

PART 9. TRAFFIC CONTROLS FOR BICYCLE FACILITIES

TABLE OF CONTENTS

	<u>Page</u>
CHAPTER 9A. GENERAL.....	9-1
Section 9A.01 Requirements for Bicyclist Traffic Control Devices.....	9-1
Section 9A.02 Scope.....	9-1
Section 9A.03 Definitions Relating to Bicycles.....	9-1
Section 9A.04 Maintenance.....	9-2
Section 9A.05 Relation to Other Documents.....	9-2
Section 9A.06 Placement Authority.....	9-3
Section 9A.07 Meaning of Standard, Guidance, Option, and Support.....	9-3
Section 9A.08 Colors.....	9-3
 CHAPTER 9B. SIGNS.....	 9-5
Section 9B.01 Application and Placement of Signs.....	9-5
Section 9B.02 Design of Bicycle Signs.....	9-6
Section 9B.03 STOP and YIELD Signs (R1-1, R1-2).....	9-8
Section 9B.04 Bicycle Lane Signs (R3-16, R3-17).....	9-10
Section 9B.05 BEGIN RIGHT TURN LANE YIELD TO BIKES Sign (R4-4).....	9-10
Section 9B.06 NO MOTOR VEHICLES Sign (R5-3).....	9-10
Section 9B.07 Bicycle Prohibition Sign (R5-6).....	9-11
Section 9B.08 No Parking Bicycle Lane Signs (R7-9, R7-9a).....	9-11
Section 9B.09 Bicycle Regulatory Signs (R9-5, R9-6).....	9-11
Section 9B.10 Shared-Use Path Restriction Sign (R9-7).....	9-12
Section 9B.11 Other Regulatory Signs.....	9-12
Section 9B.12 Turn or Curve Warning Signs (W1 Series).....	9-12
Section 9B.13 Intersection Warning Signs (W2 Series).....	9-12
Section 9B.14 Bicycle Surface Condition Warning Sign (W8-10).....	9-15
Section 9B.15 Bicycle Crossing Warning Sign (W11-1).....	9-15
Section 9B.16 Other Bicycle Warning Signs.....	9-16
Section 9B.17 Bicycle Route Guide Signs (D11-1).....	9-16
Section 9B.18 Bicycle Route Markers (M1-8, M1-9).....	9-20
Section 9B.19 Destination Arrow and Supplemental Plaque Signs for Bicycle Route Signs.....	9-21
Section 9B.20 Bicycle Parking Area Sign (D4-3).....	9-21
 CHAPTER 9C. MARKINGS.....	 9-23
Section 9C.01 Functions of Markings.....	9-23
Section 9C.02 General Principles.....	9-23
Section 9C.03 Marking Patterns and Colors on Shared-Use Paths.....	9-25

Section 9C.04	Markings For Bicycle Lanes	9-27
Section 9C.05	Word Messages and Symbols Applied to the Pavement	9-27
Section 9C.06	Object Markers on Shared-Use Paths	9-27
Section 9C.07	Pavement Markings for Obstructions	9-32

CHAPTER 9D. SIGNALS. 9-35

Section 9D.01	Application.	9-35
Section 9D.02	Signal Operations for Bicycles	9-35

FIGURES

Figure 9B-1.	Sign Placement on Shared-Use Paths	9-6
Figure 9B-2.	Example of Signing for Beginning and End of a Bicycle Route	9-18
Figure 9B-3.	Typical Signs and Markings for Shared-Use Paths	9-19
Figure 9C-1.	Typical Intersection Pavement Markings -- Designated Bicycle Lane with Left-Turn Area, Heavy Turn Volumes, Parking, One-Way Traffic or Divided Highway	9-24
Figure 9C-2.	Centerline Markings for Shared-Use Paths	9-26
Figure 9C-3.	Typical Bicycle Lane Treatment at a Right Turn Only Lane	9-28
Figure 9C-4.	Typical Bicycle Lane Treatment at Parking Lane into a Right Turn Only Lane	9-29
Figure 9C-5.	Typical Pavment Markings for Bicycle Lanes on a Two-Way Street	9-30
Figure 9C-6.	Typical Optional Word and Symbol Pavement Markings for Bicycle Lanes	9-31
Figure 9C-7.	Typical Obstruction Pavement Marking	9-33

TABLES

Table 9B-1.	Sign Sizes for Shared-Use Paths	9-7
-------------	---	-----

CHAPTER 9A. GENERAL

Section 9A.01 Requirements for Bicyclist Traffic Control Devices

Support:

General information and definitions concerning traffic control devices are found in Part 1.

Section 9A.02 Scope

Support:

Part 9 covers signs, pavement markings, and traffic signals specifically related to bicycle operation on both roadways and shared-use paths.

Guidance:

Parts 1, 2, 3, and 4 should be reviewed for general provisions, signs, pavement markings, and signals.

Standard:

None of the bikeway designations in this Manual shall be construed to preclude permitted bicycle travel on roadways or portions of roadways that do not have bikeway designations.

Section 9A.03 Definitions Relating to Bicycles

Standard:

The following terms shall be defined as follows when used in Part 9:

- 1. Bicycle Lane—a portion of a roadway that has been designated by signs and pavement markings for preferential or exclusive use by bicyclists.**
- 2. Bicycle Path—see Shared-Use Path.**
- 3. Bikeway—a generic term for any road, street, path, or way that in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.**

4. **Designated Bicycle Route**—a system of bikeways designated by the jurisdiction having authority with appropriate directional and informational route markers, with or without specific bicycle route numbers. Bicycle routes, which might be a combination of various types of bikeways, should establish a continuous routing.
5. **Shared-Use Path**—a bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent alignment. Shared-use paths might also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users.

Section 9A.04 Maintenance

Guidance:

All signs, signals, and markings, including those on bicycle facilities, should be properly maintained to command respect from both the driver and the bicyclist. When installing signs and markings on bicycle facilities, an agency should be designated to maintain these devices.

Section 9A.05 Relation to Other Documents

Support:

"The Uniform Vehicle Code and Model Traffic Ordinance" published by the National Committee on Uniform Traffic Laws and Ordinances (see Section 1A.11) has provisions for bicycles and is the basis for the traffic control devices included herein.

Informational documents used during the development of the signing and marking recommendations in Part 9 include the following:

- A. "Guide for Development of Bicycle Facilities," which is available from the American Association of State Highway and Transportation Officials (see Page ii for the address);
- B. "Selecting Roadway Design Treatments to Accommodate Bicycles," FHWA Publication No. FHWA-RD-92-073, which is available from the FHWA Research and Technology Report Center, 9701 Philadelphia Court, Unit Q, Lanham, MD 20106.

Other documents that relate to the application of traffic control devices in general are listed in Section 1A.11.

Section 9A.06 Placement Authority

Support:

Section 1A.08 contains information regarding placement authority for traffic control devices.

Section 9A.07 Meaning of Standard, Guidance, Option, and Support

Support:

The introduction to this Manual contains information regarding the meaning of the headings Standard, Guidance, Option, and Support, and the use of the words shall, should, and may.

Section 9A.08 Colors

Support:

Section 1A.12 contains information regarding the color codes.

CHAPTER 9B. SIGNS

Section 9B.01 Application and Placement of Signs

Standard:

Bicycle signs shall be standard in shape, legend, and color.

All signs shall be retroreflectorized for use on bikeways, including shared-use paths and bicycle lane facilities.

Where signs serve both bicyclists and other road users, vertical mounting height and lateral placement shall be as specified in Part 2.

On shared-use paths, lateral sign clearance shall be a minimum of 0.9 m (3 ft) and a maximum of 1.8 m (6 ft) from the near edge of the sign to the near edge of the path.

Mounting height for ground-mounted signs on shared-use paths shall be a minimum of 1.2 m (4 ft) and a maximum of 1.5 m (5 ft), measured from the bottom edge of the sign to the near edge of the path surface.

When overhead signs are used on shared-use paths, the clearance from the bottom edge of the sign to the path surface directly under the sign shall be a minimum of 2.4 m (8 ft).

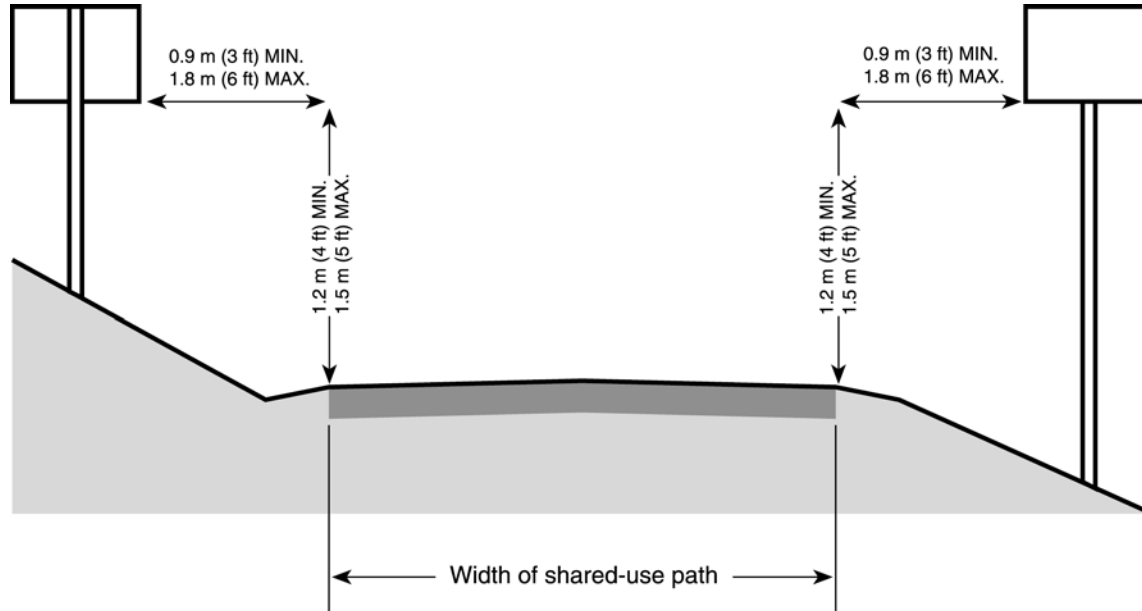
Guidance:

Signs for the exclusive use of bicyclists should be located so that drivers are not confused by them.

The clearance for overhead signs on shared-use paths should be adjusted when appropriate to accommodate typical maintenance vehicles.

Support:

Figure 9B-1 illustrates typical sign placement, lateral clearance, and mounting height for shared-use paths.

Figure 9B-1. Sign Placement on Shared-Use Paths**Section 9B.02 Design of Bicycle Signs****Standard:**

If the sign applies to drivers and bicyclists, then the size shall be as shown for conventional roads in Table 2B-1. The sign sizes for shared-use paths shall be those shown in Table 9B-1, and shall be used only for signs installed specifically for bicycle traffic applications. The sign sizes for shared-use paths shall not be used for signs that are placed in a location that would have any application to other vehicles.

Option:

Larger size signs may be used on shared-use paths when appropriate.

Guidance:

Except for size, the design of signs for bicycle facilities should be identical to that specified in this Manual for motor vehicle travel.

Support:

Uniformity in design includes shape, color, symbols, wording, lettering, and illumination or reflectorization.

Table 9B-1. Sign Sizes for Shared-Use Paths

Sign	Sign Code	Minimum Sign Size	
		Millimeters	Inches
Stop	R1-1	450 x 450	18 x 18
Yield	R1-2	600 x 600 x 600	24 x 24 x 24
Bicycle Lane	R3-16, 16a, 17, 17a	600 x 750	24 x 30
Movement Restriction	R4-1, 2, 3, 7	300 x 450	12 x 18
Begin Right Turn Lane Yield to Bikes	R4-4	900 x 750	36 x 30
No Motor Vehicles	R5-3	600 x 600	24 x 24
Bicycle Prohibition	R5-6	600 x 600	24 x 24
No Parking Bike Lane	R7-9, 9a	300 x 450	12 x 18
Pedestrians Prohibited	R9-3a	450 x 450	18 x 18
Bicycle Regulatory	R9-5, 6	300 x 450	12 x 18
Shared-Use Path Restriction	R9-7	300 x 450	12 x 18
Railroad Crossbuck	R15-1	600 x 112	24 x 4.5
Turn and Curve Warning	W1-1, 2, 3, 4, 5	450 x 450	18 x 18
Arrow Warning	W1-6, 7	600 x 300	24 x 12
Intersection Warning	W2-1, 2, 3, 4, 5	450 x 450	18 x 18
Stop, Yield, Signal Ahead	W3-1a, 2a, 3	450 x 450	18 x 18
Road Narrows	W5-2a	450 x 450	18 x 18
Bikeway Narrows	W5-4	450 x 450	18 x 18
Hill Sign	W7-5	450 x 450	18 x 18
Bump or Dip	W8-1, 2	450 x 450	18 x 18
Bicycle Surface Condition	W8-10	450 x 450	18 x 18
Advance Grade Crossing	W10-1	450 dia.	18 dia.
Bicycle Crossing	W11-1	450 x 450	18 x 18
Low Clearance	W12-2	450 x 450	18 x 18
Share the Road Plaque	W16-1	600 x 750	24 x 30
Supplemental Bike Route Plaque	D1-1	600 x 150	24 x 6
Bicycle Parking	D4-3	300 x 450	12 x 18
Bike Route	D11-1	600 x 450	24 x 18
Bicycle Route Marker	M1-8	300 x 450	12 x 18
Bicycle Route Marker	M1-9	450 x 600	18 x 24
Supplemental Bicycle Route Guide	M4-11, 12, 13	300 x 100	12 x 4
Route Marker Supplemental Plaques	M7-1, 2, 3, 4, 5, 6,7	300 x 225	12 x 9

Section 9B.03 STOP and YIELD Signs (R1-1, R1-2)**Standard:**

STOP (R1-1) signs shall be installed on shared-use paths at points where bicyclists are required to stop.

YIELD (R1-2) signs shall be installed on shared-use paths at points where bicyclists have an adequate view of conflicting traffic as they approach the sign, and where bicyclists are required to yield the right-of-way to that conflicting traffic.

Option:

A 750 x 750 mm (30 x 30 in) STOP sign or a 900 x 900 x 900 mm (36 x 36 x 36 in) YIELD sign may be used on shared-use paths for added emphasis.

Guidance:

Where conditions require bicyclists, but not drivers, to stop or yield, the STOP sign or YIELD sign should be placed or shielded so that it is not readily visible to drivers.

When considering STOP sign placement, assignment of priority at a shared-use path/roadway intersection should consider the following:

- A. Relative speeds of shared-use path and roadway users;
- B. Relative volumes of shared-use path and roadway traffic; and
- C. Relative importance of shared-use path and roadway.

Speed should not be the sole factor used to determine priority, as it is sometimes appropriate to give priority to a high-volume shared-use path crossing a low-volume street, or to a regional shared-use path crossing a minor collector street.

When assigning priority, the least restrictive control that is appropriate should be placed on the lower priority approaches. STOP signs should not be used where YIELD signs would be acceptable.



R1-1



R1-2



R3-16



R3-16a



R3-17



R3-17a



R4-1



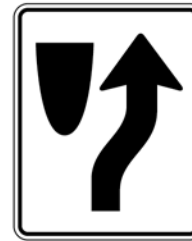
R4-2



R4-3



R4-4



R4-7



R5-3



R5-6



R7-9



R7-9a



R9-3a



R9-5



R9-6



R9-7



R10-3



R15-1

Section 9B.04 Bicycle Lane Signs (R3-16, R3-17)**Standard:**

Bicycle Lane (R3-16 and R3-17) signs shall be used only in conjunction with the Bicycle Lane Symbol pavement marking.

Bicycle Lane signs shall be used in advance of the beginning of a marked bicycle lane to call attention to the lane and the possible presence of bicyclists.

Guidance:

The R3-17 sign should be installed at periodic intervals along the bicycle lane.

Option:

Where appropriate, the message ENDS may be substituted for AHEAD on the R3-16 sign. The words LEFT or CURB may be substituted for RIGHT on the R3-17 sign.

The R3-16a sign may be used to notify bicyclists that the bicycle lane is ending.

Where there is a lane used for parking along the bikeway, the R3-17a sign may be used to notify bicyclists that they may encounter parked vehicles.

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

Where motor vehicles entering an exclusive right-turn lane must weave across bicycle traffic in bicycle lanes, the BEGIN RIGHT TURN LANE YIELD TO BIKES (R4-4) sign may be used to inform both the driver and the bicyclist of this weaving maneuver.

Section 9B.06 NO MOTOR VEHICLES Sign (R5-3)**Standard:**

The NO MOTOR VEHICLES (R5-3) sign shall be installed at the entrance to a shared-use path.

Section 9B.07 Bicycle Prohibition Sign (R5-6)**Guidance:**

Where bicyclists are prohibited, the Bicycle Prohibition (R5-6) sign should be installed at the entrance to the facility.

Option:

Where pedestrians and motor-driven cycles are also prohibited, it may be more desirable to use the R5-10a word message sign that is described in Section 2B.31. When used on a sidewalk, the bicycle prohibition sign may be 18 X 18 inches (450 x 450 mm).

Section 9B.08 No Parking Bicycle Lane Signs (R7-9, R7-9a)**Standard:**

If the installation of signs is necessary to restrict parking, standing, or stopping in a bicycle lane, appropriate signs as described in Sections 2B.34 through 2B.36, or the No Parking Bike Lane (R7-9 or R7-9a) signs shall be installed.

Section 9B.09 Bicycle Regulatory Signs (R9-5, R9-6)**Option:**

Bicycle Regulatory signs may be installed where pedestrian facilities are being used for bicycle travel.

The R9-5 sign may be used where the crossing of a street by bicyclists is controlled by pedestrian signal indications.

Where it is not intended for bicyclists to be controlled by pedestrian signal indications, the R10-3 sign (see Section 2B.40) may be used.

The R9-6 sign may be used where a bicyclist is required to cross or share a facility used by pedestrians and is required to yield to the pedestrians.

Guidance:

If used, the R9-5 or R10-3 signs should be installed off the edge of the sidewalk, near the crossing location, where bicyclists will be crossing the street.

Section 9B.10 Shared-Use Path Restriction Sign (R9-7)

Option:

The Shared-Use Path Restriction (R9-7) sign may be installed on facilities that are to be shared by pedestrians and bicyclists. The symbols may be switched as appropriate.

A designated pavement area may be provided for each mode of travel (see Section 9C.03).

Section 9B.11 Other Regulatory Signs

Option:

Other regulatory signs described in Chapter 2B may be installed on bicycle facilities as appropriate.

Section 9B.12 Turn or Curve Warning Signs (W1 Series)

Guidance:

To warn bicyclists of unexpected changes in shared-use path direction, appropriate turn or curve (W1-1 through W1-7) signs should be used.

The W1-1 through W1-5 signs should be installed no less than 15 m (50 ft) in advance of the beginning of the change of alignment.

Section 9B.13 Intersection Warning Signs (W2 Series)

Option:

Intersection Warning (W2-1 through W2-5) signs may be used on a roadway, street, or shared-use path in advance of an intersection to indicate the presence of an intersection and the possibility of turning or entering traffic.

Guidance:

When engineering judgment determines that the visibility of the intersection is limited on the shared-use path approach, Intersection Warning signs should be used.

Intersection Warning signs should not be used when the shared-use path approach to the intersection is controlled by a STOP sign, YIELD sign, or a traffic control signal.



W1-1



W1-2



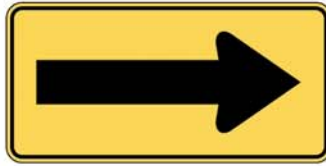
W1-3



W1-4



W1-5



W1-6



W1-7



W2-1



W2-2



W2-3



W2-4



W2-5



W3-1a



W3-2a



W3-3



W5-4



W7-5



W8-1



W8-2



W10-1



W12-2



W8-10



W8-10p



W11-1



W11-1



W16-7



W11-1



W16-1

Section 9B.14 Bicycle Surface Condition Warning Sign (W8-10)

Option:

The Bicycle Surface Condition Warning (W8-10) sign may be installed where roadway or shared-use path conditions could cause a bicyclist to lose control of the bicycle. A supplemental plaque may be used to clarify the specific type of surface condition.

Other surface conditions that might be of concern to bicyclists include SLIPPERY WHEN WET (W8-10p), BUMP (W8-1), DIP (W8-2), and Pavement Ends (W8-3), but other word message supplemental plaques that describe surface conditions that are of concern to bicyclists may also be used.

Section 9B.15 Bicycle Crossing Warning Sign (W11-1)

Support:

The Bicycle Crossing Warning (W11-1) sign alerts the road user to unexpected entries into the roadway by bicyclists, and other crossing activities that might cause conflicts. These conflicts might be relatively confined, or might occur randomly over a segment of roadway.

Option:

A supplemental plaque with the legend AHEAD or XXX FEET may be used with the Bicycle Crossing Warning sign.

Guidance:

If used in advance of a specific crossing point, the Bicycle Crossing Warning sign should be placed at a distance in advance of the crossing location that conforms with the guidance given in Table 2C-4.

Standard:

Bicycle Crossing Warning signs, when used at the location of the crossing, shall be supplemented with a diagonal downward pointing arrow (W16-7) plaque to show the location of the crossing.

Option:

A fluorescent yellow-green background color with a black legend and border may be used for Bicycle Crossing Warning signs and supplemental plaques.

Guidance:

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

Section 9B.16 Other Bicycle Warning Signs**Option:**

Other bicycle warning signs such as BIKEWAY NARROWS (W5-4) and Hill (W7-5) may be installed on bicycle facilities to warn bicyclists of conditions not readily apparent.

In situations where there is a need to warn drivers to watch for bicyclists traveling along the highway, the SHARE THE ROAD (W16-1) plaque may be used in conjunction with the W11-1 sign.

Guidance:

If used, other advance bicycle warning signs should be installed no less than 15 m (50 ft) in advance of the beginning of the condition.

Where temporary traffic control zones are present on bikeways, appropriate signs from Part 6 should be used.

Option:

Other warning signs described in Chapter 2C may be installed on bicycle facilities as appropriate.

Section 9B.17 Bicycle Route Guide Signs (D11-1)**Guidance:**

If used, Bicycle Route Guide (D11-1) signs should be provided at decision points along designated bicycle routes, including signs to inform bicyclists of bicycle route direction changes and confirmation signs for route direction, distance, and destination.

If used, Bicycle Route Guide signs should be repeated at regular intervals to ensure that bicyclists entering from side streets know that they are on a bicycle route. Similar



D11-1



M1-8



M1-9



D1-1b(L)



M4-11



D1-1b(R)



M4-12



D1-1c



M4-13



M7-1



M7-2



M7-3



M7-4



M7-5



M7-6



M7-7



D4-3

Figure 9B-2. Example of Signing for Beginning and End of a Bicycle Route

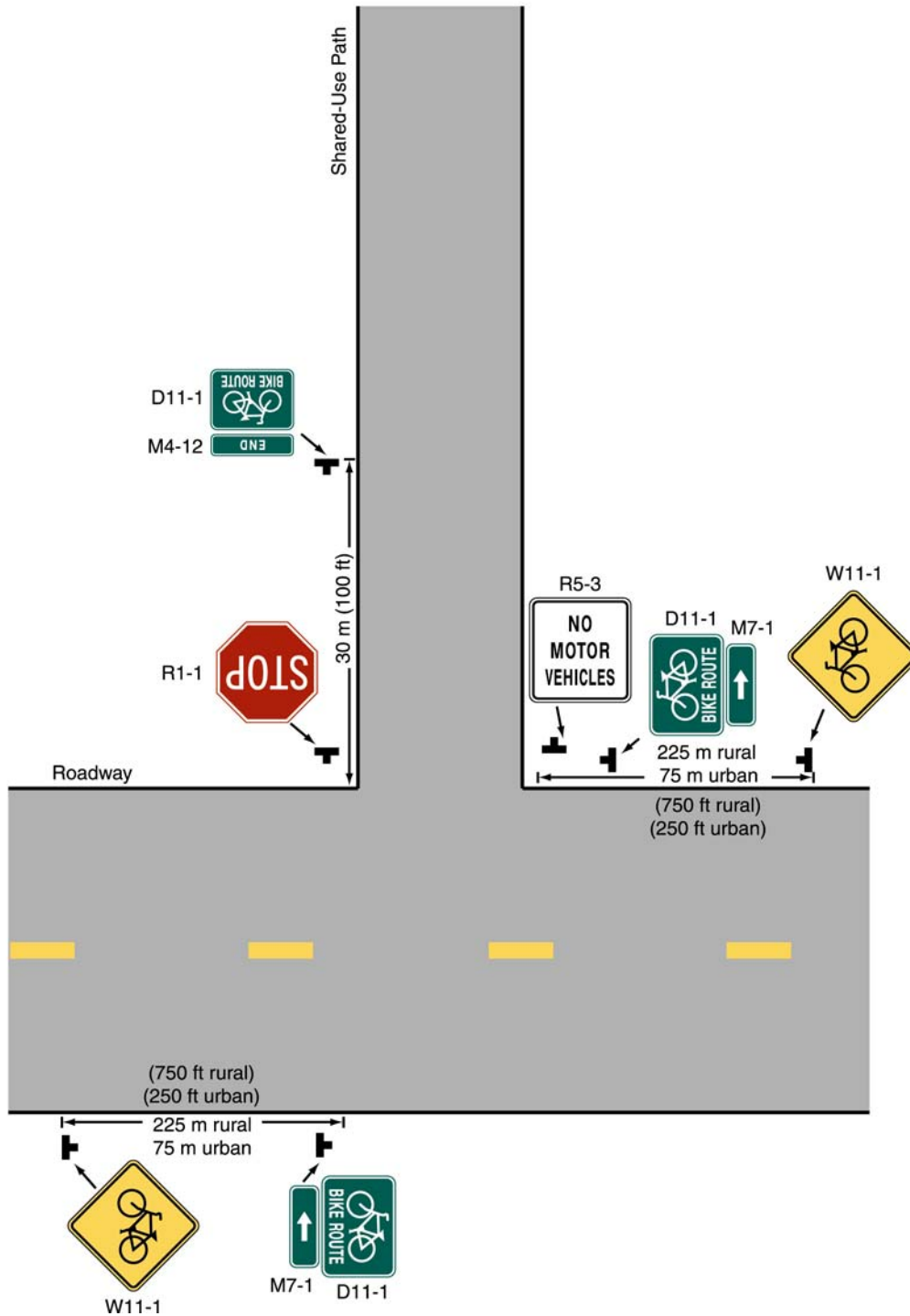
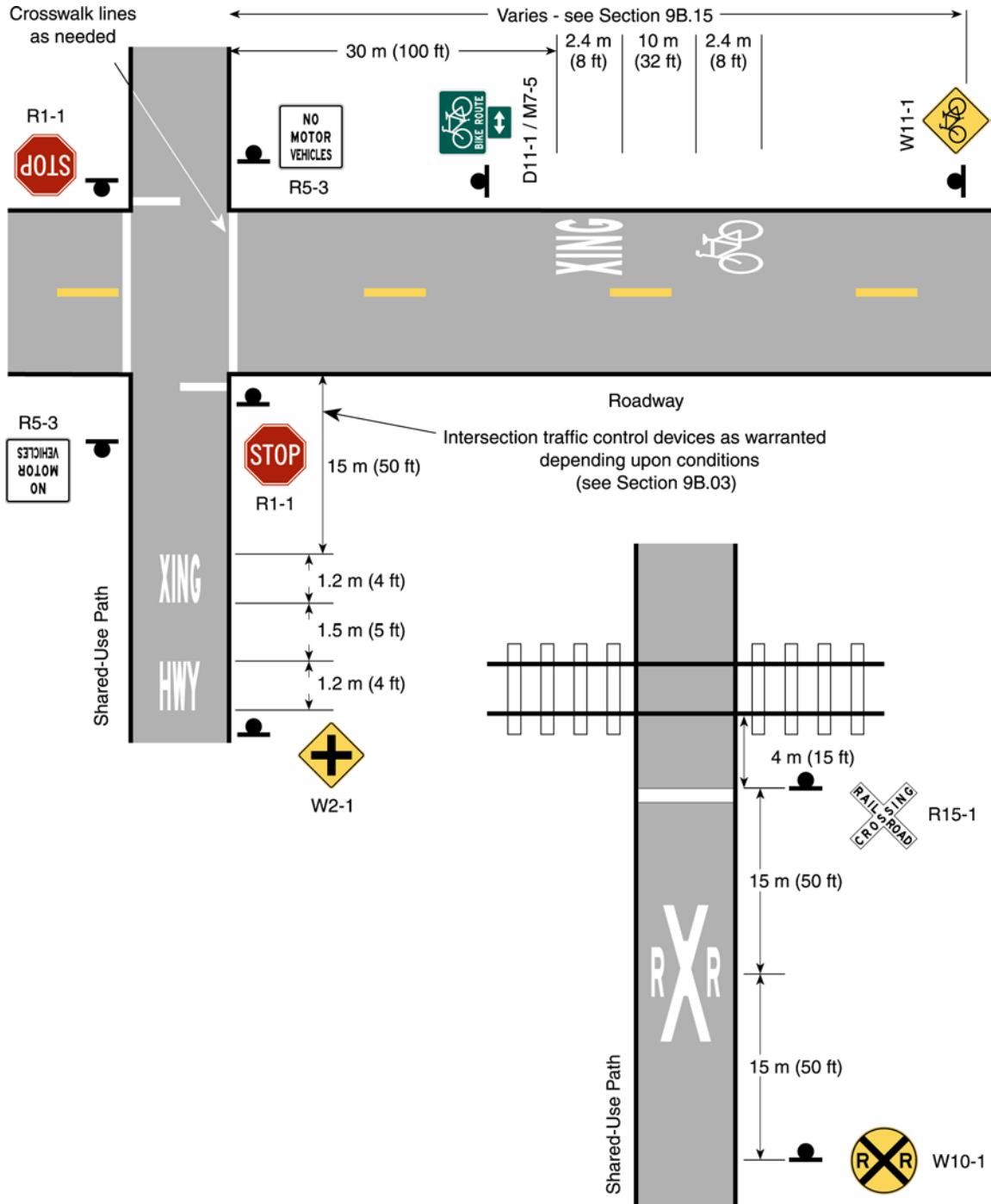


Figure 9B-3. Typical Signs and Markings for Shared-Use Paths



guide signing should be used for shared roadways with intermediate signs placed for bicyclist guidance.

Support:

Figure 9B-2 shows an example of the signing for the junction of a bicycle route with a highway. Figure 9B-3 shows an example of signing and marking for the intersection of a shared-use path with a roadway.

Section 9B.18 Bicycle Route Markers (M1-8, M1-9)

Option:

To establish a unique identification (route designation) for a state or local bicycle route, the Bicycle Route (M1-8) marker may be used.

Standard:

The Bicycle Route marker shall contain a route designation and shall have a green background with a retroreflectorized white legend and border.

Option:

Where a designated bicycle route extends for long distances through two or more states, a coordinated submittal by the affected states for an assignment of an Interstate Bicycle Route number designation may be sent to the American Association of State Highway and Transportation Officials (see Page i for the address).

Standard:

The Interstate Bicycle Route (M1-9) marker shall contain the assigned route number designation and have a black legend and border with a retroreflectorized white background.

Guidance:

If used, the Bicycle Route or Interstate Bicycle Route markers should be placed at intervals frequent enough to keep bicyclists informed of changes in route direction and to remind drivers of the presence of bicyclists.

Option:

Bicycle Route or Interstate Bicycle Route markers may be installed on shared roadways or on

shared-use paths to provide guidance for bicyclists.

The Bicycle Route Guide (D11-1) sign may be installed where no unique designation of routes is desired.

Section 9B.19 Destination Arrow and Supplemental Plaque Signs for Bicycle Route Signs

Option:

Destination (D1-1b and D1-1c) signs may be installed with Bicycle Route Guide signs, Bicycle Route markers, or Interstate Bicycle Route markers to furnish additional information, such as directional changes in the route, or intermittent distance and destination information.

The M4-11 through M4-13 supplemental plaques may be mounted above the appropriate Bicycle Route Guide signs, Bicycle Route markers, or Interstate Bicycle Route markers.

Guidance:

If used, the appropriate arrow (M7-1 through M7-7) sign should be placed below the Bicycle Route Guide sign, Bicycle Route marker, or Interstate Bicycle Route marker.

Standard:

The arrow signs and supplemental plaques used with the D11-1 or M1-8 signs shall have a white legend and border on a green background.

The arrow signs and supplemental plaques used with the M1-9 sign shall have a white legend and border on a black background.

Section 9B.20 Bicycle Parking Area Sign (D4-3)

Option:

The Bicycle Parking Area (D4-3) sign may be installed where it is desirable to show the direction to a designated bicycle parking area.

Standard:

The legend and border of the Bicycle Parking Area sign shall be green on a retroreflectorized white background.

CHAPTER 9C. MARKINGS

Section 9C.01 Functions of Markings

Support:

Markings are important on roadways that have a designated bicycle lane. Markings indicate the separation of the lanes for road users, assist the bicyclist by indicating assigned travel paths, indicate correct position for traffic signal actuation, and provide advance information for turning and crossing maneuvers.

Section 9C.02 General Principles

Guidance:

Bikeway design guides should be used when designing markings for bicycle facilities (see Section 9A.05).

Standard:

Markings used on bikeways shall be retroreflectorized.

Guidance:

Pavement marking symbols and/or word messages should be used in the bicycle lanes. Consideration should be given to selecting pavement marking materials that will minimize loss of traction for bicycles in wet conditions.

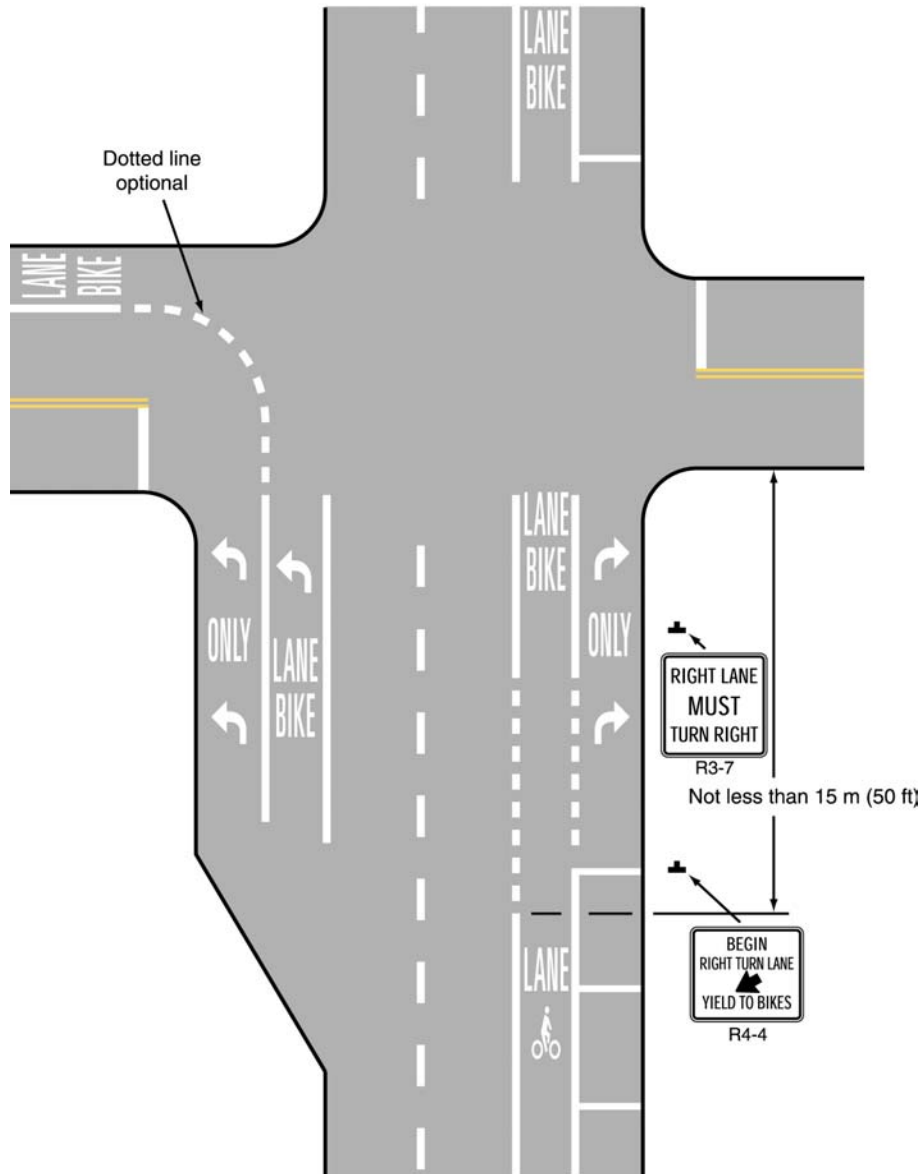
Support:

Figures 9C-1 through 9C-7 show examples of the application of lines, word messages, and symbols on designated bikeways with and without parking for motor vehicles.

Option:

A dotted line may be used to define a specific path for a bicyclist crossing an intersection (see Figure 9C-1) as described in Sections 3A.05, 3A.06, and 3B.08.

Figure 9C-1. Typical Intersection Pavement Markings – Designated Bicycle Lane with Left-Turn Area, Heavy Turn Volumes, Parking, One-Way Traffic or Divided Highway



Section 9C.03 Marking Patterns and Colors on Shared-Use Paths**Standard:**

Except as specified in the following Option, the color, symbols, size, and types of lines used for marking bicycle facilities shall be as defined in Sections 3A.05, 3A.06, and 3B.22.

Support:

In most cases, centerlines are not required on shared-use paths.

Edge lines are seldom used on shared-use paths except to delineate special features, such as an area of restricted horizontal clearance or along a route to improve nighttime visibility.

Option:

Where shared-use paths are of sufficient width to designate two minimum width lanes, a solid yellow line may be used to separate the two directions of travel where passing is not permitted, and a broken yellow line may be used where passing is permitted (see Figure 9C-2).

If used, edge lines on a shared-use path may be a solid 2-inch or 4-inch line. A Stop line, when used on a shared-use path, at a roadway intersection may be 12 inches in width.

Guidance:

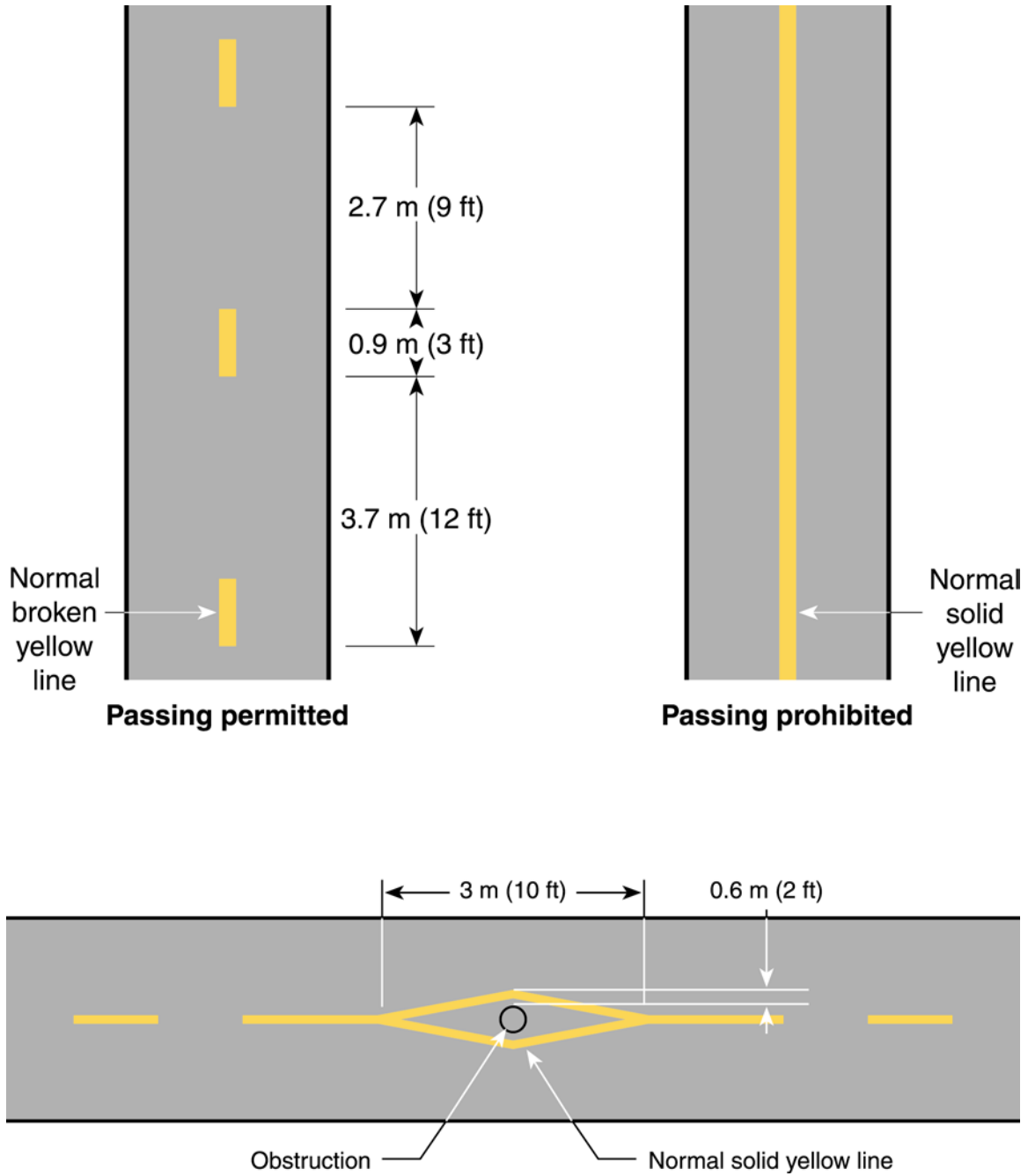
Broken lines used on shared-use paths should have the usual 1-to-3 segment-to-gap ratio. A nominal 0.9 m (3 ft) segment with a 2.7 m (9 ft) gap should be used.

If conditions make it desirable to separate two directions of travel on shared-use paths at particular locations, a solid yellow line should be used to indicate no passing and no traveling to the left of the line.

Option:

On shared-use paths, a solid white line may be used to separate different types of users. The R9-7 sign may be used to supplement the solid white line.

Figure 9C-2. Centerline Markings for Shared-Use Paths



Section 9C.04 Markings For Bicycle Lanes**Guidance:**

Longitudinal pavement markings should be used to define bicycle lanes.

Support:

Pavement markings supplement signs to designate that portion of the roadway for preferential or exclusive use by bicyclists. Markings inform all road users of the restricted nature of the bicycle lane.

Standard:

If used, the bicycle lane symbol shall be placed immediately after but not closer than 20 m (65 ft) from the crossroad, or other locations as needed. The bicycle lane symbol marking shall be white. If the bicycle lane symbol is used in conjunction with other word or symbol messages, it shall precede them.

Signs shall be used with preferential lane symbols.

Support:

Typical bicycle lane markings at right-turn lanes are shown in Figures 9C-3 and 9C-4. Typical pavement markings for bicycle lanes on a two-way street are shown in Figure 9C-5.

Section 9C.05 Word Messages and Symbols Applied to the Pavement**Option:**

Optional word and symbol markings shown in Figure 9C-6 may be used.

Smaller size letters and symbols may be used on shared-use paths. Where arrows are needed on shared-use paths, half-size layouts of the arrows may be used (see Section 3B.19).

Section 9C.06 Object Markers on Shared-Use Paths**Option:**

Fixed objects adjacent to shared-use paths may be marked with object markers (Type 1, 2, or 3). The size of Type 2 and Type 3 object markers may be reduced when placed along bicycle paths.

Figure 9C-3. Typical Bicycle Lane Treatment at a Right Turn Only Lane

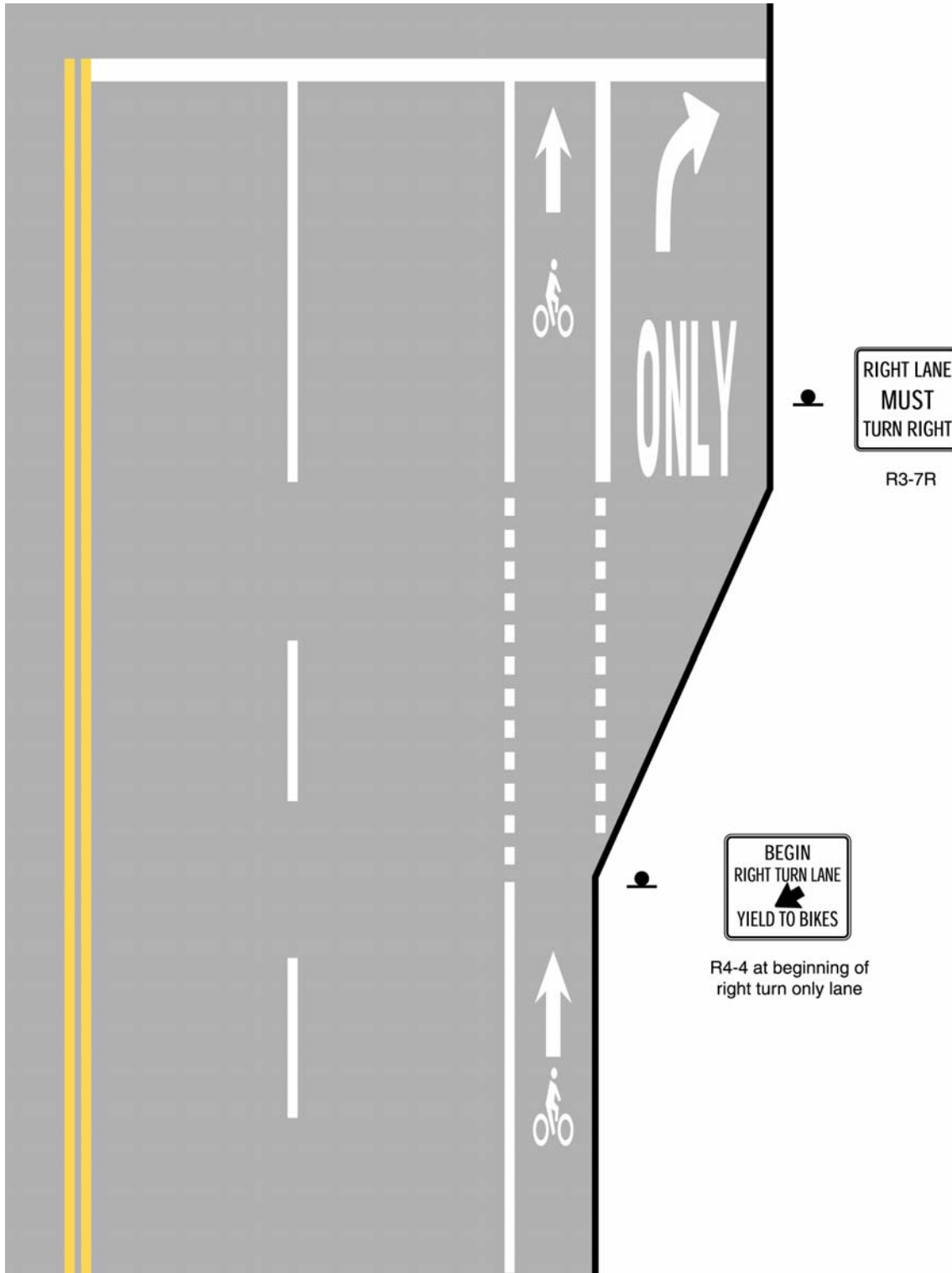


Figure 9C-4. Typical Bicycle Lane Treatment at Parking Lane into a Right Turn Only Lane

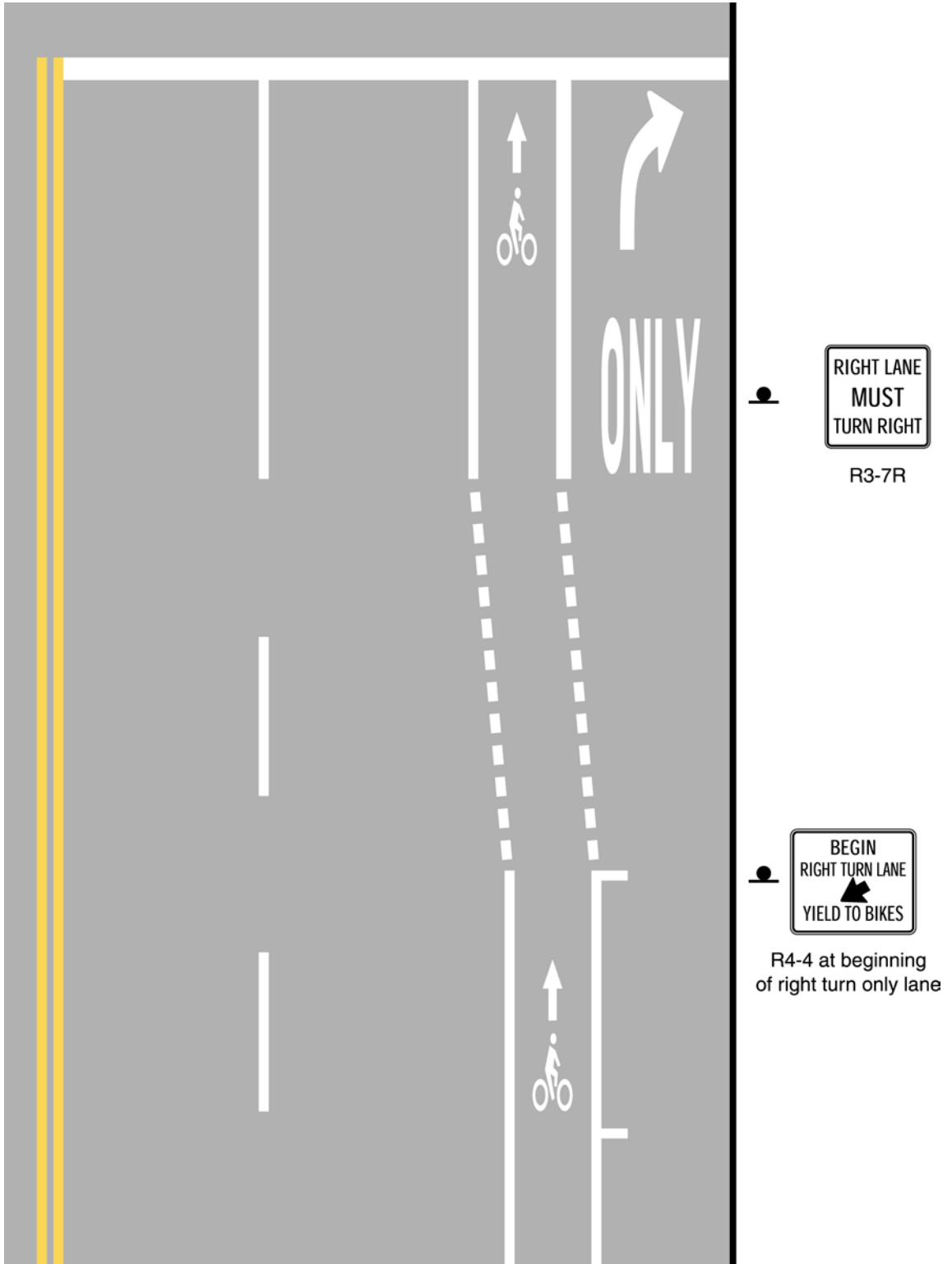


Figure 9C-5. Typical Pavement Markings for Bicycle Lanes on a Two-Way Street

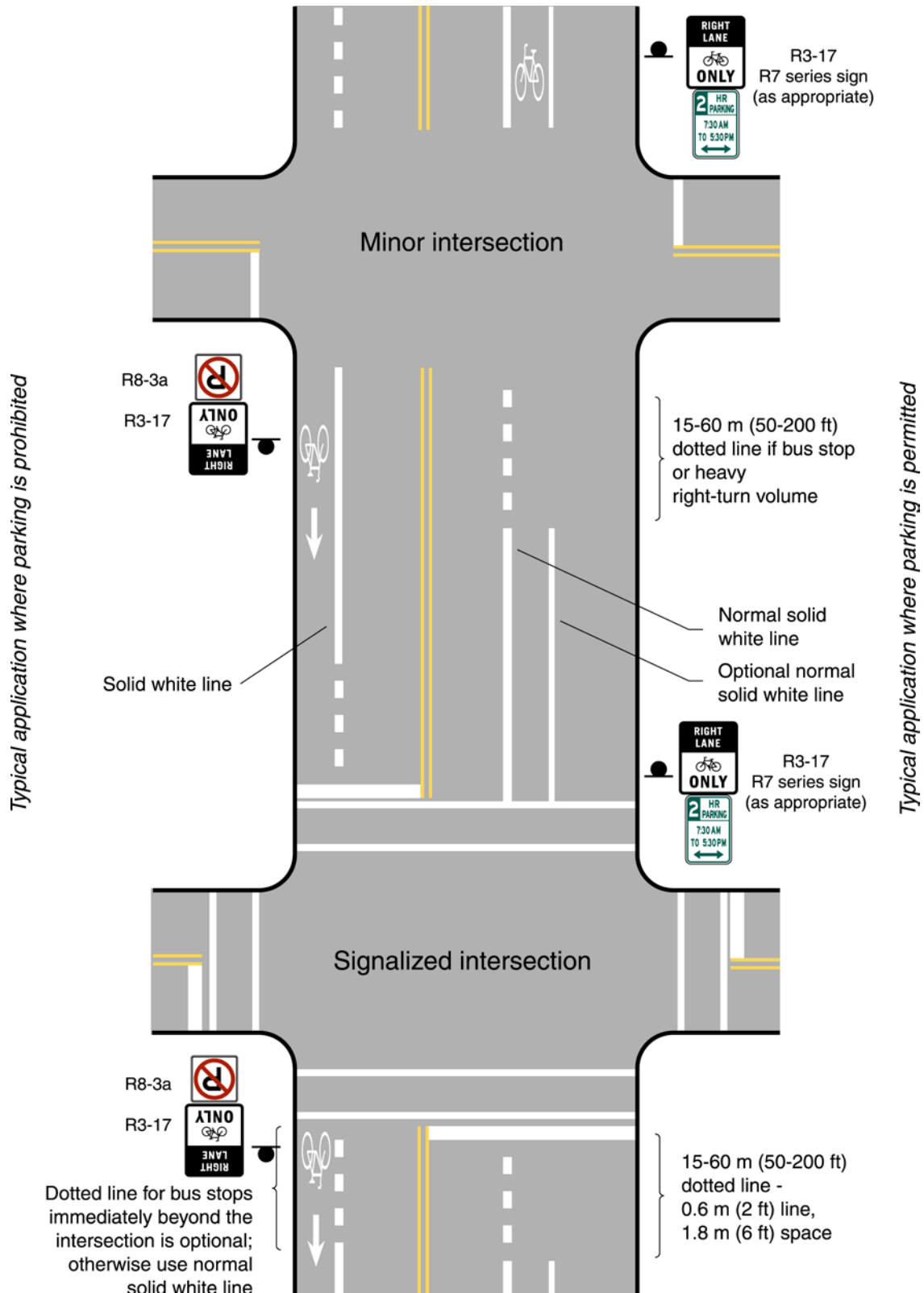
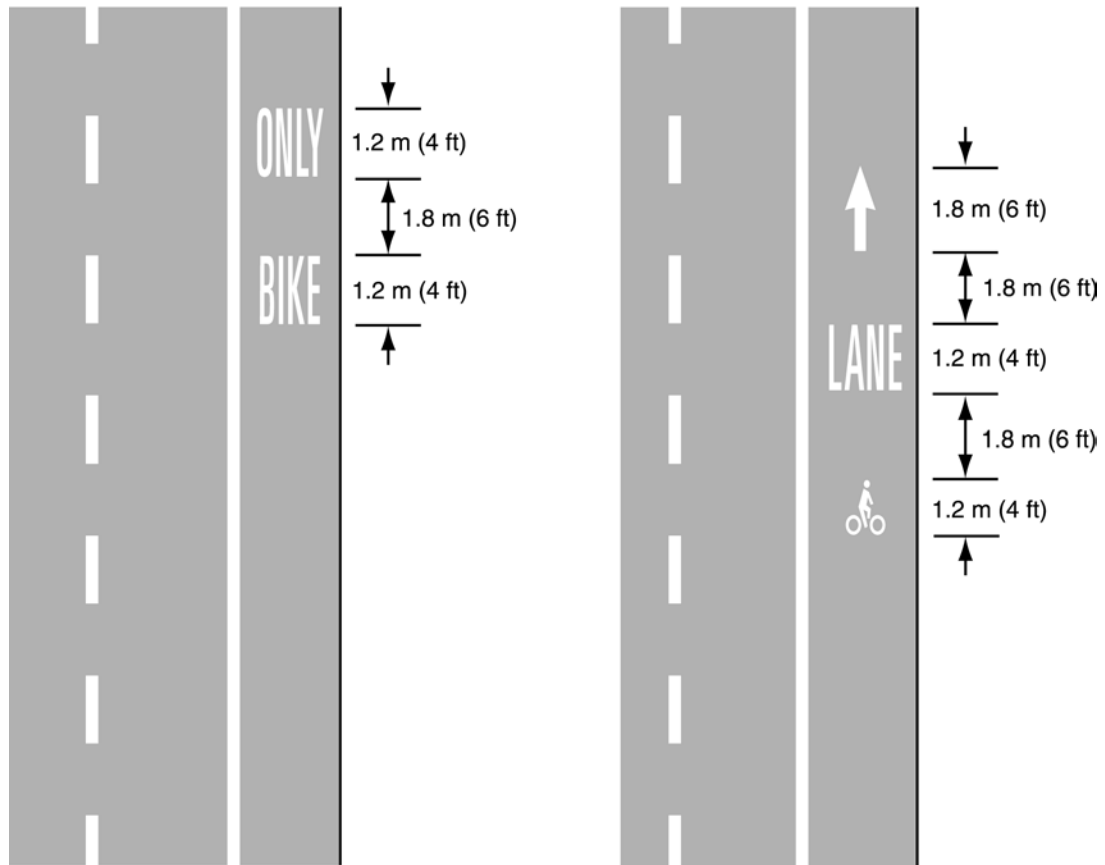


Figure 9C-6. Typical Optional Word and Symbol Pavement Markings for Bicycle Lanes



Standard:

All object markers shall be retroreflective.

Markers such as those described in Section 3C.01 shall also be used on shared-use paths, if needed.

As indicated in Section 3C.02, obstructions within the bikeway shall be marked with the appropriate object marker or delineation.

On Type 3 markers, the alternating black and retroreflective yellow stripes shall be sloped down at an angle of 45 degrees toward the side on which traffic is to pass the obstruction.

Guidance:

Care should be taken to avoid having object markers become hazardous objects. They should have the corners rounded to prevent them from becoming a hazard.



Type 1



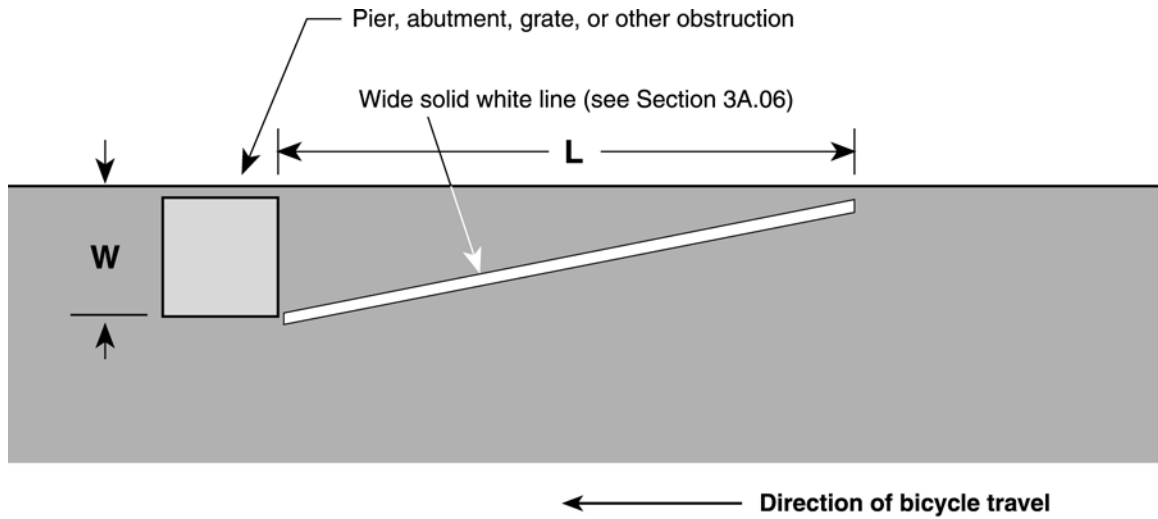
Type 2



Type 3

Section 9C.07 Pavement Markings for Obstructions**Guidance:**

In roadway situations where a drain grate or other roadway obstruction that is inappropriate for bicycle travel cannot be eliminated, white markings applied as shown in Figure 9C-7 should be used.

Figure 9C-7. Typical Obstruction Pavement Marking**For metric units:**

$L = 0.6 WS$, where S is bicycle approach speed in kilometers per hour

For English units:

$L = WS$, where S is bicycle approach speed in miles per hour

CHAPTER 9D. SIGNALS

Section 9D.01 Application

Support:

Part 4 contains information regarding signal warrants and other requirements relating to signal installations.

Option:

For purposes of signal warrant evaluation, bicyclists may be counted as either vehicles or pedestrians.

Section 9D.02 Signal Operations for Bicycles

Standard:

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.

On bikeways, the needs of bicyclists shall be considered when setting signal timing.

