information on the applicability of the minimum dimensions for sign sizes.

Standard:

- 04 Except as provided in Paragraphs 5 through 9 of this Section, TTC warning signs shall be diamond-shaped with a black legend and border on an orange background, except for the Grade Crossing Advance Warning (W10-1) sign, which shall have a black legend and border on a yellow background.

Option:

- 05 Warning signs that are required or recommended in Parts 2 or 7 to have a fluorescent yellow-green background may have that color background in TTC zones.
- 06 Existing warning signs with a yellow background that are still applicable may remain in place.
- 07 Warning signs used for TTC incident management situations may have a black legend and border on a fluorescent pink background.
- 08 Mounting or space considerations may justify a change from the standard diamond shape to a rectangular shape.
- 09 In emergencies, available warning signs having yellow backgrounds may be used if signs with orange or fluorescent pink backgrounds are not at hand.

Guidance:

- 10 Where roadway or road user conditions require greater emphasis, larger than standard size warning signs should be used, with the symbol or legend enlarged approximately in proportion to the outside dimensions.
- 11 Where any part of the roadway is obstructed or closed by work activities or incidents, advance warning signs should be installed to alert road users well in advance of these obstructions or restrictions.
- 12 Where road users include pedestrians, the provision of supplemental audible information or detectable barriers or barricades should be provided for people with vision disabilities.

Support:

- 13 Detectable barriers or barricades communicate very clearly to pedestrians who have vision disabilities that they can no longer proceed in the direction that they are traveling.

Option:

- 14 Advance warning signs may be used singly or in combination.
- 15 Where distances are not displayed on warning signs as part of the message, a supplemental plaque with the distance legend may be mounted immediately below the sign on the same support.

Section 6H.02 Position of Advance Warning Signs

Guidance:

- 01 Where highway conditions permit, warning signs should be placed in advance of the transition and activity areas at varying distances depending on roadway type, condition, and posted speed. Table 6B-1 contains information regarding the spacing of advance warning signs. Where a series of two or more advance warning signs is used, the closest sign to the transition and activity areas should be placed approximately 100 feet for low-speed urban streets to 1,000 feet or more for freeways and expressways.
- 02 Where multiple advance warning signs are needed on the approach to a transition and activity area, the ROAD WORK AHEAD (W20-1) sign should be the first advance warning sign encountered by road users.

Support:

- 03 Various conditions, such as limited sight distance or obstructions that might require a driver to reduce speed or stop, might require additional advance warning signs.

Option:

- 04 As an alternative to a specific distance on advance warning signs, the word AHEAD may be used.

Table 6H-1. Temporary Traffic Control Zone Warning Sign and Plaque Sizes (Sheet 2 of 2)

Sign or Plaque	Sign Designation	Section	Conventional Road	Freeway or Expressway	Minimum
Bicycles Merging	W9-5a	6P.01	30 x 30	—	18 x 18
Grade Crossing Advance Warning	W10-1	6H.01	36 dia.	48 Dia.	—
Truck	W11-10	6H.21	36 x 36	48 x 48	24 x 24
Double Arrow	W12-1	6H.01	30 x 30	36 x 36	—
Low Clearance	W12-2	6H.01	36 x 36	48 x 48	30 x 30
Advisory Speed (plaque)	W13-1P	6H.32	18 x 18	24 x 24	18 x 18
On Ramp (plaque)	W13-4P	6H.09	36 x 36	36 x 36	—
No Passing Zone (pennant)	W14-3	6H.01	48 x 48 x 36	64 x 64 x 48	40 x 40 x 30
XX Feet (2-line plaque)	W16-2P	6H.01	24 x 18	30 x 24	—
Road Work (with distance)	W20-1	6H.03	36 x 36	48 x 48	30 x 30
Path Work (with distance)	W20-1b	6P.01	36 x 36	—	30 x 30
Detour (with distance)	W20-2	6H.04	36 x 36	48 x 48	30 x 30
Bike Detour (with distance)	W20-2a	6P.01	36 x 36	—	30 x 30
Bike Diversion (with distance)	W20-2b	6P.01	36 x 36	—	30 x 30
Road Closed (with distance)	W20-3	6H.05	36 x 36	48 x 48	30 x 30
Path Closed (with distance)	W20-3a	6P.01	36 x 36	—	30 x 30
One Lane Road (with distance)	W20-4	6H.06	36 x 36	48 x 48	30 x 30
Lane(s) Closed (with distance)	W20-5,5a	6H.07	36 x 36	48 x 48	30 x 30
Bike Lane Closed (with distance)	W20-5b	6P.01	36 x 36	—	30 x 30
Flagger (symbol)	W20-7	6H.15	36 x 36	48 x 48	30 x 30
Flagger	W20-7a	6H.15	36 x 36	48 x 48	30 x 30
Slow (on Stop/Slow Paddle)	W20-8	6D.02	18 x 18	—	—
Workers	W21-1,1a	6H.18	36 x 36	48 x 48	30 x 30
Fresh Oil	W21-2	6H.19	36 x 36	48 x 48	30 x 30
Road Machinery Ahead	W21-3	6H.20	36 x 36	48 x 48	30 x 30
Slow Moving Vehicle	W21-4	6N.05	36 x 18	—	—
Shoulder Work	W21-5	6H.22	36 x 36	48 x 48	30 x 30
Shoulder Closed	W21-5a	6H.22	36 x 36	48 x 48	30 x 30
Shoulder Closed (with distance)	W21-5b	6H.22	36 x 36	48 x 48	30 x 30
Survey Crew	W21-6	6H.23	36 x 36	48 x 48	30 x 30
Utility Work (with distance)	W21-7	6H.24	36 x 36	48 x 48	30 x 30
Mowing Ahead	W21-8	6N.05	36 x 36	48 x 48	30 x 30
Blasting Zone Ahead	W22-1	6H.25	36 x 36	48 x 48	30 x 30
End Blasting Zone	W22-3	6H.25	42 x 36	42 x 36	36 x 30
Slow Traffic Ahead	W23-1	6H.11	48 x 24	48 x 24	—
New Traffic Pattern Ahead	W23-2	6H.14	36 x 36	48 x 48	30 x 30
Double Reverse Curve (1 lane)	W24-1	6H.31	36 x 36	48 x 48	30 x 30
Double Reverse Curve (2 lanes)	W24-1a	6H.31	36 x 36	48 x 48	30 x 30
Double Reverse Curve (3 lanes)	W24-1b	6H.31	36 x 36	48 x 48	30 x 30
All Lanes (plaque)	W24-1cP	6H.31	24 x 18	30 x 24	—
Road Work Next XX Miles	G20-1	6H.35	36 x 18	48 x 24	—
End Road Work	G20-2	6H.36	36 x 18	48 x 24	—
Pilot Car Follow Me	G20-4	6H.37	36 x 18	—	—

*See Table 2C-1 for minimum size required for signs facing traffic on multi-lane conventional roads

Notes:

1. Larger signs may be used wherever necessary for greater legibility or emphasis
2. Dimensions are shown in inches and are shown as width x height
3. See Section 2A. 17 for information on the applicability of the minimum dimensions for sign sizes

CHAPTER 6I. TTC ZONE GUIDE SIGNS

Section 6I.01 Guide Signs – General

Support:

- 01 Guide signs along highways provide road users with information to help them along their way through the TTC zone. The design of guide signs is presented in Part 2.

Guidance:

- 02 *The following guide signs should be used in TTC zones as needed:*
- A. *Standard route markings where temporary route changes are necessary,*
 - B. *Directional signs and street name signs, and*
 - C. *Special guide signs relating to the condition or work being done.*

Standard:

- 03 **If additional temporary guide signs are used in TTC zones, they shall have a black legend and border on an orange background.**

Option:

- 04 Guide signs used in TTC incident management situations may have a black legend and border on a fluorescent pink background.
- 05 When temporary directional signs and temporary street name signs are used in conjunction with detour routing, these signs may have a black legend and border on an orange background.
- 06 When permanent directional signs or permanent street name signs are used in conjunction with detour signing, they may have a white legend on a green background (see Sections 2D.35 and 2D.45).
- 07 The sizes for TTC guide signs shall be as shown in Table 6I-1.

Section 6I.02 Detour Signs and Plaques (M4-8P, M4-8a, M4-8bP, M4-9, M4-9a, M4-9b, M4-9c, and M4-10)

Standard:

- 01 **Each detour shall be adequately marked with standard temporary route signs and destination signs.**

Option:

- 02 Detour signs in TTC incident management situations may have a black legend and border on a fluorescent pink background.
- 03 The Detour Arrow (M4-10) sign (see Figure 6I-1) may be used where a detour route has been established.
- 04 The DETOUR (M4-8P) plaque (see Figure 6I-1) may be mounted at the top of a route sign assembly to mark a temporary route that detours from a highway, bypasses a section closed by a TTC zone, and rejoins the highway beyond the TTC zone.

Table 6I-1. Temporary Traffic Control Zone Guide Sign and Plaque Sizes

Sign or Plaque	Sign Designation	Section	Conventional Road	Freeway or Expressway	Minimum
Exit Open	E5-2	6H.12	48 x 36	48 x 36	—
Exit Closed	E5-2a	6H.12	48 x 36	48 x 36	—
Exit Only	E5-3	6H.13	48 x 36	48 x 36	—
Detour	M4-8P	6I.02	24 x 12	30 x 15	—
End Detour	M4-8a	6I.02	24 x 18	24 x 18	—
End (plaque)	M4-8bP	6I.02	24 x 12	24 x 12	—
Detour	M4-9	6I.02	30 x 24	48 x 36	—
Bike/Pedestrian Detour	M4-9a	6I.02	30 x 24	—	—
Pedestrian Detour	M4-9b	6I.02	30 x 24	—	—
Bike Detour (with arrow)	M4-9c	6I.02	30 x 24	—	—
Temporary Path	M4-Y9	6I.02	24x12	—	—
Detour	M4-10	6I.02	48 x 18	—	—

Notes:

1. Larger signs may be used wherever necessary for greater legibility or emphasis
2. Dimensions are shown in inches and are shown as width x height

Figure 6I-1. Exit Open and Closed and Detour Signs and Plaques**Guidance:**

- 05 The Detour Arrow (M4-10) sign should normally be mounted just below the ROAD CLOSED (R11-2, R11-3a, or R11-4) sign. The Detour Arrow sign should include a horizontal arrow pointed to the right or left as required.
- 06 The DETOUR (M4-9) sign (see Figure 6I-1) should be used for unnumbered highways, for emergency situations, for periods of short durations, or where, over relatively short distances, road users are guided along the detour and back to the desired highway without route signs.
- 07 A Street Name sign should be placed above, or the street name should be incorporated into, a DETOUR (M4-9) sign to indicate the name of the street being detoured.

Option:

- 08 The END DETOUR (M4-8a) sign or the END (M4-8bP) plaque (see Figure 6I-1) may be used to indicate that the detour has ended.

Guidance:

- 09 When the END DETOUR sign is used on a numbered highway, the sign should be mounted above a route sign after the downstream end of the detour.
- 10 The Pedestrian/Bicyclist Detour (M4-9a) sign (see Figure 6I-1) should be used where a pedestrian/bicyclist detour route has been established because of the closing of a pedestrian/bicycle facility to through traffic.

Standard:

- 11 If used, the Pedestrian/Bicyclist Detour sign shall have an arrow pointing in the appropriate direction.

Option:

- 12 The arrow on a Pedestrian/Bicyclist Detour sign may be on the sign face or on a supplemental plaque.
- 13 The Pedestrian Detour (M4-9b) sign or Bicyclist Detour (M4-9c) sign (see Figure 6I-1) may be used where a pedestrian or a bicyclist detour route (not both) has been established because of the closing of the pedestrian or bicycle facility to through traffic.
- 14 The Temporary Path (M4-Y9) sign may be used to provide additional guidance for a temporary pedestrian diversion, see Figure 6P-28. If used, the sign is placed just prior to the beginning of the diversion.

Section 6I.03 EXIT CLOSED Panel**Guidance:**

- 01 When an exit ramp is closed, an EXIT CLOSED sign panel with a black legend and border on an orange background should be placed diagonally across the interchange/intersection guide signs.

CHAPTER 6J. TTC ZONE PAVEMENT MARKINGS

Section 6J.01 Pavement Markings in TTC Zones

Support:

- 01 Pavement markings are installed or existing markings are maintained or enhanced in TTC zones to provide road users with a clearly defined path for travel through the TTC zone in day, night, and twilight periods under both wet and dry pavement conditions.

Guidance:

- 02 *The work should be planned and staged to provide for the placement and removal of the pavement markings in a way that minimizes the disruption to traffic flow approaching and through the TTC zone during the placement and removal process.*

Standard:

- 03 Existing pavement markings shall be maintained in all long-term stationary (see Section 6N.01) TTC zones in accordance with Chapters 3A and 3B, except as otherwise provided for temporary pavement markings in Section 6J.02. Pavement markings shall match the alignment of the markings in place at both ends of the TTC zone. Pavement markings shall be placed along the entire length of any paved detour or temporary roadway prior to the detour or roadway being opened to road users.

Guidance:

- 04 *For long-term stationary operations, pavement markings in the temporary traveled way that are no longer applicable should be removed or obliterated as soon as practical. Pavement marking obliteration should remove the non-applicable pavement marking material so that the markings are no longer visible and include the removal of any RPM reflectors, and the obliteration method should minimize or remedy pavement scarring.*

Standard:

- 05 Painting over existing pavement markings with black paint or spraying with asphalt shall not be accepted as a substitute for removal or obliteration.

Option:

- 06 Removable, non-reflective, preformed tape that is approximately the same color as the pavement surface may be used where markings need to be covered temporarily.

Section 6J.02 Temporary Markings

Support:

- 01 Temporary markings are those pavement markings or devices that are placed within TTC zones to provide road users with a clearly defined path of travel through the TTC zone when the permanent markings are either removed or obliterated during the work activities. Temporary markings are typically needed during the reconstruction of a road while it is open to traffic, such as overlays or surface treatments or where lanes are temporarily shifted on pavement that is to remain in place.

- 01A See Section 5B.02 for information on the use of 6 inches as the normal longitudinal marking width to aid navigation by driving automation systems.

Guidance:

- 02 *Unless justified based on engineering judgment, temporary pavement markings should not remain in place for more than 14 days after the application of the pavement surface treatment or the construction of the final pavement surface on new roadways or over existing pavements.*

- 03 *The temporary use of edge lines, channelizing lines, lane-reduction transitions, gore markings, and other longitudinal markings, and the various non-longitudinal markings (such as stop lines, railroad crossings, crosswalks, words, symbols, or arrows) should be in accordance with the State's or highway agency's policy.*

Standard:

- 04 Warning signs, channelizing devices, and delineation shall be used to indicate required road user paths in TTC zones where it is not possible to provide a clear path by pavement markings.

- 05 Except as otherwise provided in this Section, all temporary pavement markings for no-passing zones shall comply with the requirements of Chapters 3A and 3B. All temporary broken line pavement markings shall use the same cycle length as permanent markings and shall have line segments that are at least 2 feet long.

Guidance:

- 06 *All pavement markings and devices used to delineate road user paths should be reviewed during daytime and nighttime periods. See Section 6A.02, paragraph 2, item D3 for additional information.*

CHAPTER 6K. TTC ZONE CHANNELIZING DEVICES

Section 6K.01 Channelizing Devices – General

Standard:

- 01 **Designs of various channelizing devices shall be as shown in Figure 6K-1. All channelizing devices shall be crashworthy (see definition in Section 1C.02).**

Support:

- 02 The function of channelizing devices is to warn road users of conditions created by work activities in or near the roadway and to guide road users. Channelizing devices include cones, tubular markers, vertical panels, drums, barricades, and longitudinal channelizing devices.
- 03 Channelizing devices provide for smooth and gradual vehicular traffic flow from one lane to another, onto a bypass or detour, or into a narrower traveled way. They are also used to channelize traffic away from the work space, pavement drop-offs, pedestrian or shared-use paths, bicycle facilities, or opposing directions of vehicular traffic.

Guidance:

- 04 *The spacing between cones, tubular markers, vertical panels, drums, and barricades should not exceed a distance in feet equal to 1 times the speed limit in mph when used for taper channelization, and should not exceed a distance in feet equal to 2 times the speed limit in mph when used for tangent channelization.*
- 05 *When channelizing devices have the potential of leading vehicular traffic out of the intended vehicular traffic space as shown in Figure 6P-39, the channelizing devices should be extended a distance in feet of 2 times the speed limit in mph beyond the downstream end of the transition area.*

Option:

- 06 **For pedestrian channelizing devices** a gap not exceeding 2 inches between the bottom rail and the ground surface may be used to facilitate drainage.
- 07 Warning lights (see Section 6L.07) may be added to channelizing devices in areas with frequent fog, snow, or severe roadway curvature, or where visual distractions are present.
- 08 A series of sequential flashing warning lights may be placed on channelizing devices that form a merging taper in order to increase driver detection and recognition of the merging taper.

Support:

- 09 The flashing rates and patterns for warning lights used on channelizing devices are specified in Section 6L.07.

Standard:

- 10 **The retroreflective material used on channelizing devices shall display a similar color day or night.**
- 11 **Except as provided in Paragraph 12 of this Section, information identifying the owner or manufacturer of the channelizing device shall not be displayed on any portion of the device that can be seen by road users approaching the device.**

Option:

- 12 The name and telephone number of the highway agency, contractor, or supplier may be displayed on the non-retroreflective surface of all types of channelizing devices.

Standard:

- 13 **The area containing the name and telephone number shall be non-retroreflective and not over 2 inches in height.**

Guidance:

- 14 *Particular attention should be given to maintaining the channelizing devices to keep them clean, visible, and properly positioned at all times.*

Support:

- 14A **Ballast is often necessary to maintain position and stability of channelizing devices. The channelizing device manufacturer specifications may assist with selecting the appropriate ballast type, position, and weight.**

Standard:

- 15 **Channelizing devices that are no longer serviceable (see definition in Section 1C.02) shall be replaced.**

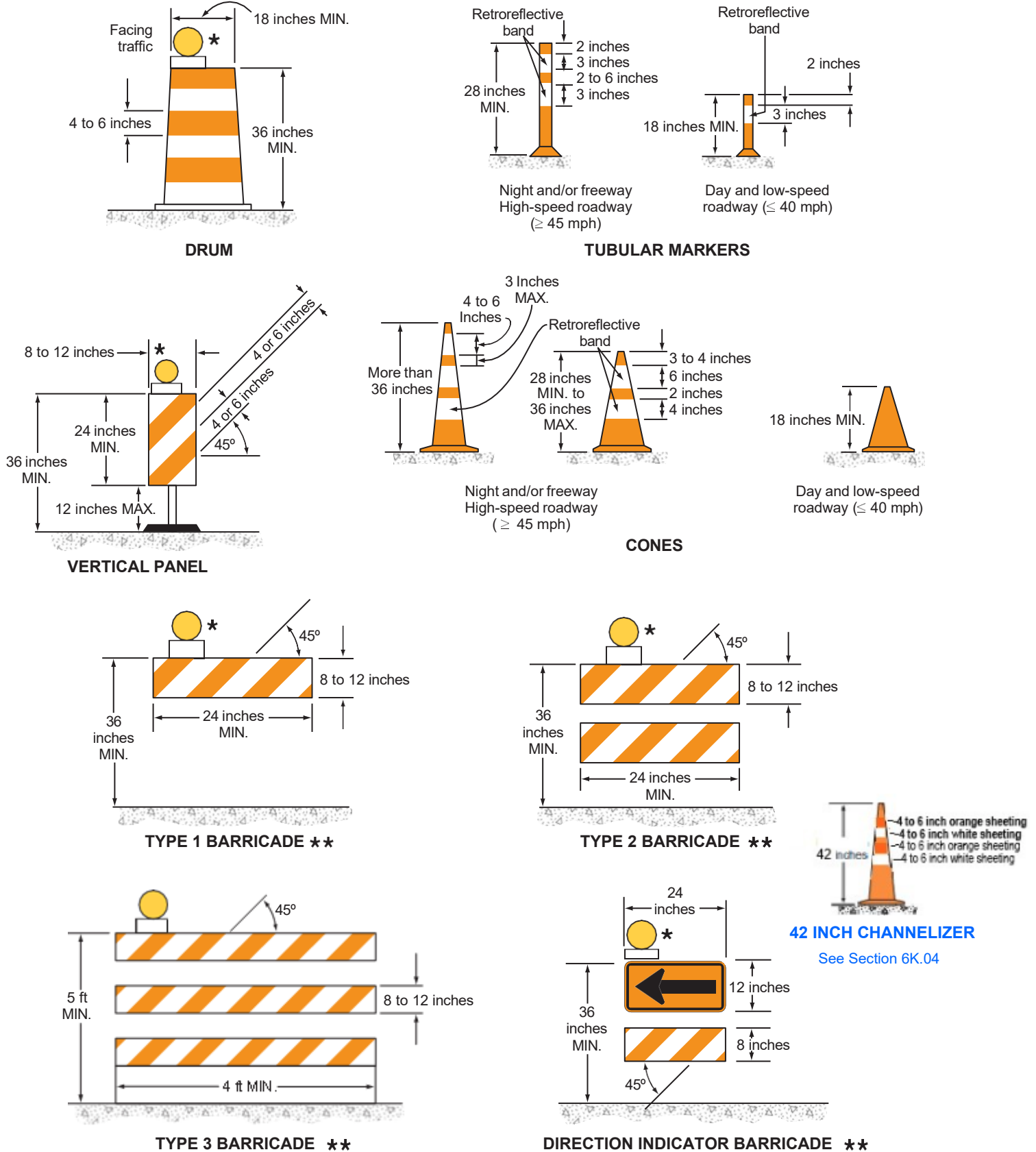
Support:

- 16 **For freeways and expressways, providing a lateral offset of at least 1 ft from the travel lane for channelizing devices has been found to improve roadway operations in a work zone.**

Section 6K.02 Pedestrian Channelizing Devices

Support:

- 01 Pedestrian channelizing devices indicate a suitable path of pedestrian travel around or through the work zone.

Figure 6K-1. Examples of Channelizing Devices

* Optional warning light

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

Guidance:

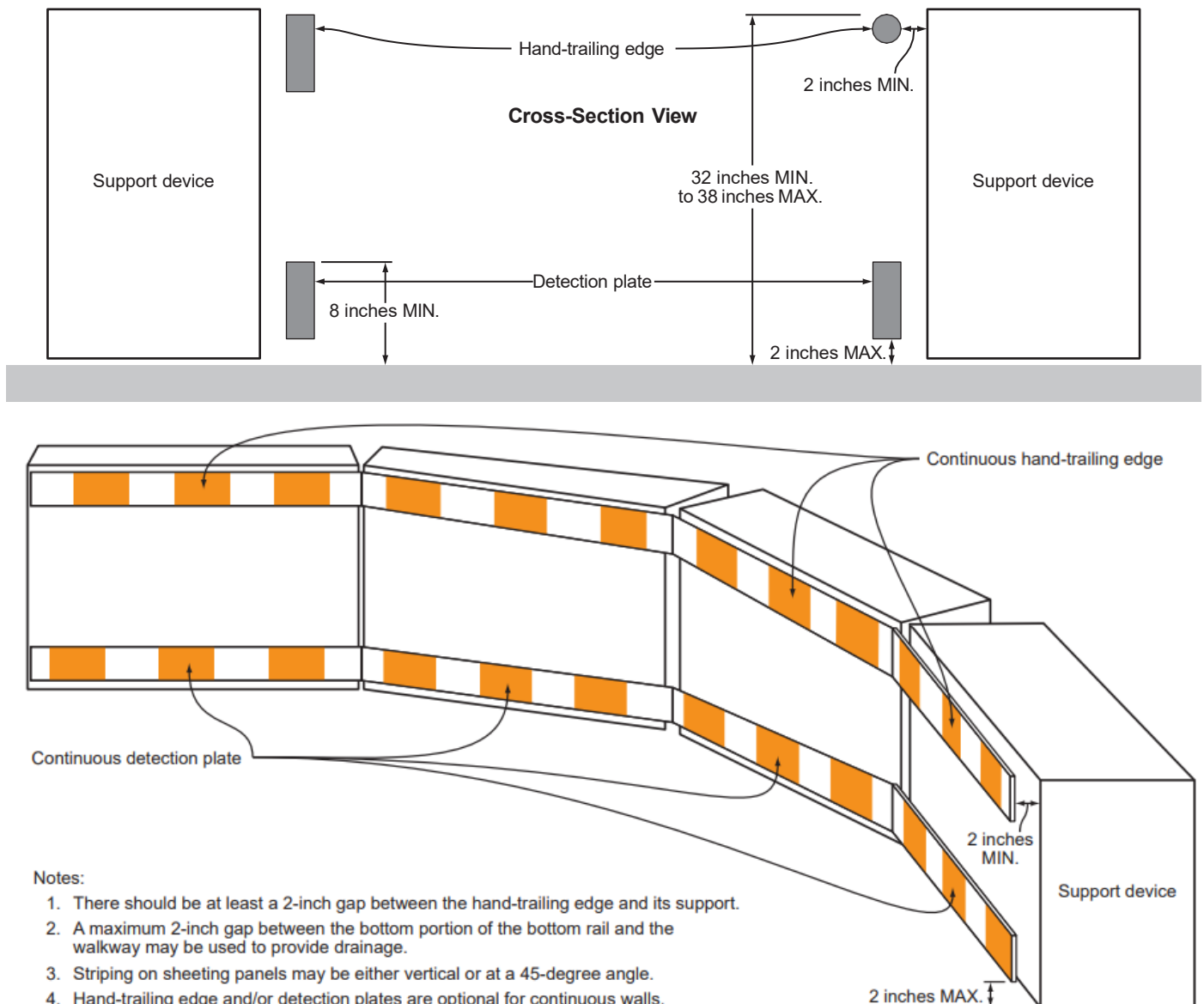
- 02 *Pedestrian channelizing devices should be provided when work activities impact sidewalks or other pedestrian facilities or when the design of the temporary pedestrian facility does not otherwise include accessibility features consistent with the features in the existing pedestrian facility.*
- 03 *The pedestrian channelizing devices should be used both to close sidewalks and to delineate an alternate route.*

Support:

- 04 An example of a pedestrian channelizing device is depicted in Figure 6K-2. [See Section 6K.07 for additional information.](#)

Standard:

- 05 **Pedestrian channelizing devices shall be crashworthy (see definition in Section 1C.02) when exposed to vehicular traffic.**
- 06 **Devices used to channelize pedestrians shall be detectable to users of long canes and visible to pedestrians with vision disabilities.**
- 07 **When used as a sidewalk closure, the device shall cover the entire width of the sidewalk.**

Figure 6K-2. Pedestrian Channelizing Device

- 08 **Pedestrian channelizing devices shall have continuous detection plates and hand-trailing edges. The bottom of the detection plate shall be no higher than 2 inches above the walkway. The top edge of the detection plate shall be at least 8 inches above the walkway. The top of the hand-trailing edge shall be no lower than 32 inches and no higher than 38 inches above the walkway. The top surface of the hand-trailing edge shall be smooth to optimize hand trailing. Both the detection plate and the hand-trailing edge shall share a common vertical plane.**

Guidance:

- 09 *When pedestrian channelizing devices are combined in a series, the gap between devices should not exceed 1 inch.*

Support:

- 10 The hand-trailing edge is the upper rail on a pedestrian channelizing device, as shown in Figure 6K-2. It is provided to allow pedestrians with vision disabilities to follow the pedestrian channelizing device with their hand. The hand-trailing edge is not a weight-bearing railing.

Guidance:

- 11 *There should be at least a 2-inch gap between the hand-trailing edge and its support.*

Option:

- 11A The hand-trailing edge may be flush with the pedestrian channelizing device.

Standard:

- 12 **When visible to vehicular traffic the detection plate and the hand-trailing edge of the pedestrian channelizing device shall have retroreflective sheeting complying with Paragraph 10 of Section 6K.01.**

Guidance:

- 13 *When not visible to vehicular traffic, the pedestrian channelizing device should have a contrasting pattern in alternating light and dark colors to provide visual contrast on the upper surface consisting of a minimum of 6 inches of sheeting or other contrasting materials.*

Option:

- 14 Non-retroreflective materials may be used on the pedestrian side of the pedestrian channelizing device.

- 15 The sheeting on the pedestrian side of the pedestrian channelizing device may have stripes that are oriented either vertically or at a 45-degree angle.

Support:

- 16 The contrast of the light and dark stripes on the barricade sheeting assists pedestrians with vision disabilities in following the designated detour.

- 17 Section 6M.04 also contains information regarding detectable edging for pedestrian channelization.

Option:

- 18 A continuous wall may be used as a pedestrian channelizing device.

Guidance:

- 19 *When used, a continuous wall should have a lower edge no more than 2 inches above the walkway, should extend a minimum of 32 inches above the walkway, should have a common vertical face, and should have alternating, contrasting sheeting positioned 32 inches above the walkway.*

Option:

- 20 The continuous wall may extend to any height above the 32-inch minimum.

Section 6K.03 Cones

Standard:

- 01 **Cones (see Figure 6K-1) shall be predominantly orange and shall be made of a material that can be struck without causing damage to the impacting vehicle. For daytime and low-speed roadways, cones shall be not less than 18 inches in height. When cones are used on freeways and other high-speed highways or at night on all highways, or when more conspicuous guidance is needed, cones shall be a minimum of 28 inches in height.**

- 02 **For nighttime use, cones shall be retroreflectorized or equipped with lighting devices for maximum visibility. Retroreflectorization of cones that are 28 to 36 inches in height shall be provided by a 6-inch wide white band located 3 to 4 inches from the top of the cone and an additional 4-inch wide white band located approximately 2 inches below the 6-inch band.**

- 03 **Retroreflectorization of cones that are more than 36 inches in height shall be provided by horizontal, circumferential, alternating orange and white retroreflective stripes that are 4 to 6 inches wide. Each cone shall have a minimum of two orange and two white stripes with the top stripe being orange. Any non-retroreflective spaces between the retroreflective stripes shall not exceed 3 inches in width.**

Guidance:

- 10 *Other TTC devices should be used to supplement temporary traffic control signals, including warning and regulatory signs, pavement markings, and channelizing devices.*
- 11 *Temporary traffic control signals not in use should be covered or removed.*
- 12 *If a temporary traffic control signal is located within ½ mile of an adjacent traffic control signal, consideration should be given to interconnected operation.*

Support:

- 12A Temporary traffic control signals may have a small sign, tag, or label providing contact information for emergencies or for issues related to the operation of the signal to facilitate maintenance and emergency response.

Standard:

- 13 Temporary traffic control signals shall not be located within 200 feet of a grade crossing unless the temporary traffic control signal is provided with preemption in accordance with Sections 4F.18, 4F.19, and 8D.09, or unless a uniformed officer or flagger is provided at the crossing to prevent vehicles from stopping within the crossing.

Section 6L.02 Automated Flagger Assistance Devices – General*Support:*

- 01 Automated Flagger Assistance Devices (AFADs) enable a flagger(s) to be positioned out of the lane of traffic and are used to control road users through TTC zones. These devices are designed to be remotely operated either by a single flagger at one end of the TTC zone or at a central location, or by separate flaggers near each device's location.
- 02 There are two types of AFADs:
 - A. An AFAD (see Section 6L.03) that uses a remotely controlled STOP/SLOW sign on either a trailer or a movable cart system to alternately control right-of-way.
 - B. An AFAD (see Section 6L.04) that uses remotely controlled red and yellow lenses and a gate arm to alternately control right-of-way.
- 03 AFADs might be appropriate for short-term and intermediate-term activities (see Section 6N.01). Typical applications include TTC activities such as, but not limited to:
 - A. Bridge maintenance,
 - B. Haul road crossings, and
 - C. Pavement patching.

Standard:

- 04 AFADs shall only be used in situations where there is only one lane of approaching traffic in the direction to be controlled.
- 05 When used at night, the AFAD location shall be illuminated in accordance with Section 6D.06.

Guidance:

- 06 AFADs should not be used for long-term stationary work (see Section 6N.01).

Standard:

- 07 Because AFADs are not traffic control signals, they shall not be used as a substitute for or a replacement for a continuously operating temporary traffic control signal as described in Section 6L.01.
- 08 AFADs shall meet the crashworthy (see definition in Section 1C.02) performance criteria contained in Section 6A.04.

Guidance:

- 09 If used, AFADs should be located in advance of one-lane, two-way tapers and downstream from the point where approaching traffic is to stop in response to the device.

Standard:

- 10 If used, AFADs shall be placed so that all of the signs and other items controlling traffic movement are readily visible to the driver of the initial approaching vehicle with advance warning signs alerting other approaching traffic to be prepared to stop.
- 11 If used, an AFAD shall be operated only by a flagger (see Section 6D.01) who has been trained on the operation of the AFAD. The flagger(s) operating the AFAD(s) shall not leave the AFAD(s) unattended at any time while the AFAD(s) is being used.
- 12 The use of AFADs shall conform to one of the following methods:
 - A. An AFAD at each end of the TTC zone (Method 1), or
 - B. An AFAD at one end of the TTC zone and a flagger at the opposite end (Method 2).
- 13 Except as provided in Paragraph 14 of this Section, two flaggers shall be used when using either Method 1 or Method 2.

Guidance:

- 06 *Transverse rumble strips should be placed transverse to vehicular traffic movement. They should not adversely affect overall pavement skid resistance under wet or dry conditions.*
- 07 *In urban areas, even though a closer spacing might be warranted, transverse rumble strips should be designed in a manner that does not promote unnecessary braking or erratic steering maneuvers by road users.*
- 08 *Transverse rumble strips should not be placed on sharp horizontal or vertical curves.*
- 09 *Rumble strips should not be placed through pedestrian crossings or on bicycle routes.*
- 10 *Transverse rumble strips should not be placed on roadways used by bicyclists unless a minimum clear path of 4 feet is provided at each edge of the roadway or on each paved shoulder.*
- 11 *Longitudinal rumble strips should not be placed on the shoulder of a roadway that is used by bicyclists unless a minimum clear path of 4 feet is also provided on the shoulder.*

Section 6M.07 Screens*Support:*

- 01 Screens are used to block the road users' view of activities that can be distracting. Screens might improve safety and motor vehicle traffic flow where volumes approach the roadway capacity because they discourage gawking and reduce headlight glare from oncoming motor vehicle traffic.

Guidance:

- 02 *Screens should not be mounted where they could adversely restrict road user visibility and sight distance and adversely affect the operation of vehicles.*

Option:

- 03 Screens may be mounted on the top of temporary traffic barriers that separate two-way motor vehicle traffic.

Guidance:

- 04 *Design of screens should be in accordance with Chapter 9 of "Roadside Design Guide," 4th Edition, 2011, AASHTO.*

Section 6M.08 Lighting for Night Work*Support:*

- 01 Utility, maintenance, or construction activities on highways are frequently conducted during nighttime periods when vehicular traffic volumes are lower. Large construction projects are sometimes operated on a double-shift basis requiring night work (see Section 6N.18).

Guidance:

- 02 *When nighttime work is being performed, floodlights should be used to illuminate the work area, equipment crossings, and other areas.*
- 03 *When used, floodlighting should be installed in a manner that minimizes glare to approaching road users, flaggers, or workers.*
- 04 *The adequacy of the floodlight placement and elimination of potential glare should be determined by driving through and observing the floodlighted area from each direction on all approaching roadways after the initial floodlight setup, at night, and periodically. Lighting should be sufficient so as to give road users the capability to identify a worker as a person. Care should be taken to minimize the potential for shadows to conceal workers within the work area.*

Support:

- 05 Desired illumination levels vary depending upon the nature of the task involved. An average horizontal luminance of 5 foot candles can be adequate for general activities. Tasks requiring high levels of precision and extreme care can require an average horizontal luminance of 20 foot candles.

Standard:

- 06 **Except in emergency situations, flagger stations shall be illuminated at night.**

Support:

- 07 Work zone presence lighting enhances safety by alerting road users to a downstream merge taper or other change in roadway alignment in locations without existing lighting. Studies have shown a decrease in speeds with its use. Work zone presence lighting is placed in the advance warning area of a work zone and the spacing between each light source is reduced closer to the merge taper or alignment change. Light sources are typically LED's and they may either be balloon style or be supported by trailer mounted towers.

- 14 Flaggers may be used for mobile operations that often involve frequent short stops.

Support:

- 15 Mobile operations also include work activities where workers and equipment move along the road without stopping, usually at slow speeds. The advance warning area moves with the work area.

Guidance:

- 16 *When mobile operations are being performed, a shadow vehicle equipped with an arrow board or a sign should follow the work vehicle, especially when vehicular traffic speeds or volumes are high. Where feasible, warning signs should be placed along the roadway and moved periodically as work progresses.*
- 17 *To avoid high-volume conditions, consideration should be given to scheduling mobile operations work during off-peak hours.*
- 18 *If there are mobile operations on a high-speed travel lane of a multi-lane divided highway, arrow boards should be used.*

Standard:

- 19 **Mobile operations shall have appropriate devices on the equipment (that is, high-intensity rotating, flashing, oscillating, or strobe lights, signs, or special lighting), or shall use a separate vehicle with appropriate warning devices. Although vehicle hazard warning lights are permitted to be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights, they shall not be used instead of these devices.**

Option:

- 20 For mobile operations that move at speeds of less than 3 mph, mobile signs or stationary signing that is periodically retrieved and repositioned in the advance warning area may be used.

Support:

- 21 A rolling roadblock, also referred to as a rolling slowdown or rolling stoppage, is a method of TTC used to slow or stop traffic as a means of temporarily removing traffic from a roadway segment downstream of the road block. The rolling roadblock closes all lanes of traffic by using pacing vehicles to create a gap so that construction activities can be performed. Rolling roadblocks are used where long-term road closures using TTC devices are not needed. A rolling roadblock consists of one blocking/pacing vehicle per lane of traffic, a clearing vehicle, and an advance warning vehicle. The rolling roadblock is normally performed by law enforcement officers during off-peak hours.

Section 6N.02 Location of Work

Support:

- 01 Chapter 6C and Sections 6M.04 and 6N.04 contain additional information regarding the steps to follow when pedestrian or bicycle facilities are affected by the worksite.

- 02 The choice of TTC needed for a TTC zone depends upon where the work is located. As a general rule, the closer the work is to road users (including bicyclists and pedestrians), the greater the number of TTC devices that are needed. Procedures are described later in this Chapter for establishing TTC zones in the following locations:

- A. Outside the shoulder,
- B. On the shoulder with no encroachment,
- C. On the shoulder with minor encroachment,
- D. Within the median, and
- E. Within the traveled way.

Standard:

- 03 **When the work space is within the traveled way, except for short-duration and mobile operations, advance warning shall provide a general message that work is taking place and shall supply information about highway conditions. TTC devices shall clearly delineate the path roadway users are to follow through the TTC zone.**

Section 6N.03 Modifications to Fulfill Special Needs

Support:

- 01 The typical applications in Chapter 6P illustrate commonly encountered situations in which TTC devices are employed.

Option:

- 02 Other devices may be added to supplement the devices provided in the typical applications, and device spacing may be adjusted to provide additional reaction time. When conditions are less complex than those depicted in the typical applications, fewer devices may be needed.

Section 6N.13 Work within the Traveled Way of a Freeway or Expressway

Support:

- 01 Special conditions encountered where vehicular traffic must be moved through or around TTC zones on high-speed, high-volume roadways can pose challenges to the TTC. Although the general principles outlined in other Sections of this Manual are applicable to all types of highways, high-speed, access-controlled highways need special planning and attention in order to accommodate vehicular traffic while also protecting road users and workers. The traffic volumes, vehicle mix (buses, trucks, cars, and bicycles, if permitted), and speed of vehicles on these facilities require that careful TTC procedures be implemented, for example, to induce critical merging maneuvers well in advance of work spaces and in a manner that creates minimum turbulence and delay in the vehicular traffic stream.
- 02 When the roadway capacity is reduced as a result of lane closures, the demand might exceed the available capacity and result in either a lengthy stopped or slow moving queue of vehicles that might extend past the normal signs used in the typical advance warning area.

Guidance:

- 03 *An assessment of the expected queue length should be a part of the TTC plan design process and adjustments to the sign spacing and number of signs as well as the possibility of using more conspicuous devices should be considered to increase the distance and conspicuity of the advance warning area.*
- 03A *Potential queueing should be considered and if queueing is anticipated, appropriate mitigation measures should be incorporated into the TTC plan.*

Support:

- 04 One strategy often employed to mitigate the extended queue issue is to work during off peak hours or at night. When the work is limited to night hours, increased use of warning lights, illumination of work spaces, and intelligent advance warning systems might be necessary.
- 05 TTC for a typical lane closure where a queue is not anticipated to accumulate on a divided highway is shown in Figures 6P-33 and 6P-34. Temporary traffic controls for short-duration and mobile operations on freeways are shown in Figure 6P-35. A typical application for shifting vehicular traffic lanes around a work space is shown in Figure 6P-36. TTC for multiple and interior lane closures on a freeway is shown in Figures 6P-37 and 6P-38.

Guidance:

- 06 *The method for closing an interior lane when the open lanes have the capacity to carry vehicular traffic should be as shown in Figure 6P-37. When the capacity of the other lanes is needed, the method shown in Figure 6P-38 should be used.*

Support:

- 07 *For any work on the Indiana interstate highways involving lane or shoulder closures and other restrictions, see the INDOT Interstate Highways Congestion Policy for procedures and information.*

Section 6N.14 Two-Lane, Two-Way Traffic on One Roadway of a Normally-Divided Highway

Support:

- 01 Two-lane, two-way operation on one roadway of a normally-divided highway is a typical procedure that requires special consideration in the planning, design, and work phases, because unique operational problems (for example, increasing the risk of head-on crashes) can arise with the two-lane, two-way operation.

Standard:

- 02 **When two-lane, two-way traffic control must be maintained on one roadway of a normally-divided highway, opposing vehicular traffic shall be separated with either temporary traffic barriers (concrete safety-shape or approved alternate), channelizing devices, Narrow Two-Way Traffic (W6-4) signs on flexible supports (see Section 6H.17), or a temporary raised island throughout the length of the two-way operation. The use of markings and complementary signing, by themselves, shall not be used.**

Support:

- 03 Figure 6P-39 shows the procedure for two-lane, two-way operation. Treatments for entrance and exit ramps within the two-way roadway segment of this type of work are shown in Figures 6P-40 and 6P-41.

Section 6N.15 Crossovers

Guidance:

- 01 *The following are considered good guiding principles for the design of crossovers:*
- A. *Tapers for lane drops should be separated from the crossovers, as shown in Figure 6P-39.*
 - B. *Crossovers should be designed for speeds no lower than 10 mph below the posted speed, the off-peak 85th-percentile speed prior to the work starting, or the anticipated operating speed of the roadway, unless unusual site conditions require that a lower design speed be used.*
 - C. *A good array of channelizing devices, delineators, and full-length, properly placed pavement markings should be used to provide drivers with a clearly defined travel path.*
 - D. *The design of the crossover should accommodate all vehicular traffic, including trucks and buses.*

Support:

- 07 Desired illumination levels vary depending upon the nature of the task involved. An average horizontal luminance of 5 foot candles can be adequate for general activities. An average horizontal luminance of 10 foot candles can be adequate for activities around equipment. Tasks requiring high levels of precision and extreme care can require an average horizontal luminance of 20 foot candles.

Section 6N.19 Late Merge**Support:**

- 01 The Late Merge is designed to use all available lanes until the merge point is reached at the lane closure taper rather than merging as soon as possible into the open lane. The Late Merge addresses many of the challenges that are associated with traffic operations in advance of lane closures at TTC zones such as queue length, capacity, and driver satisfaction.

Option:

- 02 Late Merge systems may consist of static or portable changeable message signs.

Guidance:

- 03 *Static Late Merge signing should consist of the STAY IN LANE TO MERGE POINT (R9-4a) sign and the MERGE HERE TAKE TURNS (W9-2a) sign (see Figure 6N-1).*

Option:

- 04 The following messages may be used on changeable message signs at an upstream location during the Late Merge application:

- A. "STAY IN YOUR LANE/MERGE AHEAD"
- B. "STAY IN YOUR LANE/MERGE AHEAD XX MILES"
- C. "USE BOTH LANES/TO MERGE POINT"
- D. "USE BOTH LANES/STOPPED TRAFFIC AHEAD"
- E. "SLOW TRAFFIC AHEAD/USE BOTH LANES"

- 05 The following messages are typically used on changeable message signs at the merge point during the Late Merge application:

- A. "TAKE YOUR TURN/MERGE HERE"
- B. "MERGE HERE/TAKE TURNS"

Support:

- 06 A dynamic late lane merge system that can alternate between a late and early merge based on traffic conditions may improve freeway operations.

CHAPTER 60. CONTROL OF TRAFFIC THROUGH TRAFFIC INCIDENT MANAGEMENT AREAS

Section 60.01 General

Support:

- 01 The National Incident Management System (NIMS) requires the use of the Incident Command System (ICS) at traffic incident management scenes.
- 02 A traffic incident is an emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic.
- 03 A traffic incident management area is an area of a highway where temporary traffic controls are installed, as authorized by a public authority or the official having jurisdiction of the roadway, in response to a road user incident, natural disaster, hazardous material spill, or other unplanned incident. It is a type of TTC zone and extends from the first warning device (such as a sign, light, or cone) to the last TTC device or to a point where vehicles return to the original lane alignment and are clear of the incident.
- 04 Traffic incidents can be divided into three general classes of duration, each of which has unique traffic control characteristics and needs. These classes are:
- A. Major—expected duration of more than 2 hours,
 - B. Intermediate—expected duration of 30 minutes to 2 hours, and
 - C. Minor—expected duration under 30 minutes.
- 05 The primary functions of TTC at a traffic incident management area are to inform road users of the incident and to provide guidance information on the path to follow through the incident area. Alerting road users and establishing a well-defined path to guide road users through the incident area will serve to protect the incident responders and those involved in working at the incident scene and will aid in moving road users expeditiously past or around the traffic incident, will reduce the likelihood of secondary traffic crashes, and will preclude unnecessary use of the surrounding local road system. Examples include a stalled vehicle blocking a lane, a traffic crash blocking the traveled way, a hazardous material spill along a highway, and natural disasters such as floods and severe storm damage.
- Guidance:*
- 06 *In order to reduce response time for traffic incidents, highway agencies, appropriate public safety agencies (law enforcement, fire and rescue, emergency communications, emergency medical, and other emergency management), and private sector responders (towing and recovery and hazardous materials contractors) should mutually plan for occurrences of traffic incidents along the major and heavily traveled highway and street system.*
- 07 *On-scene responder organizations should train their personnel in TTC practices for accomplishing their tasks in and near traffic and in the requirements for traffic incident management contained in this Manual. On-scene responders should take measures to move the incident off the traveled roadway or to provide for appropriate warning. All on-scene responders and news media personnel should constantly be aware of their visibility to oncoming traffic and wear high-visibility apparel. Planning and training should include incorporation of estimated time durations to clear the event as part of their initial incident estimate. When events are deemed as probable Major Traffic Incidents that could generate prolonged lane or road closures, notification of all affected agencies should be initiated as part of the initial incident report that is provided to the emergency communications center who would then be responsible for making notifications to appropriate state, regional, and local agencies and resources for the purpose of ramping up and responding as quickly as possible thus facilitating a more rapid transition from emergency TTC to an MUTCD-compliant TTC zone when warranted.*
- 08 *Emergency vehicles arriving at an incident should be positioned in a manner that attempts to protect both the responders performing their duties and road users traveling through the incident scene, while minimizing, to the extent practical, disruption of the adjacent traffic flow. Emergency vehicle positions should optimize traffic flow through the incident scene. All emergency vehicles that subsequently arrive should be positioned in a manner that does not interfere with the established temporary traffic flow.*
- 09 *Responders arriving at a traffic incident should estimate the magnitude of the traffic incident, the expected time duration of the traffic incident, and the expected vehicle queue length, and then should set up the appropriate temporary traffic controls for these estimates.*
- 09A *Training for on-scene responder organization in TTC practices including Traffic Incident Management (TIM) Responder Training may improve emergency response times and help personnel accomplish incident management task.*
- Option:
- 10 Warning and guide signs used for TTC traffic incident management situations may have a black legend and border on a fluorescent pink background (see Figure 60-1).
- Support:
- 11 While some traffic incidents might be anticipated and planned for, emergencies and disasters might pose more severe and unpredictable problems. The ability to quickly install proper temporary traffic controls might greatly reduce the effects of an incident, such as secondary crashes or excessive traffic delays. An essential part of fire, rescue, spill clean-up, highway agency, and enforcement activities is the proper control of road users through the

Table 6P-1. Index to Typical Applications (Sheet 1 of 2)

Typical Application Description	Typical Application Number
Work Outside of the Shoulder (see Section 6N.05)	
Work Beyond the Shoulder	TA-1
Blasting Zone	TA-2
Work on the Shoulder (see Sections 6N.06 and 6N.07)	
Work on the Shoulders	TA-3
Short-Duration or Mobile Operation on a Shoulder	TA-4
Shoulder Closure on a Freeway	TA-5
Shoulder Work with Minor Encroachment	TA-6
Work within the Traveled Way of a Two-Lane Highway (see Section 6N.09)	
Road Closed with a Diversion	TA-7
Roads Closed with an Off-Site Detour	TA-8
Overlapping Routes with a Detour	TA-9
Lane Closure on a Two-Lane Road Using Flaggers	TA-10
Lane Closure on a Two-Lane Road with Low Traffic Volumes	TA-11
Lane Closure on a Two-Lane Road Using Traffic Control Signals	TA-12
Temporary Road Closure	TA-13
Haul Road Crossing	TA-14
Work in the Center of a Road with Low Traffic Volumes	TA-15
Surveying Along the Center Line of a Road with Low Traffic Volumes	TA-16
Mobile Operations on a Two-Lane Road	TA-17
Work within the Traveled Way of an Urban Street (see Section 6N.10)	
Lane Closure on a Minor Street	TA-18
Detour for One Travel Direction	TA-19
Detour for a Closed Street	TA-20
Work within the Traveled Way at an Intersection and on Sidewalks (see Section 6N.12)	
Lane Closure on the Near Side of an Intersection	TA-21
Right-Hand Lane Closure on the Far Side of an Intersection	TA-22
Left-Hand Lane Closure on the Far Side of an Intersection	TA-23
Half Road Closure on the Far Side of an Intersection	TA-24
Multiple Lane Closures at an Intersection	TA-25
Closure in the Center of an Intersection	TA-26
Closure at the Side of an Intersection	TA-27
Sidewalk Detour or Diversion	TA-28
Crosswalk Closures and Pedestrian Detours	TA-29
Work within the Traveled Way of a Multi-Lane, Non-Access Controlled Highway (see Section 6N.11)	
Interior Lane Closure on a Multi-Lane Street	TA-30
Lane Closure on a Street with Uneven Directional Volumes	TA-31
Half Road Closure on a Multi-Lane, High-Speed Highway	TA-32
Stationary Lane Closure on a Divided Highway	TA-33
Lane Closure with a Temporary Traffic Barrier	TA-34
Mobile Operation on a Multi-Lane Road	TA-35

Table 6P-1. Index to Typical Applications (Sheet 2 of 2)

Typical Application Description	Typical Application Number
Work within the Traveled Way of a Freeway or Expressway (see Section 6N.13)	
Lane Shift on a Freeway	TA-36
Double Lane Closure on a Freeway	TA-37
Interior Lane Closure on a Freeway	TA-38
Median Crossover on a Freeway	TA-39
Median Crossover for an Entrance Ramp	TA-40
Median Crossover for an Exit Ramp	TA-41
Work in the Vicinity of an Exit Ramp	TA-42
Partial Exit Ramp Closure	TA-43
Work in the Vicinity of an Entrance Ramp	TA-44
Temporary Reversible Lane Using Movable Barriers	TA-45
Work in the Vicinity of a Grade Crossing (see Section 6N.17)	
Work in the Vicinity of a Grade Crossing	TA-46
Work in the Vicinity of Bicycle Lanes and Shared Use Paths (see Section 6N.04)	
Bicycle Lane Closure without a Detour	TA-47
Bicycle Lane Closure with an On-Road Detour	TA-48
Shared-Use Path Closure with a Diversion	TA-49
On-Road Detour for a Shared-Use Path	TA-50
Paved Shoulder Closure with a Bicycle Diversion onto a Temporary Path	TA-51
Work in the Traveled Way of Roundabouts	
Short-Term or Short-Duration Work in a Circular Intersection	TA-52
Flagging Operation on a Single-Lane Circular Intersection	TA-53
Inside Lane Closure on a Multi-Lane Circular Intersection	TA-54

Table 6P-2. Meaning of Symbols on Typical Application Diagrams

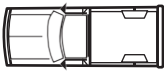
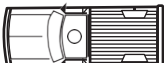
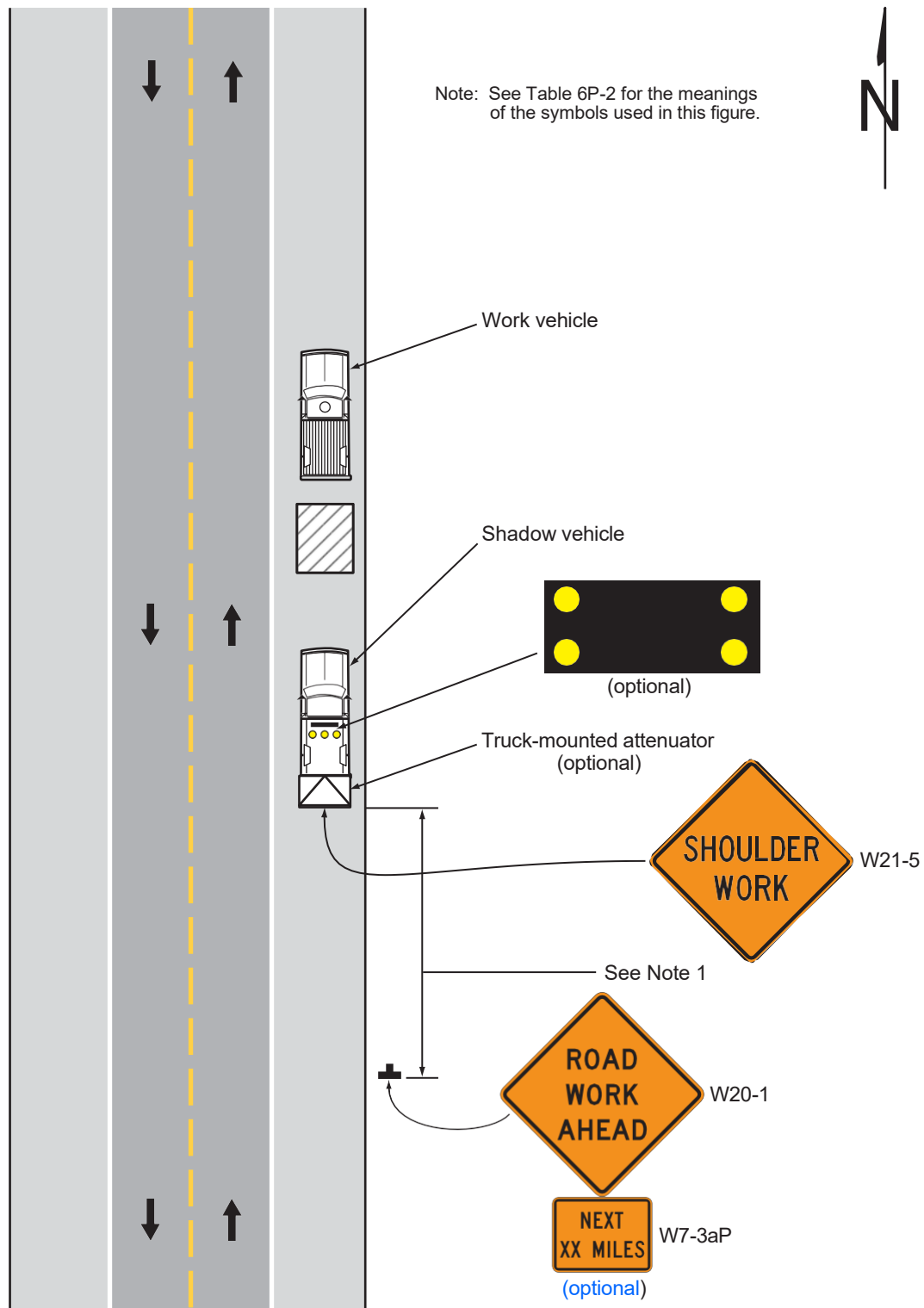
	Arrow board		Shadow vehicle
	Arrow board support or trailer (shown facing down)		Sign (shown facing left)
	Changeable message sign or support trailer		Surveyor
	Channelizing device		Temporary barrier
	Crash cushion		Temporary barrier with warning light
	Direction of temporary traffic detour		Traffic or pedestrian signal
	Direction of travel		Truck-mounted attenuator
	Flagger		Type 3 barricade
	High-level warning device (Flag tree)		Warning light
	Longitudinal channelizing device		Work space
	Luminaire		Work vehicle
	Pavement markings that should be removed for a long-term project		

Figure 6P-4. Short-Duration or Mobile Operation on a Shoulder (TA-4)



Typical Application 4

Notes for Figure 6P-17—Typical Application 17
Mobile Operations on a Two-Lane Road

Standard:

1. **Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.**
2. **Shadow and work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights.**
3. **If an arrow board is used, it shall be used in the caution mode.**

Guidance:

4. *Where practical and when needed, the work and shadow vehicles should pull over periodically to allow vehicular traffic to pass.*
5. *Whenever adequate stopping sight distance exists to the rear, the shadow vehicle should maintain the minimum distance from the work vehicle and proceed at the same speed. The shadow vehicle should slow down in advance of vertical or horizontal curves that restrict sight distance.*
6. *The shadow vehicles should also be equipped with two high-intensity flashing lights mounted on the rear, adjacent to the sign.*

Option:

7. Positive protection devices may be used per Section 6M.02.
8. The distance between the work and shadow vehicles may vary according to terrain, paint drying time, and other factors.
9. Additional shadow vehicles to warn and reduce the speed of oncoming or opposing vehicular traffic may be used. Law enforcement vehicles may be used for this purpose.
10. A truck-mounted attenuator may be used on the shadow vehicle or on the work vehicle.
- 10A. *Truck-Mounted attenuator manufacturers have recommendations for where signs and other traffic control devices may be placed on a truck-mounted attenuator. Signs and other traffic control devices that are not placed in accordance with manufacturer recommendations may adversely affect the crash worthiness of the truck mounted attenuator.*
11. If the work and shadow vehicles cannot pull over to allow vehicular traffic to pass frequently, a DO NOT PASS sign may be placed on the rear of the vehicle blocking the lane.

Support:

12. Shadow vehicles are used to warn motor vehicle traffic of the operation ahead.

Standard:

13. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

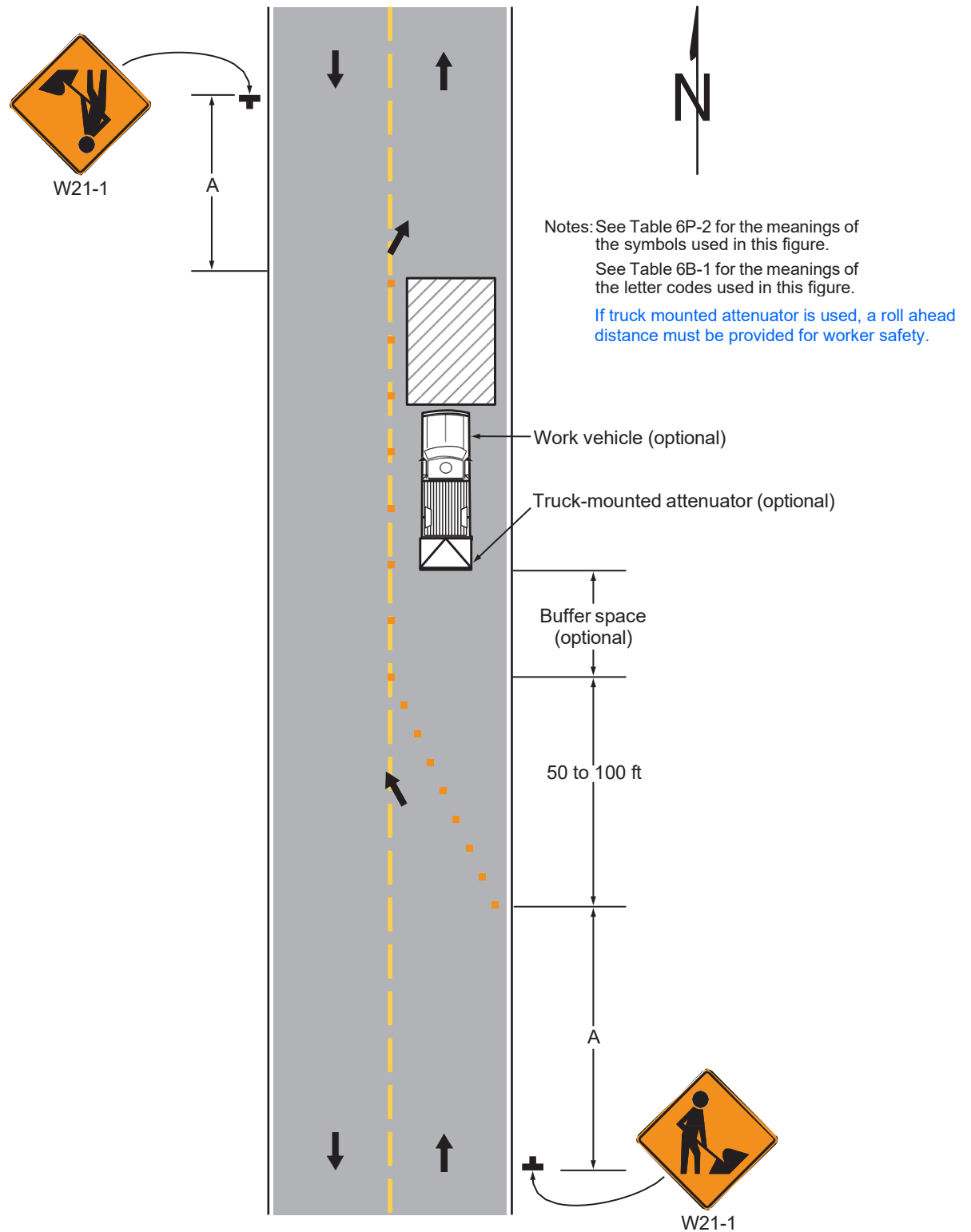
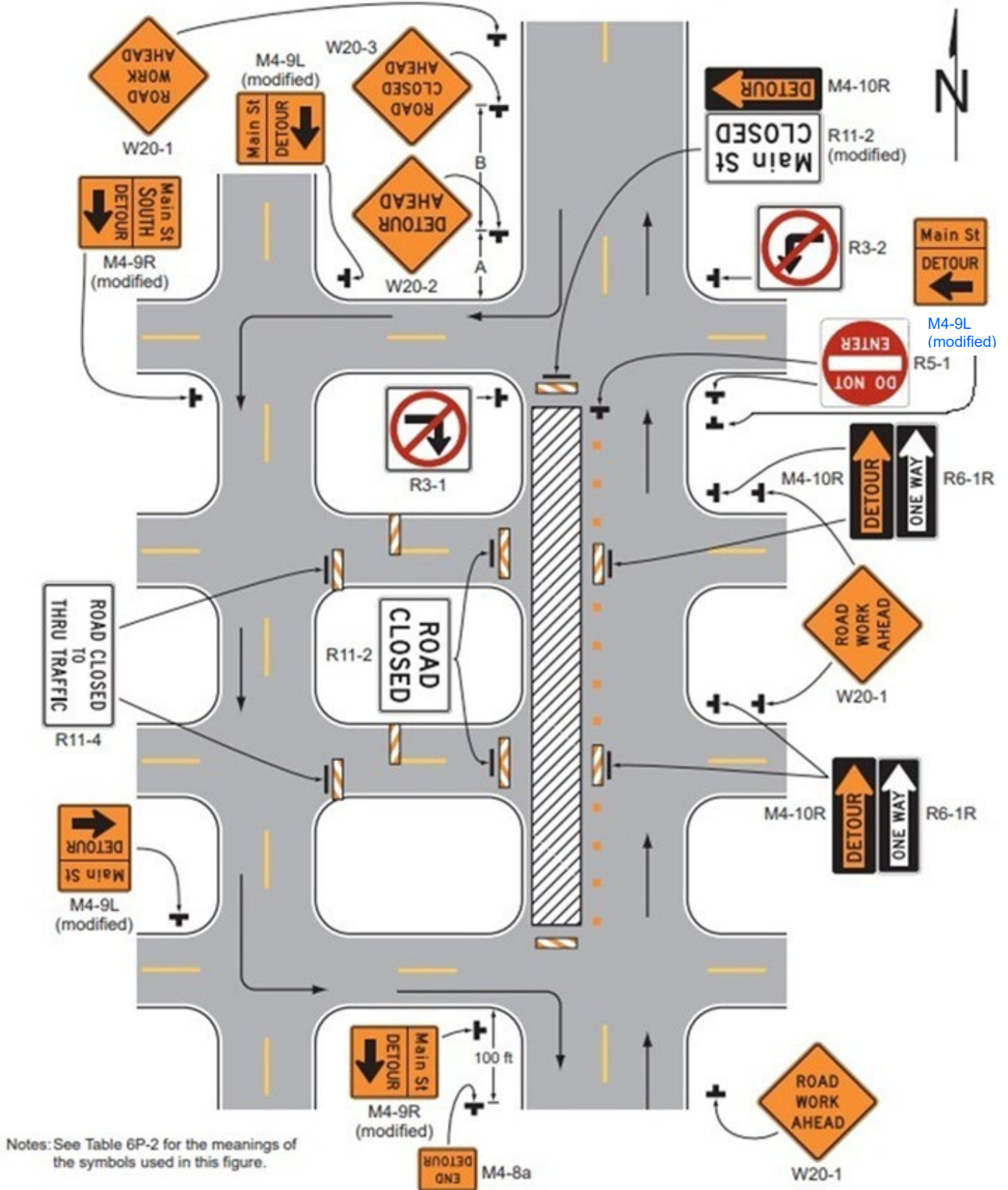
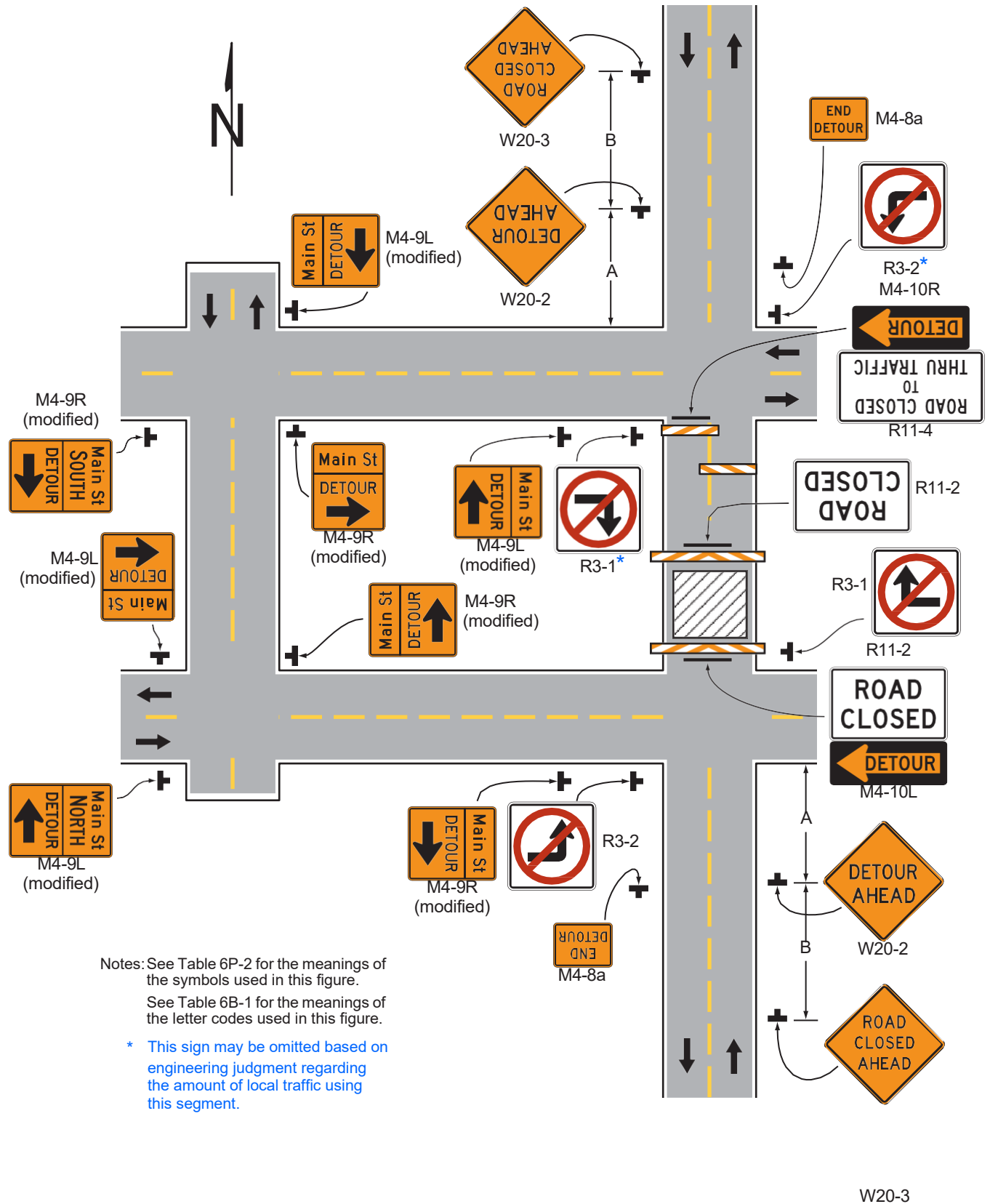
Figure 6P-18. Lane Closure on a Minor Street (TA-18)**Typical Application 18**

Figure 6P-19. Detour for One Travel Direction (TA-19)



Typical Application 19

Figure 6P-20. Detour for a Closed Street (TA-20)



Typical Application 20

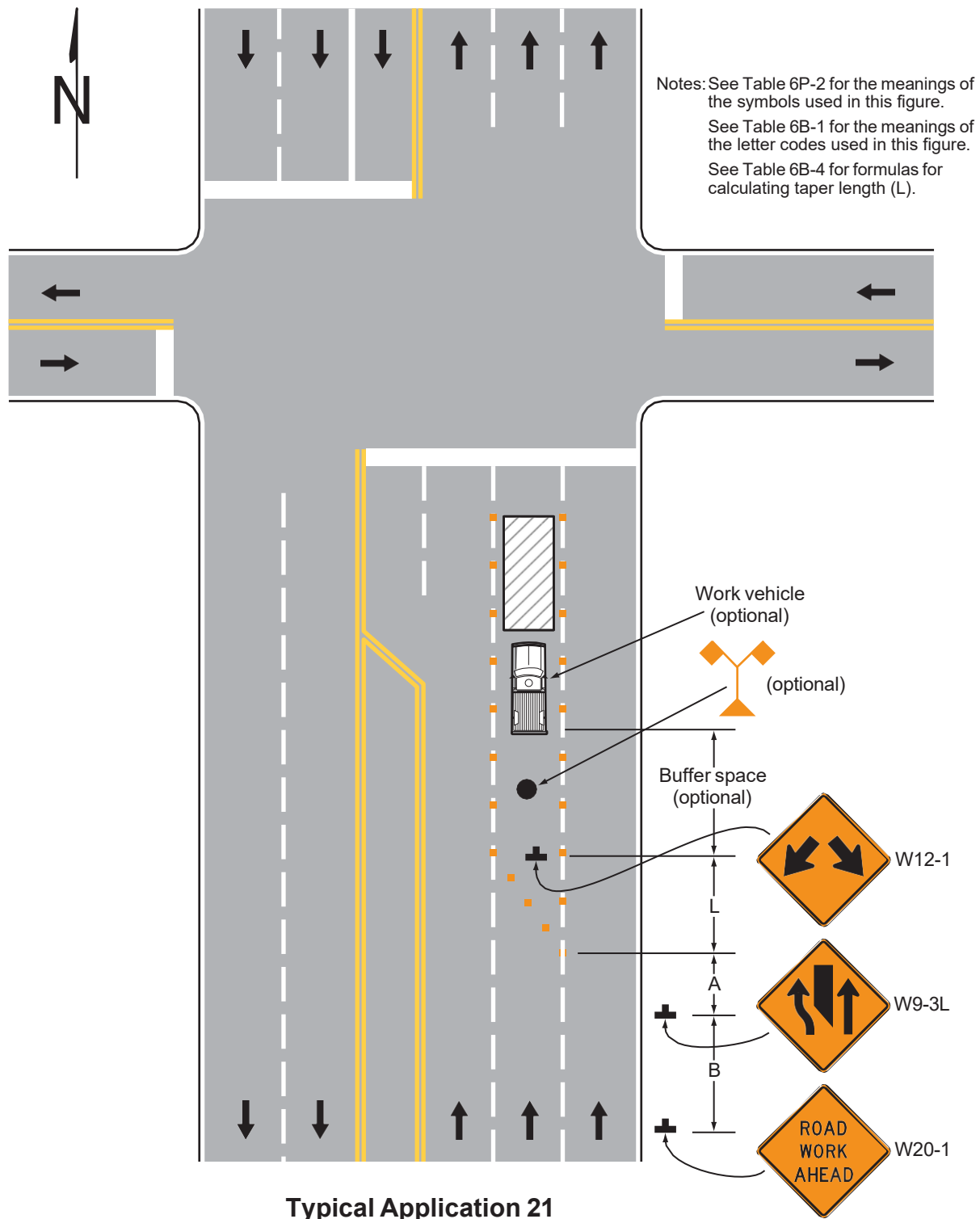
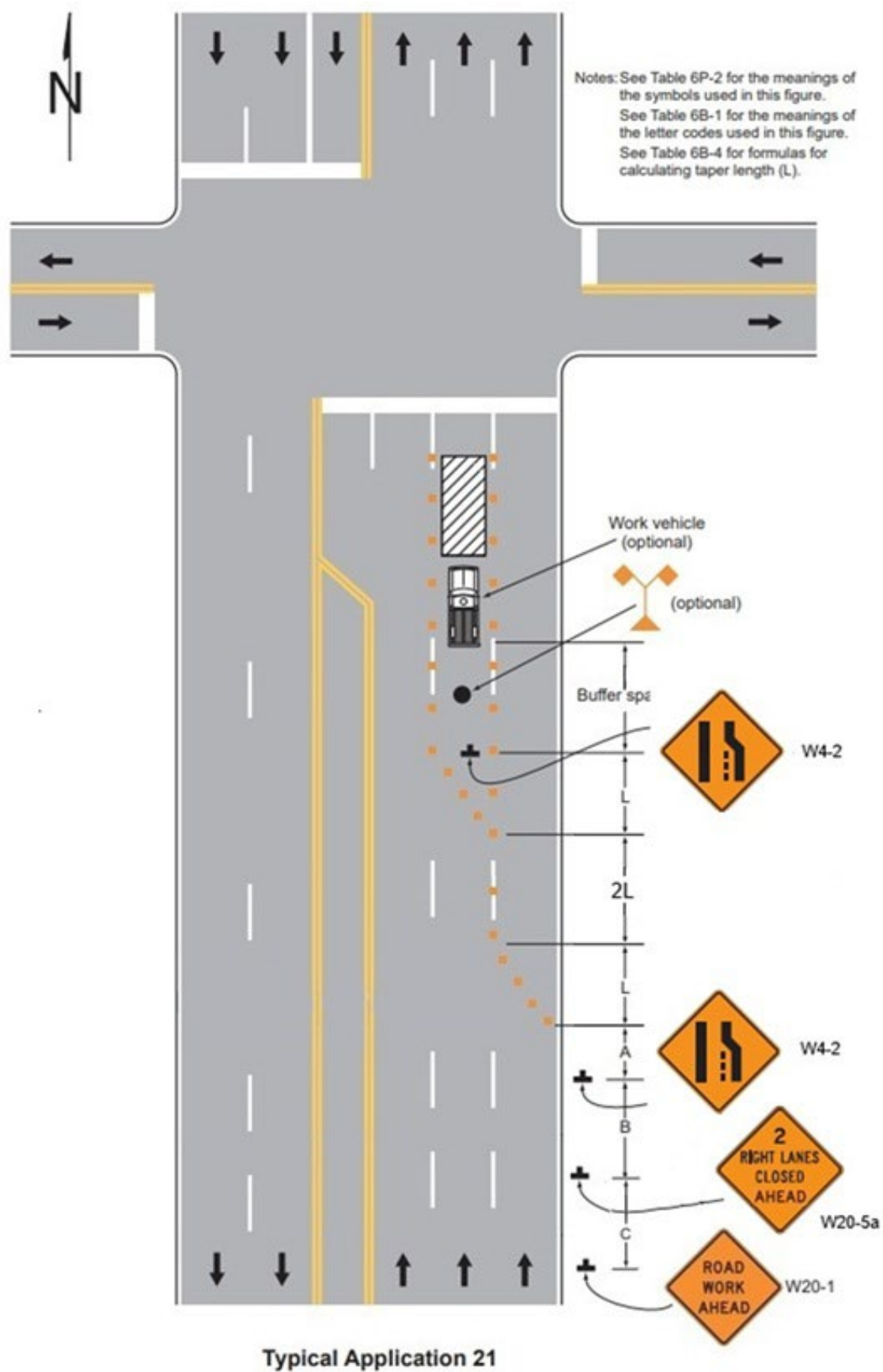
Figure 6P-21. Lane Closure on the Near Side of an Intersection (TA-21)**A. Center Lane Closure**

Figure 6P-21. Lane Closure on the Near Side of an Intersection (TA-21)

B. Double Lane Closure



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Notes for Figure 6P-22—Typical Application 22

Right-Hand Lane Closure on the Far Side of an Intersection

Guidance:

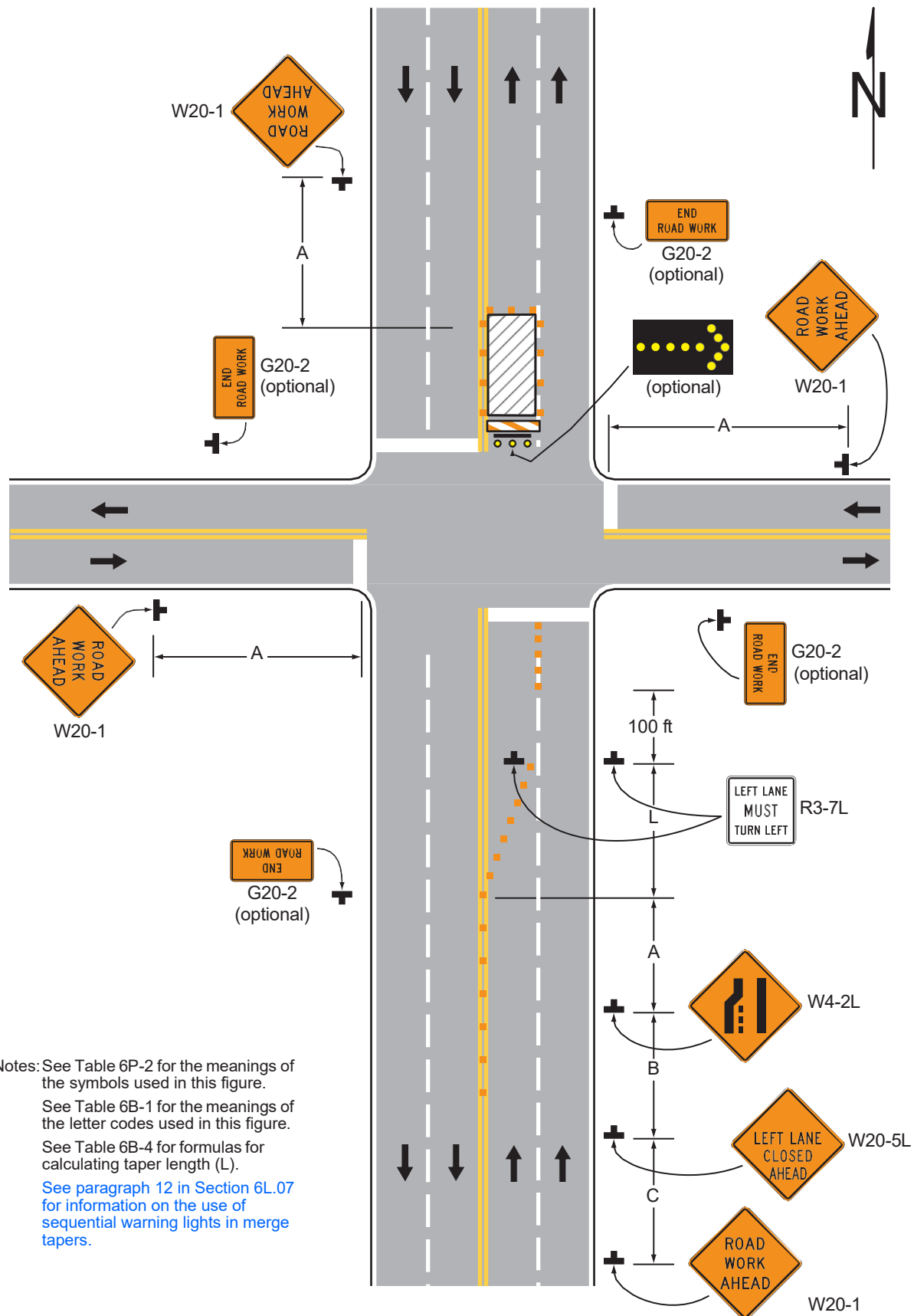
1. *If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6P-29.*

Option:

2. Positive protection devices may be used per Section 6M.02.
3. When the normal procedure of closing on the near side of the intersection any lane that is not carried through the intersection results in the closure of a right-hand lane having significant right-turn movements, then the right-hand lane may be restricted to right turns only, requiring through traffic to use the left lane.
4. For intersection approaches reduced to a single lane, left-turn movements may be prohibited to maintain capacity for through vehicular traffic.
5. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
6. Where the turning radius is large, it may be possible to create a right-turn island using channelizing devices or pavement markings.
7. If dimension “A” is not available to create a temporary right-turn lane, continuous channelizers may be installed from the end of the taper to the intersection and, as a result, the RIGHT LANE MUST TURN RIGHT signs would not be installed.

Support:

8. By first closing off the right-hand lane and then reopening it as a turn bay, [the right turn bay allows storage for turning vehicles so that](#) the capacity of the through lane is [partially maintained](#) by separating the right-turning vehicles from the through vehicles.

Figure 6P-23. Left-Hand Lane Closure on the Far Side of an Intersection (TA-23)**Typical Application 23**

Notes for Figure 6P-24—Typical Application 24

Half Road Closure on the Far Side of an Intersection

Guidance:

1. *If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6P-29.*
2. *When turn prohibitions are implemented, two turn prohibition signs should be used, one on the near side and, space permitting, one on the far side of the intersection.*

Option:

3. Positive protection devices may be used per Section 6M.02.
4. A buffer space may be used between opposing directions of vehicular traffic as shown in this application.
5. When the normal procedure of closing on the near side of the intersection any lane that is not carried through the intersection results in the closure of a right-hand lane having significant right-turn movements, then the right-hand lane may be restricted to right turns only, requiring through traffic to use the left lane.
6. Where the turning radius is large, a right-turn island using channelizing devices or pavement markings may be used.
7. If there is insufficient space to place the back-to-back Keep Right sign and No Left Turn symbol signs at the end of the row of channelizing devices separating opposing vehicular traffic flows, the No Left Turn symbol sign may be placed on the right and the Keep Right sign may be omitted.
8. For intersection approaches reduced to a single lane, left-turn movements may be prohibited to maintain capacity for through vehicular traffic.
9. Flashing warning lights and/or flags may be used to call attention to advance warning signs.
10. Temporary pavement markings may be used to delineate the travel path through the intersection.
11. If dimension “A” is not available to create a temporary right turn lane, continuous channelizers may be installed from the end of the taper to the intersection and, as a result, the RIGHT LANE MUST TURN RIGHT signs would not be installed.
12. For Long-term stationary work zones, dotted lines may be used to provide channelization through the intersection. If the intersection is signalized, one signal head may be placed over the open lane to improve driver navigation.

Notes for Figure 6P-26—Typical Application 26 Closure in the Center of an Intersection

Guidance:

1. *All lanes should be a minimum of 10 feet in width as measured to the near face of the channelizing devices.*

Option:

2. A high-level warning device may be placed in the work space, if there is sufficient room.
3. For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 9 feet may be used.
4. Flashing warning lights and/or flags may be used to call attention to advance warning signs.
5. Left turns may be prohibited as required by geometric conditions, such as where the streets are so narrow that it might be physically impossible to turn left, especially for large vehicles.
6. For short-duration work operations, the channelizing devices may be eliminated if a vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights is positioned in the work space.
7. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

Standard:

8. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

Support:

9. *For high volume intersections, consider closing one approach or using flaggers.*

Notes for Figure 6P-27—Typical Application 27

Closure at the Side of an Intersection

Guidance:

1. *The situation depicted can be simplified by closing one or more of the intersection approaches. If this cannot be done, and/or when capacity is a problem, through vehicular traffic should be directed to other roads or streets.*
2. *Depending on road user conditions, flagger(s) or uniformed law enforcement officer(s) should be used to direct road users within the intersection. At signalized intersections, flaggers should only be used if the signal is in flash mode or deactivated.*

Support:

- 2A. *At signalized intersections, consider changing the signal phasing to operate one approach at a time.*

Standard:

3. **At night, flagger stations shall be illuminated, except in emergencies.**

Option:

4. *Flashing warning lights and/or flags may be used to call attention to the advance warning signs.*
5. *For short-duration work operations, the channelizing devices may be eliminated if a vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights is positioned in the work space.*
6. *A BE PREPARED TO STOP sign may be added to the sign series.*

Guidance:

7. *When used, the BE PREPARED TO STOP sign should be located before the Flagger symbol sign.*
8. *ONE LANE ROAD AHEAD signs should also be used to provide adequate advance warning.*

Support:

9. *Turns may be prohibited as required by vehicular traffic conditions, such as where the streets are so narrow that it might be physically impossible to make certain turns, especially for large vehicles.*

Option:

10. *Positive protection devices may be used per Section 6M.02.*
11. *Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.*

Standard:

12. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

Notes for Figure 6P-28—Typical Application 28

Sidewalk Detour or Diversion

Standard:

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. A pedestrian channelizing device (see Figure 6K-2) that is detectable by a person with a vision disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
2. When used, temporary ramps shall provide a 12:1 (8.33%) or flatter slope, with a slip-resistant surface. The ramp landing area shall provide a 48-inch x 48-inch minimum area with a 2% or flatter cross-slope.
3. When used, Longitudinal Channelizing Devices used for temporary pedestrian routes shall comply with Section 6K.02.
4. Temporary traffic barriers, if used, shall comply with the provisions of Section 6M.02.
5. SIDEWALK CLOSED CROSS HERE signs shall include audible information devices to provide adequate communication to pedestrians with vision disabilities.
6. Audible information devices shall be provided where midblock sidewalk closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians with vision disabilities.

Guidance:

7. *The surface of an alternate pathway should meet the requirements of the U.S. Department of Justice 2010 ADA Standards for Accessible Design, September 15, 2010, 28 CFR 35 and 36, Americans with Disabilities Act of 1990.*
8. *The protective requirements of a TTC situation have priority in determining the need for temporary traffic barriers and their use in this situation should be based on engineering judgment.*

Option:

9. Street lighting may be considered.
10. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS signs, may be used to control vehicular traffic.
11. For nighttime closures, Type A Flashing warning lights may be used on barricades that support signs and close sidewalks.
12. Type C Steady-Burn or Type D 360-degree Steady-Burn warning lights may be used on channelizing devices separating the temporary sidewalks from vehicular traffic flow.
13. Signs, such as KEEP RIGHT (LEFT), may be placed along a temporary sidewalk to guide or direct pedestrians.
14. The width of the alternate pedestrian route may be 48 inches with a passing area of 60 inches every 200 feet.

Support:

15. The TEMPORARY PATH sign is used for sidewalk diversions where the pedestrian route is not readily apparent.

Notes for Figure 6P-29—Typical Application 29

Crosswalk Closures and Pedestrian Detours

Standard:

1. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.
2. Curb parking shall be prohibited for at least 50 feet in advance of the midblock crosswalk.
3. SIDEWALK CLOSED CROSS HERE signs shall include audible information devices to provide adequate communication to pedestrians with vision disabilities.
4. Audible information devices shall be provided where midblock sidewalk closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians with vision disabilities.

Guidance:

5. *Pedestrian traffic signal displays controlling closed crosswalks should be covered or deactivated.*

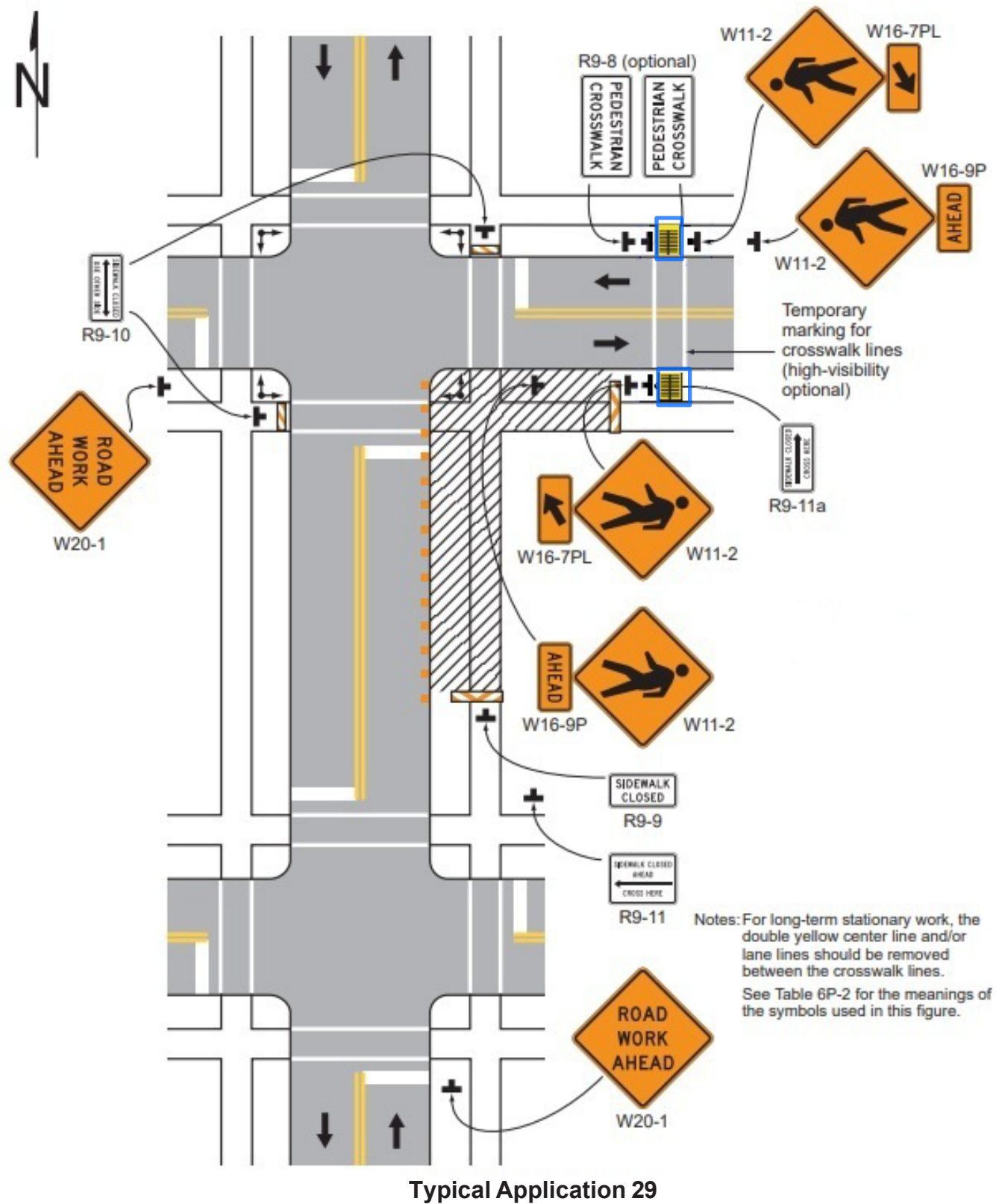
Option:

6. Street lighting may be considered.
7. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS signs, may be used to control vehicular traffic.
8. For nighttime closures, Type A Flashing warning lights may be used on barricades supporting signs and closing sidewalks.
9. Type C Steady-Burn or Type D 360-degree Steady-Burn warning lights may be used on channelizing devices separating the work space from vehicular traffic.
10. In order to maintain the systematic use of the fluorescent yellow-green background for pedestrian, bicycle, and school warning signs in a jurisdiction, the fluorescent yellow-green background for pedestrian, bicycle, and school warning signs may be used in TTC zones.
11. Positive protection devices may be used per Section 6M.02.

Support:

12. See Section 6C.02 for information on accommodating the needs of pedestrians with disabilities.

Figure 6P-29. Crosswalk Closures and Pedestrian Detours (TA-29)



Notes for Figure 6P-30—Typical Application 30

Interior Lane Closure on a Multi-Lane Street

Guidance:

1. *This information applies to low-speed, low-volume urban streets. Where speed or volume is higher, additional signing such as LEFT LANE CLOSED XX FT should be used between the signs shown.*

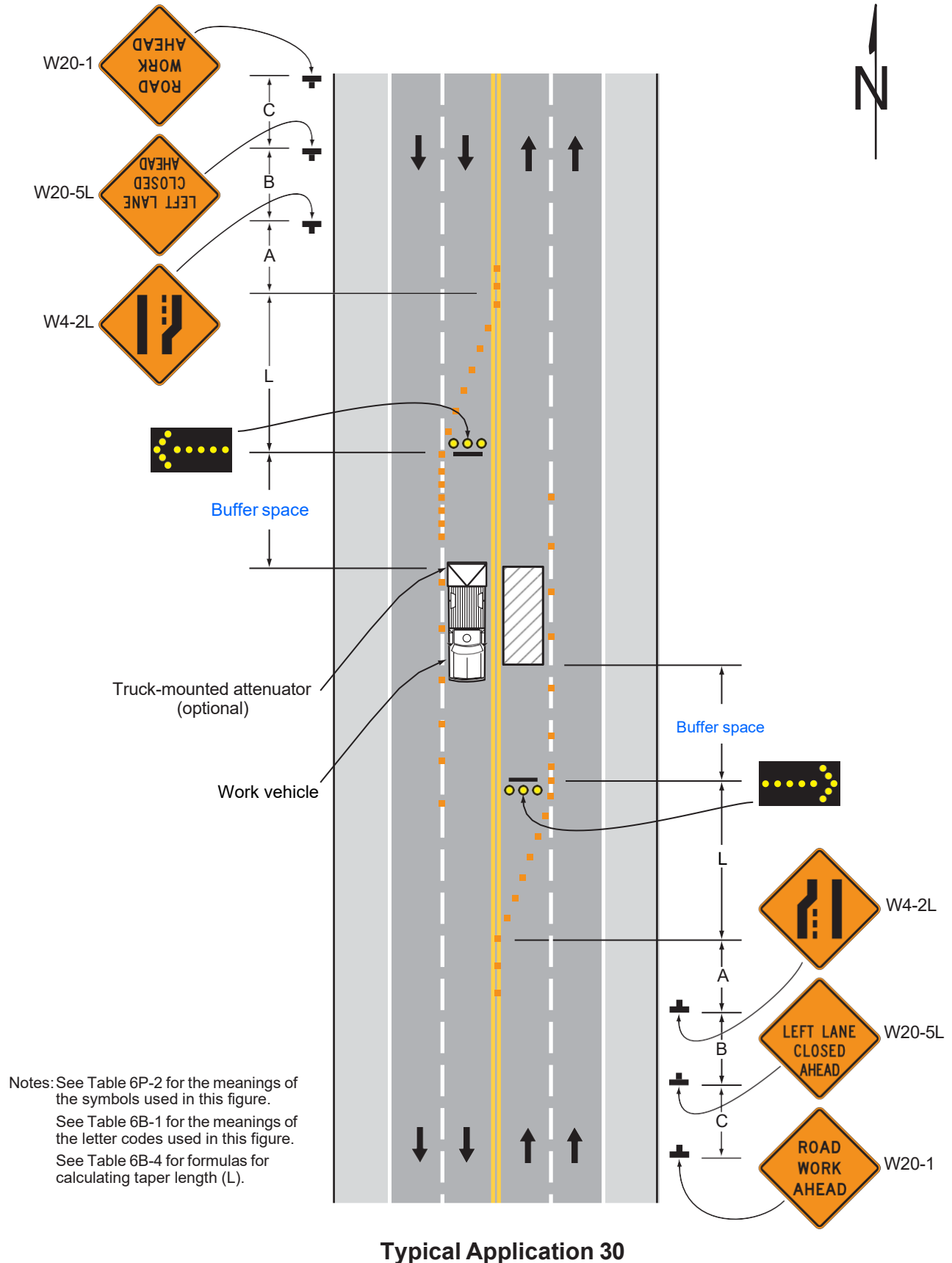
Option:

2. Positive protection devices may be used per Section 6M.02.
3. Shadow vehicles with a truck-mounted attenuator may be used.

Support:

4. The closure of the adjacent interior lane in the opposing direction might not be necessary, depending upon the activity being performed and the work space needed for the operation.
5. A buffer space is typically provided after a merge taper on a multi-lane street.

Figure 6P-30. Interior Lane Closure on a Multi-Lane Street (TA-30)



Notes for Figure 6P-31—Typical Application 31

Lane Closure on a Street with Uneven Directional Volumes

Standard:

1. **The illustrated information shall be used only when the vehicular traffic volume indicates that two lanes of vehicular traffic shall be maintained in the direction of travel for which one lane is closed.**

Option:

2. The procedure may be used during a peak period of vehicular traffic and then changed to provide two lanes in the other direction for the other peak.

Guidance:

3. *For high speeds, a LEFT LANE CLOSED XX FT sign should be added for vehicular traffic approaching the lane closure, as shown in Figure 6P-32.*
4. *Conflicting pavement markings should be removed for long-term projects. For short-term and intermediate-term projects where this is impracticable, the channelizing devices in the area where the pavement markings conflict should be placed at a maximum spacing of $\frac{1}{2} S$ feet where S is the speed in mph. Temporary markings should be installed where needed.*
5. *If the lane shift has curves with recommended speeds of 30 mph or less, Reverse Turn signs should be used.*
6. *Where the shifted section is long, a Reverse Curve sign should be used to show the initial shift and a second sign should be used to show the return to the normal alignment.*
7. *If the tangent distance along the temporary diversion is less than 600 feet, the Double Reverse Curve sign should be used at the location of the first Two Lane Reverse Curve sign. The second Two Lane Reverse Curve sign should be omitted.*

Standard:

8. **Except as provided in Note 11 below, the number of lanes illustrated on the Reverse Curve or Double Reverse Curve signs shall be the same as the number of through lanes available to road users, and the direction of the reverse curves shall be appropriately illustrated.**

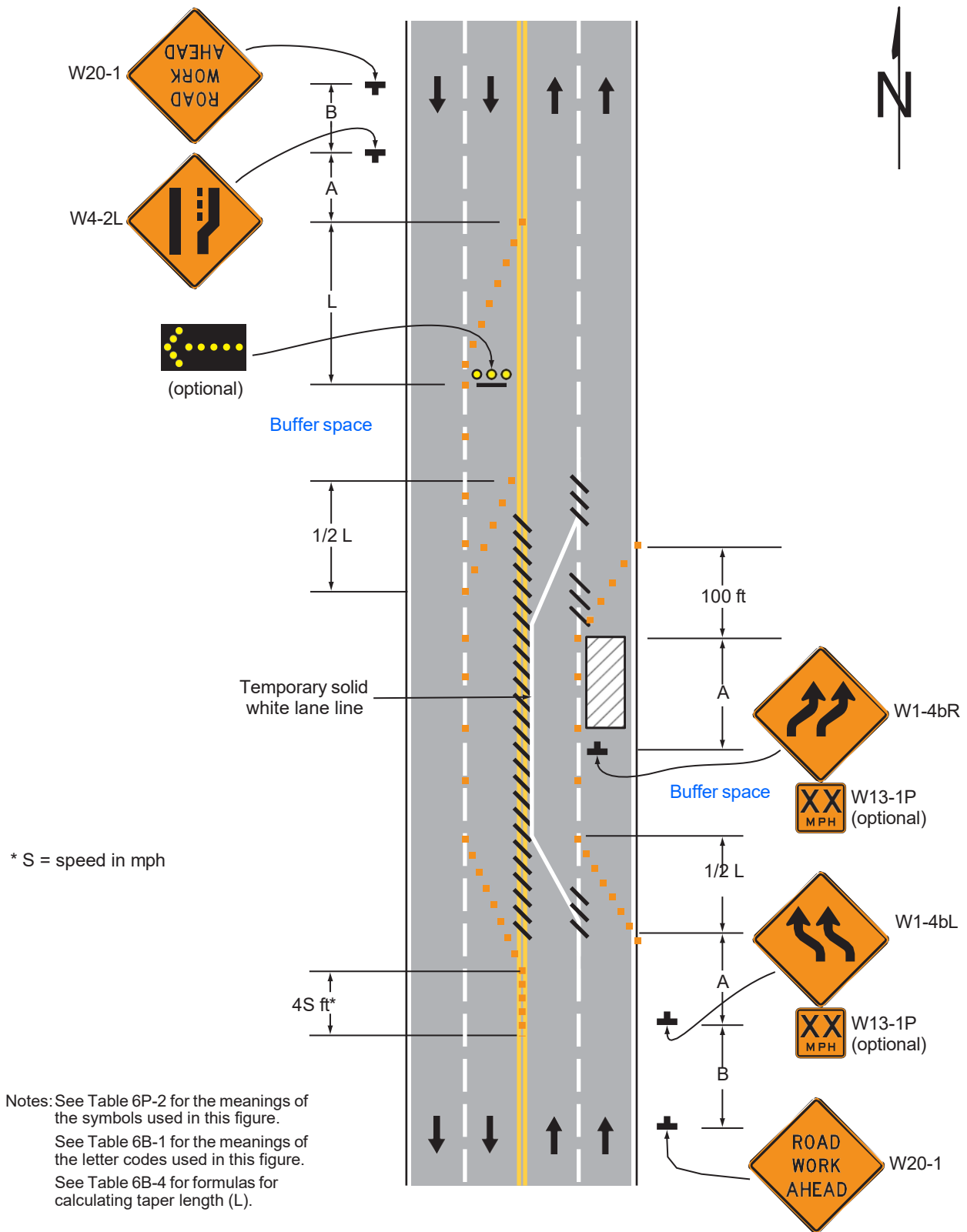
Option:

9. Positive protection devices may be used per Section 6M.02.
10. A longitudinal buffer space may be used in the activity area to separate opposing vehicular traffic.
11. Where two or more lanes are being shifted, a Reverse Curve (or Reverse Turn) sign with an ALL LANES plaque (see Figure 6H-1) may be used instead of a sign that illustrates the number of lanes.
12. Where more than three lanes are being shifted, the Reverse Curve (or Turn) sign may be rectangular.
13. A work vehicle or a shadow vehicle may be equipped with a truck-mounted attenuator.

Support:

14. A buffer space is typically provided after a merge taper on a multi-lane street.

Figure 6P-31. Lane Closure on a Street with Uneven Directional Volumes (TA-31)



Typical Application 31

Notes for Figure 6P-33—Typical Application 33 Stationary Lane Closure on a Divided Highway

Standard:

1. This information also shall be used when work is being performed in the lane adjacent to the median on a divided highway. In this case, the **LEFT LANE CLOSED** signs and the corresponding **Lane Ends** signs shall be substituted.
2. When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed as needed.

Guidance:

3. *When paved shoulders having a width of 8 feet or more are closed, channelizing devices should be used to close the shoulder in advance of the merging taper to direct vehicular traffic to remain within the traveled way.*

Option:

4. A truck-mounted attenuator may be used on the work vehicle and/or shadow vehicle.
5. Positive protection devices may be used per Section 6M.02.

Support:

6. Where conditions permit, restricting all vehicles, equipment, workers, and their activities to one side of the roadway might be advantageous.

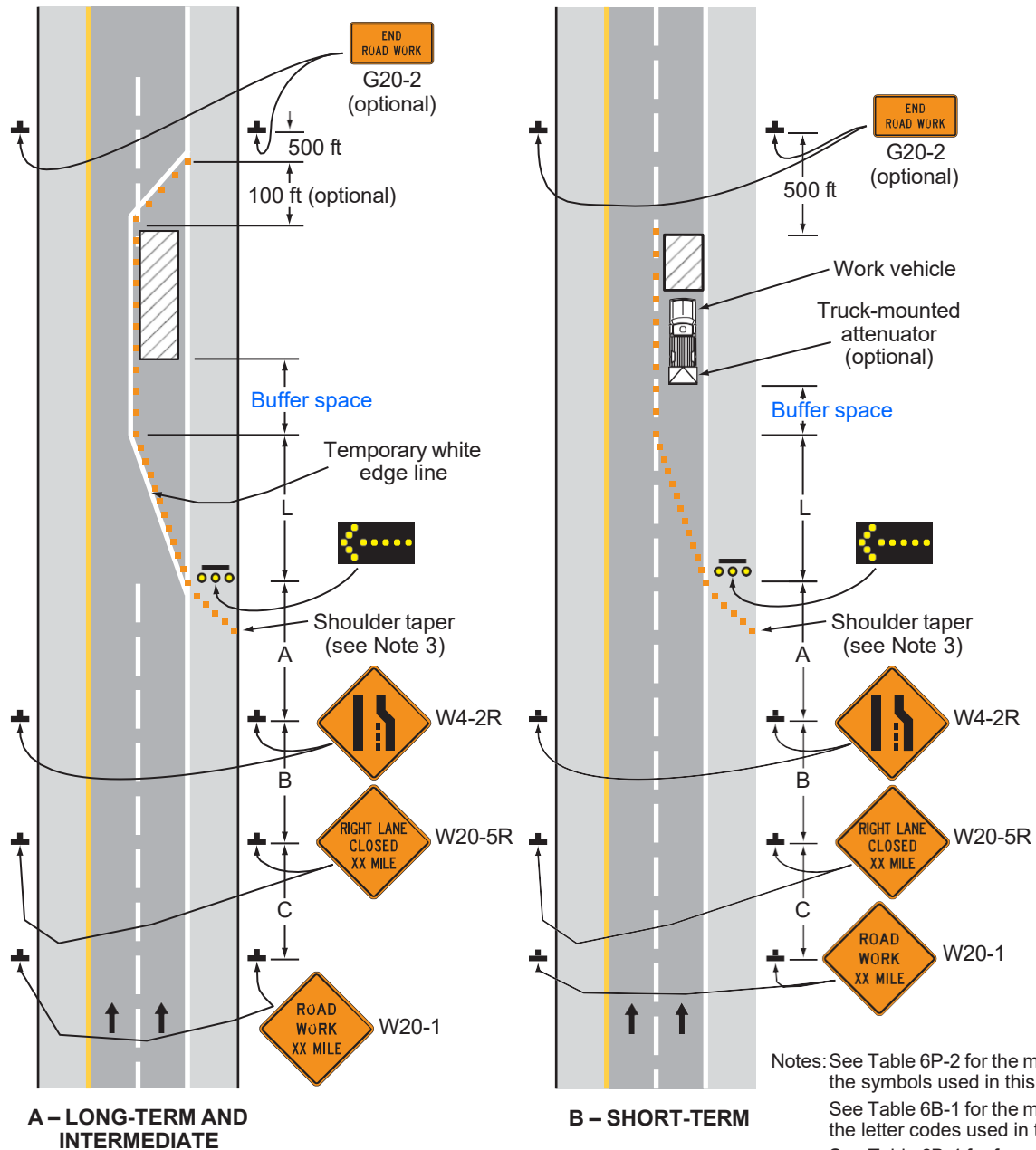
Standard:

7. **An arrow board shall be used when a freeway lane is closed. When more than one freeway lane is closed, a separate arrow board shall be used for each closed lane.**

Support:

8. A buffer space is typically provided after a merge taper on a divided highway.

Figure 6P-33. Stationary Lane Closure on a Divided Highway (TA-33)



Typical Application 33

Notes for Figure 6P-34—Typical Application 34 Lane Closure with a Temporary Traffic Barrier

Standard:

1. This information also shall be used when work is being performed in the lane adjacent to the median on a divided highway. In this case, the **LEFT LANE CLOSED** signs and the corresponding **Lane Ends** signs shall be substituted.

Guidance:

2. For long-term lane closures on facilities with permanent edge lines, a temporary edge line should be installed from the upstream end of the merging taper to the downstream end of the downstream taper, and conflicting pavement markings should be removed.
3. The use of a barrier should be based on engineering judgment.

Standard:

4. Temporary traffic barriers, if used, shall comply with the provisions of Section 6M.02.
5. The barrier shall not be placed along the merging taper. The lane shall first be closed using channelizing devices and pavement markings.

Option:

6. Type C Steady-Burn warning lights may be placed on channelizing devices and the barrier parallel to the edge of pavement for nighttime lane closures.
7. The barrier shown in this typical application is an example of one method that may be used to close a lane for a long-term project. If the work activity permits, a movable barrier may be used and relocated to the shoulder during non-work periods or peak-period vehicular traffic conditions, as appropriate.

Standard:

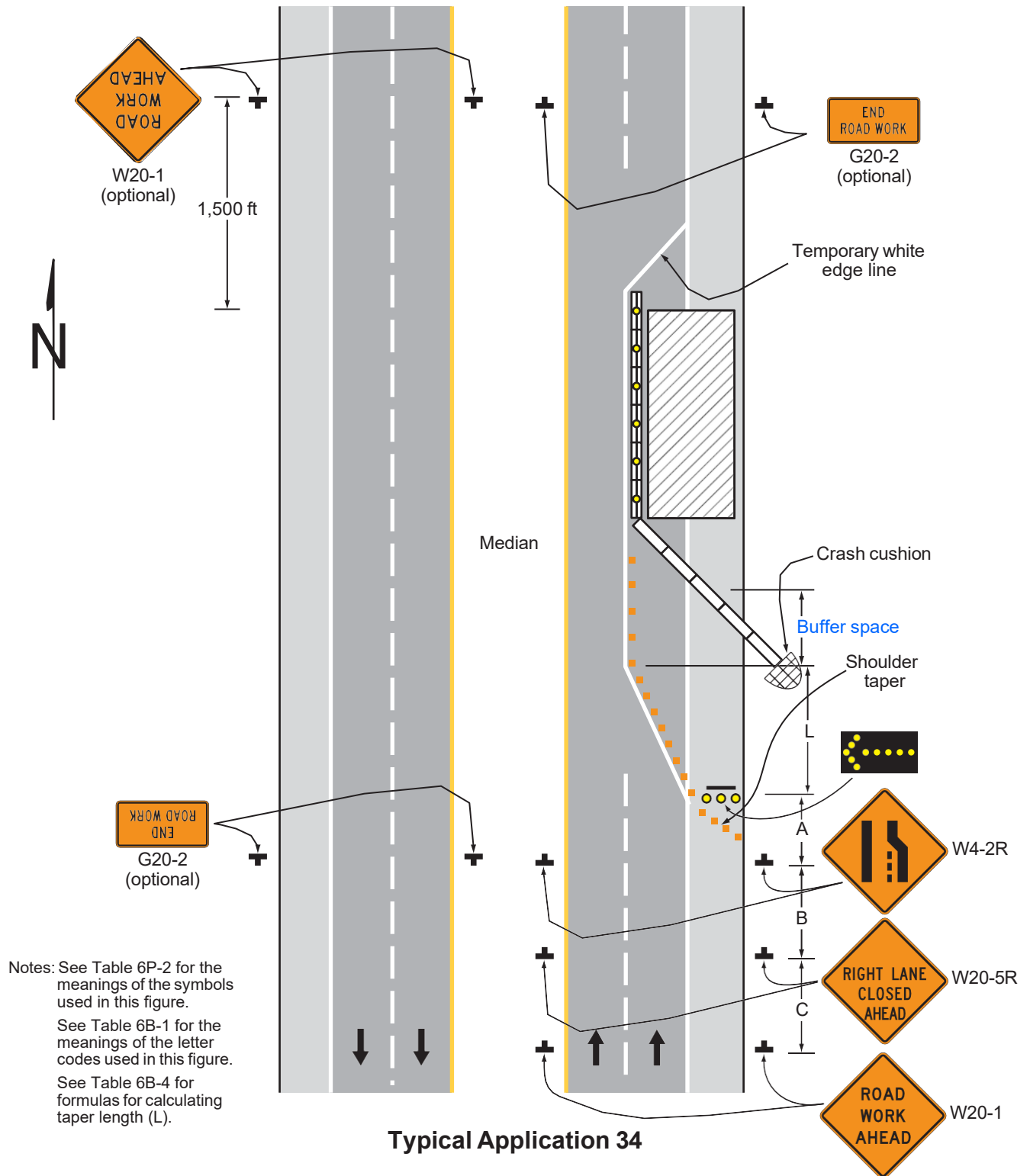
8. If a movable barrier is used, the temporary white edge line shown in the typical application shall not be used. During the period when the right-hand lane is opened, the sign legends and the channelization shall be changed to indicate that only the shoulder is closed, as illustrated in Figure 6P-5. The arrow board, if used, shall be placed at the downstream end of the shoulder taper and shall display the caution mode.

Guidance:

9. If a movable barrier is used, the shift should be performed in the following manner. When closing the lane, the lane should be initially closed with channelizing devices placed along a merging taper using the same information employed for a stationary lane closure. The lane closure should then be extended with the movable-barrier transfer vehicle moving with vehicular traffic. When opening the lane, the movable-barrier transfer vehicle should travel against vehicular traffic from the termination area to the transition area. The merging taper should then be removed using the same information employed for a stationary lane closure.

Support:

10. A buffer space is typically provided after a merge taper on a divided highway.

Figure 6P-34. Lane Closure with a Temporary Traffic Barrier (TA-34)

Notes for Figure 6P-37—Typical Application 37

Double Lane Closure on a Freeway

Standard:

1. An arrow board shall be used when a freeway lane is closed. When more than one freeway lane is closed, a separate arrow board shall be used for each closed lane.

Guidance:

2. Ordinarily, the preferred position for the second arrow board is in the closed exterior lane at the upstream end of the second merging taper. However, the second arrow board should be placed in the closed interior lane at the downstream end of the second merging taper in the following situations:
 - a. When a shadow vehicle is used in the interior closed lane, and the second arrow board is mounted on the shadow vehicle;
 - b. If alignment or other conditions create any confusion as to which lane is closed by the second arrow board; and
 - c. When the first arrow board is placed in the closed exterior lane at the downstream end of the first merging taper (the alternative position when the shoulder is narrow).

Option:

3. Flashing warning lights and/or flags may be used to call attention to the initial warning signs.
4. A truck-mounted attenuator may be used on the shadow vehicle.
5. Positive protection devices may be used per Section 6M.02.
6. If a paved shoulder having a minimum width of 10 feet and sufficient strength is available, the left-hand and adjacent interior lanes may be closed and vehicular traffic carried around the work space on the right-hand lane and a right-hand shoulder.

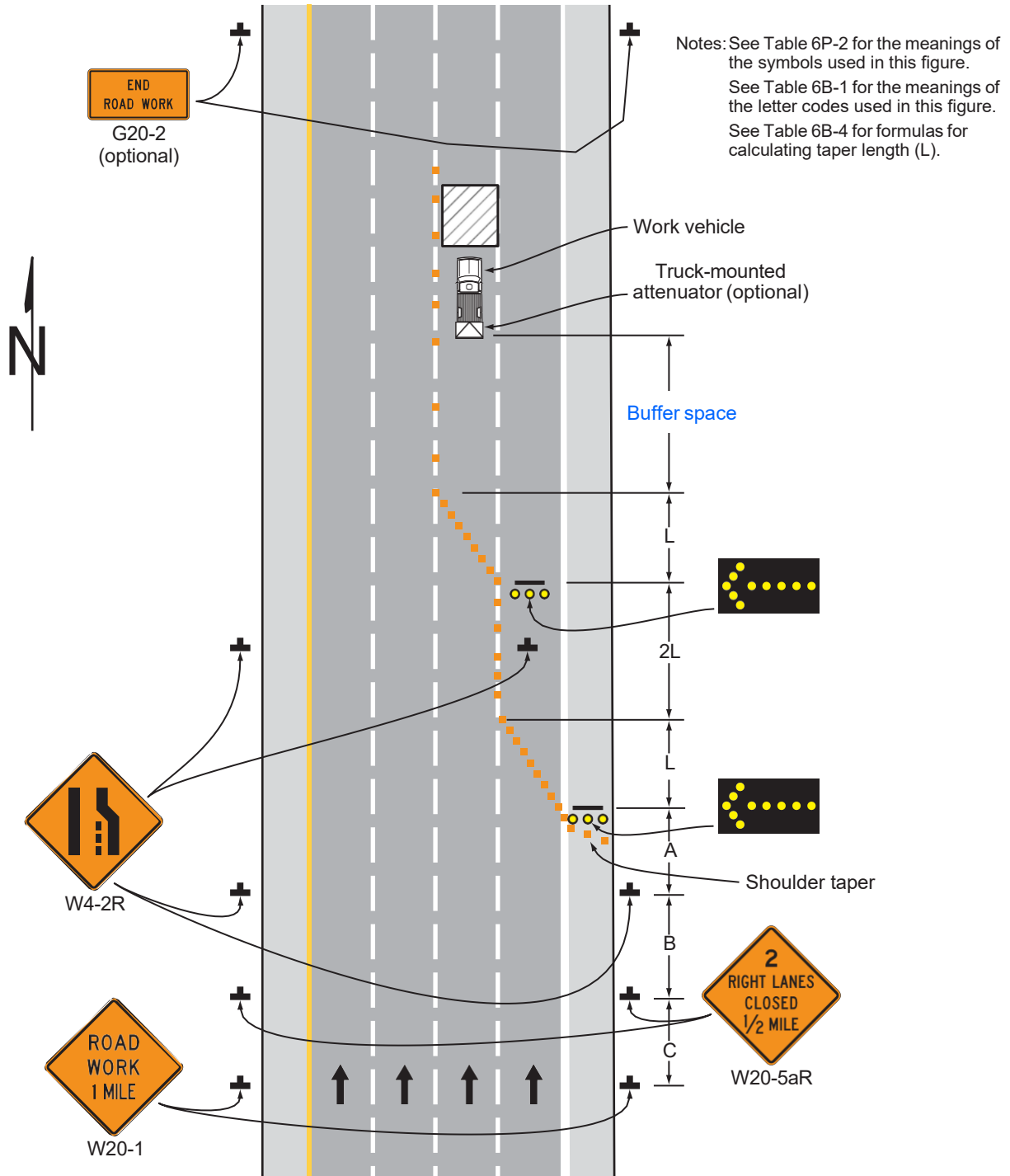
Guidance:

7. When a shoulder lane is used that cannot adequately accommodate trucks, trucks should be directed to use the normal travel lanes.

Support:

8. A buffer space is typically provided after a merge taper on a freeway.

Figure 6P-37. Double Lane Closure on a Freeway (TA-37)



Typical Application 37

Notes for Figure 6P-38—Typical Application 38

Interior Lane Closure on a Freeway

Standard:

1. An arrow board shall be used when a freeway lane is closed. When more than one freeway lane is closed, a separate arrow board shall be used for each closed lane.
2. If temporary traffic barriers are installed, they shall comply with the provisions and requirements in Section 6M.02.
3. The barrier shall not be placed along the shifting taper. The lane shall first be shifted using channelizing devices and pavement markings.
4. For long-term stationary work, existing conflicting pavement markings shall be removed and temporary markings shall be installed before traffic patterns are changed.

Guidance:

5. *For a long-term closure, a barrier should be used to provide additional safety to the operation in the closed interior lane. A buffer space should be used at the upstream end of the closed interior lane.*
6. *An arrow board displaying an arrow pointing to the right should be placed on the left-hand shoulder at the beginning of the taper.*
7. *For long-term use, the broken lane lines should be made solid white in the two-lane section.*

Option:

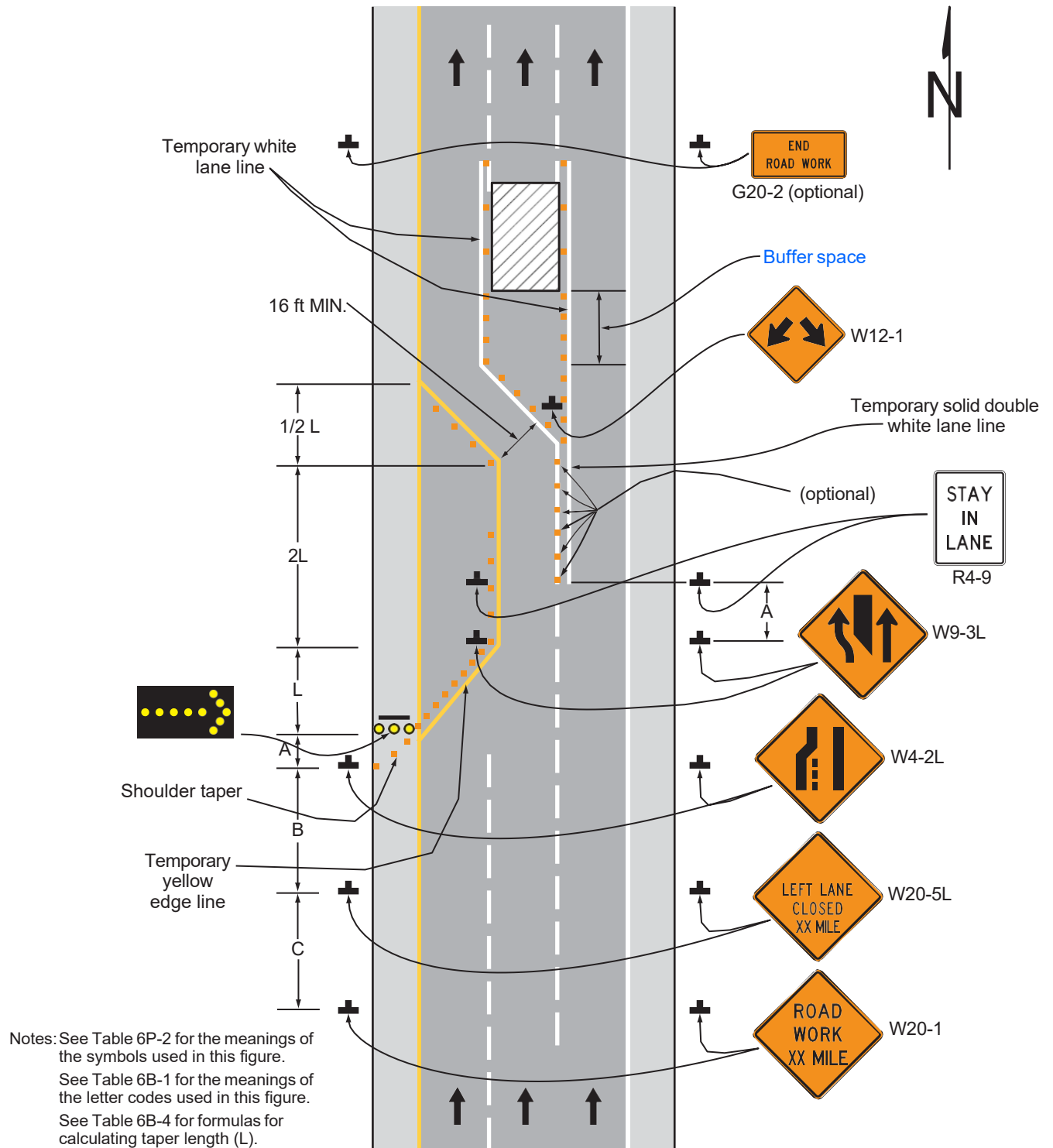
8. As an alternative to initially closing the left-hand lane, as shown in the typical application, the right-hand lane may be closed in advance of the interior lane closure with appropriate channelization and signs. The Interior Lane Shift Ahead symbol sign may be mirrored to indicate a right lane shift.
9. A short, single row of channelizing devices in advance of the vehicular traffic split to restrict vehicular traffic to their respective lanes may be added.
10. DO NOT PASS signs may be used.
11. If a paved shoulder having a minimum width of 10 feet and sufficient strength is available, the left-hand and center lanes may be closed and motor vehicle traffic carried around the work space on the right-hand lane and a right-hand shoulder.
12. A work vehicle with a truck-mounted attenuator may be used within the closed interior lane between the buffer space and the work area.
13. Positive protection devices may be used per Section 6M.02.

Guidance:

14. *When a shoulder lane is used that cannot adequately accommodate trucks, trucks should be directed to use the normal travel lanes.*

Support:

15. A buffer space is typically provided when the shift taper is a full lane width on a freeway.

Figure 6P-38. Interior Lane Closure on a Freeway (TA-38)**Typical Application 38**

Notes for Figure 6P-46—Typical Application 46

Work in the Vicinity of a Grade Crossing

Guidance:

1. *When grade crossings exist either within or in the vicinity of roadway work activities, extra care should be taken to minimize the probability of conditions being created, by lane restrictions, flagging, or other operations, where vehicles might be stopped within the grade crossing, considered as being 15 feet on either side of the closest and farthest rail.*

Standard:

2. **If the queuing of vehicles across active rail tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the grade crossing to prevent vehicles from stopping within the grade crossing (as described in Note 1 above), even if automatic warning devices are in place.**

Guidance:

3. *Early coordination with the railroad company or transit agency should occur before work starts.*
4. *In the example depicted, the buffer space of the activity area should be extended upstream of the grade crossing (as shown) so that a queue created by the flagging operation will not extend across the grade crossing.*

Standard:

5. **The DO NOT STOP ON TRACKS sign shall be used on all approaches to a grade crossing within the limits of a TTC zone.**

Option:

6. Positive protection devices may be used per Section 6M.02.
7. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
8. A BE PREPARED TO STOP sign may be added to the sign series.
9. Automated Flagger Assistance Devices (see Section 6L.02) may be used in situations where there is only one lane of approaching traffic in the direction to be controlled.

Guidance:

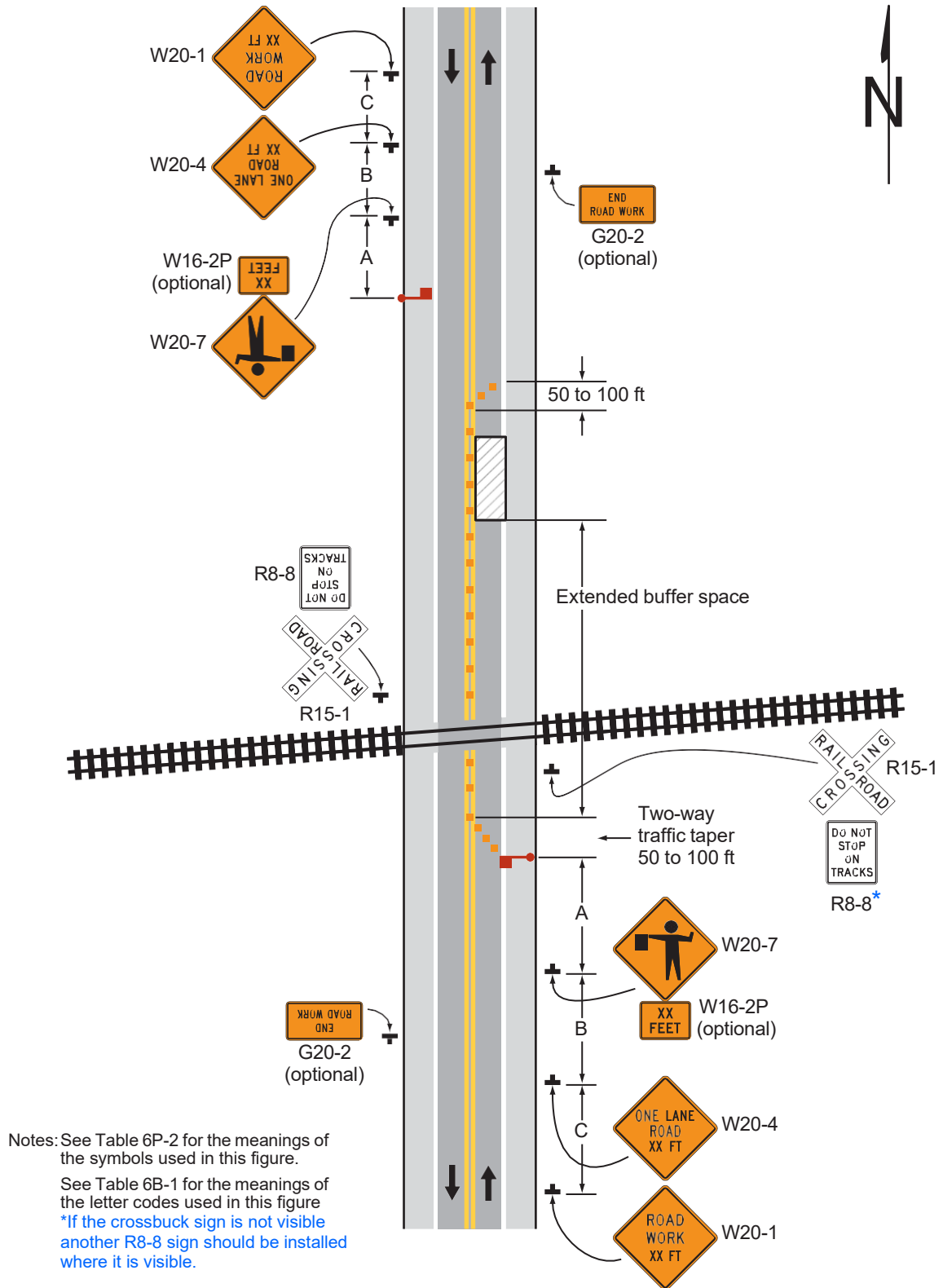
10. *When used, the BE PREPARED TO STOP sign should be located before the Flagger symbol sign.*

Standard:

11. **At night, flagger stations shall be illuminated, except in emergencies.**

Support:

12. See Section 6J.01 for information on the removal of conflicting markings in long-term stationary work zones.

Figure 6P-46. Work in the Vicinity of a Grade Crossing (TA-46)**Typical Application 46**

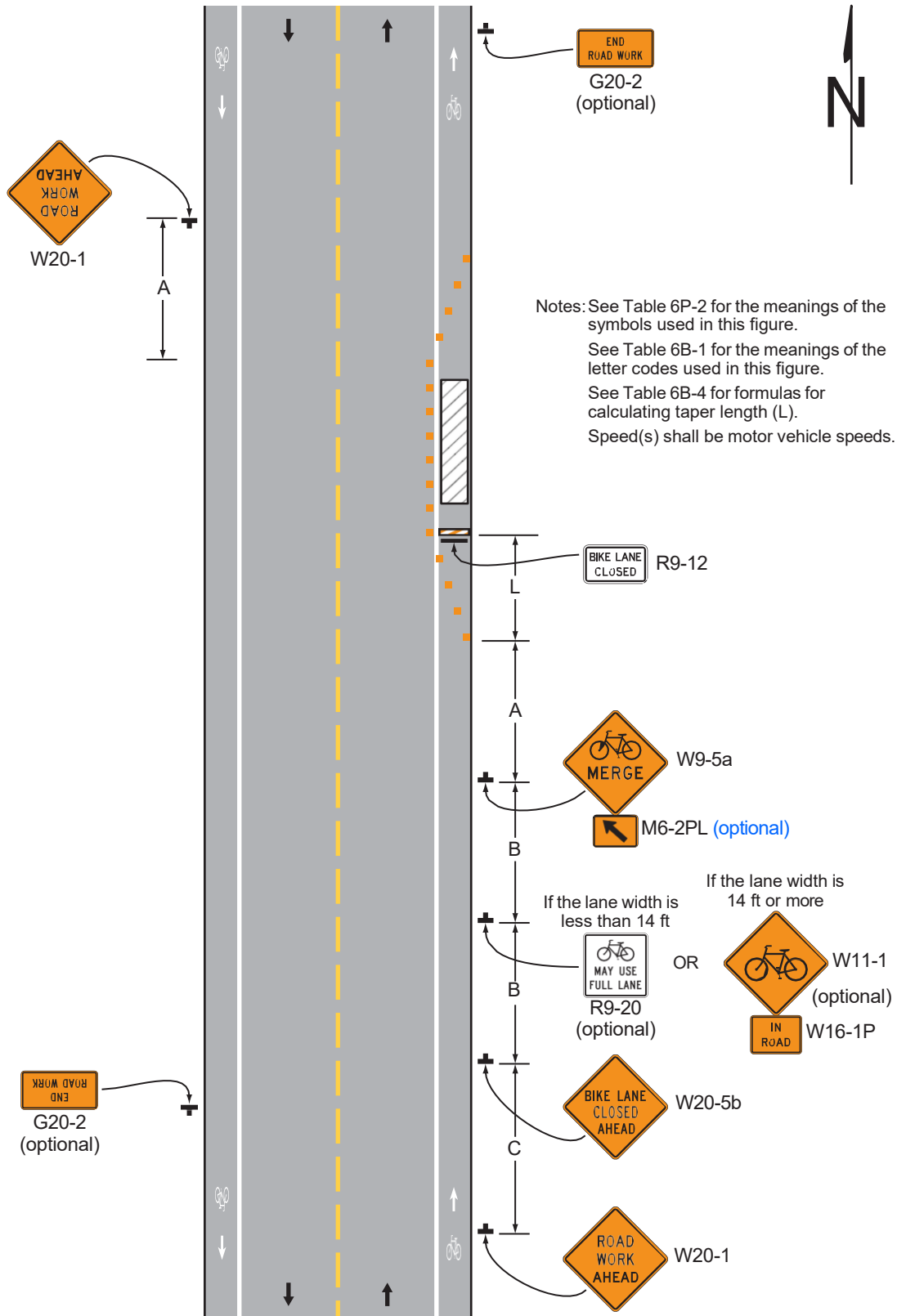
Notes for Figure 6P-47—Typical Application 47
Bicycle Lane Closure without a Detour

Guidance:

1. *If a bicycle lane on a roadway having a speed limit of 35 mph or higher is closed and conditions are not appropriate to direct bicyclists into a shared lane, a separate bicycle facility or detour route should be considered (see Figures 6P-48 and 6P-51).*

Option:

2. If a bicycle lane on a roadway having a speed limit of 30 mph or less is closed, and the adjacent travel lane is less than 14 feet wide, then BICYCLES ALLOWED USE OF FULL LANE signs may be used.
3. If a bicycle lane on a roadway having a speed limit of 30 mph or less is closed, and the adjacent travel lane is at least 14 feet wide throughout the TTC zone, then Bicycle Warning signs in association with IN STREET or IN ROADWAY plaques may be used.
4. A M6-2P directional arrow plaque may be used with the Bicycles Merging sign.

Figure 6P-47. Bicycle Lane Closure without a Detour (TA-47)

Notes for Figure 6P-49—Typical Application 49
Shared-Use Path Closure with a Diversion

Guidance:

1. *The temporary paved shared-use path should be at least as wide as the shared-use path that was temporarily closed.*

Option:

2. Pedestrian channelizers may be considered for paved shared-use paths that are open to pedestrians.

Notes for Figure 6P-50—Typical Application 50
On-Road Detour for a Shared-Use Path

Guidance:

1. *The on-road detour route for bicyclists should use the most direct route practical on roadways or shoulders where conditions are appropriate for bicycling.*
2. *Bicycle related regulatory and/or warning signs should be considered along the bicycle detour based on engineering judgment and traffic conditions.*
3. *A Street Name sign or Bike Route Name sign should be mounted with the Bike Detour sign.*

Option:

4. The Street Name sign or Bike Route Name sign may be either white on green or black on orange.

Standard:

5. **Where used the Street Name sign or Bike Route Name sign shall be placed above the Bike Detour sign.**

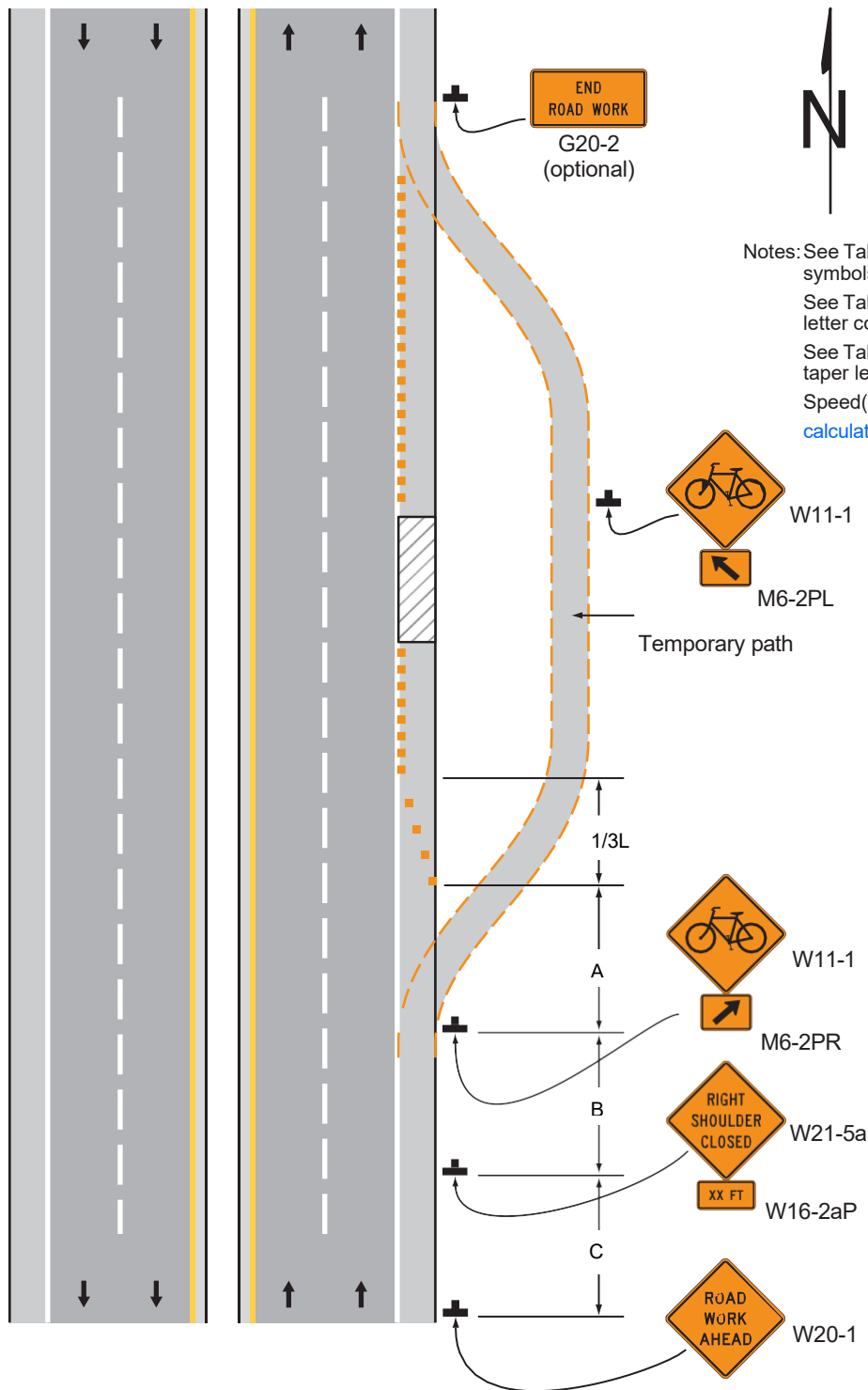
Option:

6. If a bicycle lane on a roadway having a speed limit of 30 mph or less is closed, and the adjacent travel lane is less than 14 feet wide, then BICYCLES ALLOWED USE OF FULL LANE signs may be used.
7. If a bicycle lane on a roadway having a speed limit of 30 mph or less is closed, and the adjacent travel lane is at least 14 feet wide throughout the TTC zone, then Bicycle Warning signs in association with IN STREET or IN ROADWAY plaques may be used.

Support:

8. The M4-10 detour sign is typically used with the PATH CLOSED sign, unless there is an adjacent road where drivers could readily see the detour sign and be misled or confused, in which case the detour sign is omitted.

Figure 6P-51. Paved Shoulder Closure with a Bicycle Diversion onto a Temporary Path (TA-51)



Typical Application 51

CHAPTER 7B. SIGNS

Section 7B.01 Design of School Signs**Standard:**

01 Except as provided in Section 2A.07, the sizes of signs and plaques to be used on conventional roadways in school areas shall be as shown in Table 7B-1.

02 The sizes in the Oversized column in Table 7B-1 shall be used on expressways in school areas.

Guidance:

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

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

Sign	Sign Designation	Section	Conventional Road	Minimum	Oversized
School	S1-1	7B.02	36 x 36	30 x 30	48 x 48
School Bus Stop Ahead	S3-1	7B.04	36 x 36	30 x 30	48 x 48
School Bus Turn Ahead	S3-2	7B.04	36 x 36	30 x 30	48 x 48
Reduced School Speed Limit Ahead	S4-5, S4-5a	7B.05	36 x 36	30 x 30	48 x 48
School Speed Limit XX When Flashing	S5-1	7B.05	24 x 48	—	36 x 72
End School Zone	S5-2	7B.02	24 x 30	—	36 x 48
End School Speed Limit	S5-3	7B.05	24 x 30	—	36 x 48
Stop When School Bus Stops	SR5-Y1	7B.04	24 x 24		
All Lanes Stop When School Bus Stops	SR5-Y2	7B.04	36 x 36		
Yield (Stop) Here for School Crossing	R1-5a, R1-5c	7B.03	36 x 36	—	—
In-Street Ped or School Crossing	R1-6, R1-6a, R1-6b, R1-6c	7B.03	12 x 36	—	—
Overhead School Crossing	R1-9b, R1-9c	7B.03	90 x 24	—	—
Speed Limit (School Use)	R2-1	7B.05	24 x 30	—	36 x 48
Begin Higher Fines Zone	R2-10	7B.06	24 x 30	—	36 x 48
End Higher Fines Zone	R2-11	7B.06	24 x 30	—	36 x 48

Plaque	Sign Designation	Section	Conventional Road	Minimum	Oversized
Time of Day X:XX to X:XX AM X:XX to X:XX PM	S4-1P	7B.06	24 x 12	—	36 x 18
When Children Are Present	S4-2P	7B.06	24 x 12	—	36 x 18
School	S4-3P	7B.02, 7B.05	24 x 9	—	36 x 12
When Flashing	S4-4P	7B.05, 7B.06	24 x 12	—	36 x 18
Days of Week Mon-Fri	S4-6P	7B.05	24 x 12	—	36 x 18
All Year	S4-7P	7B.02	24 x 12	—	30 x 18
School Days	S4-Y8P	7B.05	24 x 18		30 x 24
All Year	S4-7P	7B.02	24 x 12	—	30 x 18
Fines Higher	R2-6P	7B.06	24 x 18	—	36 x 24
Fines Double	R2-6aP	7B.06	24 x 18	—	36 x 24
\$XX Fine	R2-6bP	7B.06	24 x 18	—	36 x 24
XX Feet (2-line)	W16-2P	7B.02,	24 x 18	—	30 x 24
XX Ft (1-line)	W16-2aP	7B.02,	24 x 12	—	30 x 18
Directional Arrow	W16-5P	7B.02,	21 x 15	—	30 x 21
Advance Turn Arrow	W16-6P	7B.02,	21 x 15	—	30 x 21
Downward Diagonal Arrow	W16-7P	7B.02,	21 x 15	—	30 x 21
Ahead	W16-9P	7B.02,	24 x 12	—	30 x 18

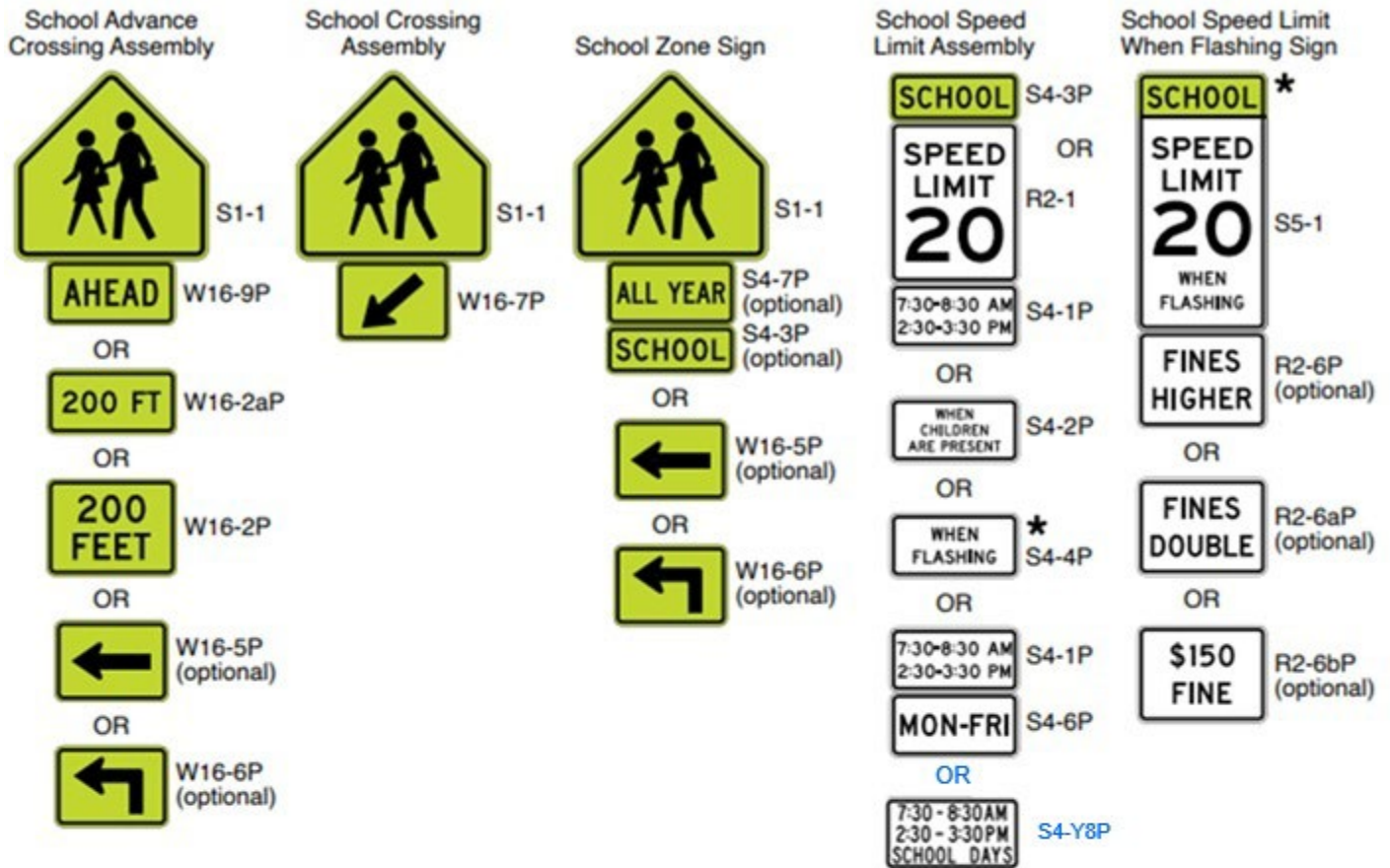
Notes: 1. Larger sizes may be used when appropriate

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

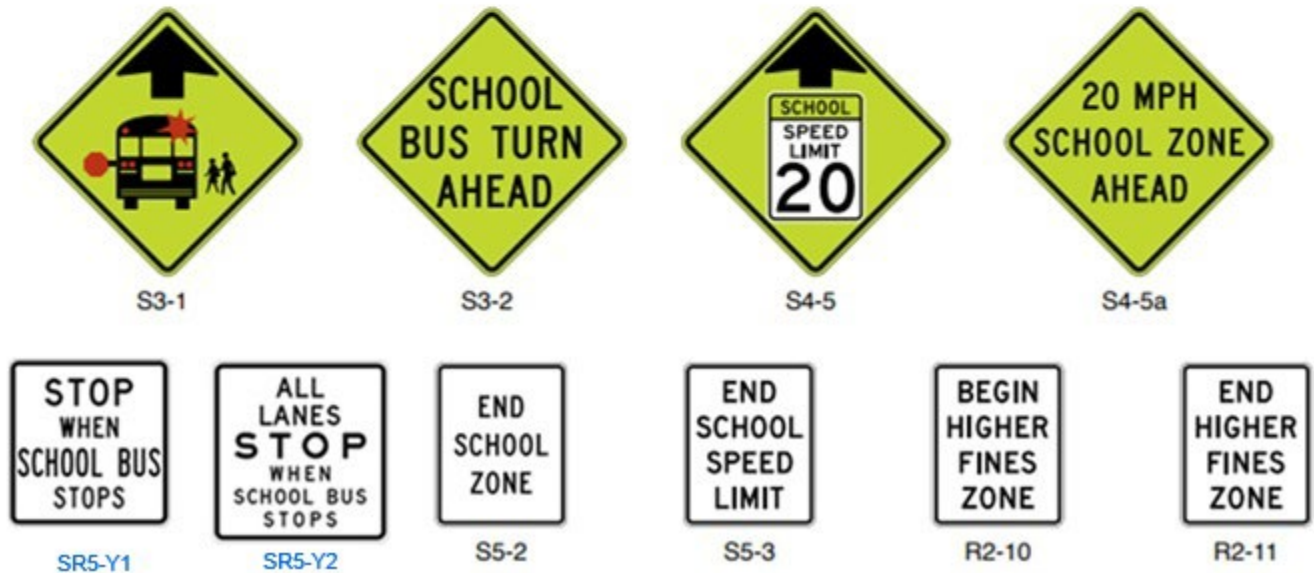
3. Minimum sign sizes for multi-lane conventional roads shall be as shown in the Conventional Road column

Figure 7B-1. Signs in School Areas and at School Crossings (Sheet 1 of 2)

A – School area signs



* If used, the assembly or sign with WHEN FLASHING legend shall be accompanied by a flashing yellow Speed Limit Sign Beacon (see Section 4S.04).



Option:

- 16 A 12-inch reduced size in-street School (S1-1) sign (see Figure 7B-1) may be used instead of the In-Street Pedestrian Crossing (R1-6 or R1-6a) or the In-Street School Crossing (R1-6b or R1-6c) sign at a school crossing on approaches that are not controlled by a traffic control signal, pedestrian hybrid beacon, or an emergency-vehicle hybrid beacon. A 12 x 6-inch reduced size diagonal downward-pointing arrow (W16-7P) plaque (see Figure 7B-1) may be mounted below the reduced size in-street School (S1-1) sign.

Standard:

- 17 **If an In-Street Pedestrian Crossing sign, an In-Street School Crossing sign, or a reduced size in-street School (S1-1) sign is placed in the roadway, the sign support shall comply with the mounting height and special mounting support requirements for an In-Street Pedestrian Crossing (R1-6 or R1-6a) sign (see Section 2B.20).**
- 18 **The In-Street Pedestrian Crossing sign, the In-Street School Crossing sign, the Overhead Pedestrian Crossing sign, and the reduced size in-street School (S1-1) sign shall not be used on approaches that are controlled by a traffic control signal, pedestrian hybrid beacon, or an emergency-vehicle hybrid beacon.**

Section 7B.04 School Bus Stop Signs*Guidance:*

- 01 *The School Bus Stop Ahead (S3-1) sign (see Figure 7B-1) should be installed in advance of locations where a school bus, when stopped to pick up or discharge passengers, is not visible to road users for an adequate distance and where there is no opportunity to relocate the school bus stop to provide adequate sight distance.*

Option:

- 02 The SCHOOL BUS TURN AHEAD (S3-2) sign (see Figure 7B-1) may be installed in advance of locations where a school bus turns around on a roadway at a location not visible to approaching road users for a distance as determined by the "0" column under Condition B of Table 2C-3, and where there is no opportunity to relocate the school bus turn around to provide the distance provided in Table 2C-3.
- 03 The STOP WHEN SCHOOL BUS STOPS (SR5-Y1) sign may be used at a location where motorists have been observed to regularly ignore the extended arm signal device displayed on a stopped school bus.
- 04 The ALL LANES STOP WHEN SCHOOL BUS STOPS (SR5-Y2) sign may be used on a non-divided highway at a location where motorists heading in the opposite direction of a stopped school bus have been observed to regularly ignore the extended arm signal device when displayed.

Standard:

- 05 **The ALL LANES STOP WHEN SCHOOL BUS STOPS (SR5-Y2) sign shall not be used on a divided highway.**

Support:

- 06 *The use of school bus stop signs normally involves field investigation and engineering judgment.*

Section 7B.05 School Speed Limit Signs and Plaques**Standard:**

- 01 A School Speed Limit assembly (see Figure 7B-1) or a School Speed Limit When Flashing (S5-1) sign (see Figure 7B-1) shall be used to indicate the speed limit where a reduced school speed limit zone has been established based upon an engineering study or where a reduced school speed limit is specified for such areas by statute. The School Speed Limit assembly or School Speed Limit When Flashing sign shall be placed at or as near as practicable to the point where the reduced school speed limit zone begins (see Figures 7B-2 and 7B-4).

- 02 **If a reduced school speed limit zone has been established, a School (S1-1) sign shall be installed in advance (see Table 2C-3 for advance placement guidelines) of the first School Speed Limit sign assembly or S5-1 sign that is encountered in each direction as traffic approaches the reduced school speed limit zone (see Figures 7B-2 and 7B-4).**

- 03 **Except as provided in Paragraph 4 of this Section, the downstream end of an authorized and posted reduced school speed limit zone shall be identified with an END SCHOOL SPEED LIMIT (S5-3) sign (see Figures 7B-1, 7B-2, and 7B-4).**

Option:

- 04 If a reduced school speed limit zone ends at the same point as a designated school zone (see Section 7B.02), an END SCHOOL ZONE (S5-2) sign may be used instead of an END SCHOOL SPEED LIMIT (S5-3) sign. A standard Speed Limit sign showing the speed limit for the section of highway that is downstream from the authorized and posted reduced school speed limit zone may be mounted on the same post above the END SCHOOL SPEED LIMIT (S5-3) sign or the END SCHOOL ZONE (S5-2) sign.

Guidance:

- 05 *The beginning point of a reduced school speed limit zone should be at least 200 feet in advance of the school grounds or a school crossing; however, this 200-foot distance should be increased if the reduced school speed limit is 30 mph or higher. The maximum beginning point of a reduced school speed limit zone should not be greater than 500 feet in advance of the school grounds or a school crossing.*

Standard:

- 06 **The School Speed Limit assembly shall be either a static sign assembly, a blank-out sign, or a changeable message sign (see Chapter 2L).**

07 The static School Speed Limit assembly shall consist of a top plaque (S4-3P) with the legend SCHOOL, a Speed Limit (R2-1) sign, and a bottom plaque (S4-1P, S4-2P, S4-4P, S4-6P, or S4-Y8P) indicating the specific periods of the day and/or days of the week that the special school speed limit is in effect (see Figure 7B-1).

08 When a School Speed Limit When Flashing (S5-1) sign or a Speed Limit (R2-1) sign with a supplemental WHEN FLASHING (S4-4P) plaque is used, a Speed Limit Sign Beacon (see Section 4S.04) shall be used to identify the periods that the school speed limit is in effect.

09 Fluorescent yellow-green pixels shall be used when the “SCHOOL” message is displayed on a changeable message sign for a school speed limit.

Option:

10 Changeable message signs may use blank-out messages or other methods in order to display the school speed limit only during the periods it applies.

11 A Vehicle Speed Feedback (W13-20aP) plaque that displays the speed of approaching drivers (see Sections 2B.21 and 2C.13), that is part of a School Speed Limit assembly or a School Speed Limit When Flashing (S5-1) sign, may be used in a school speed limit zone.

Guidance:

12 If used, the Vehicle Speed Feedback (W13-20aP) plaque should only be used during the time period when the school speed limit is in effect.

13 A Reduced School Speed Limit Ahead (S4-5 or S4-5a) sign (see Figure 7B-1) 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 that advance notice would be appropriate.

Standard:

14 If used, the Reduced School Speed Limit Ahead sign shall be followed by a School Speed Limit sign or a School Speed Limit assembly.

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

Section 7B.06 Higher Fines Zone Signs and Plaques in School Areas

Support:

01 The signs and plaques used to inform road users of higher fines zones and their locations depend on whether the fines apply to all traffic violations or only to speeding violations. Their locations also depend on whether the higher fines zone begins and/or ends at the same point as the school zone or school speed limit zone. Figures 7B-4 and 7B-5 show examples of higher fines zones signing.

Standard:

02 Where increased fines are imposed for traffic violations within a designated school zone:

- A. A BEGIN HIGHER FINES ZONE (R2-10) sign (see Figure 7B-1) or a FINES HIGHER (R2-6P), FINES DOUBLE (R2-6aP), or \$XX FINE (R2-6bP) plaque (see Figure 7B-1) shall be installed as a supplement to the School Zone (S1-1) sign to identify the beginning point of the higher fines zone (see Figures 7B-4 and 7B-5); and
- B. An END HIGHER FINES ZONE (R2-11) sign (see Figure 7B-1) or an END SCHOOL ZONE (S5-2) sign (see Figure 7B-1) shall be installed at the downstream end of the zone to notify road users of the termination of the increased fines zone (see Figure 7B-5).

03 If exceeding the speed limit is the only traffic violation that is subject to higher fines, a FINES HIGHER (R2-6P), FINES DOUBLE (R2-6aP), or \$XX FINE (R2-6bP) plaque shall be posted with the School Speed Limit (S5-1) sign and shall not be posted beneath the School Zone (S1-1) sign (see Section 7B.05).

04 If the portion of the roadway that is subject to higher fines does not begin at the location of the School Zone (S1-1) sign, a BEGIN HIGHER FINES ZONE (R2-10) sign shall be placed at the point where the higher fines begin (see Sheet 2 of Figure 7B-5).

Option:

05 If a BEGIN HIGHER FINES ZONE (R2-10) sign is used downstream of the School Zone (S1-1) sign, a FINES HIGHER (R2-6P), FINES DOUBLE (R2-6aP), or \$XX FINE (R2-6bP) plaque may also be placed beneath the School Zone (S1-1) sign.

06 Where appropriate, one of the following plaques may be mounted below the sign that identifies the beginning point of the higher fines zone:

- A. A S4-1P plaque (see Figure 7B-1) specifying the times that the higher fines are in effect,
- B. A WHEN CHILDREN ARE PRESENT (S4-2P) plaque (see Figure 7B-1), or
- C. A WHEN FLASHING (S4-4P) plaque (see Figure 7B-1) if used in conjunction with a yellow flashing beacon.

CHAPTER 7D. CROSSING SUPERVISION

Section 7D.01 Adult Crossing Guards

Option:

- 01 Adult crossing guards may be used to provide gaps in traffic at school crossings where an engineering study has shown that adequate gaps need to be created, and where authorized by law.

Support:

- 02 Adult crossing guards can also add conspicuity at the crossing where children, who are typically smaller in stature, might not be as visible.
- 03 High standards for selection of adult crossing guards are essential because they are responsible for the safety of and the efficient crossing of the street by schoolchildren within and in the immediate vicinity of school crosswalks.

Guidance:

- 04 *Jurisdictions should have policies and procedures for the qualifications, selection, and training of adult crossing guards.*

Option:

- 05 Use of adult crossing guards may be preferred to installing traffic signals that would only meet the criteria in Section 4C.06.

Section 7D.02 Operating Procedures for Adult Crossing Guards

Standard:

- 01 Law enforcement officers performing school crossing supervision and adult crossing guards shall wear high-visibility retroreflective safety apparel labeled as ANSI 107-2020 standard performance for Class 2, Type R, as described in Section 6C.05.
- 02 Adult crossing guards shall not direct traffic in the usual law enforcement regulatory sense. In the control of traffic, they shall pick opportune times to create a sufficient gap in the traffic flow. At these times, they shall stand in the roadway to indicate that pedestrians are about to use or are using the crosswalk, and that all vehicular traffic must stop.
- 03 Adult crossing guards shall use a STOP paddle. The STOP paddle shall be the primary hand-signaling device.
- 04 The STOP paddle shall comply with the provisions for a STOP/SLOW paddle (see Section 6D.02) except both sides shall be a STOP face.
- 05 The paddle shall be retroreflective or illuminated when used during hours of darkness.

PART 8

TRAFFIC CONTROL FOR RAILROAD AND LIGHT RAIL TRANSIT GRADE CROSSINGS

CHAPTER 8A. GENERAL

Section 8A.01 Introduction

Support:

- 01 Where the acronym “LRT” is used in Part 8, it refers to “light rail transit.”
- 02 Chapters 8A, 8B, 8C, and 8D describe the traffic control devices that are used at highway-rail and highway-LRT grade crossings. Unless otherwise provided in the text or on a figure or table, the provisions of Part 8 are applicable to both highway-rail and highway-LRT grade crossings. Where the phrase “grade crossing” is used by itself without the prefix “highway-rail” or “highway-LRT,” it refers to both highway-rail and highway-LRT grade crossings.
- 03 Chapter 8E describes the traffic control devices that are used at pathway and sidewalk grade crossings.
- 04 Traffic control for grade crossings includes all signs, signals, markings, other warning devices, and their supports along highways approaching and at grade crossings. The function of this traffic control is to promote safety and provide effective operation of rail and/or LRT and highway traffic at grade crossings.
- 05 For purposes of design, installation, operation, and maintenance of traffic control devices at grade crossings, it is recognized that the crossing of the highway and rail tracks is situated on a right-of-way available for the joint use of both highway traffic and railroad or LRT traffic.
- 06 Grade crossings and the traffic control devices that are associated with them are unique in that in many cases, the highway agency or authority with jurisdiction, the regulatory agency with statutory authority (if applicable), and the railroad company or transit agency are jointly involved in the development of engineering judgment or the performance of an engineering study. This joint process is accomplished through the efforts of a Diagnostic Team made up of the highway agency with jurisdiction, the regulatory agency with statutory authority (if applicable), and the railroad company and/or transit agency (if applicable).
- 06A The Indiana Department of Transportation (INDOT) has the regulatory authority (by Indiana Code) to order installation of active warning devices at any crossing. However, local agencies also have the authority (by Indiana Code) to install or upgrade the traffic control devices at crossings by entering into agreements with railroads by mutual consent without INDOT intervention or regulatory approval. While highway agencies are typically responsible for determining the need and type of warning devices at highway-rail crossings, nothing precludes a railroad from initiating a request for such a study. Further, railroad input may be needed to complete such a study, and their cooperation and participation is needed for any installation beyond standard crossbucks.
- 07 In Part 8, the combination of traffic control devices selected or installed at a specific grade crossing is referred to as a “traffic control system.”
- 08 The combination of railroad or LRT active traffic control devices used to inform road users at a grade crossing of the approach or presence of rail traffic and the necessary control equipment for the devices are referred to as a “grade crossing warning system.” The “2023 AREMA Communications and Signals Manual” published by the American Railway Engineering and Maintenance-of-Way Association (AREMA) contains further information about grade crossing warning systems.

Standard:

- 09 **Except at grade crossings of privately-owned roadways, pathways, and sidewalks, the traffic control devices, systems, and practices described in this Manual shall be used at all grade crossings open to public travel, consistent with Federal, State, and local laws and regulations.**

Support:

- 10 23 CFR 655.603 contains information on the applicability of this Manual at private grade crossings.

Section 8A.02 Highway-LRT Grade Crossings

Support:

- 01 Part 8 also describes the traffic control devices that are used in locations where light rail transit (LRT) vehicles are operating along streets and highways in mixed traffic with road users.
- 02 LRT is a mode of public transportation that employs LRT vehicles (commonly known as light rail vehicles, streetcars, or trolleys) that operate on rails in streets in mixed traffic, and LRT traffic that operates in semi-exclusive rights-of-way, or in exclusive rights-of-way. Where the phrase “LRT” is used in Part 8, it refers to light rail vehicles, streetcars, and trolleys. Grade crossings with LRT can occur at intersections or at midblock locations, including public and private driveways.
- 03 An initial educational campaign along with an ongoing program to continue to educate new drivers is beneficial when introducing LRT operations to an area and, hence, new traffic control devices.
- 04 LRT alignments can be grouped into one of the following three types (see definitions in Section 1C.02):
 - A. Exclusive: An LRT right-of-way that is grade-separated or protected by a fence or traffic barrier. Motor vehicles, pedestrians, and bicycles are prohibited within the right-of-way. This type of alignment does not have grade crossings and is not further addressed in Part 8.

CHAPTER 8B. SIGNS

Section 8B.01 Purpose and Application

Support:

- 01 Passive traffic control systems, consisting of signs and pavement markings only, identify and direct attention to the location of a grade crossing and advise road users to reduce their speed or stop at the grade crossing as necessary in order to yield to any rail traffic occupying, or approaching and in proximity to, the grade crossing.
- 02 Signs and markings regulate, warn, and guide the road users so that they, as well as LRT vehicle operators on mixed-use alignments, can take appropriate action when approaching a grade crossing.
- 03 Unless otherwise provided in this Chapter, the provisions of Part 2 are applicable to the design and location of signs at grade crossings.
- 04 [Indiana Code requires the railroad company to install and maintain the Highway-Rail Grade Crossing \(Crossbuck\) Signs and Number of Tracks Signs.](#)

Section 8B.02 Sizes of Grade Crossing Signs

Standard:

- 01 The minimum sizes of grade crossing signs shall be as shown in Table 8B-1.

Option:

- 02 Signs larger than those shown in Table 8B-1 may be used (see Section 2A.07).

Section 8B.03 Grade Crossing (Crossbuck) Sign (R15-1) and Number of Tracks Plaque (R15-2P) at Active and Passive Grade Crossings

Standard:

- 01 The Grade Crossing (R15-1) sign (see Figure 8B-1), commonly identified as the Crossbuck sign, shall be retroreflective white with the words RAILROAD CROSSING in black lettering, mounted as shown in Figure 8B-2.

Support:

- 02 In most States, the Crossbuck sign requires road users to yield the right-of-way to rail traffic at a grade crossing.

Standard:

- 03 As a minimum, one Crossbuck sign shall be used on each highway approach to every highway-rail grade crossing, alone or in combination with other traffic control devices.
- 04 As a minimum, one Crossbuck sign shall be used on each highway approach to every highway-LRT grade crossing where flashing-light signals or automatic gates are used, alone or in combination with other traffic control devices.

Option:

- 05 A Crossbuck sign may be used on a highway approach to a highway-LRT grade crossing where flashing-light signals or automatic gates are not used, alone or in combination with other traffic control devices.

Standard:

- 06 If there are two or more tracks at a grade crossing, the number of tracks shall be indicated on a supplemental Number of Tracks (R15-2P) plaque (see Figure 8B-1) of inverted T shape mounted below the Crossbuck sign in the manner shown in Figure 8B-2.
- 07 On each approach to a highway-rail grade crossing and, if used, on each approach to a highway-LRT grade crossing, the Crossbuck sign shall be installed on the right-hand side of the highway on each approach to the grade crossing. Where restricted sight distance or unfavorable highway geometry exists on an approach to a grade crossing, or where there is a one-way multi-lane approach, an additional Crossbuck sign shall be installed on the left-hand side of the highway, possibly placed back-to-back with the Crossbuck sign for the opposite approach, or otherwise located so that two Crossbuck signs are displayed for that approach.

- 08 A strip of retroreflective white material not less than 2 inches in width shall be used on the back of each blade of each Crossbuck sign for the length of each blade at all passive grade crossings, except those where Crossbuck signs have been installed back-to-back or where double-faced Crossbuck signs have been installed.

Option:

- 09 A strip of retroreflective white material not less than 2 inches in width may be used on the back of each blade of each Crossbuck sign for the length of each blade at active grade crossings.

Table 8B-1. Grade Crossing Sign and Plaque Minimum Sizes (Sheet 2 of 2)

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Minimum	Oversized
			Single Lane	Multi-Lane			
Rough Crossing (plaque)	W10-15P	8B.25	30 x 24	30 x 24	—	—	36 x 30
Another Train Coming Activated Blank-Out	W10-16	8B.18	30 x 30	30 x 30	—	—	—
Busway Crossing	W10-21	8B.06	36x36	36x36	48x48	—	48x48
Signal Ahead (plaque)	W10-21aP	8B.06	30x24	30x24	—	—	—
Emergency Notification	I13-1	8B.27	—	—	—	12 x 9	—
Push to Exit	I13-2	8E.06	—	—	—	18 x 9	—
XX Feet Between Tracks	W10-Y11c	—	24 x 24	24 x 24	—	—	—
XX Feet to Tracks Behind You	W10-Y11d	—	30x24	30 x 24	—	—	—
Train Traffic Resumed - Tracks in Service	W10-Y12a	—	36 x 24	36 x 24	—	—	—

Notes: 1. Larger signs may be used when appropriate

2. Dimensions in inches are shown as width x height

3. Table 9A-1 shows the minimum sizes that may be used for grade crossing signs and plaques that face shared-use paths and pedestrian facilities

Guidance:

- 10 *Minimum clearance dimensions for crossbuck signs relative to the proximity to the nearest rail should conform to the requirements of the railroad company and/or transit agency, and the regulatory agency with statutory authority (if applicable).*
- 11 *Except as provided in Paragraph 12 of this Section, the mounting height of Crossbuck signs, measured vertically from the center of the sign to the elevation of the near edge of the pavement, should be approximately 9 feet (see Figure 8B-2).*

Option:

- 12 The 9-foot mounting height for the Crossbuck sign may be varied as required by local conditions and may be increased to accommodate signs mounted below the Crossbuck sign.

Section 8B.04 Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings

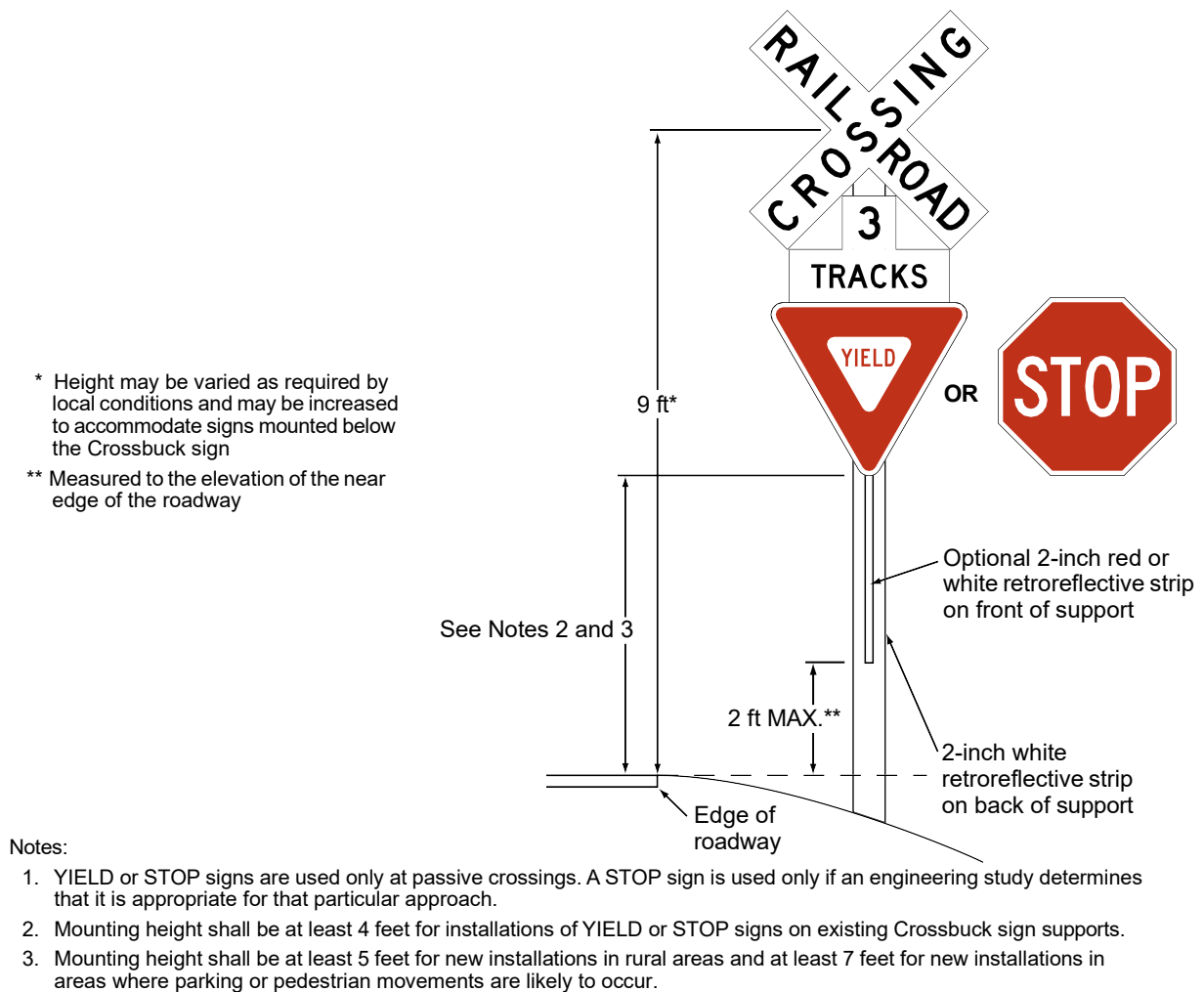
Standard:

- 01 **A Crossbuck Assembly shall consist of a Crossbuck (R15-1) sign, and a Number of Tracks (R15-2P) plaque if two or more tracks are present, that complies with the provisions of Section 8B.03, and either a YIELD (R1-2) or STOP (R1-1) sign installed on the same support, except as provided in Paragraph 10 of this Section. YIELD or STOP signs used at passive grade crossings shall be installed in compliance with the provisions of Section 2B.18, and Figures 8B-2 and 8B-3.**
- 02 **At all public highway-rail grade crossings that are not equipped with the active traffic control systems that are described in Chapter 8D, except crossings where road users are directed by an authorized person on the ground to not enter the crossing at all times that an approaching train is about to occupy the crossing, a Crossbuck Assembly shall be installed on the right-hand side of the highway on each approach to the highway-rail grade crossing.**
- 03 **If a Crossbuck sign is used on a highway approach to a public highway-LRT grade crossing that is not equipped with the active traffic control systems that are described in Chapter 8D, a Crossbuck Assembly shall be installed on the right-hand side of the highway on each approach to the highway-LRT grade crossing.**
- 04 **Where restricted sight distance or unfavorable highway geometry exists on an approach to a grade crossing that has a Crossbuck Assembly, or where there is a one-way multi-lane approach, an additional Crossbuck Assembly shall be installed on the left-hand side of the highway.**
- 05 **A YIELD sign shall be the default traffic control device for Crossbuck Assemblies on all highway approaches to passive grade crossings unless an engineering study performed by the regulatory agency or highway authority having jurisdiction over the roadway approach determines that a STOP sign is appropriate.**

Guidance:

- 06 *The use of STOP signs at passive grade crossings should be limited to unusual conditions where requiring all motor vehicles to make a full stop is determined to be necessary by a Diagnostic Team. Among the factors that should be considered by the Diagnostic Team are the line of sight to approaching rail traffic (giving due consideration to seasonal crops or vegetation beyond both the highway and railroad or LRT rights-of-ways), the number of tracks, the speeds of trains or LRT equipment and motor vehicles, and the crash history at the grade crossing.*

Figure 8B-2. Crossbuck Assembly with a YIELD or STOP Sign on the Crossbuck Sign Support



07 Where a passive grade crossing is located on a stop-controlled approach and the clear storage distance is less than the length of the design vehicle, and where adequate sight distance to oncoming traffic on the parallel roadway is available to road users stopped on the approach to the grade crossing, consideration should be given to installing a STOP sign at the Crossbuck Assembly instead of at the highway-highway intersection. If the STOP sign is installed at the Crossbuck Assembly instead of at the highway-highway intersection, the Diagnostic Team should consider installing some other intersection traffic control device at the highway-highway intersection.

Support:

07A Before installing a separate post on railroad property, permission from the railroad is needed.

Standard:

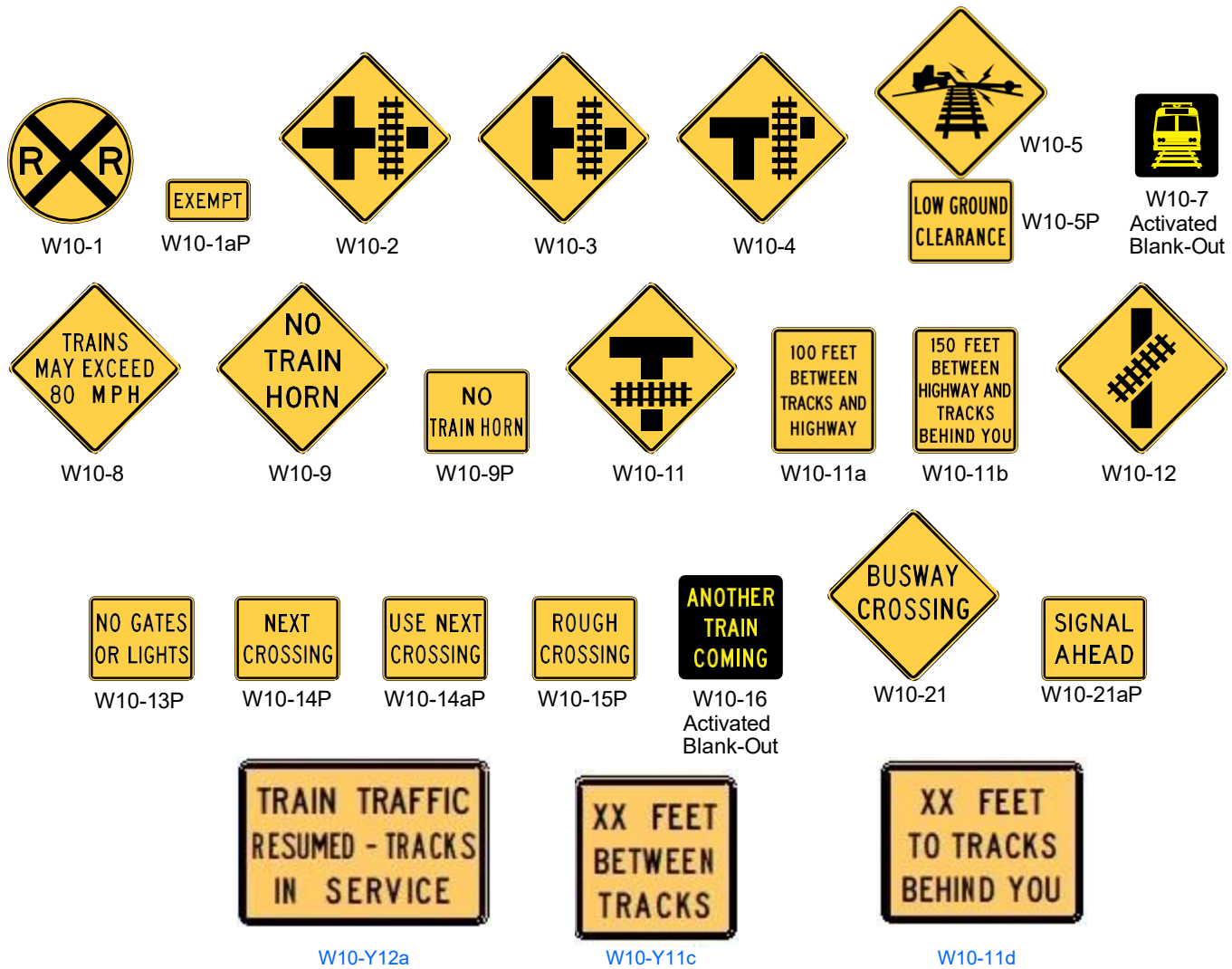
08 If a Crossbuck Assembly is installed on the approach to a passive grade crossing located at a highway-highway intersection controlled by a traffic control signal that is not interconnected with the grade crossing and not preempted by the approach of rail traffic, a Diagnostic Team shall be convened to determine the appropriate traffic control devices. A STOP sign shall not be installed on a Crossbuck Assembly in this situation.

Support:

09 Sections 8A.01 through 8A.05 contain information regarding the responsibilities of the Diagnostic Team, highway agency, regulatory agency with statutory authority (if applicable), and the railroad company or transit agency regarding the selection, design, and operation of traffic control devices placed at grade crossings.

Option:

10 If a YIELD or STOP sign is installed for a Crossbuck Assembly at a grade crossing, it may be installed on the same support as the Crossbuck sign or it may be installed on a separate support at a point where the motor vehicle is to stop, or as near to that point as practicable, but in either case, the YIELD or STOP sign is considered to be a part of the Crossbuck Assembly.

Figure 8B-4. Warning Signs and Plaques for Grade Crossings

Note: The W10-11 sign is a W10-3 sign modified for geometrics. Other signs can be oriented or revised as needed to better portray the geometrics of the roadways and the tracks.

Guidance:

- 07 If the distance between the tracks and the parallel highway, from the nearest rail of the tracks to the edge of the parallel roadway, is 100 feet or more, a W10-1 sign should be installed in advance of the grade crossing, and the W10-2, W10-3, or W10-4 sign should not be used on the parallel highway.

Section 8B.07 **DO NOT STOP ON TRACKS Sign (R8-8)**

Guidance:

- 01 If motor vehicle queues are likely to extend onto the tracks, a DO NOT STOP ON TRACKS (R8-8) sign (see Figure 8B-1) should be used.

Support:

- 02 Locations where motor vehicles could queue onto the grade crossing include intersections where a STOP or YIELD sign is installed downstream of the grade crossing, where there is a downstream circular intersection, or where there is a pre-signal installed at the grade crossing.

Guidance:

- 03 The R8-8 sign, if used, should be located on the right-hand side of the highway on either the near or far side of the grade crossing, depending upon which position provides better visibility to approaching drivers.

Option:

- 04 DO NOT STOP ON TRACKS signs may be placed on both sides of the track.
- 05 On divided highways and one-way streets, a second DO NOT STOP ON TRACKS sign may be placed on the near or far left-hand side of the highway at the grade crossing to further improve the visibility of the sign.

Section 8B.08 TRACKS OUT OF SERVICE Sign (R8-9)

Option:

- 01 The TRACKS OUT OF SERVICE (R8-9) sign (see Figure 8B-1) may be used at a grade crossing instead of a Crossbuck (R15-1) sign and a Number of Tracks (R15-2P) plaque or instead of a Crossbuck Assembly where railroad or LRT tracks have been temporarily or permanently abandoned, but only until such time that the tracks are removed or covered.

Standard:

- 02 Where tracks are out of service, except as provided in Paragraphs 3 and 4 of this Section, traffic control devices and gate arms shall be removed and the signal heads shall be removed or hooded or turned from view to clearly indicate that they are not in operation.
- 03 Where tracks are out of service, even if a TRACKS OUT OF SERVICE (R8-9) sign has been installed, an Emergency Notification System (I13-1) sign (see Section 8B.27) shall be retained at the grade crossing and shall be visible to road users.

Guidance:

- 04 Warning signs, such as the Low Ground Clearance Grade Crossing (W10-5) sign and the Skewed Crossing (W10-12) sign, that warn road users about physical roadway conditions at the grade crossing should be left in place after the tracks are taken out of service, until the physical condition is no longer present.

Standard:

- 05 The R8-9 sign shall be removed when the tracks have been removed or paved over or when the grade crossing is returned to service. The Emergency Notification System (I13-1) sign shall be removed when the tracks have been removed or paved over.
- 06 Thirty days prior to resuming operation over an abandoned or unused railroad grade crossing, the railroad shall provide INDOT and the road authority, having jurisdiction over the roadway, with written notification and request the TRACKS OUT OF SERVICE (R8 – 9) signs be removed. The railroad shall mark the railroad grade crossing, for a minimum of six months, with the TRAIN TRAFFIC RESUMED – TRACKS IN SERVICE (W10 – Y12a) signs.
- 07 If a highway – rail grade crossing is returned to service, the railroad shall mark the railroad grade crossing with the W10 – Y12a sign for a 6-month period. This sign shall be installed on the post used for mounting the Crossbuck signs, within 1 inch below the Crossbuck signs (R15–1, R15–2), or on a separate post such that the W10 – Y12a sign does not block, or is not blocked by, the visual elements of any other railroad warning device or other traffic sign or device.

Option:

- 08 The governmental agency that has jurisdiction over the roadway that had an abandoned or unused railroad grade crossing and the railroad has resumed operation of the railroad grade crossing, may install an additional W10-Y12a sign, as a primary sign, beneath any of the other Highway-Rail Grade Crossing Advance Warning Signs (W10 Series), as deemed appropriate.

Section 8B.09 STOP HERE WHEN FLASHING Signs (R8-10 and R8-10a)

Option:

- 01 The STOP HERE WHEN FLASHING (R8-10 and R8-10a) signs (see Figure 8B-1) may be used at a grade crossing to inform drivers of the location of the stop line or the point at which to stop when the flashing-light signals (see Section 8D.02) are activated.

Section 8B.10 STOP HERE ON RED Signs (R10-6 and R10-6a)

Support:

- 01 The STOP HERE ON RED (R10-6 or R10-6a) sign (see Figure 8B-1) defines and facilitates observance of stop lines at traffic control signals.

Option:

- 02 STOP HERE ON RED signs may be used at locations where motor vehicles frequently violate the stop line or where it is not obvious to road users where to stop.

Guidance:

- 03 If possible, stop lines should be placed at a point where the motor vehicle driver has adequate sight distance along the track.

Section 8B.11 EXEMPT Grade Crossing Plaques (R15-3P and W10-1aP)

Standard:

- 00 The "EXEMPT" plaque shall not be used in Indiana unless specifically permitted by statute.

Guidance:

- 02 *The decision to provide notification of another train should be made by a Diagnostic Team. In making this determination, the Diagnostic Team should consider the pedestrian usage, pedestrian collision history, train speeds and volumes, operating plans and/or schedules, and the presence of a nearby station or transit center.*

Option:

- 03 An ANOTHER TRAIN COMING (W10-16) train-activated blank-out sign (see Figure 8B-4) may be used to provide notification of another train coming. For added sign conspicuity, a Warning Beacon may be used in accordance with the requirements of Section 4S.03.

Section 8B.19 TRAINS MAY EXCEED 80 MPH Sign (W10-8)*Guidance:*

- 01 *Where trains are permitted to travel at speeds exceeding 80 mph, a TRAINS MAY EXCEED 80 MPH (W10-8) sign (see Figure 8B-4) should be installed facing road users approaching the highway-rail grade crossing.*
- 02 *If used, the TRAINS MAY EXCEED 80 MPH signs should be installed between the Grade Crossing Advance Warning (W10-1 through W10-4) sign (see Figure 8B-4) and the highway-rail grade crossing on all approaches to the highway-rail grade crossing. The locations should be determined based on specific site conditions.*

Section 8B.20 NO TRAIN HORN Sign or Plaque (W10-9 and W10-9P)**Standard:**

- 01 **Either a NO TRAIN HORN (W10-9) sign (see Figure 8B-4) or a NO TRAIN HORN (W10-9P) plaque (see Figure 8B-4) shall be installed in each direction at each highway-rail grade crossing where a Quiet Zone has been established in compliance with 49 CFR Part 222. If a W10-9P plaque is used, it shall supplement and be mounted directly below the Grade Crossing Advance Warning (W10-1 through W10-4) sign (see Figure 8B-4).**

Section 8B.21 Storage Space Signs (W10-11, W10-11a, and W10-11b)*Guidance:*

- 01 *A Storage Space (W10-11) sign supplemented by a word message Storage Space Ahead (W10-11a) sign (see Figure 8B-4) should be used where there is a highway intersection in close proximity to the grade crossing and the Diagnostic Team determines that adequate space is not available to store a design vehicle(s) between the highway intersection and the train or LRT equipment dynamic envelope.*
- 02 *The Storage Space (W10-11 and W10-11a) signs should be mounted in advance of the grade crossing at an appropriate location to advise drivers of the space available for motor vehicle storage between the highway intersection and the grade crossing.*

Option:

- 03 A word message Storage Space Behind (W10-11b) sign (see Figure 8B-4) may be mounted beyond the grade crossing at the highway intersection under the STOP or YIELD sign or just prior to the signalized intersection to remind drivers of the storage space between the tracks and the highway intersection.

Standard:

- 04 **A Storage Space (W10-11) sign shall not be used as a replacement for the required Advance Warning (W10-1) sign. If used, the Storage Space sign shall be used in addition to the W10-1 sign and shall be mounted on a separate post.**

Guidance:

- 05 *A Tracks Storage Space (W10-Y11c) sign supplemented by a word message tracks storage distance (W10-Y11d) sign should be used where there is a highway-rail grade crossing in close proximity to an intersection and an engineering study determines that adequate space is not available to store a design vehicle(s) between the train dynamic envelopes.*
- 06 *The Tracks Storage Space (W10-Y11c and W10-Y11d) signs should be mounted in advance of the first highway-rail grade crossing at an appropriate location to advise drivers of the space available for vehicle storage between the second set of tracks and the highway-rail first grade crossing.*

Option:

- 07 *The Tracks Storage Space sign, W10-Y11c, may be placed beyond the first highway-rail grade crossing just prior to the second set of tracks to remind drivers of the storage space between the tracks.*

Section 8B.22 Skewed Crossing Sign (W10-12)*Option:*

- 01 The Skewed Crossing (W10-12) sign (see Figure 8B-4) may be used at a skewed grade crossing to warn road users that the tracks are not perpendicular to the highway.

Guidance:

- 02 *If the Skewed Crossing sign is used, the symbol should show the direction of the crossing (near left to far right as shown on the sign image in Figure 8B-4, or the mirror image if the track goes from far left to near right).*

Standard:

- 03 **The Skewed Crossing sign shall not be used as a replacement for the required Advance Warning (W10-1) sign. If used, the Skewed Crossing sign shall be used in addition to the W10-1 sign and shall be mounted on a separate post.**

Option:

- 17 Additional flashing-light signals may be mounted on the same supporting post and directed toward vehicular traffic approaching the grade crossing from other than the principal highway route, such as where there are approaching routes on highways closely adjacent to and parallel to the track(s).

Guidance:

- 18 *Where the storage distance for vehicles approaching a grade crossing is less than a design vehicle length, the Diagnostic Team should consider providing additional flashing-light signals aligned toward the movement turning toward the grade crossing.*
- 19 *The Diagnostic Team should consider the use of additional flashing-light signals to provide supplemental warning to pedestrians, especially on one-way streets and divided highways.*

Standard:

- 20 **References to lenses in this Section shall not be used to limit flashing-light signal optical units to incandescent lamps within optical assemblies that include lenses.**

Support:

- 21 Research has resulted in flashing-light signal optical units that are not lenses, such as, but not limited to, light-emitting diode (LED) flashing-light signal modules.

Option:

- 22 If a Diagnostic Team determines that it is appropriate, the flashing-light signals may be installed on overhead structures or cantilevered supports as shown in Figure 8D-1 where needed for additional emphasis, or for better visibility to approaching traffic, particularly on multi-lane approaches or highways with profile restrictions.
- 23 If it is determined by a Diagnostic Team that one flashing-light signal on the cantilever arm is not sufficiently visible to road users, one or more additional flashing-light signals may be mounted on the supporting post and/or on the cantilever arm.

Standard:

- 24 **Breakaway or frangible bases shall not be used on the supporting posts for overhead structures or cantilevered arms that support overhead flashing-light signals.**

Section 8D.03 Automatic Gates**Support:**

- 01 An automatic gate is a traffic control device used in conjunction with flashing-light signals.

Standard:

- 02 **The automatic gate (see Figure 8D-1) shall consist of a drive mechanism and a fully retroreflective red-and-white-striped gate arm with lights. When in the down position, the gate arm shall extend across the approaching lanes of highway traffic.**
- 03 **In the normal sequence of operation, unless constant warning time detection or other advanced system requires otherwise, the flashing-light signals and the lights on the gate arm (in its normal upright position) shall be activated immediately upon detection of approaching rail traffic. The gate arm shall start its downward motion not less than 3 seconds after the flashing-light signals start to operate, shall reach its horizontal position at least 5 seconds before the arrival of the rail traffic, and shall remain in the down position until the rail traffic completely clears the grade crossing.**

Support:

- 03A See the latest edition of the “AREMA Communications and Signals Manual” for information on the minimum and maximum warning time for automatic gates upon detection of approaching rail traffic.

Standard:

- 04 **When the rail traffic clears the grade crossing, and if no other rail traffic is detected, the gate arm shall ascend to its upright position, following which the flashing-light signals and the lights on the gate arm shall cease operation.**
- 05 **Gate arms shall be fully retroreflective on both sides and shall have vertical stripes alternately red and white at 16-inch intervals measured horizontally. The width (which becomes the height of the retroreflective sheeting when the automatic gate is in the down position) of the retroreflective sheeting on the front of the gate arm shall be at least 4 inches for the first 32 feet of gate arm length measured from the center of the gate mast. The front of the gate arm beyond 32 feet to the tip of the gate shall have retroreflective sheeting at least 2 inches in width.**

Support:

- 06 It is acceptable to replace a damaged gate arm with a gate arm having vertical stripes even if the other existing gate arms at the same grade crossing have diagonal stripes; however, it is also acceptable to replace a damaged gate arm with a gate arm having diagonal stripes if the other existing gate arms at the same grade crossing have diagonal stripes in order to maintain consistency per the provisions of Paragraph 13 of Section 1B.03.

Section 8D.05 Exit Gate and Four-Quadrant Gate Systems

Option:

- 01 Exit Gate systems may be installed to improve safety at grade crossings where a Diagnostic Team determines that less restrictive measures, such as automatic gates and median islands, are not effective.

Support:

- 02 A grade crossing that includes exit gates on some, but not all, of the exiting lanes is an Exit Gate system, but is not considered to be a Four-Quadrant Gate system.
- 03 The term Four-Quadrant Gate system is used in a generic sense in that it refers to the fact that all entrances and exits from a grade crossing are controlled by automatic gates in order to provide a full closure to all entering and exiting lanes. The term Four-Quadrant Gate system does not refer to the number of gates installed, but rather the fact that a full closure is provided.

Standard:

- 04 **The Exit Gate system shall use a series of automatic gates with fully retroreflective red-and-white-striped gate arms with lights, and when in the down position the gate arms extend individually across the entrance and exit lanes of the roadway as shown in Figure 8D-2. The provisions contained in Section 8D.02 for flashing-light signals shall be followed for signal specifications, location, and clearance distances.**
- 05 **Gate arm design, colors, and lighting requirements shall be in accordance with the provisions contained in Section 8D.03.**

Support:

- 06 The provisions contained in Section 8D.03 for automatic gates are applicable to exit gates. [Section 8D.03 includes information on the minimum and maximum warning time for automatic gates upon detection of approaching rail traffic.](#)

Standard:

- 07 **In the normal sequence of operation, unless constant warning time detection or other advanced system requires otherwise, the flashing-light signals and the lights on the gate arms (in their normal upright positions) shall be activated immediately upon the detection of approaching rail traffic. The entrance gate arms shall start their downward motion not less than 3 seconds after the flashing-light signals start to operate and shall reach their horizontal position at least 5 seconds before the arrival of the rail traffic. Exit gate arm activation and downward motion shall be based on detection or timing requirements established by a Diagnostic Team. If an Exit Gate system is present, the queue exit gate clearance time (see AREMA Manual) shall be long enough to permit the exit gate arm to lower after a design vehicle of maximum length is clear of the minimum track clearance distance (see Section 8A.07). The gate arms shall remain in the down position as long as the rail traffic occupies the grade crossing.**
- 08 **When the rail traffic clears the grade crossing, and if no other rail traffic is detected, the gate arms shall ascend to their upright positions, following which the flashing-light signals and the lights on the gate arms shall cease operation.**
- 09 **Except as provided in Paragraph 21 of this Section, the exit gate arm mechanism shall be designed to fail-safe in the up position.**
- 10 **At locations where gate arms are offset a sufficient distance for motor vehicles to drive between the entrance and exit gate arms, median islands (see Figure 8D-2) shall be installed in accordance with the needs determined by the Diagnostic Team.**

Guidance:

- 11 *The gate arm should ascend to its upright position in 12 seconds or less.*
- 12 *Constant warning time detection circuits should be used with Exit Gate systems where practical.*
- 13 *The operating mode of the exit gates should be determined by a Diagnostic Team.*
- 14 *If the Timed Exit Gate Operating Mode is used, the Diagnostic Team should also determine the Exit Gate Clearance Time (see definition in Section 1C.02).*
- 15 *If the Dynamic Exit Gate Operating Mode is used, highway vehicle intrusion detection devices that are part of a system that incorporates processing logic to detect the presence of motor vehicles within the minimum track clearance distance (see Section 8A.07) should be installed to control exit gate operation. Exit gates should be independently controlled for each direction of roadway traffic.*
- 16 *Regardless of which exit gate operating mode is used, the Exit Gate Clearance Time should be considered when determining additional time requirements for the Minimum Warning Time.*

Support:

- 17 The minimum warning time is the least amount of time that active warning devices operate prior to the arrival of rail traffic at a grade crossing.

Support:

- 04 Section 2B.33 contains information for the application of BEGIN and END plaques.
 - 05 Section 9B.03 contains information on displaying the bicycle lane on Advance Intersection Lane Control signs.
- Option:**

- 06 Where two or more movements from a bicycle lane are allowed, or where the emphasis of allowed bicycle movements is needed, an Optional Movement Lane Control sign (see Section 2B.29) may be supplemented with a BIKE LANE (R3-5hP) plaque above the Optional Movement Lane Control sign.
- 07 Where bicycle lanes are located between travel lanes on intersection approaches or where only a single bicycle movement is allowed from a certain bicycle lane, a Mandatory Movement Lane Control sign (see Section 2B.28) may be supplemented with a BIKE LANE plaque to require a bicyclist in a particular bicycle lane at an intersection to stay in the same lane and proceed straight through the intersection, or to indicate a required turn from a particular bicycle lane.

Section 9B.05 BEGIN RIGHT TURN LANE YIELD TO BIKES Sign (R4-4)**Option:**

- 01 Where motor vehicles entering a mandatory right-turn lane must weave across bicyclists in bicycle lanes, the BEGIN RIGHT TURN LANE YIELD TO BIKES (R4-4) sign (see Figure 9B-1) may be used to inform both the motorist and the bicyclist of this weaving maneuver (see Figures 9E-3 and 9E-4).

Guidance:

- 02 *The R4-4 sign should not be used when bicyclists need to move left because of a right-turn lane drop situation.*

Section 9B.06 Bicycle Wrong Way Sign and RIDE WITH TRAFFIC Plaque (R5-1b and R9-3cP)**Option:**

- 01 The Bicycle WRONG WAY (R5-1b) sign and RIDE WITH TRAFFIC (R9-3cP) plaque (see Figure 9B-1) may be placed facing wrong-way bicyclists, such as on the left-hand side of a roadway.
- 02 This sign and plaque may be mounted back-to-back with other signs to minimize visibility to other traffic.

Guidance:

- 03 *The RIDE WITH TRAFFIC plaque should be used only in conjunction with the Bicycle WRONG WAY sign, and should be mounted directly below the Bicycle WRONG WAY sign.*

Section 9B.07 NO MOTOR VEHICLES Sign (R5-3)**Option:**

- 01 The NO MOTOR VEHICLES (R5-3) sign (see Figure 9B-1) may be installed at the entrance to a shared-use path.

Support:

- 02 *An ordinance or Official Action needs to be adopted for the NO MOTOR VEHICLES (R5-3) sign to be enforceable.*

Section 9B.08 Selective Exclusion Signs**Option:**

- 01 Selective Exclusion signs (see Figure 9B-1) may be installed at the entrance to a roadway or facility to notify road or facility users that designated types of traffic are excluded from using the roadway or facility.

Support:

- 02 Typical exclusion messages include:
 - A. No Bicycles (R5-6);
 - B. No Pedestrians (R9-3);
 - C. No Skaters (R9-13);
 - D. No Equestrians (R9-14);
 - E. No Snowmobiles (R9-15); and
 - F. No All-Terrain Vehicles (R9-16).

Option:

- 03 Where bicyclists, pedestrians, and motor-driven cycles are all prohibited, the R5-10a word message sign (see Section 2B.45) may be used.

Guidance:

- 27 *If used, Confirming or Reassurance assemblies should consist of a Cardinal Direction auxiliary plaque and a route sign. Where the Confirming or Reassurance assembly is for an alternative route, the appropriate auxiliary plaque for an alternative route should also be included in the assembly.*
- 28 *If used, a Confirming assembly should be installed just beyond intersections of numbered routes.*
- 29 *If used, Reassurance assemblies should be installed between intersections in urban areas as needed, and beyond the built-up area of any incorporated city or town.*
- 30 *If used, Bicycle Route signs for either confirming or reassurance purposes should be spaced at such intervals as necessary to keep bicyclists informed of their routes.*

Section 9D.09 Bicycle Parking Area, Sharing Station, and Lockers Guide Signs (D4-3, D4-4, and D4-4a)*Support:*

- 01 Bicycle parking areas include bicycle racks or stands, parking stations or structures, sharing systems, or lockers. These facilities can be either regulated or unregulated.

Option:

- 02 The Bicycle Parking Area (D4-3) guide sign (see Figure 9D-1) may be installed where it is desirable to show the direction to a designated bicycle parking area. The arrow may be reversed as appropriate.
- 03 The Bicycle-Sharing Station (D4-4) guide sign (see Figure 9D-1) may be installed to provide directional information to a designated bicycle-sharing system. The arrow may be reversed as appropriate.
- 04 The Bicycle-Sharing Station guide sign may be modified with two lines to accommodate installation in constrained areas.
- 05 The Bicycle Lockers (D4-4a) guide sign (see Figure 9D-1) may be installed where it is desirable to show the direction to designated bicycle lockers. The arrow may be reversed as appropriate.

Guidance:

- 06 *If used, the Bicycle-Sharing Station guide sign should be used in conjunction with a regulated bicycle-sharing system such as one that requires the user to pre-register or provide a deposit in order to use a bicycle.*
- 07 *Where it is determined that unregulated bicycle-sharing parking facilities necessitate a bicycle parking sign, the Bicycle Parking Area guide sign should be used.*

Standard:

- 08 **In accordance with Section 1D.07, Bicycle Parking Area, Sharing Station, and Lockers guide signs shall not include promotional advertising, business logos, or other identification that would convey the involvement of a public-private partnership for operating the bicycle parking facility or sharing system.**

Support:

- 09 [See Section 2H.13 on Acknowledgment Signs for additional information regarding sponsorship signage.](#)

Section 9D.10 Reference Location Signs (D10-1 through D10-3) and Intermediate Reference Location Signs (D10-1a through D10-3a)*Support:*

- 01 There are two types of reference location signs:
- A. Reference Location (D10-1, D10-2, and D10-3) signs (see Figure 9D-1) show an integer distance point along a shared-use path; and
 - B. Intermediate Reference Location (D10-1a, D10-2a, and D10-3a) signs (see Figure 9D-1) show the same information as Reference Locations signs, but they also show a tenth-of-a-mile decimal so that they can be installed between integer distance points along a shared-use path.

Option:

- 02 Reference Location (D10-1 through D10-3) signs may be installed along any section of a shared-use path to assist users in estimating their progress, to provide a means for identifying the location of emergency incidents and crashes, and to aid in maintenance and servicing.
- 03 To augment the reference location sign system, Intermediate Reference Location (D10-1a to D10-3a) signs, which show the tenth of a mile with a decimal point, may be installed at one-tenth-of-a-mile intervals, or at some other regular spacing.

Guidance:

- 04 *If Intermediate Reference Location (D10-1a through D10-3a) signs are used to augment the reference location sign system, the Reference Location sign at the integer mile point should display a decimal point and a zero numeral.*
- 05 *Reference location signs for shared-use paths should have a minimum mounting height of 2 feet, measured vertically from the bottom of the sign to the elevation of the near edge of the shared-use path, and should not be governed by the mounting height requirements prescribed in Section 9A.02.*

- 05 Where the bicycle lane symbols or word markings are used, Bicycle Lane signs (see Section 9B.04) may also be used, but not necessarily adjacent to every set of pavement markings in order to avoid overuse of the signs.

Support:

- 06 Section 3H.06 contains information on green-colored pavement for use in bicycle lanes.

Standard:

- 07 **The bicycle symbol or BIKE LANE pavement word marking and the pavement marking arrow shall not be used in a shoulder.**

- 08 **A portion of the roadway shall not be established as both a shoulder and a bicycle lane.**

Support:

- 08A Paved shoulders on the edge of roadways can be enhanced to serve as a functional space for bicyclists and pedestrians to travel in the absence of other facilities with more separation, but motorized vehicles normally cannot use the shoulder as a travel lane.

- 09 Where a shoulder is provided or is of sufficient width to meet the expectation of a highway user in that it can function as a space for emergency, enforcement, or maintenance activities, or avoidance or recovery maneuvers, Section 9B.16 contains information regarding the Bicycles Use Shoulder Only sign that can be used to denote locations on a freeway or expressway where bicycles are permitted on an available and usable shoulder.

- 10 Examples of pavement markings for bicycle lanes on a two-way street are shown in Figure 9E-2.

Section 9E.02 Bicycle Lanes at Intersection Approaches

Standard:

- 01 **Except as provided in Paragraph 2 of this Section, a through bicycle lane shall not be positioned to the right of a right turn only lane or to the left of a left turn only lane.**

Option:

- 02 A through bicycle lane may be positioned to the right of a right turn only lane or to the left of a left turn only lane provided that the bicycle lane is controlled by a traffic signal that displays bicycle signal indications (see Chapter 4H).

Support:

- 03 Unless controlled by a bicycle signal indication, a bicyclist continuing straight through an intersection from the right of a right turn only lane or from the left of a left turn only lane would be inconsistent with normal traffic behavior and would violate the expectations of right-turning or left-turning motorists.

Guidance:

- 04 *When the right (left) through lane is dropped to become a mandatory right-turn (left-turn) lane, the bicycle lane markings should stop at least 100 feet before the beginning of the right-turn (left-turn) lane. Through bicycle lane markings should resume to the left (right) of the mandatory right-turn (left-turn) lane.*

- 05 *Except as provided in Paragraph 2 of this Section, an optional through-right (through-left) turn lane next to a mandatory right-turn (left-turn) lane should not be used where there is a through bicycle lane.*

Standard:

- 06 **A bicycle lane located on an intersection approach between general-purpose lanes for motor vehicle movements shall be marked with at least one bicycle symbol and at least one arrow pavement marking as provided in Paragraph 4 of Section 9E.01.**

- 07 **A bicycle lane shall not be marked within a general-purpose lane, either with dotted or any other line markings.**

Option:

- 08 Where there is insufficient width in the roadway to include both a bicycle lane and a general-purpose turn lane, bicycle travel may be accommodated within the turn lane or general-purpose lane using shared-lane markings.

Standard:

- 09 **Where a general-purpose turn lane is controlled by a traffic control signal, through bicycle movements shall not be accommodated in the turn lane unless the turning movement is always permitted to proceed simultaneously with the adjacent through movement.**

Support:

- 10 Examples of bicycle lane markings on approaches to intersections are shown in Figures 9E-3, 9E-4, and 9E-9.

Guidance:

- 11 *The longitudinal line defining a bicycle lane should be dotted on approaches to intersections where turning vehicles are permitted to cross the path of through-moving bicycles (see Figure 9D-7).*

Section 9E.04 Bicycle Lanes at Driveways**Support:**

- 01 The definition of an “Intersection” in Section 1C.02 contains information to determine if a driveway can be considered an intersection.

Option:

- 02 Bicycle lanes may be continued through a driveway using solid or dotted longitudinal lines.
- 03 The bicycle symbol, the arrow marking, pavement word markings, or a combination thereof may be used in bicycle lane extensions through driveways.
- 04 Green-colored pavement (see Section 3H.06) may be used as a background to enhance the conspicuity of the bicycle symbol at driveways.

Section 9E.05 Bicycle Lanes at Circular Intersections**Standard:**

- 01 **Bicycle lanes shall not be provided in the circulatory roadway of an unsignalized circular intersection that includes conflicts at entry or exit points (see Chapter 3D) except as provided in Paragraph 4 of this Section.**

Guidance:

- 02 *Bicycle lane markings should stop at least 100 feet before the crosswalk, or if no crosswalk is provided, at least 100 feet before the yield line, or if no yield line is provided, then at least 100 feet before the edge of the circulatory roadway.*
- 03 *If used, bicycle crossings should be a minimum of 20 feet from the edge of the circular roadway.*

Option:

- 04 Separated bicycle lanes may be used in circular intersections.

Support:

- 05 Separated bicycle lanes allow bicycles to navigate a circular intersection and its crossing points without merging into traffic and without dismounting and using a crosswalk at the intersection crossing point. This is beneficial at multi-lane and higher-speed circular intersections.
- 06 Section 9E.10 contains information on using shared-lane markings to facilitate the bicycle movement through a circular intersection.
- 07 The “Guide for the Development of Bicycle Facilities,” 2012 Fourth Edition, American Association of State Highway and Transportation Officials, contains information on designing for bicycles on the sidewalk in lieu of, or in addition to, using shared-lane markings in the circulatory roadway of the intersection.
- 08 The FHWA’s informational guide “Improving Intersections for Pedestrians and Bicyclists” contains information on incorporating separated bicycle lanes and other bicycle facilities into circular intersections.

Section 9E.06 Buffer-Separated Bicycle Lanes**Support:**

- 01 Buffer-separated bicycle lanes provide additional lateral separation between a bicycle lane and a general-purpose lane by a pattern of pavement markings without the presence of vertical elements. Providing a buffer space between a bicycle lane and a general-purpose lane creates more separation between motor vehicles and bicycles, can reduce vehicle encroachment into the bicycle lane, and can increase the comfort of bicyclists.
- 02 Providing a buffer space between a bicycle lane and a parking lane can reduce crashes involving bicycles and the opening of vehicle doors from the parking lane.

Standard:

- 03 **If used, and except as provided in Paragraph 5 of this Section, a buffer space shall be marked with a solid white line along both edges of the buffer space where crossing is discouraged.**

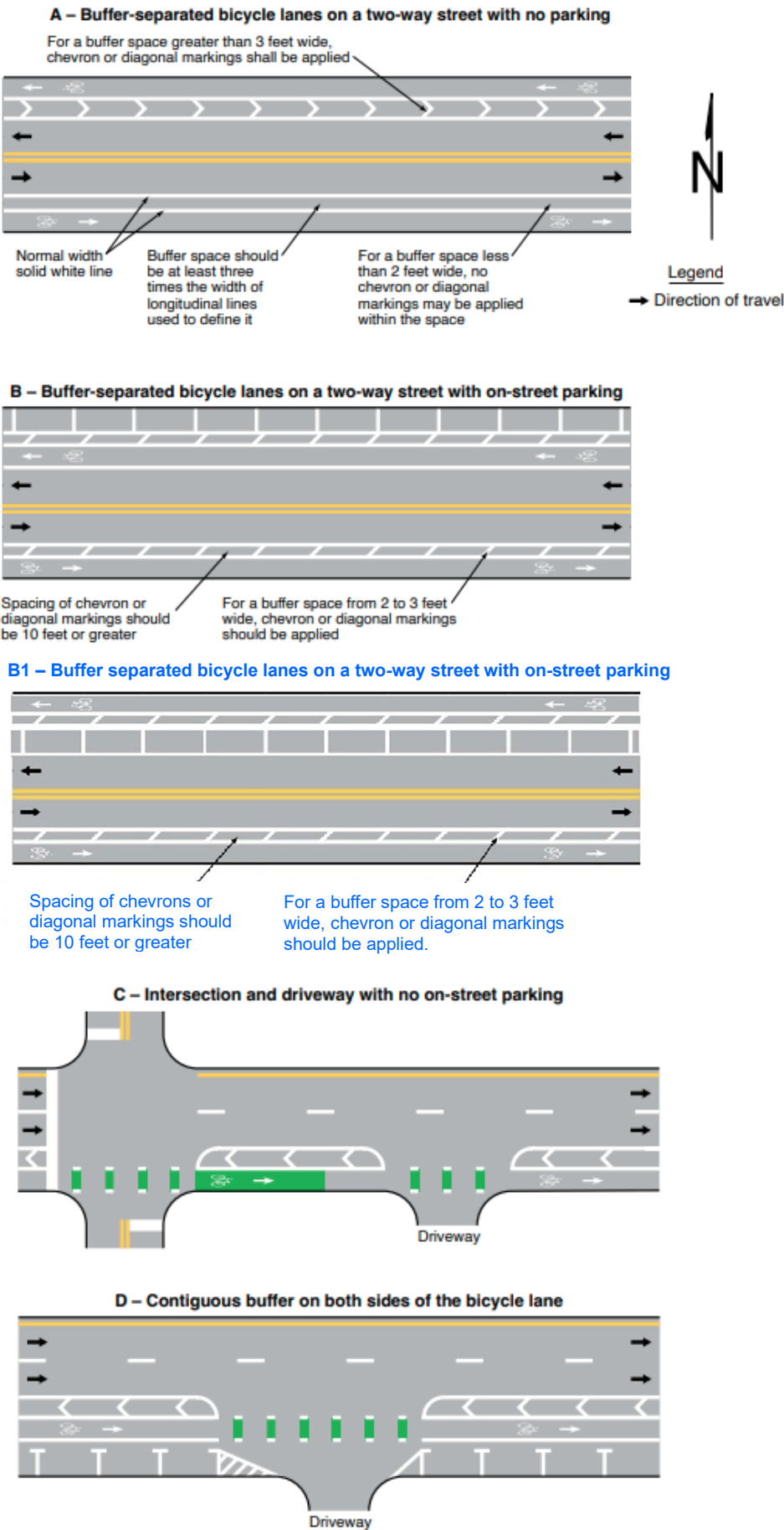
Guidance:

- 04 *Engineering judgment should be used to establish intermittent breaks or interruptions in the buffer space, such as for driveways, transit stops, or on-street parallel parking lanes, in order to convey access points or an otherwise general legal movement to cross the buffer space (see Figure 9E-6).*

Option:

- 05 Buffer spaces may be established without specific longitudinal lines if contiguous facilities have longitudinal lines or other pavement markings themselves that, when installed, automatically demarcate the buffer space (see Drawing D in Figure 9E-6).
- 05A Buffer spaces may be established on either side of an on-street parallel parking lane, see Drawings B and B1 in Figure 9E-6).

Figure 9E-6. Examples of Markings for Buffer-Separated Bicycle Lanes



CHAPTER 9F. SIGNALS

Section 9F.01 Application

Support:

- 01 Part 4 contains information regarding signal warrants and other requirements relating to signal installations.

Option:

- 02 For purposes of signal warrant evaluation, bicycles may be counted as either vehicles or pedestrians.

Section 9F.02 Bicycle Signal Faces

Support:

- 01 Chapter 4H contains information on the design and application of bicycle signal faces.
- 02 Section 9B.22 contains information for the Bicycle Signal sign that is required to be installed with a bicycle signal face.

Section 9F.03 Signal Operations for Bicycles

Standard:

- 01 At installations where visibility-limited signal faces are used, signal faces shall be adjusted so bicyclists for whom the indications are intended can see the signal indications. If the visibility-limited signal faces cannot be aimed to serve the bicyclist, then separate signal faces shall be provided for the bicyclist.
- 02 On bikeways, signal timing and actuation shall be reviewed and adjusted to consider the needs of bicyclists.

Support:

- 03 Traffic volumes, speed, and adjacent context are factors to consider as part of a thorough signal timing review.