Meeting Date: November 04, 2021 **Item Number:** 21-22	**From:** Gurinderpal (Johnny) Bhullar, PE, TE, Secretary to CTCDC
Sponsored By: Lee Haber, PE, Caltrans	**Presented By:** Russ Wenham, PE, TE, PTOE, Caltrans
Description: Planned Editorial Changes to Part 3 and Part 9 to Incorporate Green-Colored Pavement, Bikeway Separator Post & Editorial Cleanup	

Recommendation:
Bikeway Separator Posts: Motion by committee to recommend inclusion of the proposed changes to the CA MUTCD - Section 3F.03 "Delineator Application" and Section 9C.102(CA) "Class IV Bikeways" regarding to bikeway separator posts.

Editorial Clean-Up & Green-Colored Pavement: Motion by committee to recommend Caltrans to make editorial changes throughout Part 3 and Part 9 to include green-colored pavement and address other minor errors.

Agency Making Request/Sponsor:
Caltrans.

Background:
Traffic control for bicycle facilities (Part 9 of the CA MUTCD) is one of the most modified Parts of the CA MUTCD since initial publication of the 2014 edition of the manual. With the growing deployment of bikeways throughout California, Caltrans identified the need for a comprehensive review and update to Part 9 of the manual. This planned revision is the result of reviewing the entire Part 9 and making systematic editorial changes to all sections for consistency and uniformity.

Green-Colored Pavement: The use green-colored pavements have become widespread based on the following FHWA interim approvals:

- Interim approval IA-14: Optional Use of Green Colored Pavement for Bike Lanes.
- Interim approval IA-14.10: Green Colored Pavement for Bike Lanes – California Statewide.
- Interim approval IA-18: Optional Use of an Intersection Bicycle Box.
- Interim approval IA-20: Optional Use of Two-Stage Bicycle Turn Boxes.

The optional uses addressed in the above green-colored pavement interim approvals are included in the notice of proposed amendment to the federal MUTCD. The attached planned editorial changes to the CA MUTCD are consistent with the above interim approvals and the federal proposed amendments related to green-colored pavement.

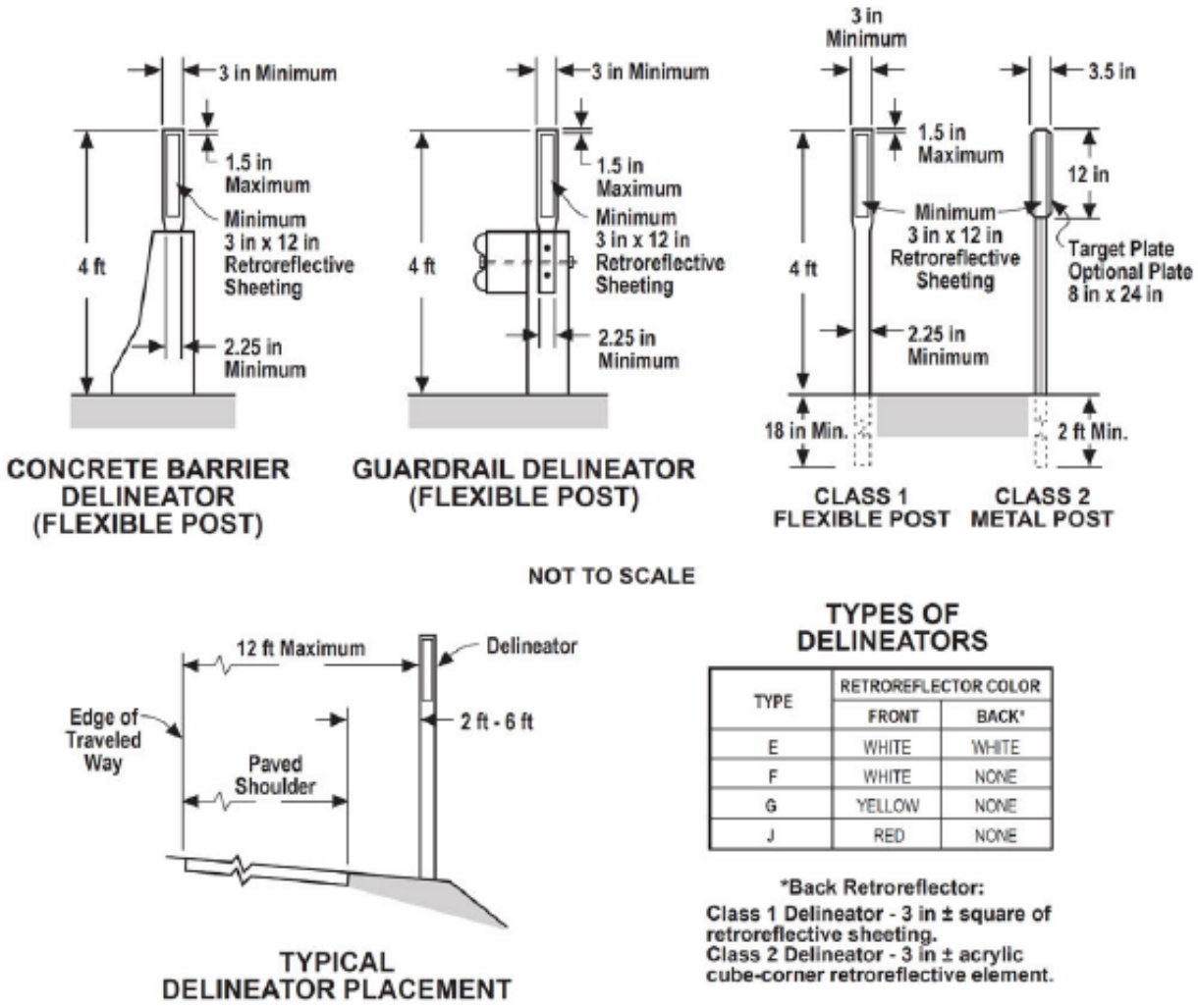
Bikeway Separator Post: Class IV separated bikeways contain vertical elements in the buffer areas. Often it is desirable for the vertical elements to be flexible posts, such as white channelizers or other styles of flexible posts.

Section 9C.102 (CA) "Class IV Bikeways" of the CA MUTCD uses the term "flexible delineator posts" and refers to the FHWA "Separated Bike Lane Planning and Design Guide" (FHWA Guide) for detailed information on planning and design of separated bike lanes. The FHWA Guide also uses the term "flexible delineator post".
Section 1A.13 "Definitions of Headings, Words, Phrases in this Manual" of the CA MUTCD defines a delineator as "a retroreflective device mounted on the roadway surface or at the side of the roadway in a series to indicate the alignment of the roadway, especially at night or in adverse weather."

Section 3F.03 "Delineator Application" of the CA MUTCD uses the term "delineator" to refer to roadside applications and the term "channelizer" is used where delineation is required within a paved area.

Figure 3F-101 (CA) of the CA MUTCD provides very specific examples of delineators and contains details that are consistent with the Caltrans Standard Plans. See below for Figure 3F-101 (CA):

Figure 3F-101 (CA). Examples of Delineators



TYPES OF DELINEATORS

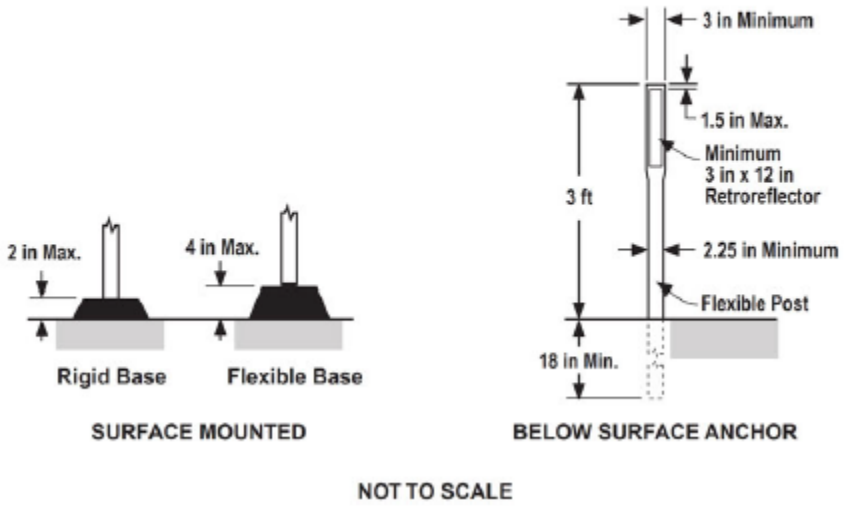
TYPE	RETROREFLECTOR COLOR	
	FRONT	BACK*
E	WHITE	WHITE
F	WHITE	NONE
G	YELLOW	NONE
J	RED	NONE

*Back Retroreflector:
Class 1 Delineator - 3 in ± square of retroreflective sheeting.
Class 2 Delineator - 3 in ± acrylic cube-corner retroreflective element.

Section 3H.01 "Channelizing Devices" of the CA MUTCD states that "channelizers are flexible retroreflective devices for installing within the roadway to discourage road users from crossing a line or area of a roadway. Unlike delineators, which indicate the roadway alignment, channelizers are intended to provide additional guidance and/or restriction to traffic by supplementing pavement markings and delineation." Section 3H.01 also states that "channelizers may be used for additional emphasis to discourage median crossings at traffic islands and at lane separations."

Figure 3H-101 (CA) of the CA MUTCD provides a very specific example of a channelizer and contains details that are consistent with the Caltrans Standard Plans. See below for Figure 3H-101 (CA).

Figure 3H-101 (CA). Example of Channelizers



Caltrans issued Design Information Bulletin DIB 89-01 "Class IV Bikeway Guidance" in 2018 that uses the term "flexible post" for vertical elements and includes pictures of example facilities with flexible posts in various sizes.

With the widespread construction of Class IV bikeways, manufactures and practitioners are developing innovative flexible post solutions that are beneficial to safe operation of Class IV bikeways. One such example is the US Reflector K71$_{TM}$ bicycle lane post that has been installed at numerous locations throughout California. See below for a picture of the K71$_{TM}$ flexible posts on a project in the City of Redding, California.

It will serve both the manufacture and practitioner communities to add the generic term "bicycle separator post" to the CA MUTCD to clearly indicate that the posts may not conform to the narrow definitions and standard plans that have been published for channelizers and delineators. It is the intent of Caltrans to create the additional category "bicycle separator post" on its Authorized Materials List to facilitate deployment of flexible separator posts that are purpose-built for bikeways.

Editorial Nature of Changes: The planned language for this revision will only edit "guidance", "option", and "support", or will use the proposed language for the next version of the Federal MUTCD. This revision will not create new "standards" in the CA MUTCD. Therefore, Caltrans is presenting this item to the CTCDC to obtain feedback, suggestions and comments on the planned revisions and no formal voting is needed due to the editorial natures of the proposals.

Future Updates After FHWA Publishes Final Rule: It is anticipated that the new federal MUTCD will be published in early 2022. Caltrans will have up to 2 years to adopt an updated CA MUTCD. While the goal of the attached planned updates is to be consistent with the pending new federal MUTCD, it is anticipated that some sections and wording will need to be updated in the updated version of the CA MUTCD. To provide the best practices for the end-users of the CA MUTCD at the earliest time, Caltrans is planning the updates presented in the attachments.

Attachments:
Attachment A – Proposed change to Part 3 of the CA MUTCD
Attachment B – Proposed change to Part 9 of the CA MUTCD

ATTACHMENT A

Note:

Black text is consistent with the Federal MUTCD.
Blue text is current text as amended for use in California.
~~Struck-out red~~ text is to be deleted from the CA MUTCD.
Red text is newly proposed text.

Add to Section 3F.03:

Section 3F.03 Delineator Application

20As shown in Figure 3F102(CA) and Figure 3F104(CA) Type K(CA), Type P(CA), and Type R(CA) Object Markers are used along with delineators. See Figure 2C-13(CA) for object marker details.

21Bikeway separator posts are a type of delineator used as vertical elements to define Class IV bikeways. Refer to FHWA "Separated Bike Lane Planning and Design Guide" for information on design of bikeway separator posts. See Section 9C.102(CA) Class IV Bikeways for more details.

Insert new Section 3G.101(CA):

Section 3G.101(CA) Green-Colored Pavement for Bicycle Facilities

Support:

01Green-colored pavement is used to enhance the conspicuity of locations where bicyclists are expected to operate, and areas where bicyclists and other roadway traffic might have potentially conflicting weaving or crossing movements. Green- colored pavement is also used to enhance the conspicuity of word, symbol, and/or arrow pavement markings when these markings are used in certain bicycle facilities (see Figure G-101(CA)).

Standard:

02**If used, green-colored pavement shall be limited to:**

A. Bicycle lanes (See Section 9C.04),
B. Extensions of bicycle lanes through intersections (See Section 9C.04),
C. Extensions of bicycle lanes through areas where motor vehicles enter an exclusive turn lane in which motor vehicles must weave across bicycle traffic in bicycle lanes,
D. Two-stage turn boxes,
E. Bicycle Box,
F. Bicycle detector symbol (See Section 9C.05), and
G. Separated bicycle lanes within the roadway.

03**Green-colored pavement shall not be incorporated into shared-use paths, shared-lane markings, crosswalks, class I bikeways, or electric-vehicle parking stations or parking stalls.**

Option:

04Green-colored pavement may be installed for the entire length of a bicycle lane or bicycle lane extension or for only a portion (or portions) of the bicycle lane or bicycle lane extension.

05Green-colored pavement may be installed for the entire length of a class IV physically separated bikeway within the roadway or for only a portion (or portions) of the class IV physically separated bikeway.

Standard:

06**Green-colored pavement shall not be used instead of dotted lines used to extend a bicycle lane or a class IV separated bicycle lane within a roadway across an intersection, driveway, or ramp. The pattern of the green-colored pavement shall match the pattern of the dotted lines, thus filling in only the areas that are directly between a pair of dotted line segments.**

Guidance:

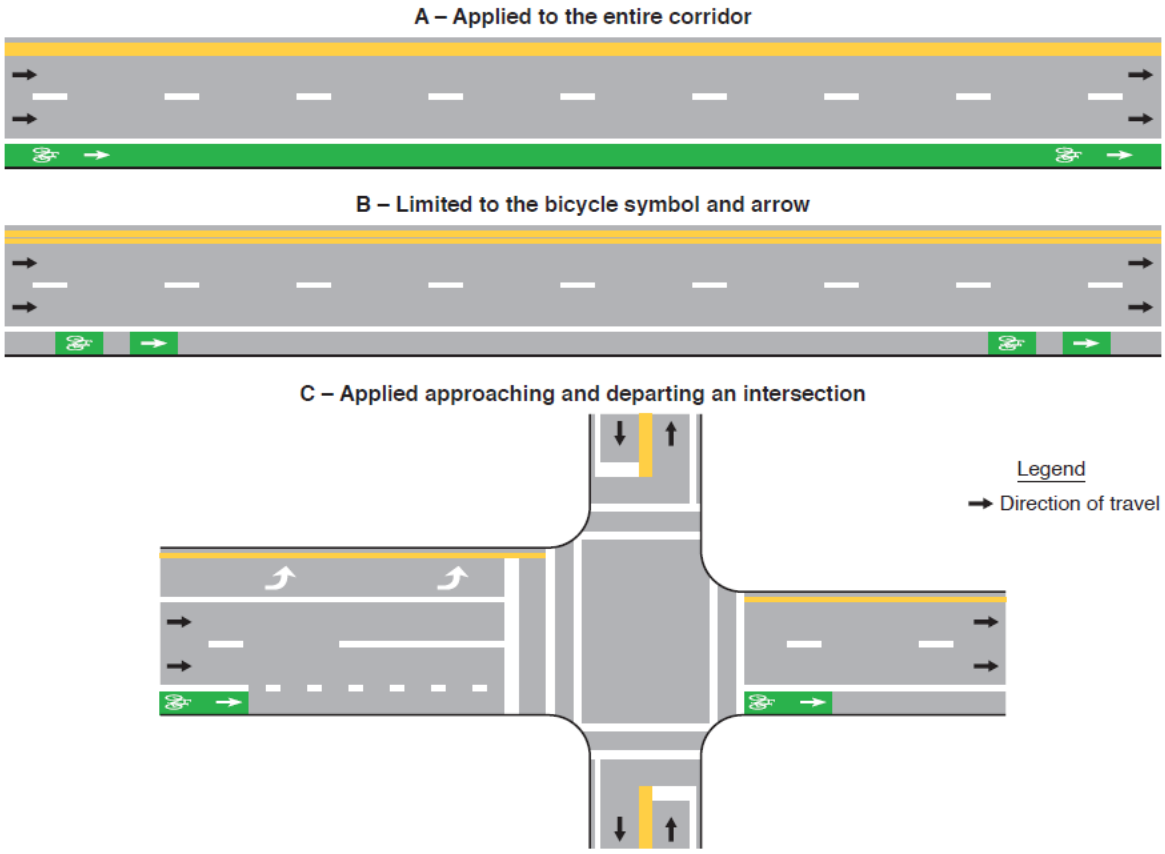
07*Appropriate regulatory (see Chapter 9B) or guide signing (see Chapter 9D) should be installed to provide related information to the presence of the colored pavement.*

Standard:

08Green-colored pavement shall conform to FHWA Interim Approvals for "Green Colored Pavement for Bike Lanes – California Statewide (IA-14.10)", "Optional Use of an Intersection Bike Box (IA-18)" and "Optional Use of Two-Stage Bicycle Turn Boxes (IA-20)".

Insert new Figure 3G-101(CA):

Figure 3G-101(CA)- Examples of Optional Green-Colored Pavement Applications



ATTACHMENT B

Note:

Black text is consistent with the Federal MUTCD.
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Red text is newly proposed text.

Proposed Changes to Part 9 Throughout the Following:

PART 9
TRAFFIC CONTROL FOR BICYCLE FACILITIES

CHAPTER 9A. GENERAL

Section 9A.01 Requirements for Bicyclist Traffic Control Devices

Support:

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

Section 9A.02 Scope

Support:

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

Guidance:

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

Standard:

03 **The absence of a marked bicycle lane or any of the other traffic control devices discussed in this Chapter on a particular roadway shall not be construed to mean that bicyclists are not permitted to travel on that roadway.**

Section 9A.03 Definitions Relating to Bicycles

Support:

01 Definitions and acronyms pertaining to Part 9 are provided in Sections 1A.13 and 1A.14.

Section 9A.04 Maintenance

Guidance:

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

02 *Separated bikeways should be accessible to street maintenance equipment (e.g., street sweeping, snow removal).*

Section 9A.05 Relation to Other Documents

Support:

01 "The Uniform Vehicle Code and Model Traffic Ordinance" published by the National Committee on Uniform Traffic Laws and Ordinances and the California Vehicle Code (see Section 1A.11) ~~has~~ have provisions for bicycles and ~~is~~ are the basis for the traffic control devices included in this Manual.

01a Refer to California Streets and Highway Code Section 890.4 for definition of "Bikeways".

02 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 i for the address); and

B. State and local government design guides.

C. "Highway Design Manual" (Caltrans).

D. "Complete Intersections: A Guide to Reconstructing Intersections and Interchanges for Bicyclists and Pedestrians" (Caltrans).

E. "Separated Bike Lane Planning and Design Guide," which is available from the Federal Highway Administration (see Page ii for the address) ~~; and~~

F. NACTO Urban Bikeway Design Guide and Urban Street Design Guide (see Page iii for the address).

G. Design Information Bulletin Number 89 Class IV Bikeway Guidance (DIB 89) (Caltrans).

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

Section 9A.06 Placement Authority

Support:

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

02 The following references from the California Vehicle Code relate to bicycles:

A. Section 21100 – Rules and regulations for operation of bicycles on the public sidewalks.

B. Section 21113 – Driving or parking of bicycles or motorized bicycles on public grounds including University of California and the California State University campuses.

C. Section 21116 - Bicycle paths or routes on levees, canal banks, natural watercourse banks, or pipeline rights-of-way.

D. Sections 21200 through 21212 – Operation of bicycles on California roadways.

E. Section 21202 – Bicycle operation on roadway.

F. Section 21207 – Bicycle lanes.

G. Section 21208 – Permitted movements from bicycle lanes.

H. Section 21209 - Motor vehicles and motorized bicycles in bicycle lanes.

I. Section 21210 – Bicycle parking.

J. Section 21211 - Obstruction of bikeways or bicycle paths or trails.

K. Section 21229 – Operation of motorized scooters in bicycle lanes.

L. Section 21230 – Operation of motorized scooters on bicycle paths, trails or bikeways.

M. Section 21450 – Color-lighted bicycle symbols on official traffic control signals.

N. Section 21450.5 – Detection of motorcycles and bicycles at traffic-actuated signals.

O. Section 21456.2 – Bicycles and traffic signals.

P. Section 21456.3 – Bicycle signals.

Q. Section 21650.1 – Bicycle operated on roadway or highway shoulder.

R. Section 21717 – Turning across bicycle lane.

S. Section 21750 – Overtake and pass to left.

T. Section 21760 – Three Feet for Safety Act

U. Section 21960 – Bicycle and pedestrian restrictions on freeways and expressways.

V. Section 21966 – Pedestrians in bicycle lanes.

W. Section 23330 – Bicycles not permitted at vehicle crossings.

03 The following references from the California Streets and Highways Code relate to bicycles:

A. Section 885.2 –Statewide bicycle program.

B. Section 886 – State bicycle facilities coordinator.

C. Section 887 - Definition of non-motorized transportation facility.

D. Section 887.2 – Statewide bicycle map.

E. Section 887.6 – Agreements with local agencies to construct and maintain non-motorized transportation facilities.

F. Section 888 – Severance of existing major non-motorized route by freeway construction.

G. Section 888.2 – Incorporation of non-motorized transportation facilities in the design of freeways.
H. Section 889 – California Bicycle Routes of National, State, or Regional Significance Act.
I. Section 890.2 – Definition of bicycle.
J. Section 890.4 – Definitions of Class I, II, III and IV bikeways.
K. Section 890.6 – Caltrans, in cooperation with county and city governments, to establish minimum safety design criteria for the planning and construction of bikeways and roadways where bicycle travel is permitted.
L. Section 890.8 - Caltrans to establish uniform specifications and symbols for signs, markers, and traffic control devices for bikeways and roadways where bicycle travel is permitted.
M. Section 891 – Local agencies must comply with design criteria and uniform specifications and symbols for signs, markers, and traffic control devices established by Caltrans.
N. Section 891.2 & 891.4 – Local agencies bicycle transportation plan.
O. Section 891.8 – Local agency establishment of bikeways.
P. Section 892 – Use of abandoned right of way as a non-motorized transportation facility.

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

Support:

01 ~~The introduction to this Manual~~ Paragraph 1 of Section 1A.13 and Section 1A.13 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:

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

Section 9A.101(CA) Traffic Controls for Bicycle Facilities at Rail Crossings

Standard:

01 **Any bicycle facility traversing an at-grade railroad crossing shall conform to Part 8.**

CHAPTER 9B. SIGNS

Section 9B.01 Application and Placement of Signs

Standard:

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

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

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

04 **Where used on a shared-use path or separated bikeway, no portion of a sign or its support shall be placed less than 2 feet laterally from the near edge of the path, or less than 8 feet vertically over the entire width of the shared-use path (see Figure 9B-1).**

05 **Mounting height for post-mounted signs on shared-use paths or separated bikeways shall be a minimum of 4 feet, measured vertically from the bottom of the sign to the elevation of the near edge of the path surface (see Figure 9B-1).**

Guidance:

06 *Signs for the exclusive use of bicyclists should be located so that other road users are not confused by them.*

07 *The clearance for overhead signs on shared-use paths or separated bikeways should be adjusted when appropriate to accommodate path users requiring more clearance, such as equestrians, or typical maintenance or emergency vehicles.*

Support:

08 California signs for bicycle facilities are shown in Figures 9B-2(CA) and 9B-4(CA).

Section 9B.02 Design of Bicycle Signs

Standard:

01 **If the sign or plaque applies to motorists and bicyclists, then the size shall be as shown for conventional roads in Tables 2B-1, 2C-2, or 2D-1.**

02 **The minimum sign and plaque sizes for shared-use paths or separated bikeways shall be those shown in Table 9B-1, and shall be used only for signs and plaques installed specifically for bicycle traffic applications. The minimum sign and plaque sizes for bicycle facilities shall not be used for signs or plaques that are placed in a location that would have any application to other vehicles.**

Option:

03 Larger size signs and plaques may be used on bicycle facilities when appropriate (see Section 2A.11).

Guidance:

04 *Except for size, the design of signs and plaques for bicycle facilities should be identical to that provided in this Manual for signs and plaques for streets and highways.*

Support:

05 Uniformity in design of bicycle signs and plaques includes shape, color, symbols, arrows, wording, lettering, and illumination or retroreflectorization.

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

Standard:

01 **STOP (R1-1) signs (see Figure 9B-2) shall be installed on shared-use paths or separated bikeways at points where bicyclists are required to stop.**

02 **YIELD (R1-2) signs (see Figure 9B-2) shall be installed on shared-use paths or separated bikeways 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:

03 A 30 x 30-inch STOP sign or a 36 x 36 x 36-inch YIELD sign may be used on shared-use paths or separated bikeways for added emphasis.

Guidance:

04 *Where conditions require path users or bikeway users, but not roadway users, to stop or yield, the STOP or YIELD sign should be placed or shielded so that it is not readily visible to road users.*

05 *When placement of STOP or YIELD signs is considered, priority at a shared-use path or a bikeway with roadway intersection should be assigned with consideration of the following:*

A. Relative speeds of shared-use path, bikeway, and roadway users,

B. Relative volumes of shared-use path, bikeway, and roadway traffic, and

C. Relative importance of shared-use path, bikeways, and roadway.

06 *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, or where a separated bikeway begins, ends, or it merges with other types of roadway.*

07 *When priority is assigned, 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.*

Section 9B.04 Bike Lane Signs and Plaques (R3-17, R3-17aP, R3-17bP)

~~**Standard:**~~

01 ~~**The Bike Lane (R3-17) sign and the R3-17aP and R3-17bP plaques (see Figure 9B-2) shall be used only in conjunction with marked bicycle lanes as described in Section 9C.04.**~~

~~*Guidance:*~~

02 ~~*If used, Bike Lane signs and plaques should be used in advance of the upstream end of the bicycle lane, at the downstream end of the bicycle lane, and at periodic intervals along the bicycle lane as determined by engineering judgment based on prevailing speed of bicycle and other traffic, block length, distances from adjacent intersections, and other considerations.*~~

Standard:

03 **The Bike Lane (R81(CA)) sign shall be placed at the beginning of each designated Bike Lane and along each Bike Lane at all major changes in direction. The R81(CA) sign shall be used to regulate bicycle and motor vehicle traffic, in accordance with CVC Sections 21207, 21207.5, 21208, 21209 and 21717.**

Guidance:

04 *The Bike Lane (R81(CA)) sign should be placed at every arterial street and at 1/2 mile intervals of each designated Bike lane.*

Option:

05 The BEGIN (R81A(CA)) and END (R81B(CA)) signs may be used below the R81(CA) sign to mark the beginning or end of a bike lane.

Support:

06 The R81(CA), R81A(CA) and R81B(CA) signs are shown in Figure 9B-2(CA).

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

Option:

01 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 (see Figure 9B-2) may be used to inform both the motorist and the bicyclist of this weaving maneuver (see Figures 9C-1, 9C-4, and 9C-5).

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 Bicycles May Use Full Lane Sign (R4-11)

Option:

01 The Bicycles May Use Full Lane (R4-11) sign (see Figure 9B-2) may be used on roadways where no bicycle lanes or adjacent shoulders usable by bicyclists are present and where travel lanes are too narrow for bicyclists and motor vehicles to operate side by side.

02 The Bicycles May Use Full Lane sign may be used in locations where it is important to inform road users that bicyclists might occupy the travel lane.

03 Section 9C.07 describes a Shared Lane Marking that may be used in addition to or instead of the Bicycles May Use Full Lane sign to inform road users that bicyclists might occupy the travel lane.

Support:

04 The Uniform Vehicle Code (UVC) (Also refer to CVC 21202(a)(3)) defines a "substandard width lane" as a "lane that is too narrow for a bicycle and a vehicle to travel safely side by side within the same lane."

Section 9B.07 Bicycle WRONG WAY Sign and RIDE WITH TRAFFIC Plaque (R5-1b, R9-3c)

Option:

01 The Bicycle WRONG WAY (R5-1b) sign and RIDE WITH TRAFFIC (R9-3cP) plaque (see Figure 9B-2) may be placed facing wrong-way bicycle traffic, such as on the left 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.08 NO MOTOR VEHICLES Sign (R5-3)

Option:

01 The NO MOTOR VEHICLES (R5-3) sign (see Figure 9B-2) may be installed at the entrance to a shared-use path or separated bikeway.

02 The Bike Path Exclusion (R44A(CA)) sign may be used to identify a bike path or separated bikeway and prohibit motor vehicles and motorized bicycles from entering the bike path. If motorized bicycles are permitted, the "Motorized Bicycles" portion may be replaced with "Motorized Bicycles Permitted".

Support:

03 The R44A(CA) sign is shown in Figure 9B-2(CA).

Section 9B.09 Selective Exclusion Signs

Option:

01 Selective Exclusion signs (see Figure 9B-2) 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.

Standard:

02 **If used, Selective Exclusion signs shall clearly indicate the type of traffic that is excluded.**

Support:

03 Typical exclusion messages include:

A. No Bicycles (R5-6),
B. No Pedestrians (R9-3),
C. No Skaters (R9-13), and
D. No Equestrians (R9-14).

Option:

04 Where bicyclists, pedestrians, and motor-driven cycles are all prohibited, it may be more desirable to use the R5-10a word message sign that is described in Section 2B.39.

Section 9B.10 No Parking Bike Lane Signs (R7-9, R7-9a)

Standard:

01 **If the installation of signs is necessary to restrict parking, standing, or stopping in a bicycle lane, appropriate signs as described in Sections 2B.46 through 2B.48, or the No Parking Bike Lane (R7-9 or R7-9a) signs (see Figure 9B-2) shall be installed.**

Section 9B.11 Bicycle Regulatory Signs (R9-5, R9-6, R10-4, R10-24, R10-25, and R10-26)

Option:

01 The R9-5 sign (see Figure 9B-2) may be used where the crossing of a street by bicyclists is controlled by pedestrian signal indications.

02 Where it is not intended for bicyclists to be controlled by pedestrian signal indications, the R10-4, R10-24, or R10-26 sign (see Figure 9B-2 and Section 2B.52) may be used.

Guidance:

03 *If used, the R9-5, R10-4, R10-24, or R10-26 signs should be installed near the edge of the sidewalk in the vicinity of where bicyclists will be crossing the street.*

Option:

04 If bicyclists are crossing a roadway where In-Roadway Warning Lights (see Section 4N.02) or other warning lights or beacons have been provided, the R10-25 sign (see Figure 9B-2) may be used.

05 The R9-6 sign (see Figure 9B-2) 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.

Section 9B.12 Shared-Use Path Restriction Sign (R9-7)

Option:

01 The Shared-Use Path Restriction (R9-7) sign (see Figure 9B-2) may be installed to supplement a solid white pavement marking line (see Section 9C.03) on facilities that are to be shared by pedestrians and bicyclists in order to provide a separate designated pavement area for each mode of travel. The symbols may be switched as appropriate.

01a The Shared-Use Path Restriction (R9-7) sign may be used for locations with sidewalk level separated bikeways to further communicate the appropriate use of each space. The symbols may be switched as appropriate.

Guidance:

02 *If two-way operation is permitted on the facility for pedestrians and/or bicyclists, the designated pavement area that is provided for each two-way mode of travel should be wide enough to accommodate both directions of travel for that mode. The two-way facility should be marked according to Section 9C.03.*

Section 9B.13 Bicycle Signal Actuation Sign (R10-22)

Option:

01 The Bicycle Signal Actuation (R10-22) sign (see Figure 9B-2) may be installed at signalized intersections where markings are used to indicate the location where a bicyclist is to be positioned to actuate the signal (see Section 9C.05).

Guidance:

02 *If the Bicycle Signal Actuation sign is installed, it should be placed at the roadside adjacent to the marking to emphasize the connection between the marking and the sign.*

Section 9B.14 Other Regulatory Signs

Option:

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

Section 9B.15 Turn or Curve Warning Signs (W1 Series)

Guidance:

01 *To warn bicyclists of unexpected changes in shared-use path or separated bikeway direction, appropriate turn or curve (W1-1 through W1-7) signs (see Figure 9B-3) should be used.*

02 *The W1-1 through W1-5 signs should be installed at least 50 feet in advance of the beginning of the change of alignment.*

Section 9B.16 Intersection Warning Signs (W2 Series)

Option:

01 Intersection Warning (W2-1 through W2-5) signs (see Figure 9B-3) may be used on a roadway, street, separated bikeway 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:

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

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

Section 9B.17 Bicycle Surface Condition Warning Sign (W8-10)

Option:

01 The Bicycle Surface Condition Warning (W8-10) sign (see Figure 9B-3) may be installed where roadway, bikeway, or shared-use path conditions could cause a bicyclist to lose control of the bicycle.

02 Signs warning of other conditions that might be of concern to bicyclists, including BUMP (W8-1), DIP (W8-2), PAVEMENT ENDS (W8-3), and any other word message that describes conditions that are of concern to bicyclists, may also be used.

03 A supplemental plaque may be used to clarify the specific type of surface condition.

Section 9B.18 Bicycle Warning and Combined Bicycle/Pedestrian Signs (W11-1 and W11-15)

Support:

01 The Bicycle Warning (W11-1) sign (see Figure 9B-3) 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:

02 The combined Bicycle/Pedestrian (W11-15) sign (see Figure 9B-3) may be used where both bicyclists and pedestrians might be crossing the roadway, such as at an intersection with a shared-use path. A TRAIL X-ING (W11-15P) supplemental plaque (see Figure 9B-3) may be mounted below the W11-15 sign.

03 A supplemental plaque with the legend AHEAD or XX FEET may be used with the Bicycle Warning or combined Bicycle/Pedestrian sign.

Guidance:

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

Standard:

05 **Bicycle Warning and combined Bicycle/Pedestrian signs, when used at the location of the crossing, shall be supplemented with a diagonal downward pointing arrow (W16-7P) plaque (see Figure 9B-3) to show the location of the crossing.**

Option:

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

Guidance:

07 *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.19 Other Bicycle Warning Signs

Option:

01 Other bicycle warning signs (see Figure 9B-3) such as PATH NARROWS (W5-4a) and Hill (W7-5) may be installed on shared-use paths or separated bikeways to warn bicyclists of conditions not readily apparent.

02 In situations where there is a need to warn motorists to watch for bicyclists traveling along the highway, the SHARE THE ROAD (W16-1P) plaque (see Figure 9B-3) may be used in conjunction with the W11-1 sign.

02a In situations where there is a need to warn motorists to watch for bicyclists traveling along the freeway, the NEXT XX MILES (W7-3aP) plaque (see Figures 2C-4) may be used in conjunction with the W11-1 sign.

Guidance:

03 *If used, other advance bicycle warning signs should be installed at least 50 feet in advance of the beginning of the condition.*

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

Option:

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

Support:

06 Refer to Section 8B.25 for Skewed Crossing (W10-12) Sign.

Section 9B.20 Bicycle Guide Signs (D1-1b, D1-1c, D1-2b, D1-2c, D1-3b, D1-3c, D11-1, D11-1c, D3-1, D3-1a and G7-1(CA))

Option:

01 Bike Route Guide (D11-1) signs (see Figure 9B-4) may be provided along designated bicycle routes to inform bicyclists of bicycle route direction changes and to confirm route direction, distance, and destination.

02 If used, Bike Route Guide signs may be repeated at regular intervals so that bicyclists entering from side streets will have an opportunity to know that they are on a bicycle route. Similar guide signing may be used for shared roadways with intermediate signs placed for bicyclist guidance.

03 Alternative Bike Route Guide (D11-1c) signs may be used to provide information on route direction, destination, and/or route name in place of the "BIKE ROUTE" wording on the D11-1 sign (see Figures 9B-4 and 9B-6).

04 Destination (D1-1, D1-1a) signs, ~~Street Name (D3) signs,~~ or Bicycle Destination (D1-1b, D1-1c, D1-2b, D1-2c, D1-3b, D1-3c) signs (see Figure 9B-4) may be installed to provide direction, destination, and distance information as needed for bicycle travel. If several destinations are to be shown at a single location, they may be placed on a single sign with an arrow (and the distance, if desired) for each name. If more than one destination lies in the same direction, a single arrow may be used for the destinations.

Guidance:

04a Street Name (D3-1 or D3-1a or G7-1(CA)) signs should be installed at all street and Class I bikeway intersections and at all Class I bikeway intersections.

05 *Adequate separation should be made between any destination or group of destinations in one direction and those in other directions by suitable design of the arrow, spacing of lines of legend, heavy lines entirely across the sign, or separate signs.*

Option:

05a Street Name (D3-1 or D3-1a or G7-1(CA)) signs may be installed at all street and separated bikeway intersections.

Standard:

06 **An arrow pointing to the right, if used, shall be at the extreme right-hand side of the sign. An arrow pointing left or up, if used, shall be at the extreme left-hand side of the sign. The distance numerals, if used, shall be placed to the right of the destination names.**

07 **On Bicycle Destination signs, a bicycle symbol shall be placed next to each destination or group of destinations. If an arrow is at the extreme left, the bicycle symbol shall be placed to the right of the respective arrow.**

Guidance:

08 *Unless a sloping arrow will convey a clearer indication of the direction to be followed, the directional arrows should be horizontal or vertical.*

09 *The bicycle symbol should be to the left of the destination legend.*

10 *If several individual name signs are assembled into a group, all signs in the assembly should have the same horizontal width.*

11 *Because of their smaller size, Bicycle Destination signs should not be used as a substitute for vehicular destination signs when the message is also intended to be seen by motorists.*

Support:

12 Figure 9B-5 shows an example of the signing for the beginning and end of a designated bicycle route on a shared-use path. Figure 9B-6 shows an example of signing for an on-roadway bicycle route. Figure 9B-7 shows examples of signing and markings for a shared-use path crossing.

Section 9B.21 Bicycle Route Signs (M1-8, M1-8a, M1-9)

Option:

01 To establish a unique identification (route designation) for a State or local bicycle route, the Bicycle Route (M1-8, M1-8a) sign (see Figure 9B-4) may be used.

Standard:

02 **The Bicycle Route (M1-8) sign shall contain a route designation and shall have a green background with a retroreflectorized white legend and border. The Bicycle Route (M1-8a) sign shall contain the same information as the M1-8 sign and in addition shall include a pictograph or words that are associated with the route or with the agency that has jurisdiction over the route.**

Guidance:

03 *Bicycle routes, which might be a combination of various types of bikeways, should establish a continuous routing.*

04 *Where a designated bicycle route extends through two or more States, a coordinated submittal by the affected States for an assignment of a U.S. Bicycle Route number designation should be sent to the American Association of State Highway and Transportation Officials (see Page i for the address).*

Standard:

05 **The U.S. Bicycle Route (M1-9) sign (see Figure 9B-4) shall contain the route designation as assigned by AASHTO and shall have a black legend and border with a retroreflectorized white background.**

Guidance:

06 *If used, the Bicycle Route or U.S. Bicycle Route signs should be placed at intervals frequent enough to keep bicyclists informed of changes in route direction and to remind motorists of the presence of bicyclists.*

Option:

07 Bicycle Route or U.S. Bicycle Route signs may be installed on shared roadways, ~~or on~~ shared-use paths, separated bikeways, or bike lane facilities to provide guidance for bicyclists.

08 The Bicycle Route Guide (D11-1) sign (see Figure 9B-4) may be installed where no unique designation of routes is desired.

Option:

09 The Bicycle Route Number Marker (SG45(CA)) sign may be used on public highways/bikeways where a numerical designation for bike routes is desired. The local agency that requests the SG45(CA) sign on State highways is responsible for furnishing, installing and maintaining the signs.

Guidance:

10 *For numbered bike routes initiated by the State, the Bike Route (D11-1) sign should be used on State highways. The District Traffic Engineer is responsible for approving the use of SG45(CA) signs on State highways.*

Option:

11 The Bicycle Route Name Marker (S17(CA)) sign may be installed above the Bike Route (D11-1) sign for those bicycle routes where a community or the responsible agency has given a designated name to selected routes.

Support:

12 The SG45(CA) and S17(CA) signs are shown in Figure 9B-4(CA).

Section 9B.22 Bicycle Route Sign Auxiliary Plaques

Option:

01 Auxiliary plaques may be used in conjunction with Bike Route Guide signs, Bicycle Route signs, or U.S. Bicycle Route signs as needed.

Guidance:

02 *If used, Junction (M2-1), Cardinal Direction (M3 series), and Alternative Route (M4 series) auxiliary plaques (see Figure 9B-4) should be mounted above the appropriate Bike Route Guide signs, Bicycle Route signs, or U.S. Bicycle Route signs.*

03 *If used, Advance Turn Arrow (M5 series) and Directional Arrow (M6 series) auxiliary plaques (see Figure 9B-4) should be mounted below the appropriate Bike Route Guide sign, Bicycle Route sign, or U.S. Bicycle Route sign.*

04 *Except for the M4-8 plaque, all route sign auxiliary plaques should match the color combination of the route sign that they supplement.*

05 *Route sign auxiliary plaques carrying word legends that are used on bicycle routes should have a minimum size of 12 x 6 inches. Route sign auxiliary plaques carrying arrow symbols that are used on bicycle routes should have a minimum size of 12 x 9 inches.*

Option:

06 With route signs of larger sizes, auxiliary plaques may be suitably enlarged, but not such that they exceed the width of the route sign.

07 A route sign and any auxiliary plaques used with it may be combined on a single sign.

08 Destination (D1-1b and D1-1c) signs (see Figure 9B-4) may be mounted below Bike Route Guide signs, Bicycle Route signs, or U.S. Bicycle Route signs to furnish additional information, such as directional changes in the route, or intermittent distance and destination information.

Section 9B.23 Bicycle Parking Area Sign (D4-3)

Option:

01 The Bicycle Parking Area (D4-3) sign (see Figure 9B-4) or Bicycle Parking (G93C(CA)) sign (see Figure 9B-4(CA)) may be installed where it is desirable to show the direction to a designated bicycle parking area. The arrow may be reversed as appropriate.

01a The Advance Turn Arrow or Directional Arrow auxiliary signs (see Section 2D.26 and 2D.28) may be used in combination with and below the G93C(CA) sign to show direction to a designated bicycle parking area.

Standard:

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

Section 9B.24 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, 2, and 3) signs show an integer distance point along a shared-use path or a separated bikeway; and

B. Intermediate Reference Location (D10-1a, 2a, and 3a) signs also show a decimal between integer distance points along a shared-use path or a separated bikeway.

Option:

02 Reference Location (D10-1 to D10-3) signs (see Figure 9B-4) may be installed along any section of a shared-use path or a separated bikeway 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 (see Figure 9B-4), 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.

Standard:

04 **If Intermediate Reference Location (D10-1a to D10-3a) signs are used to augment the reference location sign system, the reference location sign at the integer mile point shall display a decimal point and a zero numeral.**

05 **If placed on shared-use paths** or a separated bikeways**, reference location signs shall contain 4.5-inch white numerals on a green background that is at least 6 inches wide with a white border. The signs shall contain the word MILE in 2.25-inch white letters.**

06 **Reference location signs shall 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 shall not be governed by the mounting height requirements prescribed in Section 9B.01.**

Option:

07 Reference location signs may be installed on one side of the shared-use path or a separated bikeway only and may be installed back-to-back.

08 If a reference location sign cannot be installed in the correct location, it may be moved in either direction as much as 50 feet.

Guidance:

09 *If a reference location sign cannot be placed within 50 feet of the correct location, it should be omitted.*

10 *Zero distance should begin at the south and west terminus points of shared-use paths or separated bikeways.*

Support:

11 Section 2H.05 contains additional information regarding reference location signs.

Section 9B.25 Mode-Specific Guide Signs for Shared-Use Paths (D11-1a, D11-2, D11-3, D11-4)

Option:

01 Where separate pathways are provided for different types of users, Mode-Specific Guide (D11-1a, D11-2, D11-3, D11-4) signs (see Figure 9B-4) may be used to guide different types of users to the traveled way that is intended for their respective modes.

02 Mode-Specific Guide signs may be installed at the entrance to shared-use paths where the signed mode(s) are permitted or encouraged, and periodically along these facilities as needed.

03 The Bicycles Permitted (D11-1a) sign, when combined with the BIKE ROUTE supplemental plaque (D11-1bP), may be substituted for the D11-1 Bicycle Route Guide sign on paths and shared roadways.

04 When some, but not all, non-motorized user types are encouraged or permitted on a shared-use path, Mode-Specific Guide signs may be placed in combination with each other, and in combination with signs (see Section 9B.09) that prohibit travel by particular modes.

Support:

05 Figure 9B-8 shows an example of signing where separate pathways are provided for different non-motorized user types.

Section 9B.26 Object Markers

Option:

01 Fixed objects adjacent to shared-use paths may be marked with Type 1, Type 2, or Type 3 object markers (see Figure 9B-3) such as those described in Section 2C.63. If the object marker is not intended to also be seen by motorists, a smaller version of the Type 3 object marker may be used (see Table 9B-1).

Standard:

02 **Obstructions in the traveled way of a shared-use path shall be marked with retroreflectorized material or appropriate object markers.**

03 **All object markers shall be retroreflective.**

04 **On Type 3 object 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.**

Section 9B.101(CA) Freeway Bicycle Signs

Support:

01 Refer Section 2B.39 and CVC 21960 for restrictions on use of freeways.
02 Refer Section 2B.39 for NO PEDESTRIANS BICYCLES MOTOR-DRIVEN CYCLES (R5-10a), NO PEDESTRIANS OR BICYCLES (R5-10b) and NO PEDESTRIANS (R5-10c) signs.

Standard:

03 **The BICYCLES MOTOR-DRIVEN CYCLES MUST EXIT (R44B(CA)) sign shall be used on freeways in advance of an exit ramp where bicycles and motor-driven cycles must exit.**

Guidance:

04 *The R5-10a, R5-10b or R5-10c sign, as appropriate, should be placed beyond the exit ramp gore as a follow-up message to the R44B(CA) sign.*

Standard:

05 **The BICYCLES MUST EXIT (R44C(CA)) sign shall be used on freeways where bicycles are required to exit.**

Support:

06 The R44B(CA) and R44C(CA) signs are shown in Figure 9B-2(CA).

Section 9B.102(CA) PASS Bicycle 3 FT MIN Sign (R117(CA))

Option:

01 In situations where there is a need to remind motorists to pass bicyclists with sufficient lateral clearance in compliance with CVC 21760 (Three Feet for Safety Act) the PASS Bicycle 3 FT MIN ~~sign~~ (R117(CA)) sign (see Figure 9B-2(CA)) may be used.

Support:

02 CVC 21202(a)(3) defines a "substandard width lane" as a lane that is too narrow for a bicycle and vehicle to travel safely side by side within the same lane.
03 Refer to Section 9B.06 for Bicycles May Use Full Lane (R4-11) sign

Section 9B.103(CA) EXCEPT Bicycle Plaque (R118(CA))

Guidance:

01 *Where signs are provided to prohibit or regulate turns from streets or driveways that intersect with a roadway and those signs are not intended for bicycle traffic, the supplemental EXCEPT Bicycle ~~plaque~~ (R118(CA)) plaque (See Figure 9B-2(CA)) should be used.*

Section 9B.104 (CA) Signs on Overcrossing Structures

Support:

01 Signage identifying overcrossing structures over a Class I or IV bikeway can be useful in orienting bikeway users.
02 Consider the skew of the structure (greater than 45 degrees), height of the overcrossing structure, and other pertinent factors while determining the feasibility of installing the sign.

Option:

03 Street Name (D3-1 or D3-1a or G7-1(CA)) signs identifying the overcrossing structure over a Class I or IV bikeway may be installed on the overcrossing structure. If sign installation on the overcrossing is not practical, roadside sign installation may be considered.

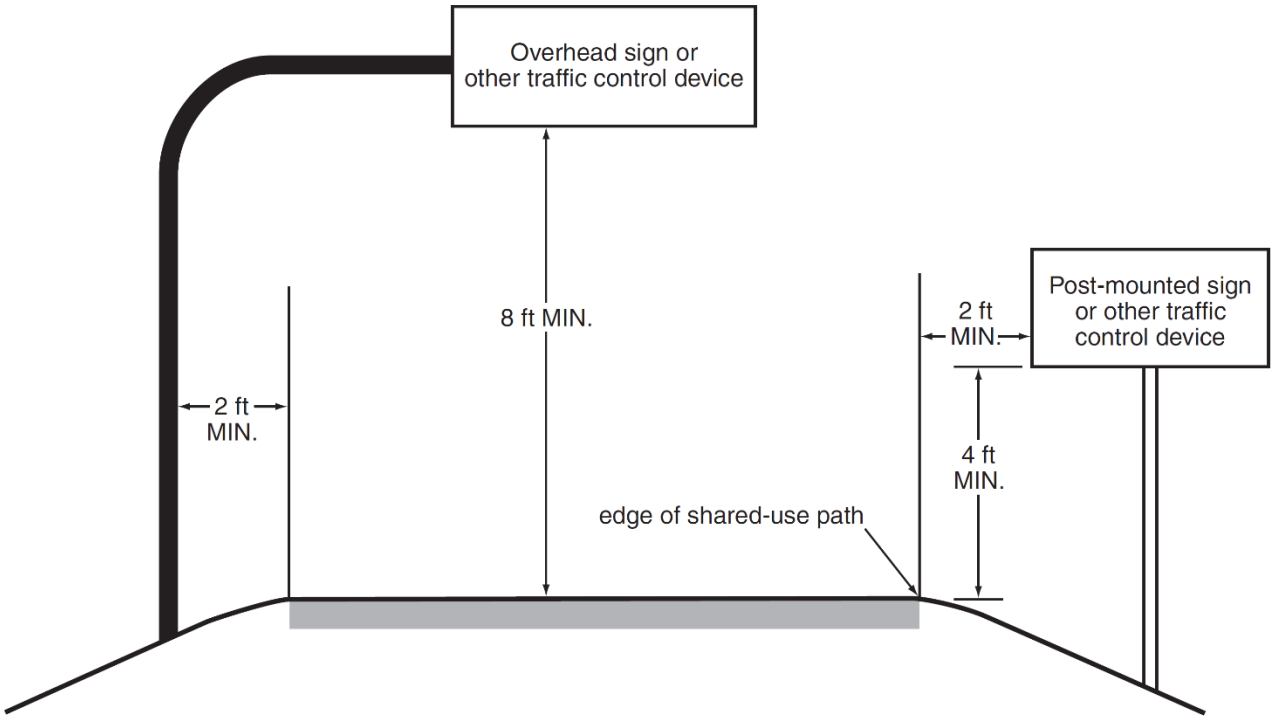
Guidance:

04 *Structural analysis should be considered prior to installation of signs on the overcrossing structure.*

Standard:

05 **Encroachment permits shall be required for a local agency to install signs on overcrossing structures within State right-of-way.**

Figure 9B-1. Sign Placement on Shared-Use Paths



Revised March 29, 2019

Figure 9B-2. Regulatory Signs and Plaques for Bicycle Facilities

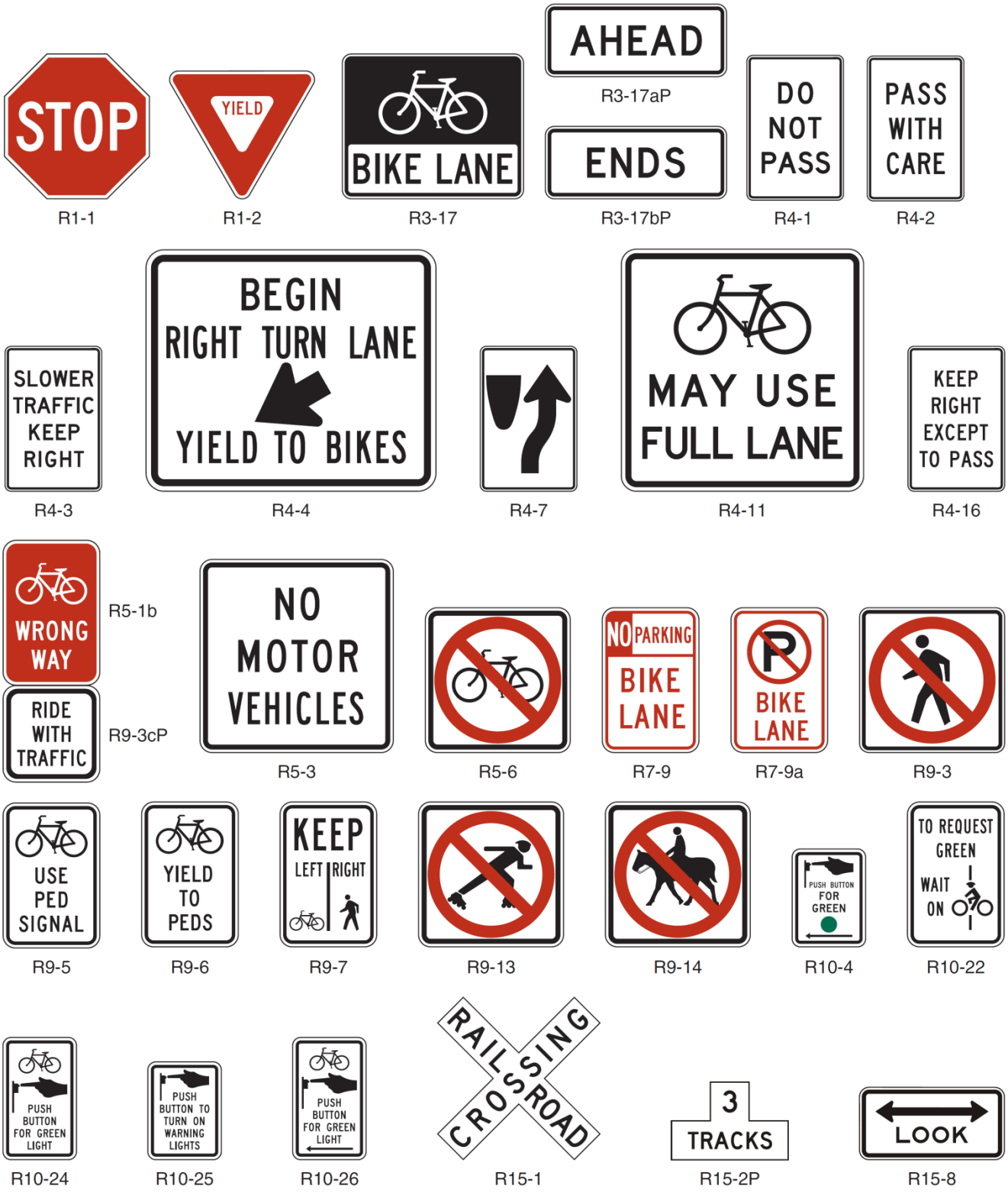


Figure 9B-2 (CA). California Regulatory Signs for Bicycle Facilities

R44A (CA)

R44B (CA)

R44C (CA)

R81 (CA)

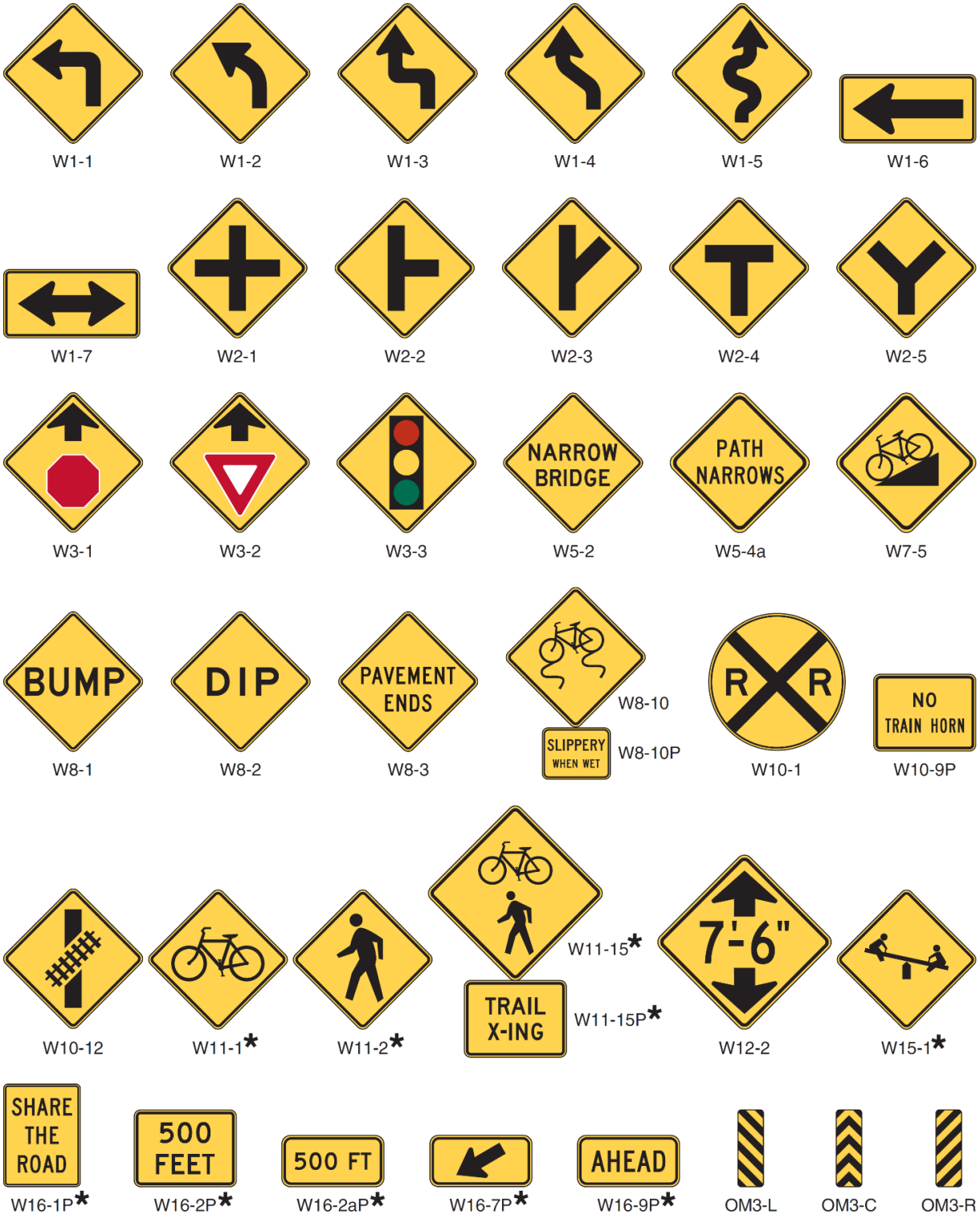
R81A (CA)

R81B (CA)

R117 (CA)

R118 (CA)

Figure 9B-3. Warning Signs and Plaques and Object Markers for Bicycle Facilities



* A fluorescent yellow-green background color may be used for this sign or plaque. The background color of the plaque should match the color of the warning sign that it supplements.

Figure 9B-4. Guide Signs and Plaques for Bicycle Facilities (Sheet 1 of 2)

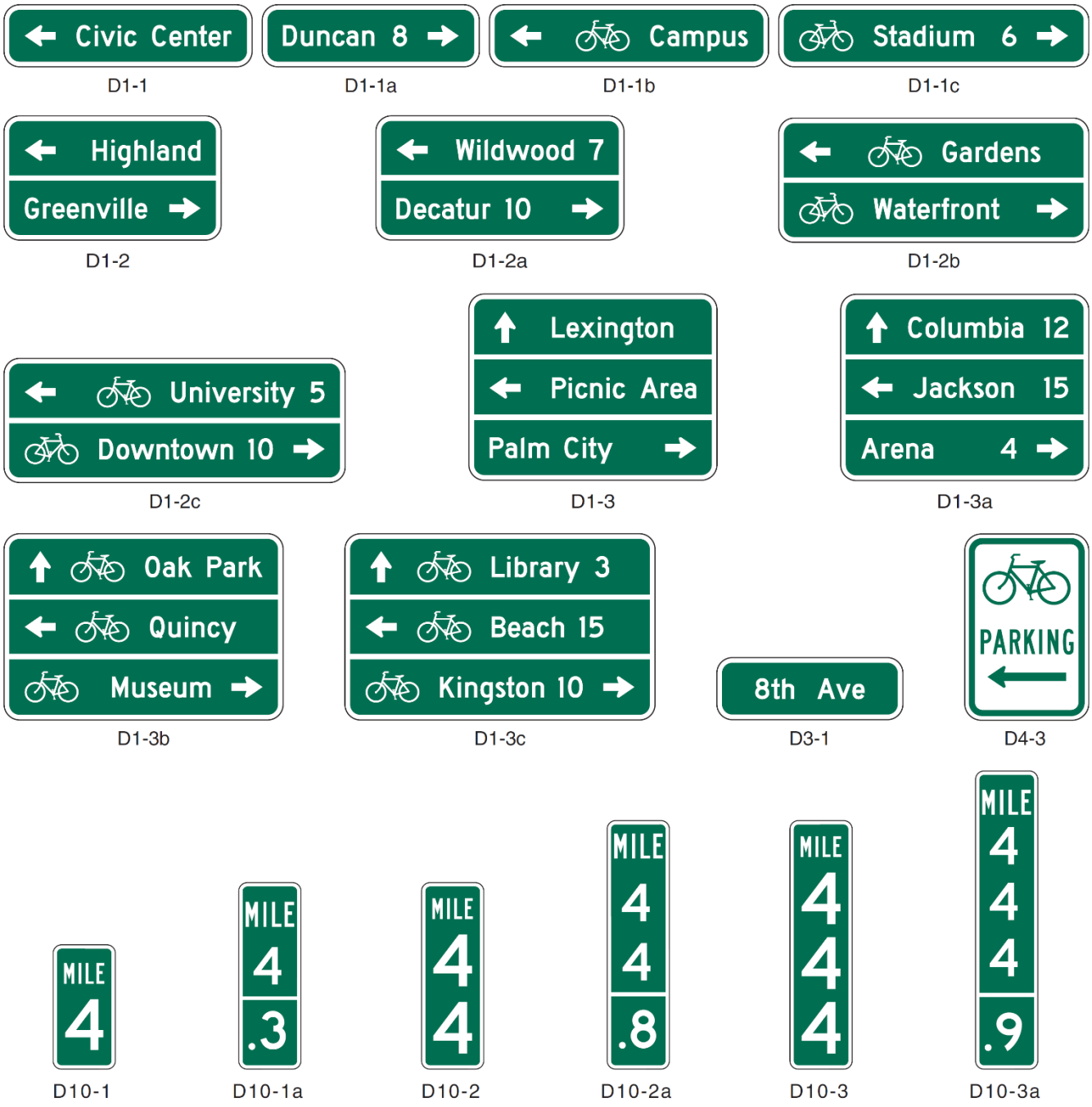


Figure 9B-4. Guide Signs and Plaques for Bicycle Facilities (Sheet 2 of 2)

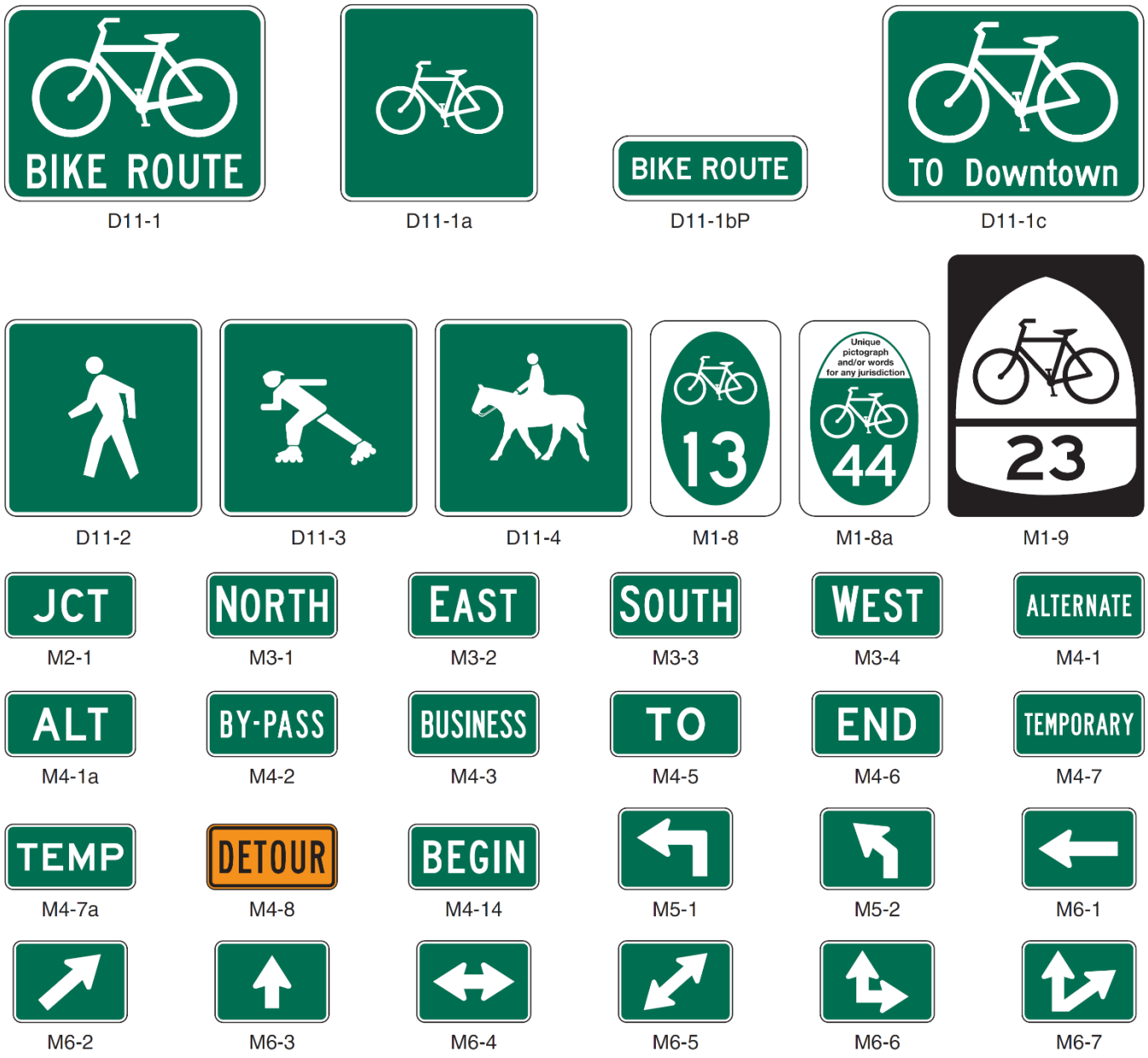


Figure 9B-4 (CA). California Guide Signs for Bicycle Facilities

G93C (CA)

SG45 (CA)

S17 (CA)

Figure 9B-5. Example of Signing for the Beginning and End of a Designated Bicycle Route on a Shared-Use Path

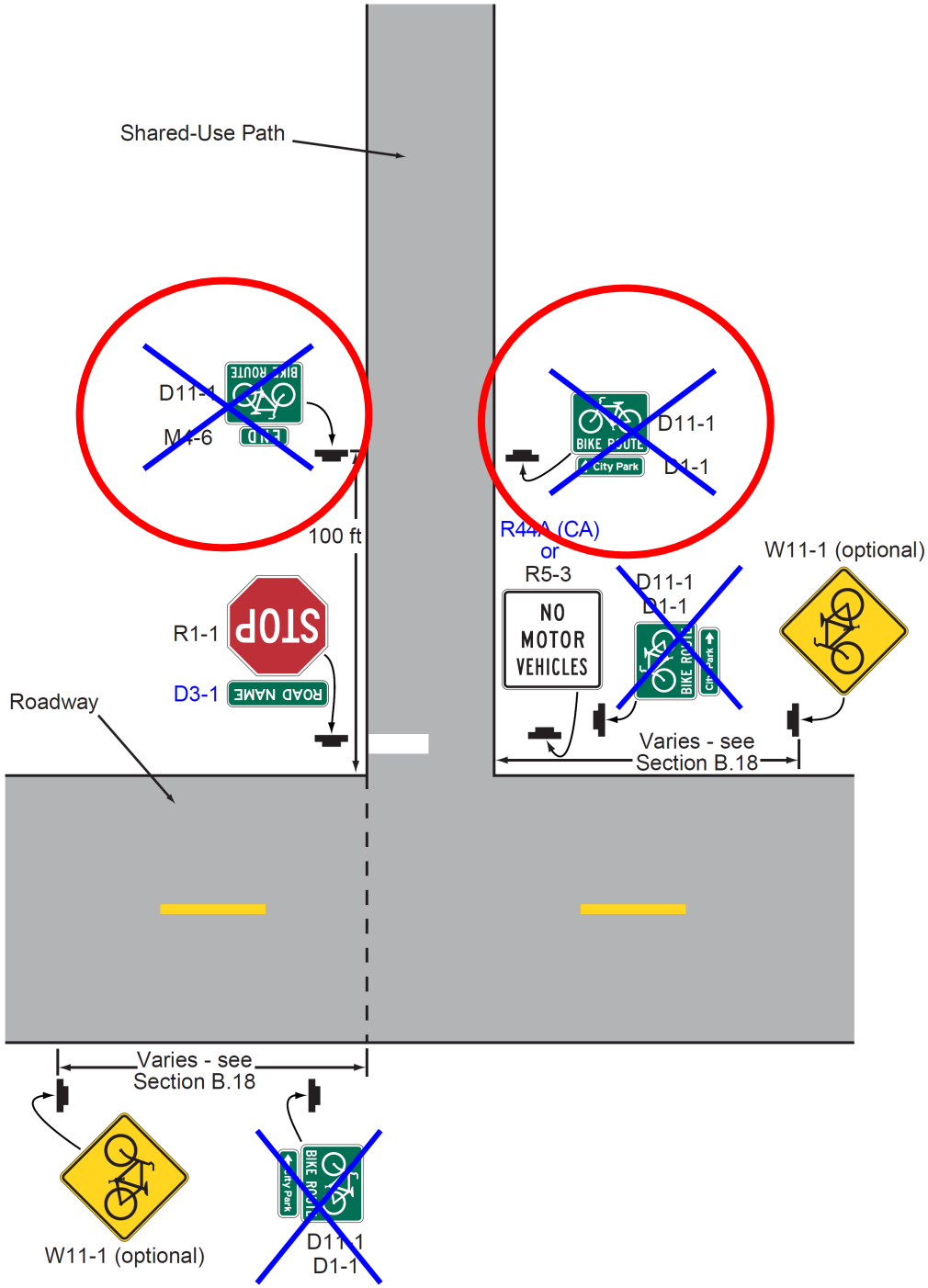


Figure 9B-6. Example of Bicycle Guide Signing

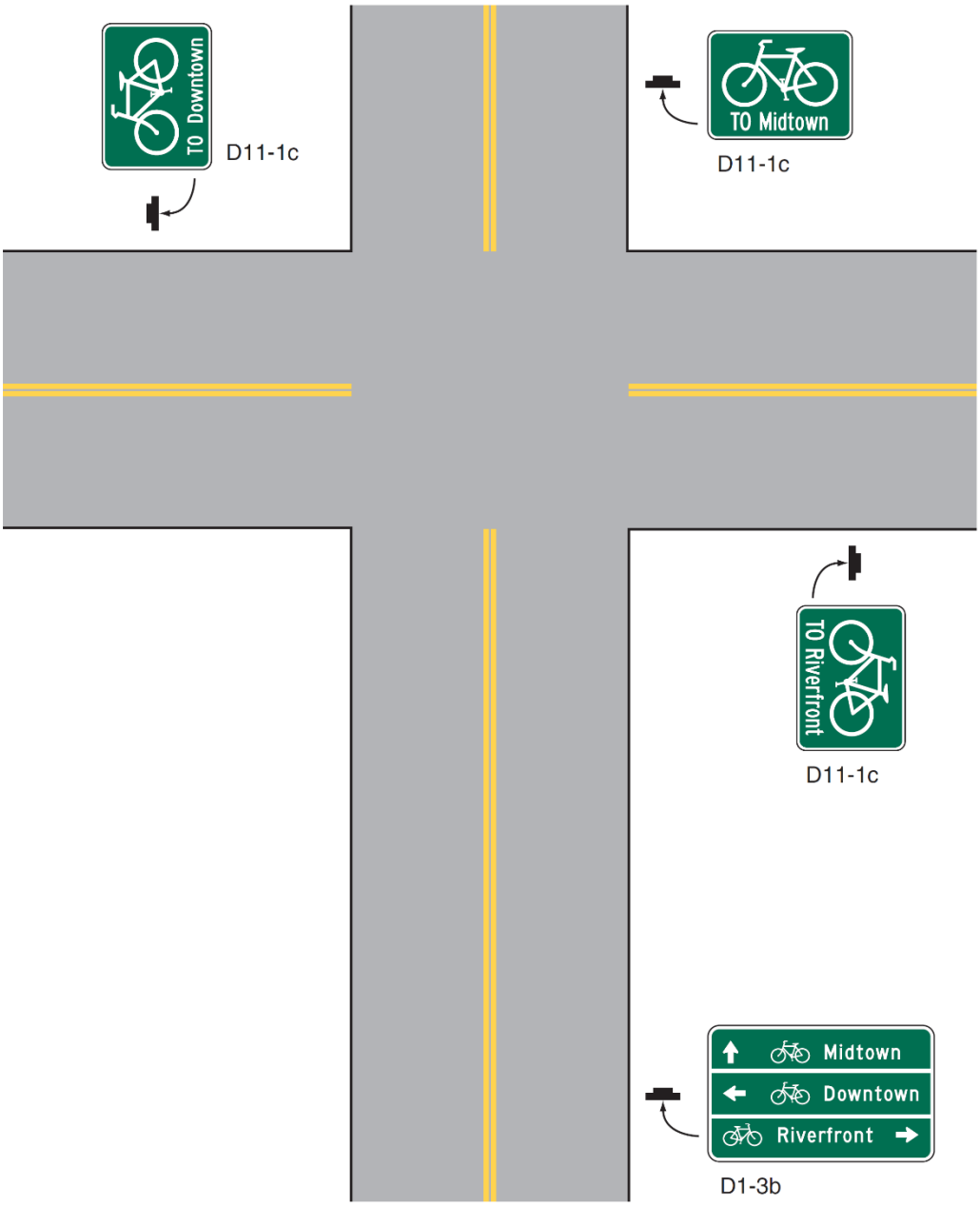


Figure 9B-7. Examples of Signing and Markings for a Shared-Use Path Crossing

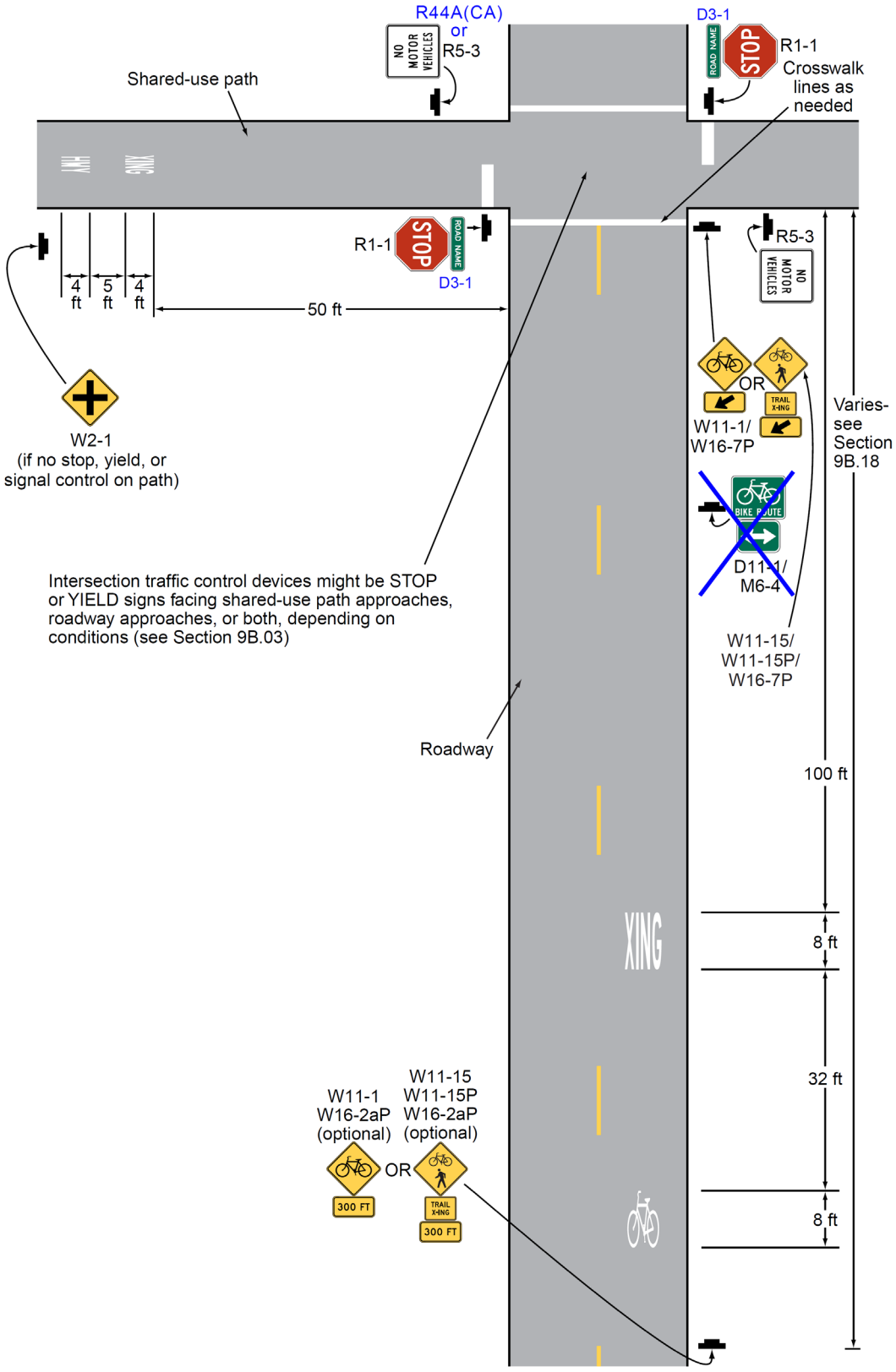


Figure 9B-8. Example of Mode-Specific Guide Signing on a Shared-Use Path

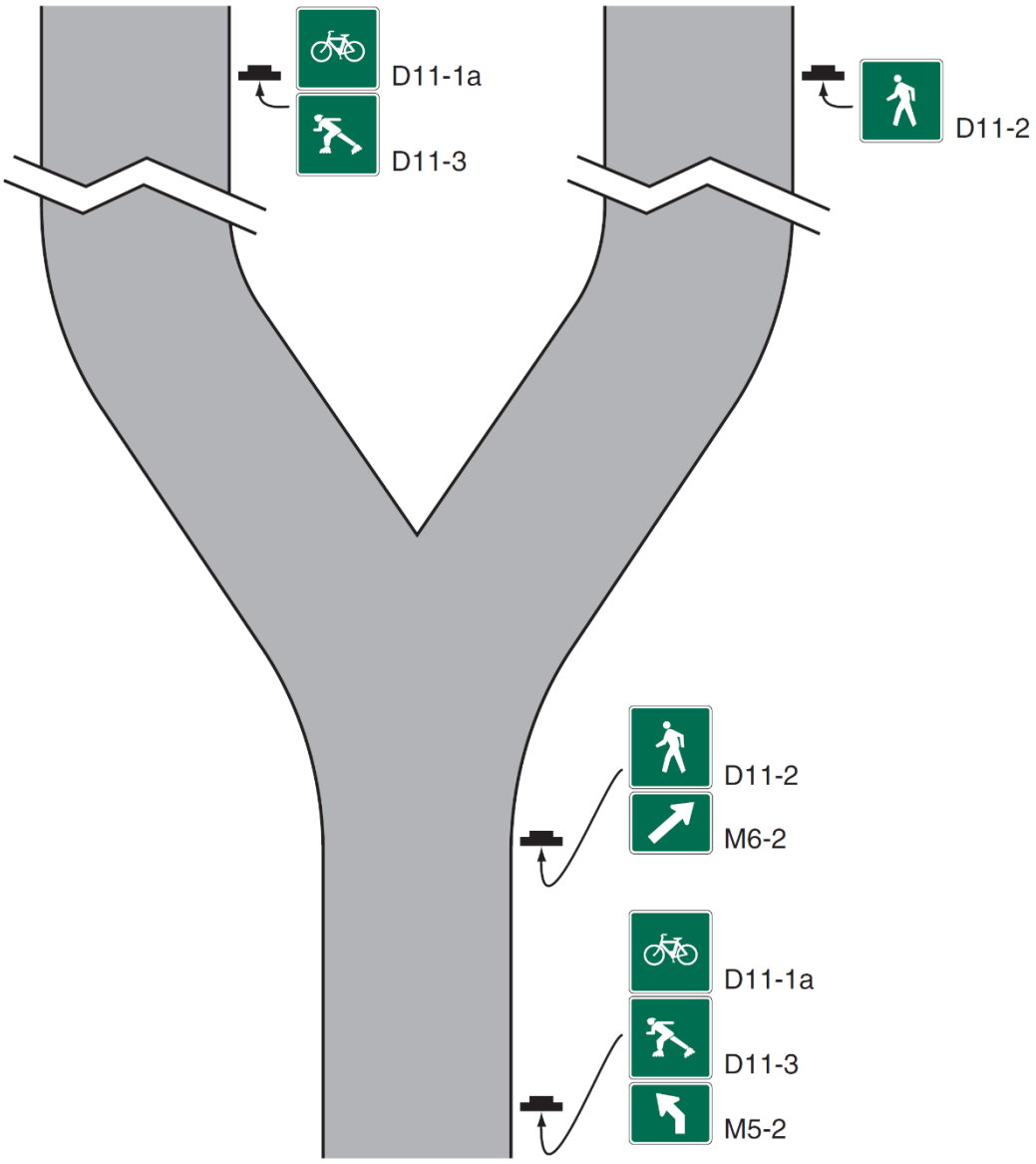


Table 9B-1. Bicycle Facility Sign and Plaque Minimum Sizes (Sheet 1 of 2)

Sign or Plaque	Sign Designation	Section	Shared-Use Path	Roadway
Stop	R1-1	2B.05, 9B.03	18 x 18	30 x 30
Yield	R1-2	2B.08, 9B.03	18 x 18 x 18	30 x 30 x 30
~~Bike Lane~~	~~R3-17~~	~~9B.04~~	~~—~~	~~24 x 18~~
~~Bike Lane (plaques)~~	~~R3-17aP, R3-17bP~~	~~9B.04~~	~~—~~	~~24 x 8~~
Movement Restriction	R4-1,2,3,7,16	2B.28,29,30,32; 9B.14	12 x 18	18 x 24
Begin Right Turn Lane Yield to Bikes	R4-4	9B.05	—	36 x 30
Bicycles May Use Full Lane	R4-11	9B.06	—	30 x 30
Bicycle Wrong Way	R5-1b	9B.07	12 x 18	12 x 18
No Motor Vehicles	R5-3	9B.08	24 x 24	24 x 24
No Bicycles	R5-6	9B.09	18 x 18	24 x 24
No Parking Bike Lane	R7-9,9a	9B.10	—	12 x 18
No Pedestrians	R9-3	9B.09	18 x 18	18 x 18
Ride With Traffic (plaque)	R9-3cP	9B.07	12 x 12	12 x 12
Bicycle Regulatory	R9-5,6	9B.11	12 x 18	12 x 18
Shared-Use Path Restriction	R9-7	9B.12	12 x 18	—
No Skaters	R9-13	9B.09	18 x 18	18 x 18
No Equestrians	R9-14	9B.09	18 x 18	18 x 18
Push Button for Green Light	R10-4	9B.11	9 x 12	9 x 12
To Request Green Wait on Symbol	R10-22	9B.13	12 x 18	12 x 18
Bike Push Button for Green Light	R10-24	9B.11	9 x 15	9 x 15
Push Button to Turn On Warning Lights	R10-25	9B.11	9 x 12	9 x 12
Bike Push Button for Green Light (arrow)	R10-26	9B.11	9 x 15	9 x 15
Grade Crossing (Crossbuck)	R15-1	8B.03, 9B.14	24 x 4.5	48 x 9
Number of Tracks (plaque)	R15-2P	8B.03, 9B.14	13.5 x 9	27 x 18
Look	R15-8	8B.17, 9B.14	18 x 9	36 x 18
Turn and Curve Warning	W1-1,2,3,4,5	2C.04, 9B.15	18 x 18	24 x 24
Arrow Warning	W1-6,7	2C.12, 2C.47, 9B.15	24 x 12	36 x 18
Intersection Warning	W2-1,2,3,4,5	2C.46, 9B.16	18 x 18	24 x 24
Stop,Yield, Signal Ahead	W3-1,2,3	2C.36, 9B.19	18 x 18	30 x 30
Narrow Bridge	W5-2	2C.20, 9B.19	18 x 18	30 x 30
Path Narrows	W5-4a	9B.19	18 x 18	—
Next XX Miles (plaque)	W7-3aP	2C.55, 9B.19	18 x 12	24 x 18
Hill	W7-5	9B.19	18 x 18	30 x 30
Bump or Dip	W8-1,2	2C.28, 9B.17	18 x 18	24 x 24
Pavement Ends	W8-3	2C.30, 9B.17	18 x 18	30 x 30
Bicycle Surface Condition	W8-10	9B.17	18 x 18	30 x 30
Slippery When Wet (plaque)	W8-10P	9B.17	12 x 9	12 x 9
Grade Crossing Advance Warning	W10-1	8B.06, 9B.19	24 Dia.	36 Dia.
No Train Horn (plaque)	W10-9P	8B.21, 9B.19	18 x 12	30 x 24
Skewed Crossing	W10-12	8B.25, 9B.19	18 x 18	36 x 36
Bicycle Warning	W11-1	9B.18	18 x 18	24 x 24
Pedestrian Crossing	W11-2	2C.50, 9B.19	18 x 18	24 x 24
Combination Bike and Ped Crossing	W11-15	9B.18	18 x 18	30 x 30
Trail Crossing (plaque)	W11-15P	9B.18	18 x 12	24 x 18
Low Clearance	W12-2	2C.27, 9B.19	18 x 18	30 x 30
Playground	W15-1	2C.51, 9B.19	18 x 18	24 x 24
Share the Road (plaque)	W16-1P	2C.60, 9B.19	—	18 x 24

Table 9B-1. Bicycle Facility Sign and Plaque Minimum Sizes (Sheet 2 of 2)

Sign or Plaque	Sign Designation	Section	Shared-Use Path	Roadway
XX Feet (plaque)	W16-2P	2C.55, 9B.18	18 x 12	24 x 18
XX Ft (plaque)	W16-2aP	2C.55, 9B.18	18 x 9	24 x 12
Diagonal Arrow (plaque)	W16-7P	9B.18	—	24 x 12
Ahead (plaque)	W16-9P	9B.18	—	24 x 12
Destination (1 line)	D1-1, D1-1a	2D.37, 9B.20	varies x 6	varies x 18
Bicycle Destination (1 line)	D1-1b, D1-1c	9B.20	varies x 6	varies x 6
Destination (2 lines)	D1-2, D1-2a	2D.37, 9B.20	varies x 12	varies x 30
Bicycle Destination (2 lines)	D1-2b, D1-2c	9B.20	varies x 12	varies x 12
Destination (3 lines)	D1-3, D1-3a	2D.37, 9B.20	varies x 18	varies x 42
Bicycle Destination (3 lines)	D1-3b, D1-3c	9B.20	varies x 18	varies x 18
Street Name	D3-1	2D.43, 9B.20	varies x 6	varies x 8
Bicycle Parking Area	D4-3	9B.23	12 x 18	12 x 18
Reference Location (1-digit)	D10-1	2H.02, 9B.24	6 x 12	10 x 18
Intermediate Reference Location (1-digit)	D10-1a	2H.02, 9B.24	6 x 18	10 x 27
Reference Location (2-digit)	D10-2	2H.02, 9B.24	6 x 18	10 x 27
Intermediate Reference Location (2-digit)	D10-2a	2H.02, 9B.24	6 x 24	10 x 36
Reference Location (3-digit)	D10-3	2H.02, 9B.24	6 x 24	10 x 36
Intermediate Reference Location (3-digit)	D10-3a	2H.02, 9B.24	6 x 30	10 x 48
Bike Route	D11-1, D11-1c	9B.20	24 x 18	24 x 18
Bicycles Permitted	D11-1a	9B.25	18 x 18	—
Bike Route (plaque)	D11-1bP	9B.25	18 x 6	—
Pedestrians Permitted	D11-2	9B.25	18 x 18	—
Skaters Permitted	D11-3	9B.25	18 x 18	—
Equestrians Permitted	D11-4	9B.25	18 x 18	—
Bicycle Route	M1-8, M1-8a	9B.21	12 x 18	18 x 24
U.S. Bicycle Route	M1-9	9B.21	12 x 18	18 x 24
Bicycle Route Auxiliary Signs	M2-1; M3-1,2,3,4; M4-1,1a,2,3,5,6,7,7a,8,14	9B.22	12 x 6	12 x 6
Bicycle Route Arrow Signs	M5-1,2; M6-1,2,3,4,5,6,7	9B.22	12 x 9	12 x 9
Type 3 Object Markers	OM3-L,C,R	2C.63, 9B.26	6 x 18	12 x 36

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

Table 9B-1(CA). California Bicycle Facility Sign and Plaque Minimum Sizes

Sign or Plaque	Sign Designation	Section	Shared-Use Path	Roadway
Bicycle Parking	G93C(CA)	9B.23	24 x 18	24 x 18
Bike Path Exclusion	R44A(CA)	9B.08	12 x 24	---
BICYCLES MOTOR-DRIVEN CYCLES MUST EXIT	R44B(CA)	9B.101(CA)	---	30 x 36
BICYCLES MUST EXIT	R44C(CA)	9B.101(CA)	---	30 x 30
Bike Lane	R81(CA)	9B.04	---	12 x 8
BEGIN	R81A(CA)	9B.04	---	12 x 5
END	R81B(CA)	9B.04	---	8 x 5
PASS Bicycle 3 FT MIN	R117(CA)	9B.102(CA)	---	30 x 30 *
EXCEPT Bicycle	R118(CA)	9C.04	---	18 x 15 *
Bicycle Route Number Marker	SG45(CA)	9B.21	12 x 18	12 x 18
Bicycle Route Name Marker	S17(CA)	9B.21	24 x 6	24 x 6

* Other sign sizes are available, see specific California Sign Specification

CHAPTER 9C. MARKINGS

Section 9C.01 Functions of Markings

Support:

01 Markings indicate the separation of the lanes for road users, assist the bicyclist by indicating assigned travel paths, indicate correct position for traffic control signal actuation, and provide advance information for turning and crossing maneuvers.

Section 9C.02 General Principles

Guidance:

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

Standard:

02 **Markings used on bikeways shall be retroreflectorized.**

02a **On State highways, markings material shall conform to Sections 84-2.02 and 84-3.02 of the Standard Specifications published by Caltrans.**

Guidance:

03 *Pavement marking word messages, symbols, and/or arrows, and/or colored pavement should be used in bikeways where appropriate. Consideration should be given to selecting pavement marking materials that will minimize loss of traction for bicycles under wet conditions.*

Standard:

04 **The colors, width of lines, patterns of lines, symbols, and arrows used for marking bicycle facilities shall be as defined in Sections 3A.05, 3A.06, and 3B.20. The green-colored pavement used for marking bicycle facilities shall be as defined in Sections 3G-101(CA).**

Support:

05 Figures 9B-7 and 9C-1 through 9C-9 show examples of the application of lines, word messages, symbols, and arrows on designated bikeways.

Option:

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

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

Option:

01 Where shared-use paths and separated bikeways 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).

Guidance:

02 *Broken lines used on shared-use paths should have the usual 1-to-3 segment-to-gap ratio. A nominal 3-foot segment with a 9-foot gap should be used.*

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

04 *Markings as shown in Figure ~~9C-2~~ 9C-8 should be used at the location of obstructions in the center of the path, including vertical elements intended to physically prevent unauthorized motor vehicles from entering the path.*

Support:

05 A centerline marking is particularly beneficial in the following circumstances:

A. Where there is heavy use;
B. On curves with restricted sight distance; and,
C. Where the path is unlighted and nighttime riding is expected.

Option:

05 A solid white line may be used on shared-use paths to separate different types of users. The R9-7 sign (see Section 9B.12) may be used to supplement the solid white line.

05a A solid white line may be used to delineate the traveled way of the bike path from the shoulder if the shoulder is paved with the same material as the bike path.

Support:

05b Refer to Caltrans' Highway Design Manual Index 1003.1.

06 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.20).

Section 9C.04 Markings For Bicycle Lanes

Support:

01 Pavement markings designate that portion of the roadway for preferential use by bicyclists. Markings inform all road users of the restricted nature of the bicycle lane.

Standard:

02 **Longitudinal pavement markings shall be used to define bicycle lanes.**

Guidance:

03 *If used, bicycle lane word, symbol, ~~and/or~~ arrow markings, and/or green-colored pavement (see Figure 9C-3) should be placed at the beginning of a bicycle lane and at periodic intervals along the bicycle lane based on engineering judgment.*

Standard:

04 **If the bicycle lane symbol marking is used in conjunction with word or arrow messages, it shall precede them.**

Option:

05 If the word, symbol, and/or arrow pavement markings shown in Figure 9C-3 are used, Bike Lane signs (see Section 9B.04) may also be used, but to avoid overuse of the signs not necessarily adjacent to every set of pavement markings.

Bicycle Lane Treatment at Intersections

Option:

05a When a bike lane approaches an intersection with right- or left-turn only lanes, Figures 9C-1, 9C-4, 9C-4(CA) or 9C-5 may be used.

Guidance:

05b *Where through motor vehicle lanes approaching an intersection become mandatory turn lanes adjacent bike lanes should be delineated using Figure 9C-109(CA).*

Standard:

06 **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.**

Support:

07 A bicyclist continuing straight through an intersection from the right of a right-turn lane or from the left of a left-turn lane would be inconsistent with normal traffic behavior and would violate the expectations of right- or left-turning motorists.

Guidance:

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

09 *An optional through-right turn lane next to a right turn only lane should not be used where there is a through bicycle lane. If a capacity analysis indicates the need for an optional through-right turn lane, the bicycle lane should be discontinued at the intersection approach.*

09a *A dashed line across the right-turn-only lane should not be used on extremely long lanes, or where there are double right-turn-only lanes. For these types of intersections, all striping should be dropped to permit judgment by the bicyclists to prevail.*

Option:

09b A Bicycle Crossing (W11-1) sign may be used to warn road users of the potential for bicyclists crossing their path. See Section 9B.18.

09c When a bike lane approaches ramp intersection that intersects the local facility at or close to 90° (typical of a compact or spread diamond configuration), then Figures 9C-4, 9C-4(CA) and 9C-5 may be used.

Guidance:

09d *However, when a bike lane approaches one or more ramp intersections that intersect the local facility at various angles other than 90° (typically high-speed, skewed ramps), Figure 9C-103(CA) should be used.*

Option:

09e At locations with right-turn-only lanes where bicycles are not prohibited but Class II bicycle facilities do not exist on the approach, a minimum 4-foot wide space for bicycle use may be provided between the right-turn and through lane, and where the posted speed is greater than 40 mph the minimum width should be 6 feet.

09f When the width between the right-turn and through lane is greater than 4-feet, a buffer area may be striped adjacent to the 4' minimum width for bicycle travel, regardless of the posted speed.

09g The buffer may be placed on the left or on the right of the 4' space for bicycle travel.

Support:

09h Refer to Caltrans' Highway Design Manual, Index 403.6.

Standard:

09i **If used, the space for bicycle use shall be delineated by Detail 39 on the right of the through lane and Detail 38A on the left of the right-turn-only lane.**

Support:

09j Refer to Figure 9C-4(CA) for details on striping and Figure 9C-104 (CA) for details on buffer area striping.

Guidance:

10 *Posts or raised pavement markers should not be used to separate bicycle lanes from adjacent travel lanes except situations provided in Section 9C.101(CA) and 9C.102(CA).*

Support:

11 Using raised devices creates a collision potential for bicyclists by placing fixed objects immediately adjacent to the travel path of the bicyclist. In addition, raised devices can prevent vehicles turning right from merging with the bicycle lane, which is the preferred method for making the right turn. Raised devices used to define a bicycle lane can also cause problems in cleaning and maintaining the bicycle lane.

Option:

11a A bicycle lane for travel in the same direction as the general purpose lanes may be placed on the left hand side of the general purpose lanes.

Standard:

12 **Bicycle lanes shall not be provided on the circular roadway of a roundabout.**

Guidance:

13 *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.*

Support:

14 Examples of bicycle lane markings at right-turn lanes are shown in Figures 9C-1, 9C-4, 9C-4 (CA), and 9C-5, 9C-109 (CA), and 9C-111 (CA). Examples of pavement markings for bicycle lanes on a two-way street are shown in Figure 9C-4 (CA), 9C-6, 9C-106(CA) and 9C-112 (CA). Pavement word message, symbol, and arrow markings for bicycle lanes are shown in Figure 9C-3.

15 Class III Bikeways (Bike Route) are shared routes and do not require pavement markings. In some instances, a 4 inch white edge stripe separating the traffic lanes from the shoulder can be helpful in providing for safer shared use. This practice is particularly applicable on rural highways and on major arterials in urban areas where there is no vehicle parking.

Option:

16 The Bike Lane Intersection (Detail 39A) line as shown in Figure 9C-101(CA) may be used to extend the bike lane to or through an intersection.

Bicycle Lane Markings on Class II Bikeways (Bike Lane)

Guidance:

17 *Bicycle lane markings on Class II Bikeways (Bike Lane) should be placed a constant distance from the marked lane line or centerline, as appropriate. Bike lanes with parking permitted should not be directed toward the curb at intersections or localized areas where parking is prohibited. Such a practice prevents bicyclists from following a straight course. Where transitions from one type of bike lane to another are necessary, smooth tapers should be provided.*

Support:

18 Class II Bikeways (Bike Lane) require standard signing and pavement markings as shown in Figure 9C-102(CA). This figure also depicts the proper method of striping bike lanes through intersections. Bike lane lines are not typically extended through intersections.

Guidance:

19 *Where right turns are not permitted, the solid bike lane stripe should extend to the edge of the intersection, and begin again on the far side. Where there is no right turn only lane ~~and~~ but right turns are permitted, the solid stripe should terminate 50 feet to 200 feet prior to the intersection.*

Option:

20 A dashed line, as shown in Figure 9C-102(CA), may be carried to, or near, the intersection. Where city blocks are short (less than 400 feet), the length of dashed stripe may be 50 feet.

Guidance:

21 *Where blocks are longer or vehicle speeds are high (greater than 35 mph), the length of dashed stripe should be increased to 200 feet.*

Standard:

22 **Raised barriers (e.g., raised traffic bars and asphalt concrete dikes) or raised pavement markers shall not be used to delineate bike lanes on Class II Bikeways (Bike Lane).**

Support:

23 Raised barriers prevent motorists from merging into bike lanes before making right turns, as required by the CVC, and restrict the movement of bicyclists desiring to enter or exit bike lanes.

24 They also impede routine maintenance. Raised pavement markers increase the difficulty for bicyclists when entering or exiting bike lanes, and discourage motorists from merging into bike lanes before making right turns.

Option:

25 Physical barriers or other vertical elements may be used to convert a Class II Bikeway (Bike Lane) to Class I Bikeway (Bike Path) or Class IV Bikeway (Separated Bikeway).

Bicycle Lane Treatment through Interchanges

Support:

26 Markings for a bike lane through a typical interchange are shown in Figure 9C-103(CA).

Option:

27 Figure 9C-103(CA) may also be used where the preferred designation is a Class III Bikeway (Bike Route), with the Bike Lane (R81(CA)) signs being replaced with Bike Route (D11-1) signs and the bike lane delineation eliminated. A 4 inch stripe may be used to delineate the shoulder throughout the bike route designation.

Standard:

28 **Signing and striping as shown in Figure 9C-103(CA) shall be repeated at additional onramps within the interchange.**

Guidance:

29 *Where the onramps intersect at the local road at or near 90º, the striping should be per Figure 9C-4(CA).*

Standard:

30 **The shoulder width shall not be reduced through the interchange area. The minimum shoulder width shall match the approach roadway shoulder width, but not less than 4 feet, or with not less than 3 feet of pavement if a gutter exists. If the shoulder width is not available, the designated bike lane shall end at the previous local road intersection.**

Bicycle Lane Treatment Where Vehicle Parking is Prohibited/Permitted

Support:

31 Markings for a bike lane where vehicle parking is prohibited or permitted are shown in Figure 9C-102(CA).

Standard:

32 **Where motorist right turns are permitted, the solid bike lane shall either be dropped entirely, or dashed (Refer Bike Lane Intersection Line ~~lane~~, Detail 39A, shown in Figure 9C-101(CA)) beginning at a point between 50 feet and 200 feet in advance of the intersection.**

Option:

33 In areas where parking stalls are not necessary (because parking is light), a 4 inch solid white stripe may be painted to fully delineate the bike lane. This may be advisable where there is concern that motorists may misconstrue the bike lane to be a traffic lane.

BIKE LANE Pavement Markings

Standard:

34 **The BIKE LANE pavement markings shall be placed on the far side of each intersection.**

Option:

35 The BIKE LANE pavement markings may also be placed at other locations as desired.

Support:

36 Examples of BIKE LANE pavement markings are shown in various figures in this chapter.

Option:

37 Optional word, arrow and symbol markings with details as shown in Figure 9C-3 may be used.

Buffered Bicycle Lanes

Support:

38 A buffered bicycle lane is a bicycle lane that is separated from the adjacent general-purpose lane or parking lane by a pattern of standard longitudinal markings. The buffer area might include chevron or diagonal markings. The buffer area width includes the width of the parallel white lines.

39 Markings for buffered bicycle lanes are shown in Figure 9C-104(CA).

40 Pavement markings can designate a buffer area between a bicycle lane and adjacent general purpose lane and/or parking lane. A buffer area provides a greater separation between the bicycle lane and adjacent lanes than is provided by a single normal or wide lane line.

Option:

41 A bicycle lane buffer area may be used to separate a bicycle lane from an adjacent general-purpose lane and/or parking lane.

Standard:

42 If used, a buffer area between a bicycle lane and general-purpose lane or parking lane shall be delineated by normal white longitudinal pavement markings.

Guidance:

43 The use of chevron or diagonal markings should be considered in a bicycle lane buffer area and should be based on Section 3B.24 and engineering judgment.

44 If used, interior chevron or diagonal markings should consist of 4 inch lines angled at 45 degrees and striped at intervals of 10 to 40 feet.

Support:

45 Increased interior chevron or diagonal marking frequency can increase motorist compliance.

Option:

46 The chevron or diagonal markings may be omitted from bicycle lane buffer areas less than 4 feet wide.

Guidance:

47 If used and where there is parking on the right side of the buffered bicycle lane, the rightmost line should be broken. Where vehicles are expected to cross the buffer area at driveways, both lines should be broken. Where neither condition exists, both lines should be solid.

48 ~~End the b~~ Buffer areas should end on the approach to the intersection of side streets or major commercial driveways as shown in Figure 9C-104(CA).

Contraflow Bicycle Lanes

Support:

49 A contraflow bicycle lane is an area of the roadway designated to allow for the lawful use by bicyclists to travel in the opposite direction from traffic on a roadway that allows traffic to travel in only one direction.

50 Markings for contraflow bicycle lanes are shown in Figure 9C-105(CA).

Standard:

51 Where used, a contraflow bicycle lane shall be marked on the left side of travel lanes so that contraflow bicycle travel is on the left of opposing traffic.

52 Where used, a contraflow bicycle lane shall be separated from opposite-direction travel by use of a solid double yellow center line marking, a painted median island, or raised median island.

53 Where intersection traffic controls along the street exist, (e.g., stop signs, flashing light signals, or traffic signals), appropriate devices shall be oriented toward bicyclists in the contraflow lane.

54 A contraflow bicycle lane shall not be installed on a two-way roadway.

Guidance:

55 A buffer area per Section 3B.24 or an island should be used to separate the contraflow lane from adjacent travel lanes at posted speeds of 40 mph and above.

Guidance:

56 Where signs are provided to regulate turns from streets or driveways that intersect with a roadway that has a contraflow bicycle lane, One Way (R6-1 or R6-2) signs should not be used. Turn Prohibition signs (R3-1 or R3-2) with supplemental EXCEPT Bicycle plaques (R118(CA)) should be used. If DO NOT ENTER signs (R5-1) are used, an EXCEPT Bicycle plaque(R118(CA)) should be placed under the DO NOT ENTER sign. See Figure 9C-105(CA).

Support:

57 Contraflow bicycle travel can be unexpected by motorists crossing the contraflow bicycle lane when entering, exiting, or crossing the roadway. Consideration of additional signalization, signing and/or marking treatments is appropriate for intersections, alleys, grade crossings, and driveways.

Option:

58 At locations where a contraflow bicycle lane is provided across an intersection or a driveway entrance, pavement markings that inform intersection or driveway traffic of the presence of the bicycle facility and the direction of permitted bicycle traffic may be placed within the contraflow bicycle lane across the intersection or driveway opening.

Bicycle Lane Line Extensions through Intersections

Support:

59 The extension of bicycle lanes through intersections advises motorists that bicyclists are likely to use the intended path.

Option:

60 Bicycle lane markings may be extended through intersections consistent with the provisions of Section 3B.08.

61 Bicycle lane markings as shown in Figure 9C-106(CA) may be used within the boundaries of bicycle lane extensions.

62 Green-colored pavements may be used in a bicycle lane extension through an intersection or a driveway consistent with Section 3G.101(CA). See Figure 9C-1, 9C-1a (CA), 9C-103(CA), 9C-105(CA), 9C-106(CA), and 9C-110(CA).

Section 9C.05 Bicycle Detector Symbol

Option:

01 A symbol (see Figure 9C-7) may be placed on the pavement indicating the optimum position for a bicyclist to actuate the signal.

02 An R10-22 sign (see Section 9B.13 and Figure 9B-2) may be installed to supplement the pavement marking.

Support:

03 Section 4D.105(CA) and Figure 4D-111(CA) contain information on bicycle detectors and their locations.

Section 9C.06 Pavement Markings for Obstructions

Guidance:

01 *In roadway situations where it is not practical to eliminate a drain grate or other roadway obstruction that is inappropriate for bicycle travel, white markings applied as shown in Figure 9C-8 should be used to guide bicyclists around the condition.*

Section 9C.07 Shared Lane Marking

Option:

01 The Shared Lane Marking shown in Figure 9C-9 may be used to:

A. Assist bicyclists with lateral positioning in a shared lane with on-street parallel parking in order to reduce the chance of a bicyclist's impacting the open door of a parked vehicle,

B. Assist bicyclists with lateral positioning in lanes that are too narrow for a motor vehicle and a bicycle to travel side by side within the same traffic lane,

C. Alert road users of the lateral location bicyclists are likely to occupy within the traveled way,

D. Encourage safe passing of bicyclists by motorists, ~~and~~

E. Reduce the incidence of wrong-way bicycling.

F. Assist bicyclists with lateral positioning within a traffic circle or roundabout (See Figure 9C.107),

G. Supplement a signed bicycle route that is identified as a Class III bicycle facility, ~~and~~

H. Encourage the lateral positioning of bicyclists away from on-street angled parking, and

I. Indicate that a bicycle can travel straight through a right-turn or left-turn only lane.

Guidance:

02 *Except as provided in Paragraph 02a and 02b, t~~T~~he Shared Lane Marking should not be placed on roadways that have a speed limit above 35 mph.*

Option:

02a The Shared Lane Marking may be placed on roadways that have a speed limit above 35 mph, where there is bicycle travel and there is no marked bicycle lane and the right-hand traffic lane is too narrow to allow motor vehicles to safely pass bicyclists.

02b The Shared Lane Marking may be placed in a right-turn or left-turn only lane to indicate that bicycle may travel straight through an intersection.

Support:

02c On roadways that have a speed limit above 35 mph, a Class II bikeway or Class IV bikeway is more appropriate to facilitate bicycle travel.

Standard:

03 **Shared Lane Markings shall not be used on shoulders, separated bikeways or in designated bicycle lanes.**

Lateral Positioning

Support:

03a The effective lane width as used in this section indicates the width of the pavement available after subtracting the width of the parked vehicle and door zone from the distance of the lane line/centerline to the face of the curb/edge of the pavement.

Guidance:

04 *If used in a shared lane with on-street parallel parking, if the effective lane width is 14 feet or greater, Shared Lane Markings should be placed so that the centers of the markings are at least ~~11~~ 13 feet from the face of the curb, or from the edge of the pavement where there is no curb. If the effective lane width is less than 14 feet, the marking should be centered within the effective lane width. See Figure 9C-108(CA).*

05 *If used on a street without on-street parking that has an outside travel lane that is less than 14 feet wide, the centers of the Shared Lane Markings should be centered in the travel lane. If used on a street without on-street parking that has an outside travel lane ~~whose~~ with lane width ~~is~~ equal to 14 feet or greater, the shared lane markings should be centered at least 4 feet from the face of the curb, or from the edge of the pavement where there is no curb.*

05a *If used on a shared right-turn or left-turn only lane that is less than 14 feet wide, to indicate that a bicycle may travel straight through an intersection, the centers of the Shared Lane Markings should be centered in the travel lane. If used on a shared right-turn or left-turn only lane that is 14 feet or greater, the Shared Lane Markings should be centered at least 4 feet from the edge of channelizing line. See Figure 9C-111(CA) and Figure 9C-112(CA).*

Support:

05b If possible, avoid placing Shared Lane Markings on the wheel paths.

05c When a shared lane is sufficiently wide that motor vehicles can pass bicyclists within the lane, the purpose of the Shared Lane Marking is to indicate a bicyclist line of travel that facilitates passing while avoiding fixed obstructions (e.g. drainage inlet, gutter joint). When a shared lane is not wide enough to enable passing with adequate clearance, the purpose of the marking is to indicate a bicyclist line of travel that deters passing within the lane.

Spacing

Guidance:

06 *If used, the Shared Lane Marking should be placed immediately after an intersection and spaced at intervals not greater than 250 feet thereafter.*

Option:

06a Closer spacing between Shared Lane Markings may be considered approaching, traversing, and departing intersections, where there is higher potential for conflicts between motorists and bicyclists. See Figure 9C-109(CA).

06b Closer spacing between Shared Lane Markings may be considered where there are sight distance constraints, for example, approaching the crest of a vertical curve.

06c Closer spacing between Shared Lane Markings may be considered to guide bicyclists when deviating from a straight line of travel (e.g. merging, angled railroad crossing).

~~Option:~~

07 Section 9B.06 describes a Bicycles May Use Full Lane sign that may be used in addition to or instead of the Shared Lane Marking to inform road users that bicyclists might occupy the travel lane.

Section 9C.101(CA) Barrier Posts on Class I Bikeways

Support:

01 Before a decision is made to install barrier posts, consideration needs to be given to the implementation of other remedial measures, such as Bike Path Exclusion (R44A(CA)) signs (see Section 9B.08) and/or redesigning the path entry so that motorists do not confuse it with vehicle access.

02 It could be necessary to install barrier posts at entrances to bike paths to prevent motor vehicles from entering. When locating such installations, care needs to be taken to assure that barriers are well marked and visible to bicyclists, day ~~or~~ and night (i.e., install reflectors or reflectorized tape).

Guidance:

03 *An envelope around the barriers should be striped as shown in Figure 9C-8. If sight distance is limited, special advance warning signs or painted pavement warnings should be provided. Where more than one post is necessary, 5 foot spacing should be used to permit passage of bicycle-towed trailers, adult tricycles, and to assure adequate room for safe bicycle passage without dismounting. Barrier post installations should be designed so they are removable to permit entrance by emergency and service vehicles.*

Support:

04 Generally, barrier configurations that preclude entry by motorcycles present safety and convenience problems for bicyclists.

Guidance:

05 *Such devices should be used only where extreme problems are encountered.*

Section 9C.102 (CA) Class IV Bikeways

Support:

01 Refer to FHWA "Separated Bike Lane Planning and Design Guide" for detailed information on planning and design of separated bike lanes.

Option:

02 Separated bikeways may be delineated for one-way or two-way operation by using traffic control devices.

Standard:

03 **Vertical elements shall be used to define separated bikeways.**

Support:

04 Vertical elements in the buffer area are critical to separated bikeway design. Forms of vertical separation include, but are not limited to, grade separation, flexible delineator posts, bikeway separator posts, inflexible physical barriers, or on-street parking. See Figure 9C.110(CA). See Caltrans' Design Information Bulletin Number 89 Class IV Bikeway Guidance (DIB 89) for more information.

05 Vertical elements are not traffic control devices in themselves; however, when placed in a position identical to a line of channelizing devices and marked and/or equipped with appropriate channelization features to provide guidance and warning both day and night, they serve as traffic control devices.

Standard:

~~05~~06 **Where separated bikeways are designed for two-way travel, a solid yellow line shall be used to separate the two directions of travel where passing is not permitted. A broken yellow line shall be used where passing is permitted (Refer to Figure 9C-110(CA). See Section 9C.03 for marking patterns.**

Option

~~06~~07 A through separated bikeway may be positioned to the right of a right turn only lane or to the left of a left turn only lane, if bicycle signals are used. See Section 4D.104 for optional use of Bicycle Signal Faces.

Standard:

~~07~~08 **The Bike Symbol pavement markings or Helmeted Bicyclist Symbol (Figure 9C-3 Option A or Option B) shall be placed on the far side of each intersection.**

Option:

09 The dashed bike lane marking, with or without green-colored pavement between left and right dash may be placed through an intersection.

~~08~~10 The DO NOT ENTER (R5-1) sign with the supplemental EXCEPT Bicycle plaque (R118 (CA)) may be used on separated bikeways to reduce the likelihood of accidental entrance by motor vehicles.

Buffer

Standard:

~~09~~11 **If used, the buffer area between the separated bikeway and general-purpose lane and parking lane (if present) shall be delineated.**

~~10~~12 **The buffer area shall be delineated by longitudinal pavement markings. See Section 9C.04 for buffer striping details.**

Support:

~~11~~13 The buffer area width includes the width of the parallel lines.

~~12~~14 See DIB 89 for buffer area width requirements.

Unobstructed passage

Standard

~~13~~15 **If accessible parking or loading zones are provided on a roadway alongside a separated bikeway, then unobstructed access by bicycles shall be maintained.**

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

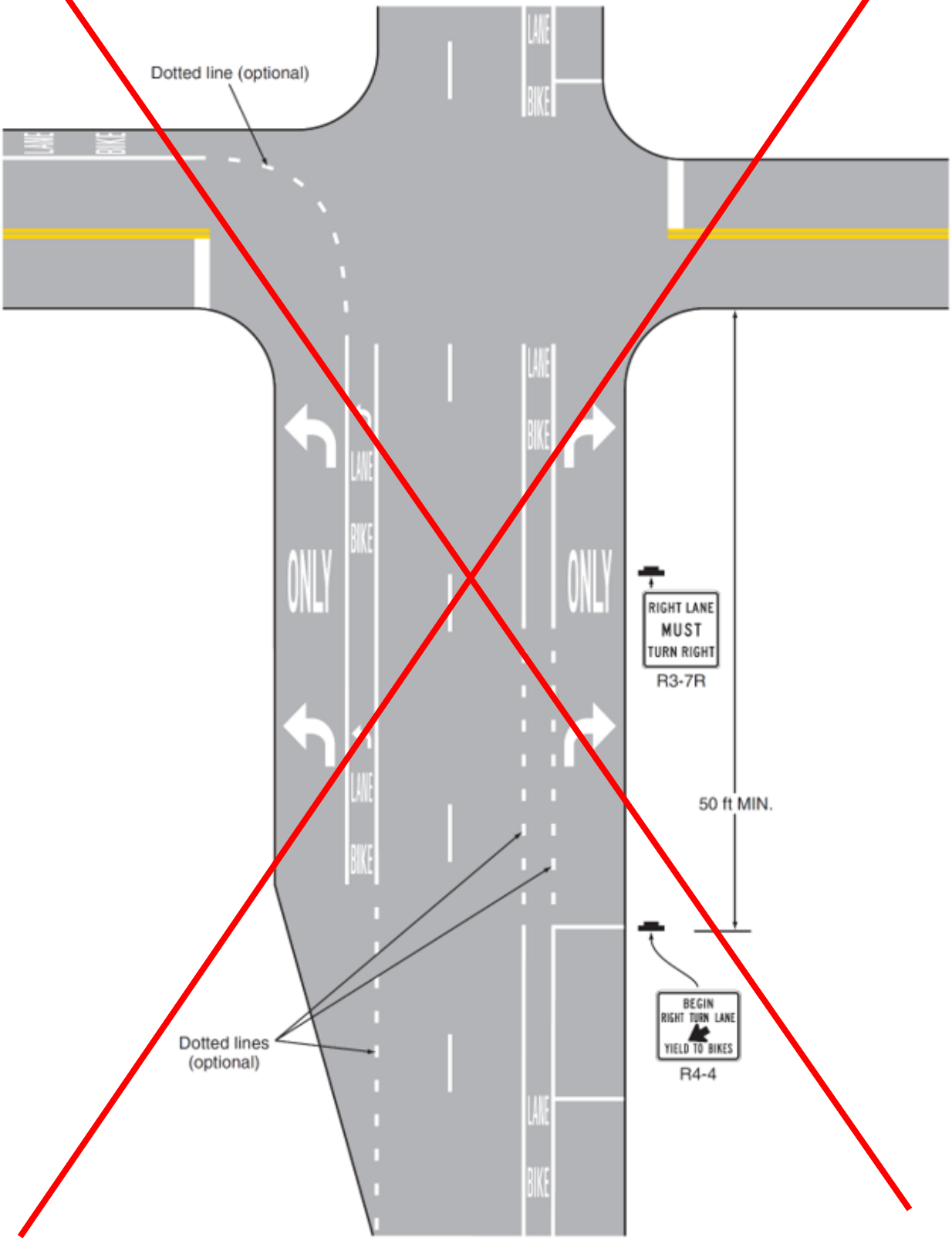


Figure 9C-1. Example of Intersection Pavement Markings—Designated Bicycle Lane with Left-Turn Area, Heavy Turn Volumes, Parking, One-Way Traffic, or Divided Highway

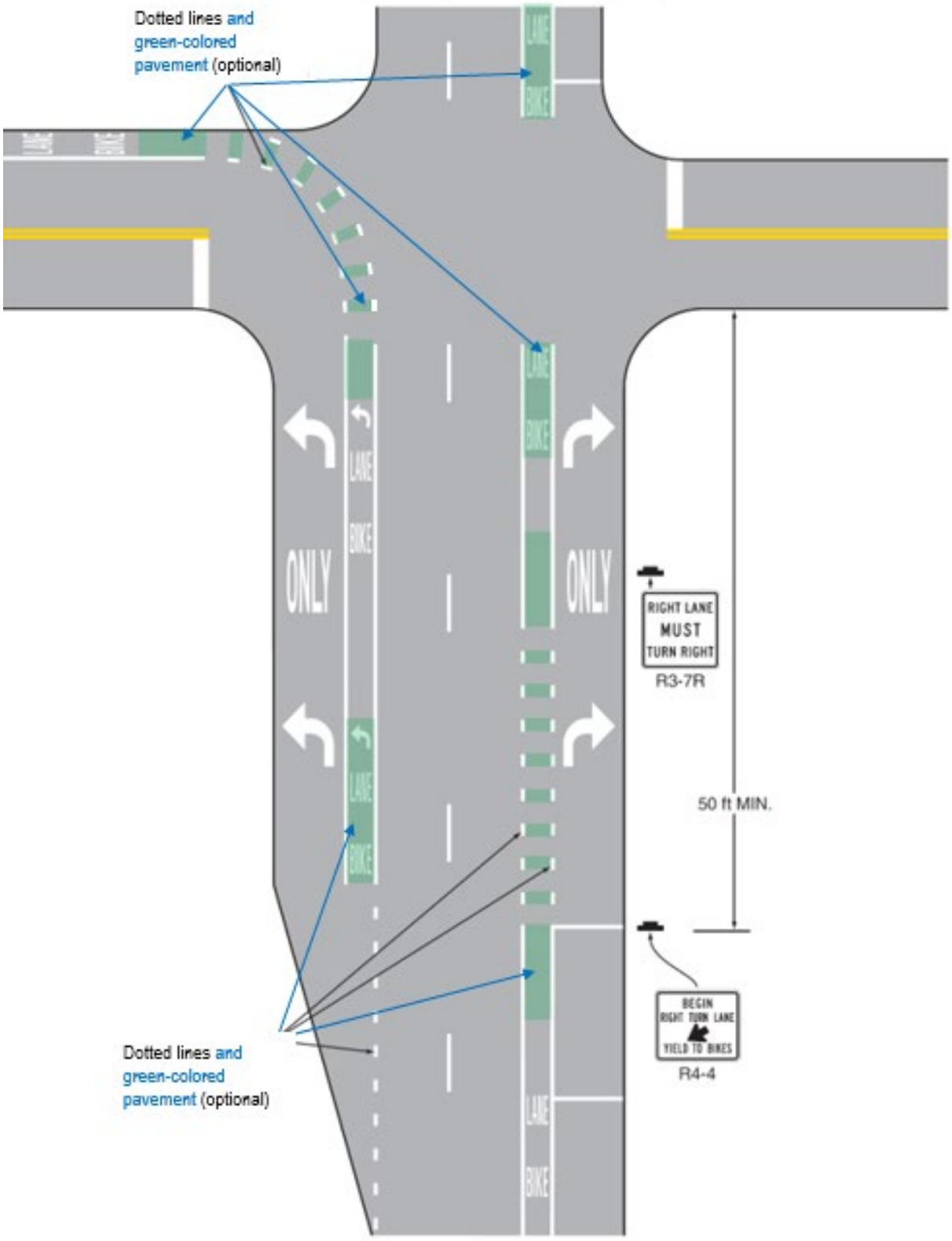


Figure 9C-1a(CA) - Alternative Examples of Intersection Pavement Markings

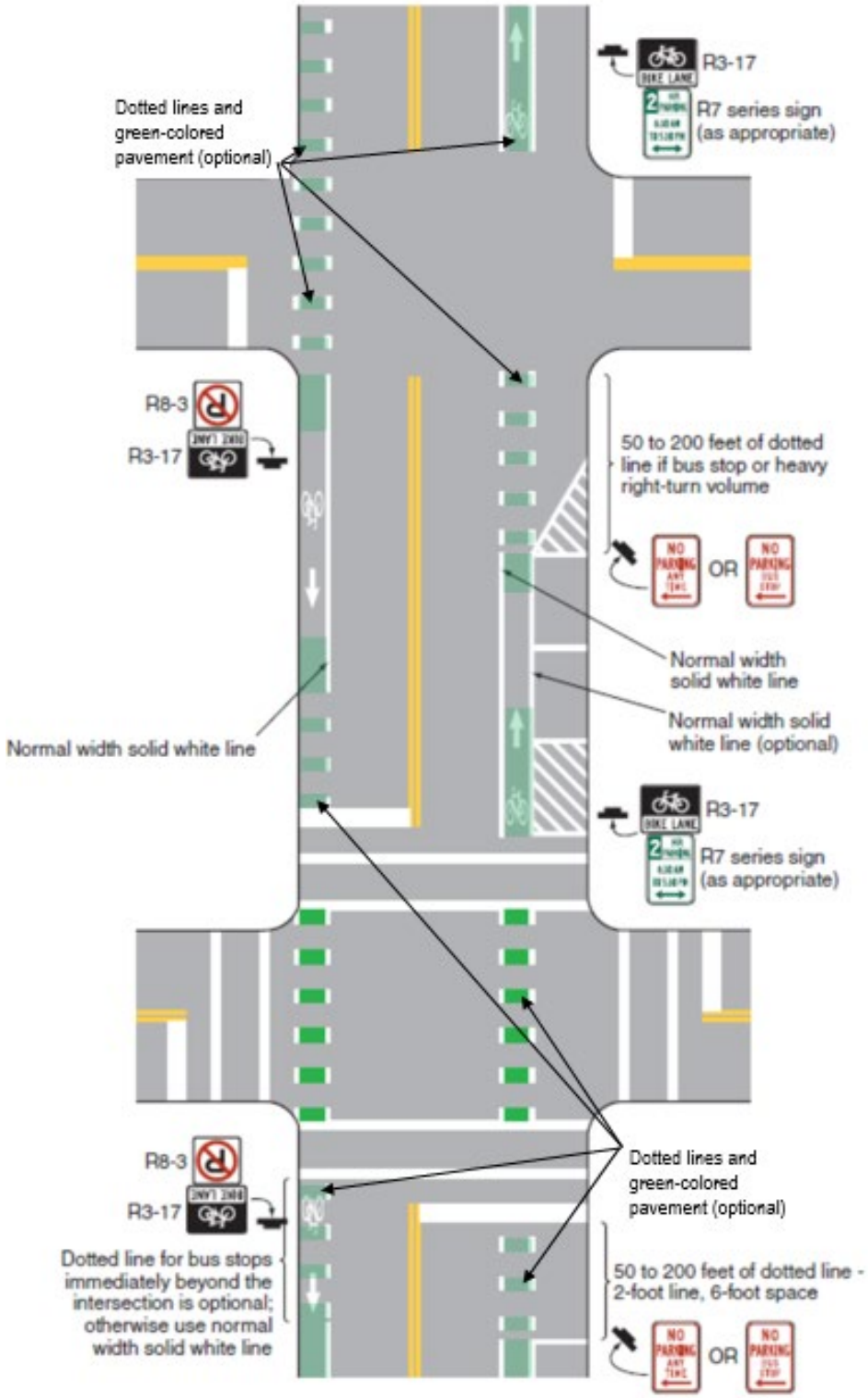


Figure 9C-2. Examples of Center Line Markings for Shared-Use Paths

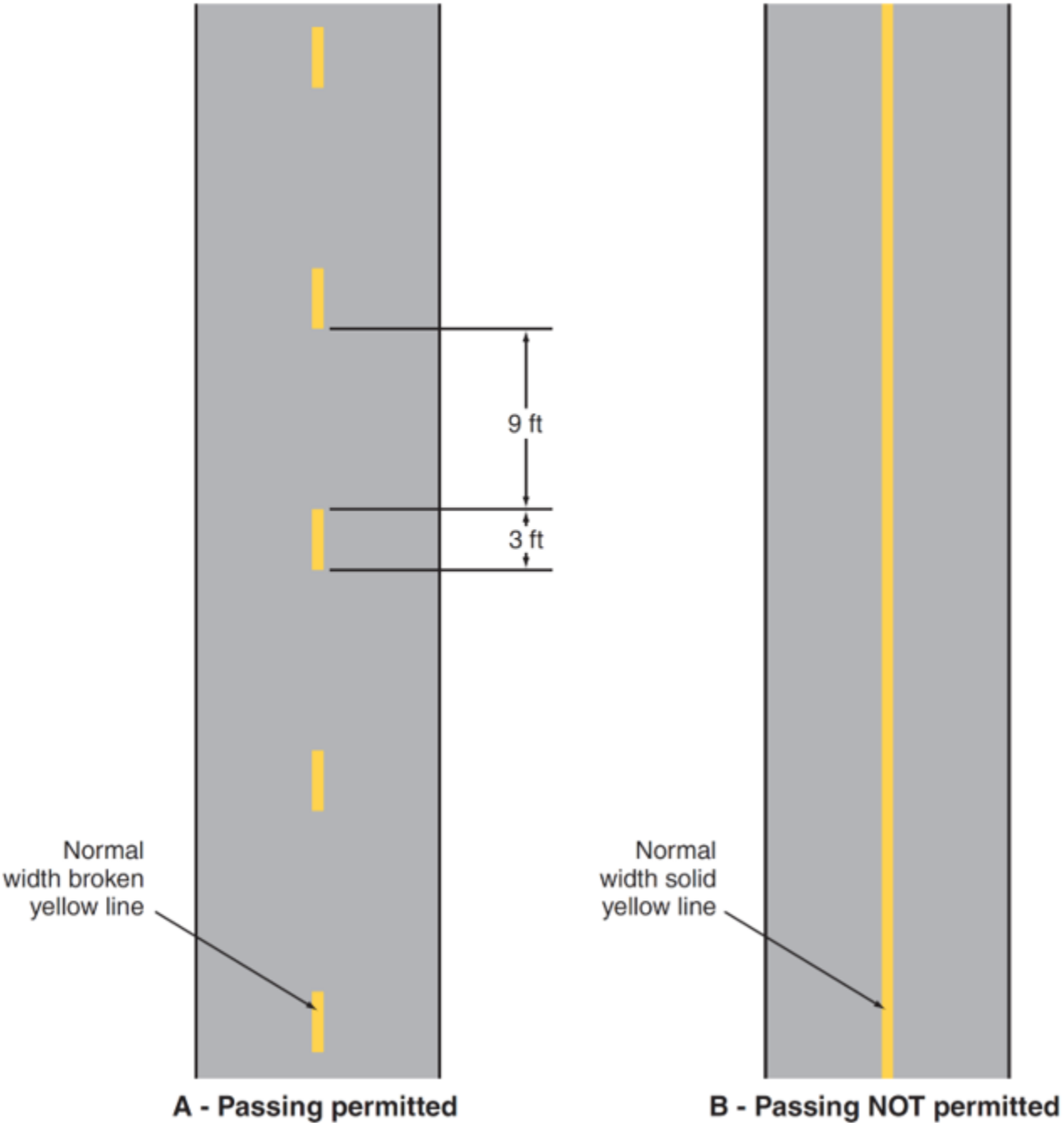
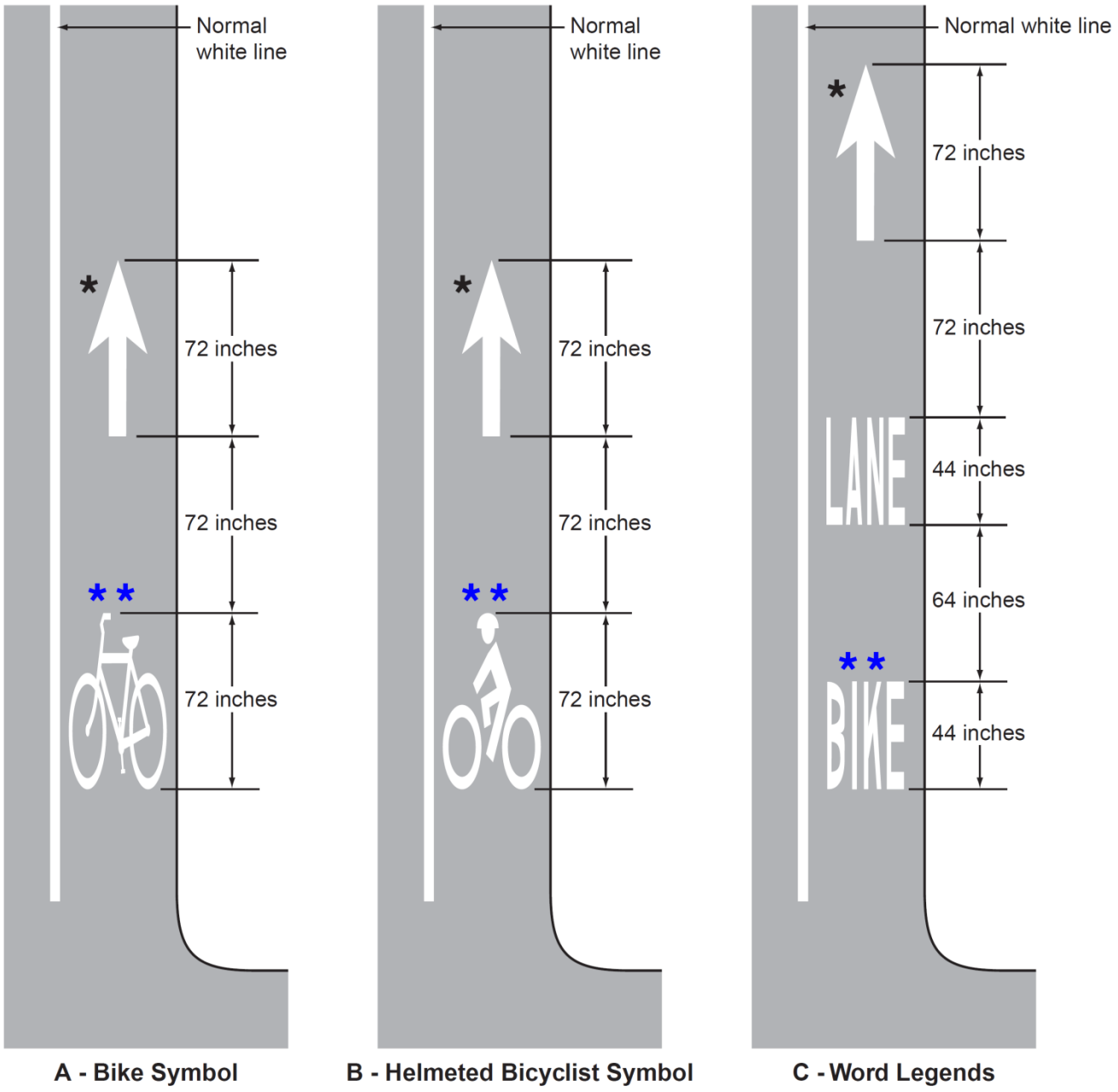


Figure 9C-3. Word, Symbol, and Arrow Pavement Markings for Bicycle Lanes



A - Bike Symbol **B - Helmeted Bicyclist Symbol** **C - Word Legends**

Legend

* Optional

** Required on far side of each intersection, optional at other locations

Figure 9C-4. Example of Bicycle Lane Treatment at a Right Turn Only Lane

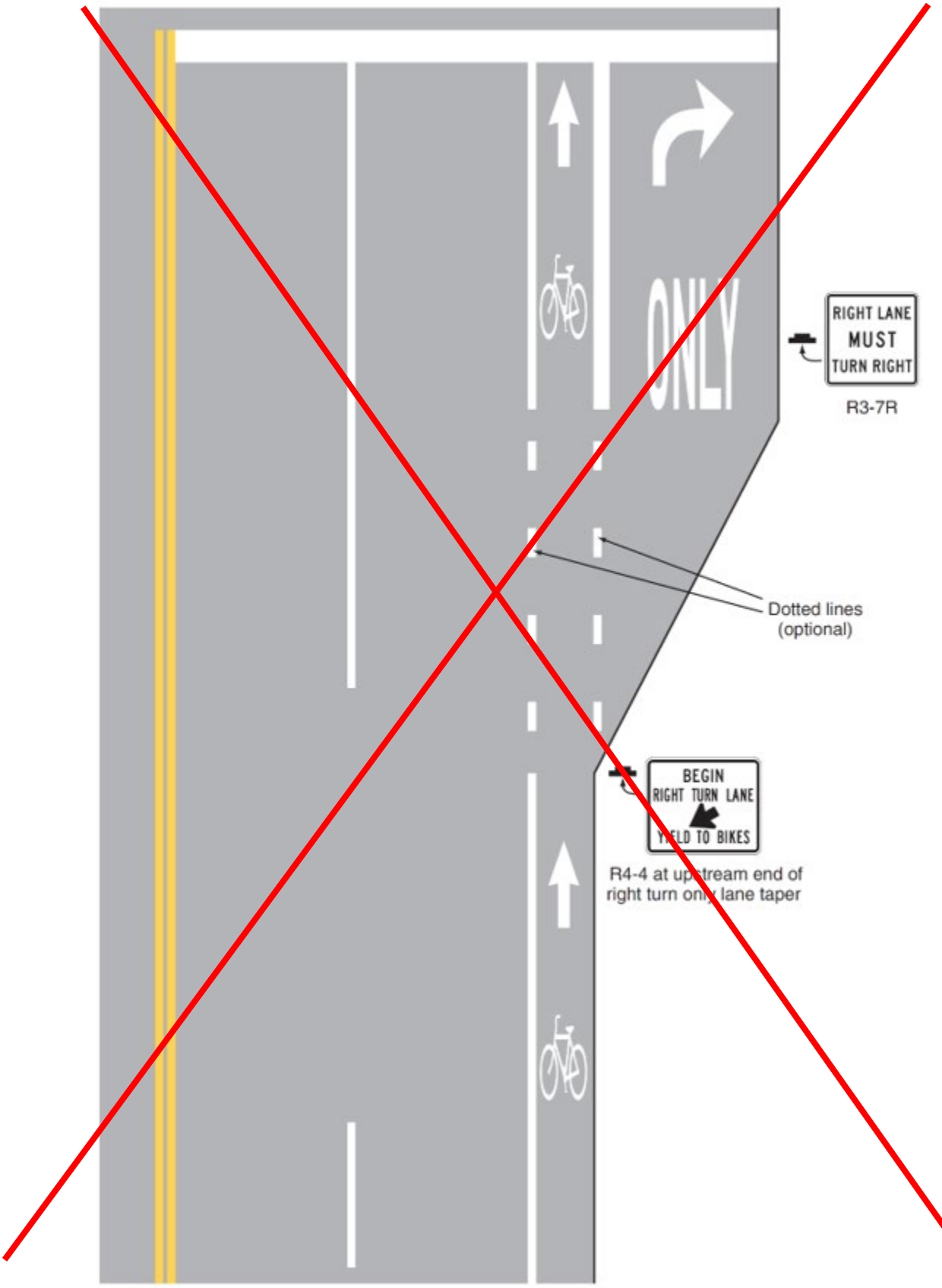


Figure 9C-4. Example of Bicycle Lane Treatment at a Right Turn Only Lane

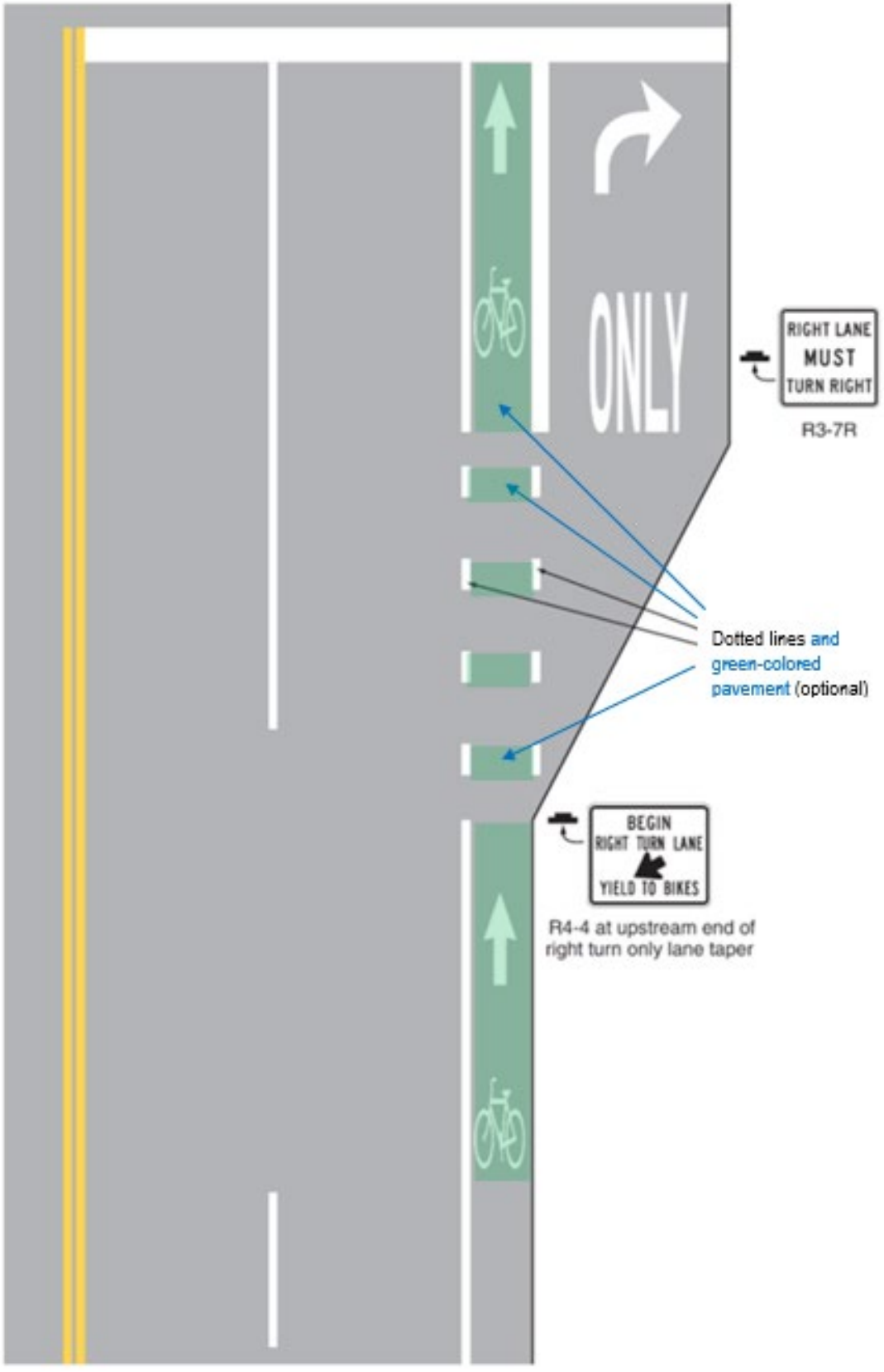
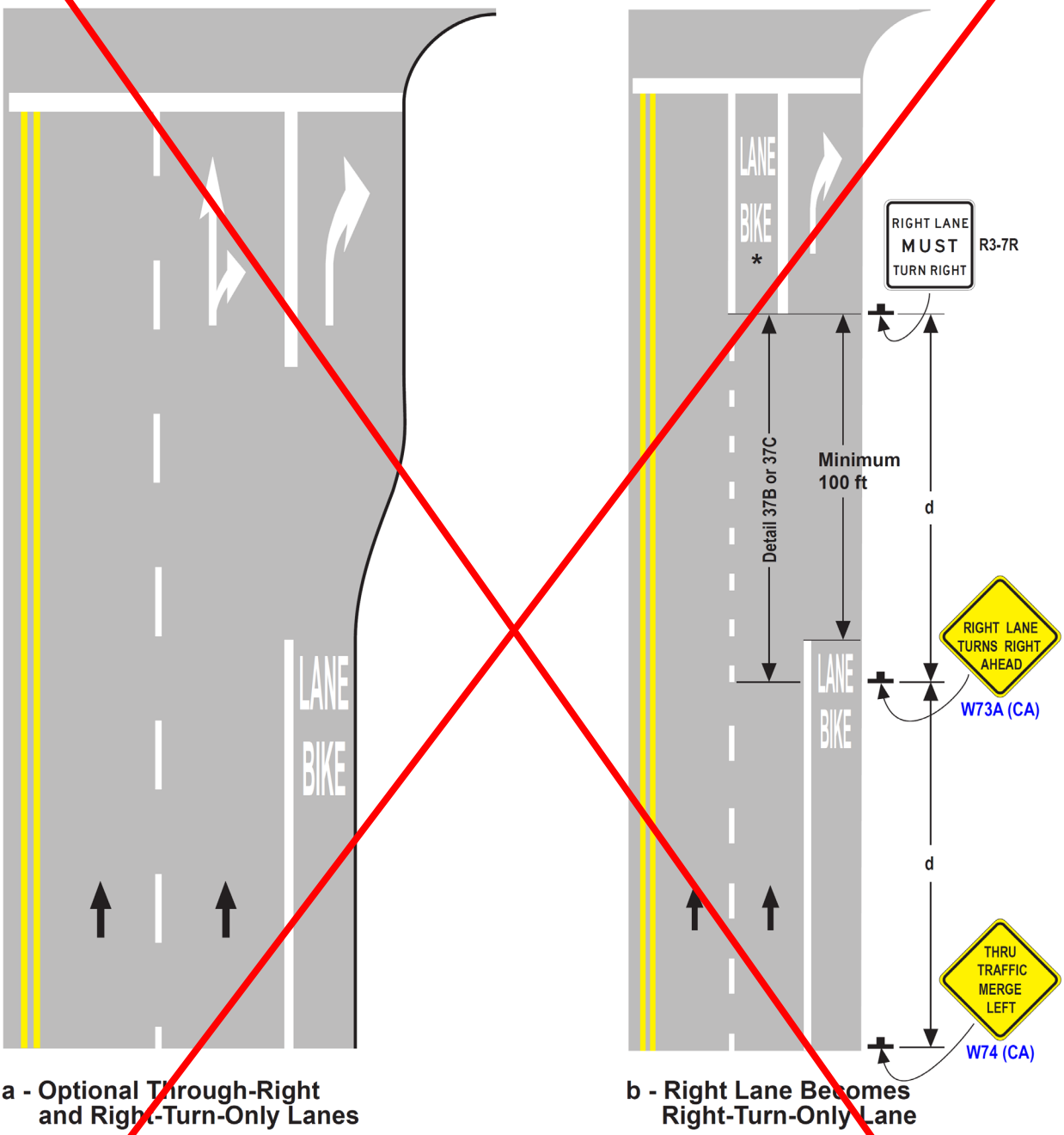


Figure 9C-4 (CA). Example of Bicycle Lane Treatment at a Right Turn Only Lane (Sheet 1 of 3)



a - Optional Through-Right and Right-Turn-Only Lanes

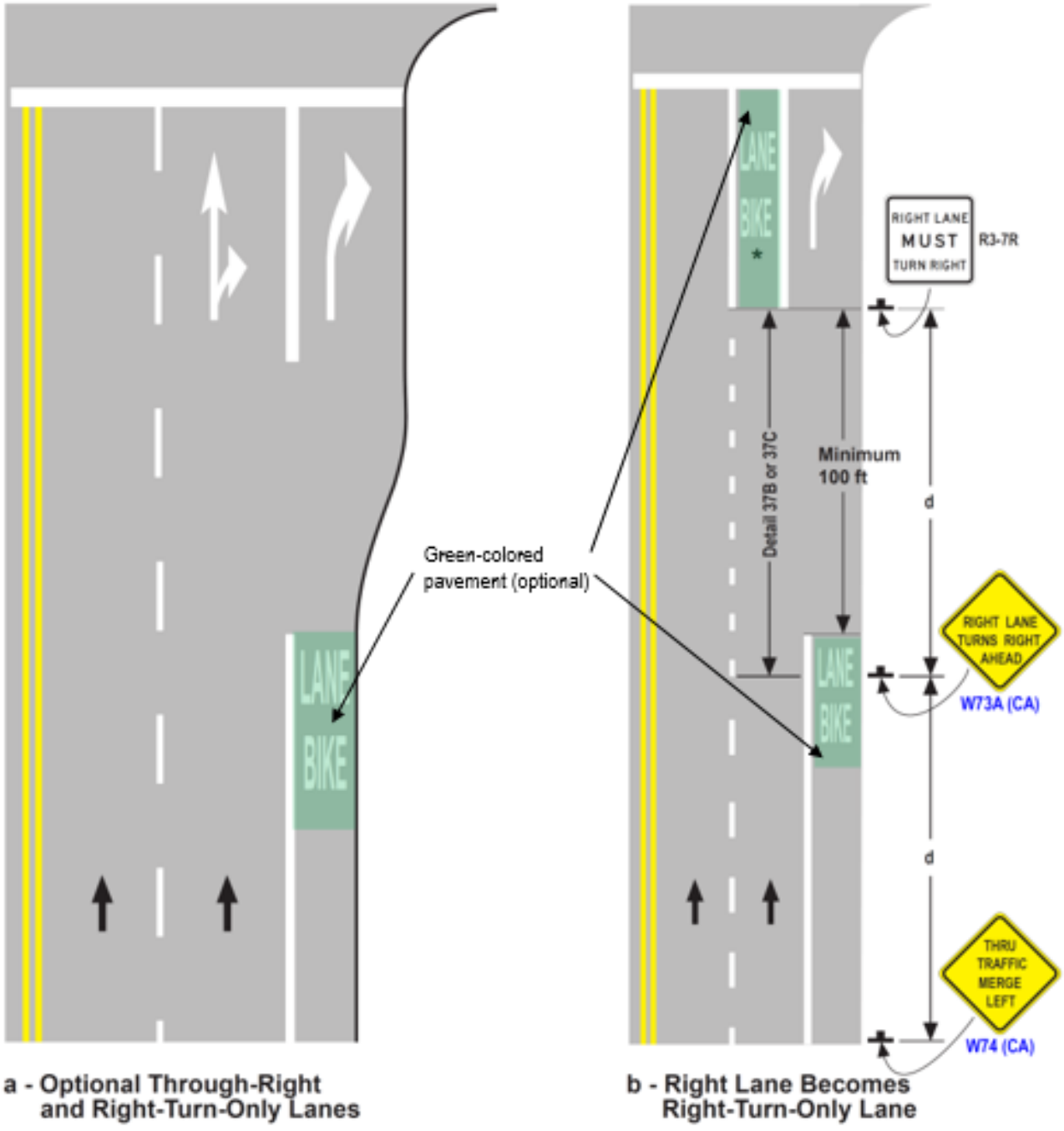
b - Right Lane Becomes Right-Turn-Only Lane

* 4 ft minimum width,
6 ft minimum width for posted speed greater than 40 mph
d = Advance Placement Distance (See Section 2C.05)

LEGEND

→ Direction of Travel NOT TO SCALE

Figure 9C-4 (CA). Example of Bicycle Lane Treatment at a Right Turn Only Lane
(Sheet 1 of 3)



* 4 ft minimum width,
6 ft minimum width for posted speed greater than 40 mph
d = Advance Placement Distance (See Section 2C.05)

LEGEND

→ Direction of Travel NOT TO SCALE

Figure 9C-4 (CA). Example of Bicycle Lane Treatment at a Right Turn Only Lane, Posted Speed > 40 mph (Sheet 2 of 3)

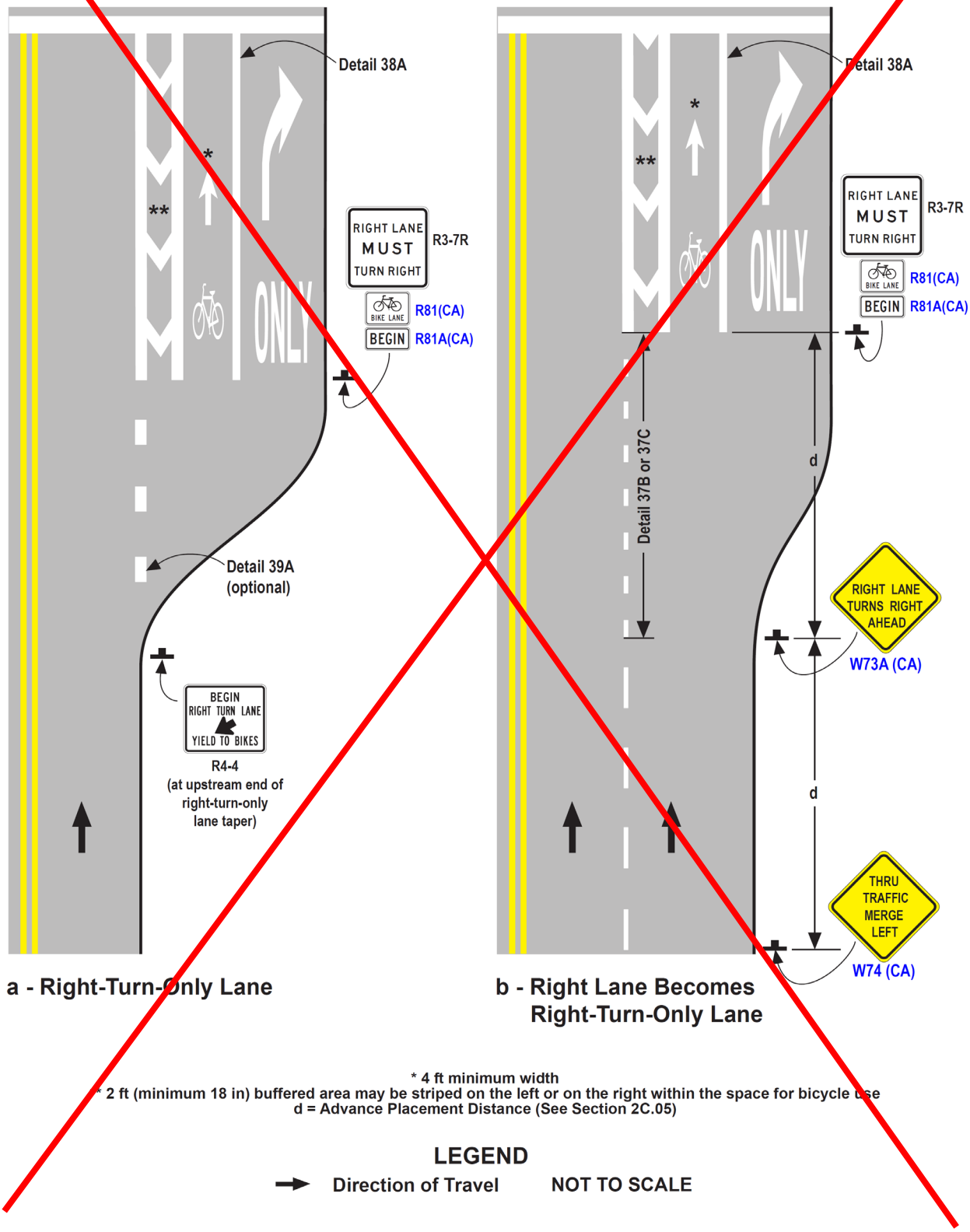
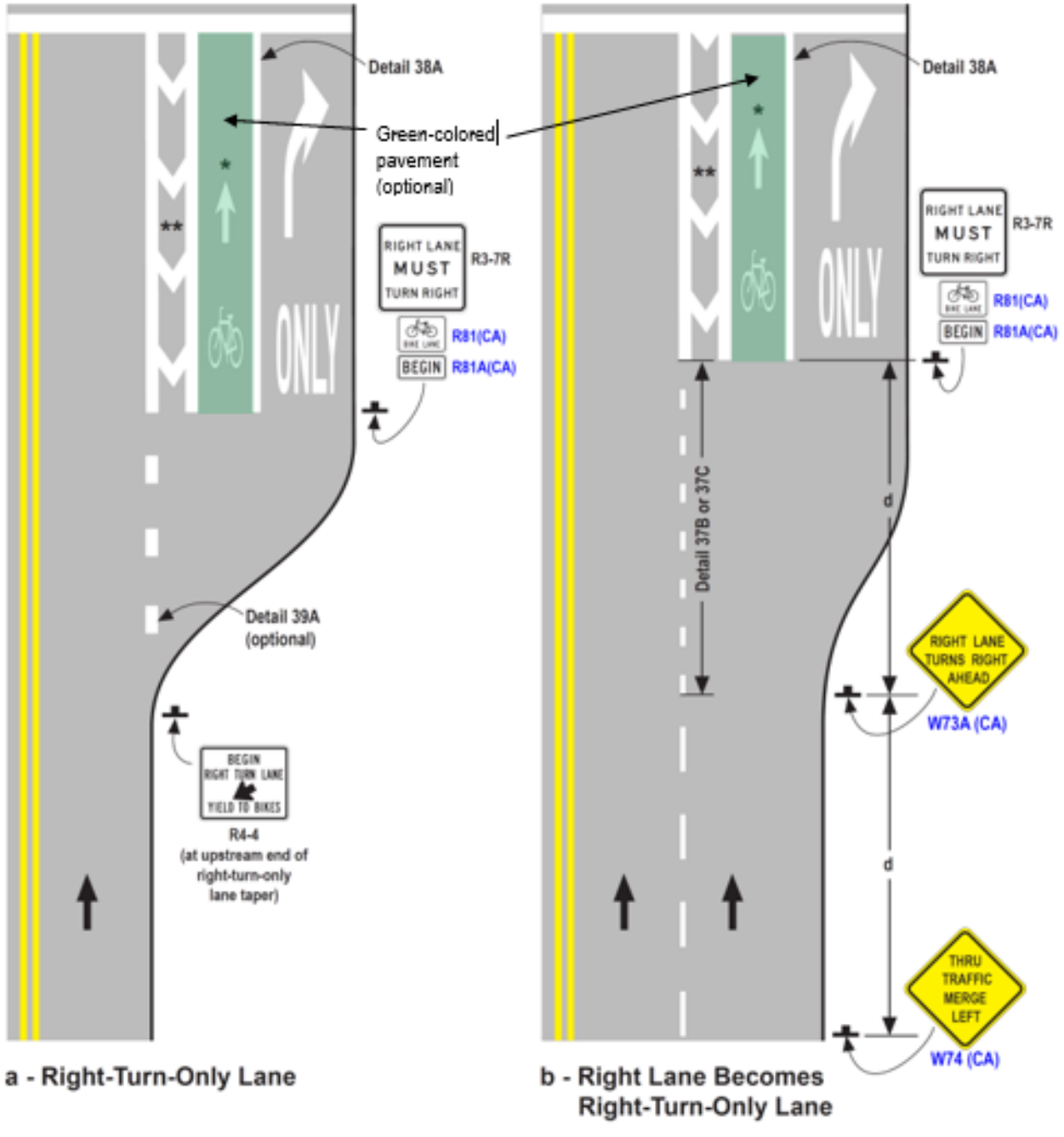


Figure 9C-4 (CA). Example of Bicycle Lane Treatment at a Right Turn Only Lane, Posted Speed > 40 mph (Sheet 2 of 3)



* 4 ft minimum width
** 2 ft (minimum 18 in) buffered area may be striped on the left or on the right within the space for bicycle use
d = Advance Placement Distance (See Section 2C.05)

LEGEND

→ Direction of Travel NOT TO SCALE

Figure 9C-4 (CA). Example of Bicycle Lane Treatment at a Right Turn Only Lane, Posted Speed ≤ 40 mph (Sheet 3 of 3)

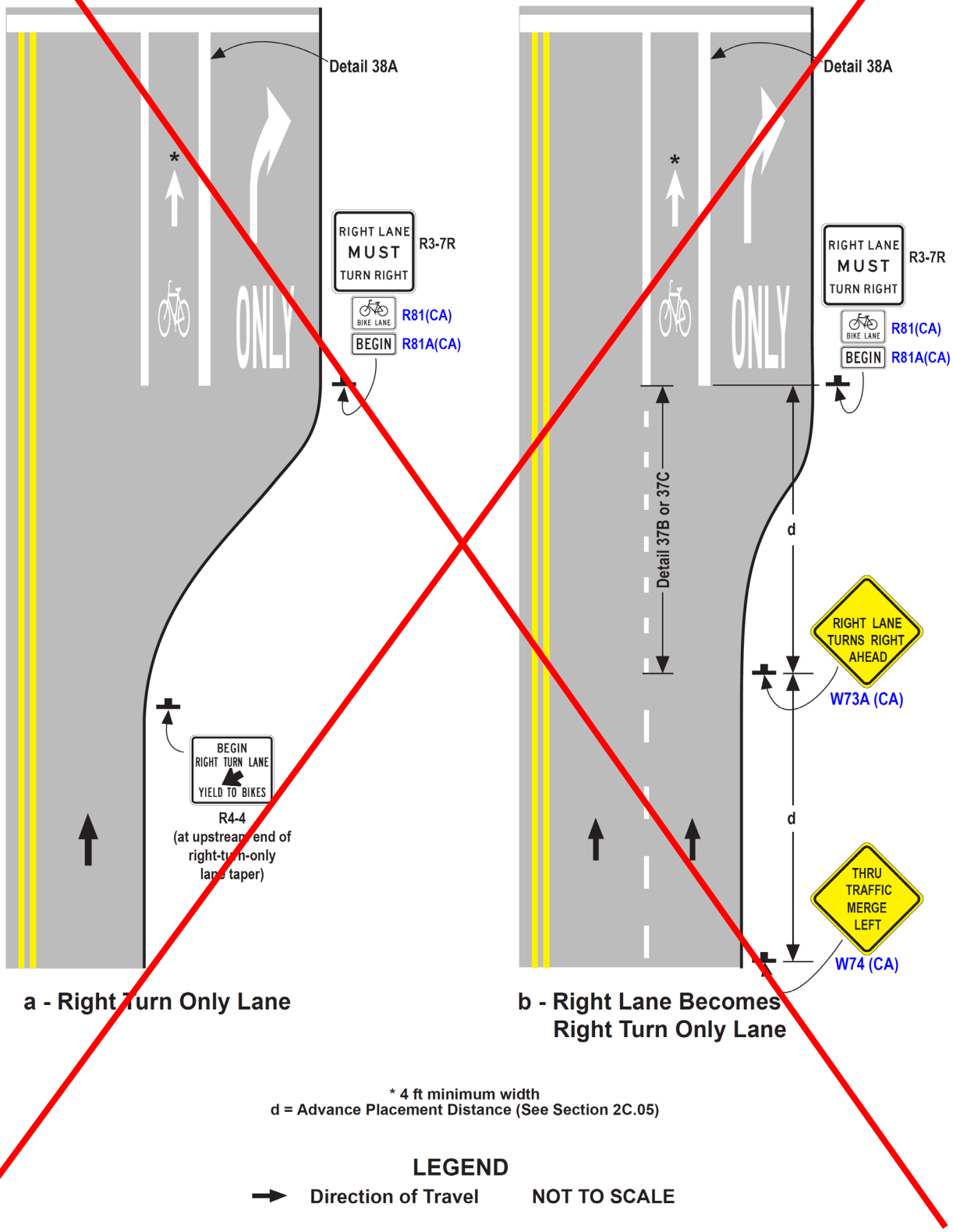


Figure 9C-4 (CA). Example of Bicycle Lane Treatment at a Right Turn Only Lane, Posted Speed ≤ 40 mph (Sheet 3 of 3)

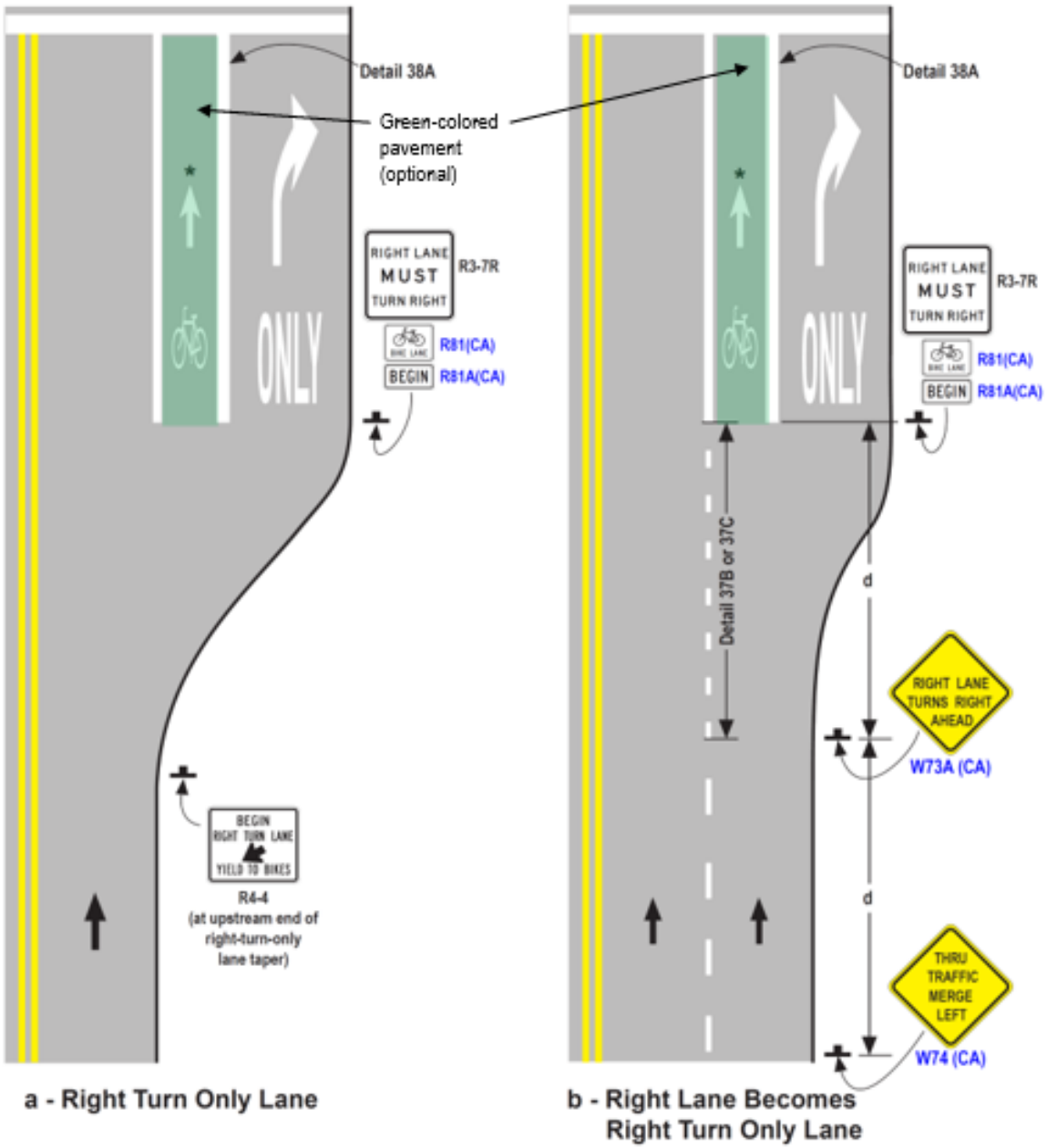


Figure 9C-5. Example of Bicycle Lane Treatment at Parking Lane into a Right Turn Only Lane

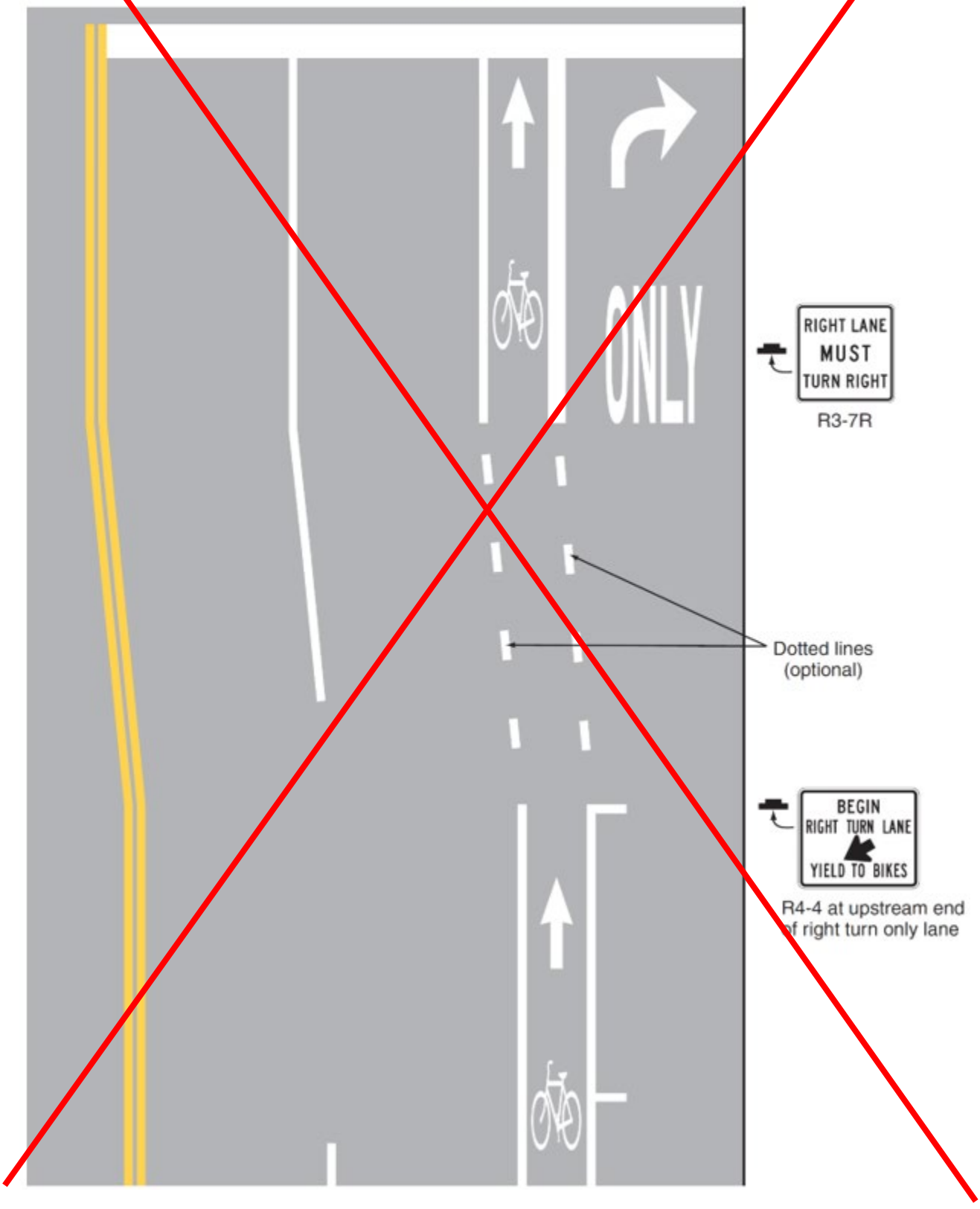


Figure 9C-5. Example of Bicycle Lane Treatment at Parking Lane into a Right Turn Only Lane

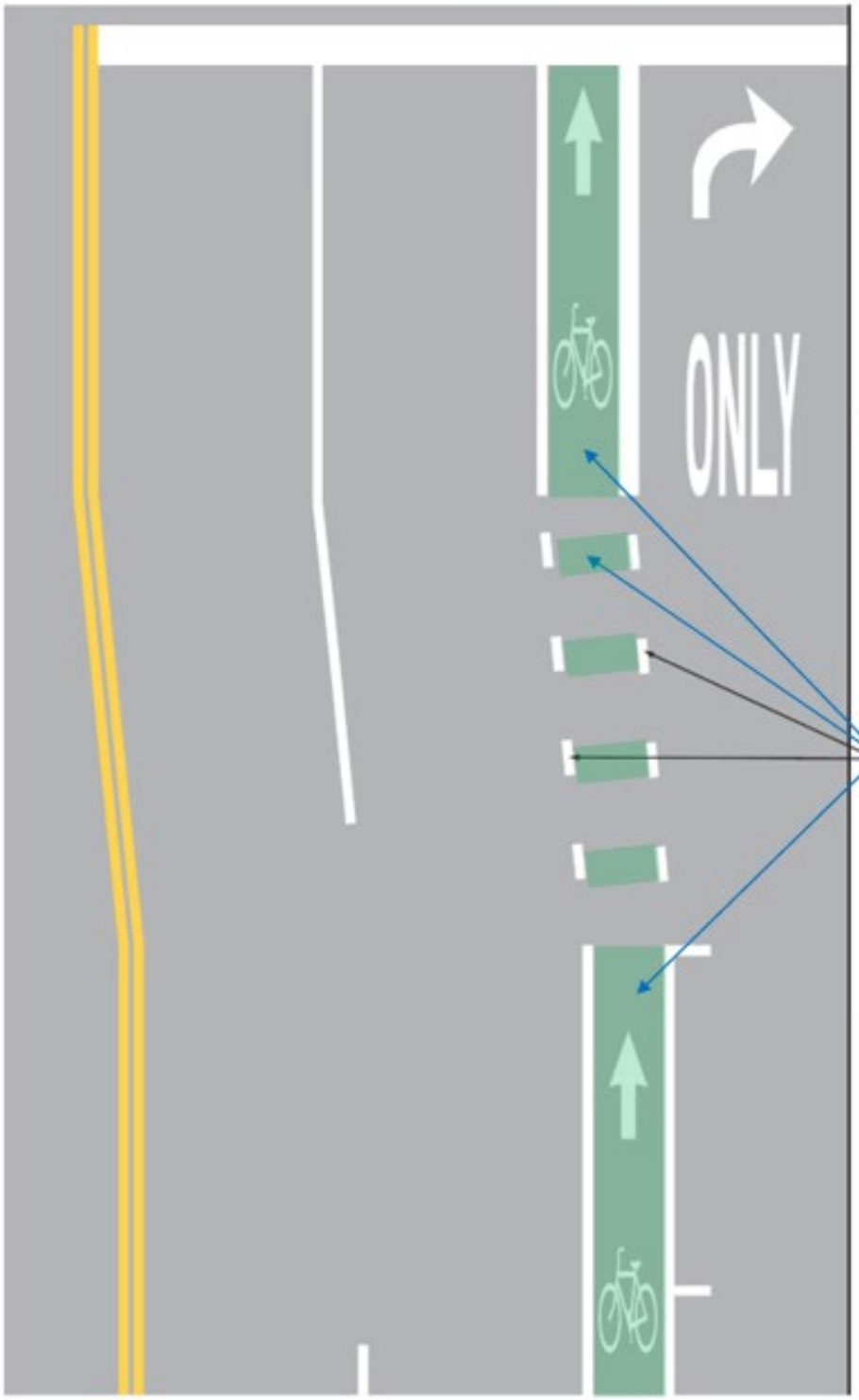


Figure 9C-6. Example of Pavement Markings for Bicycle Lanes on a Two-Way Street

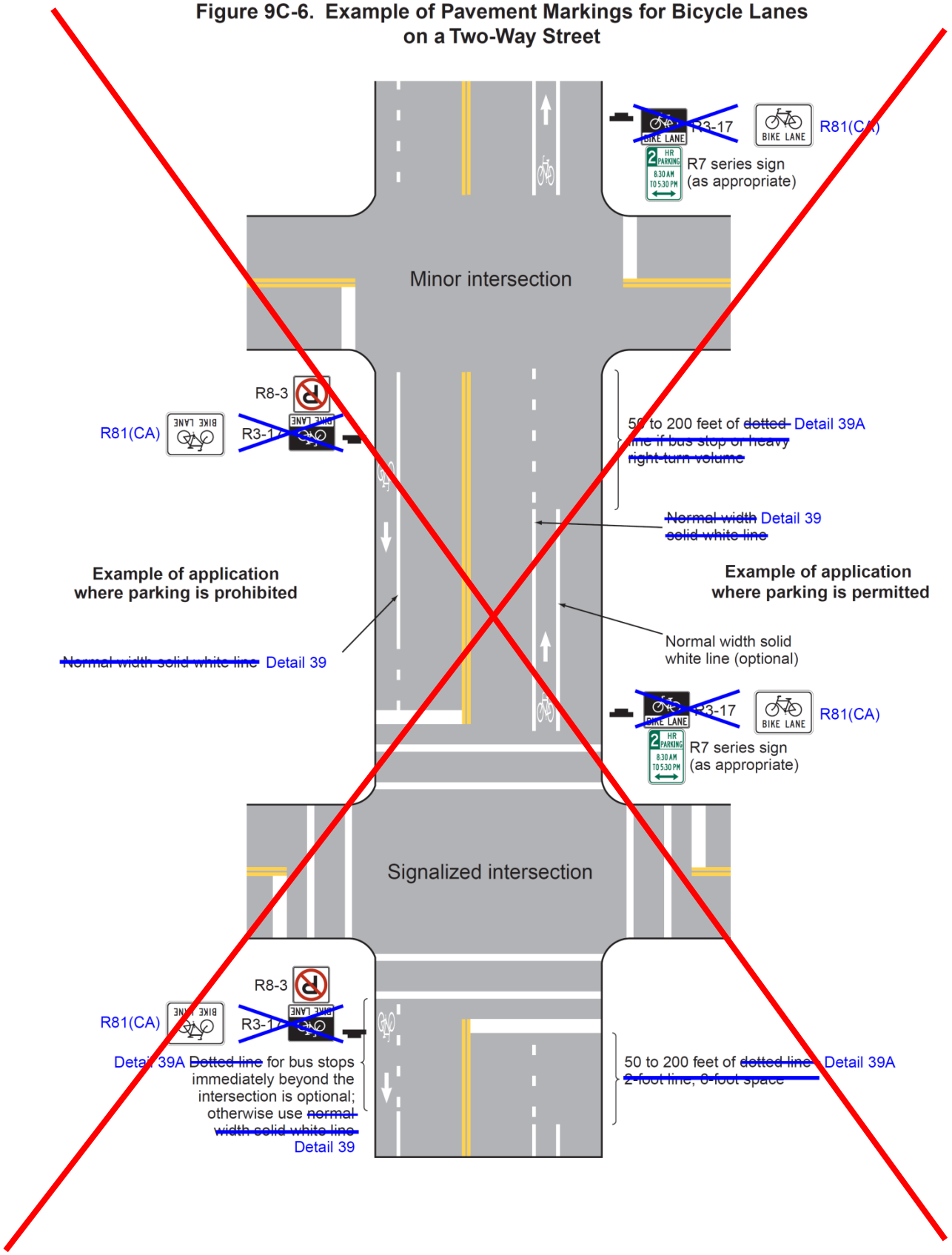


Figure 9C-6. Example of Pavement Markings for Bicycle Lanes on a Two-Way Street

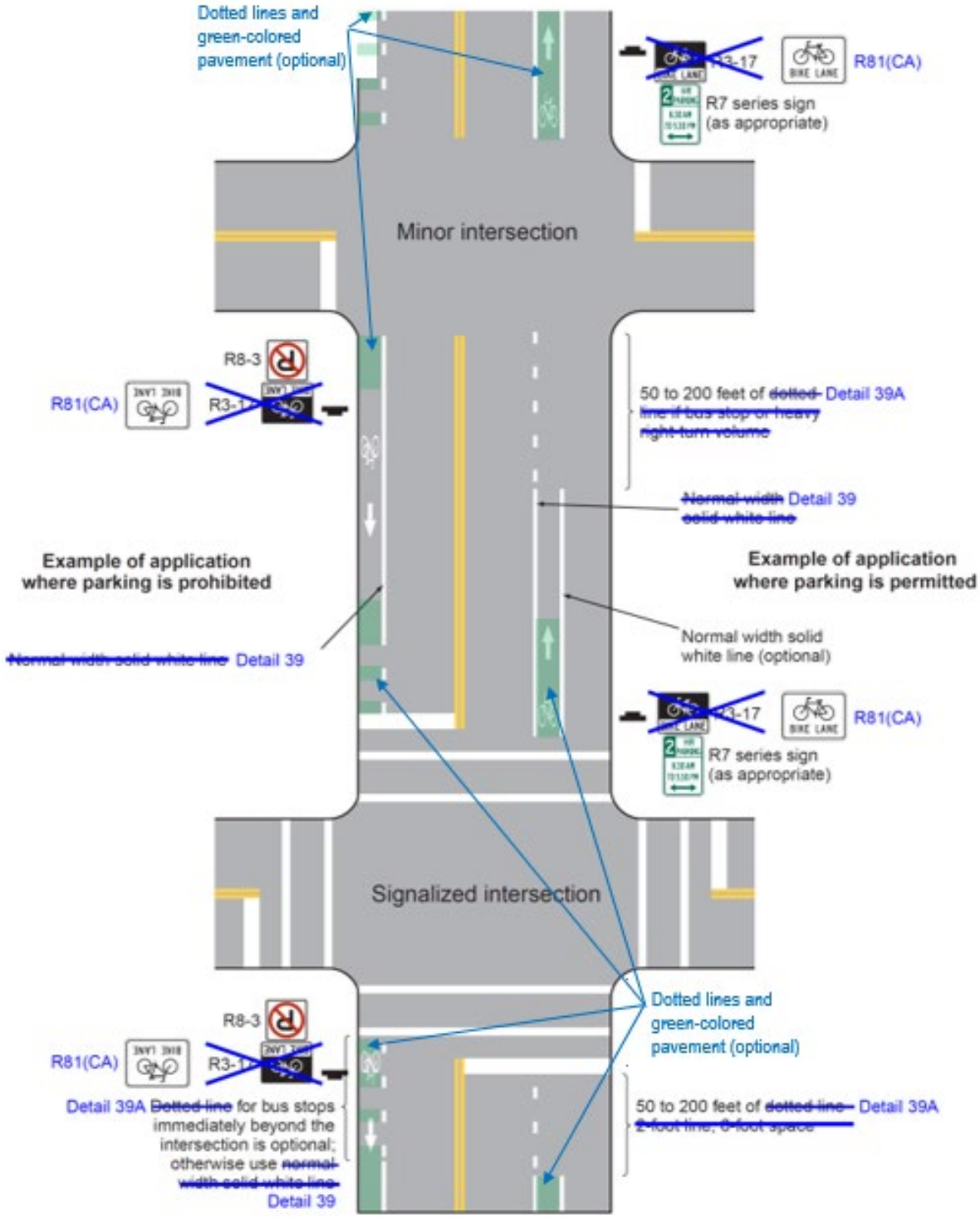


Figure 9C-7. Bicycle Detector Pavement Marking

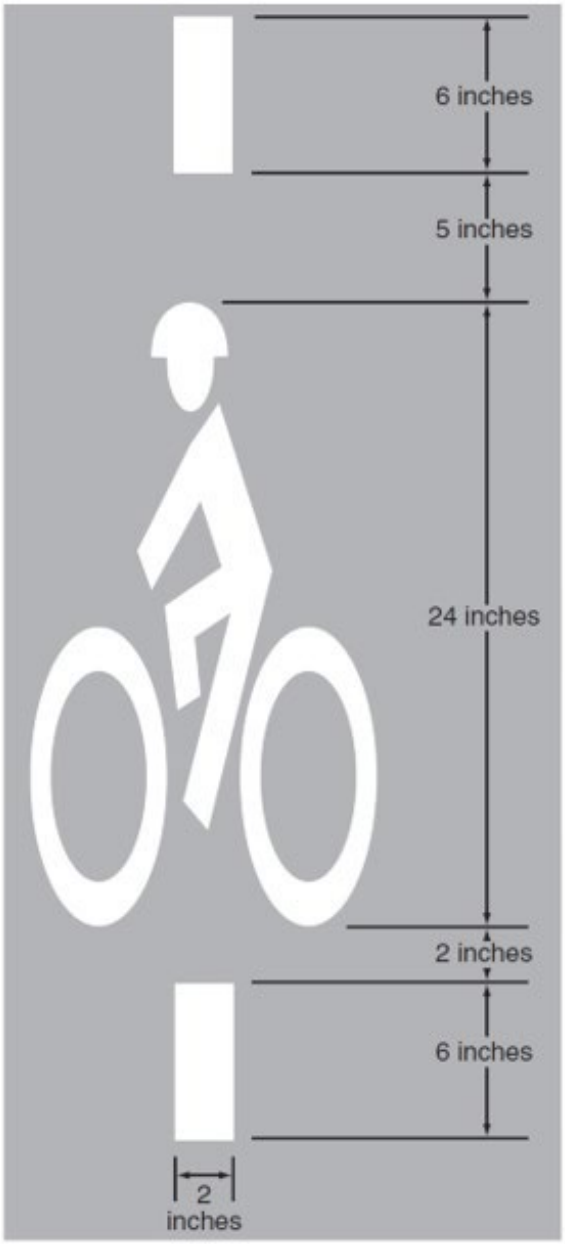
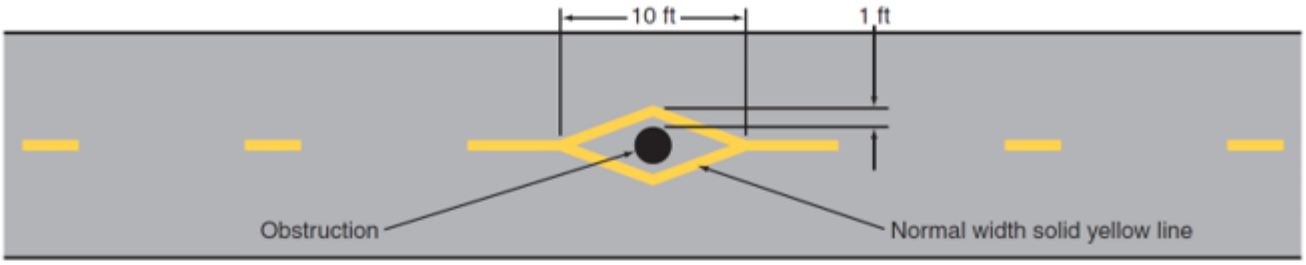
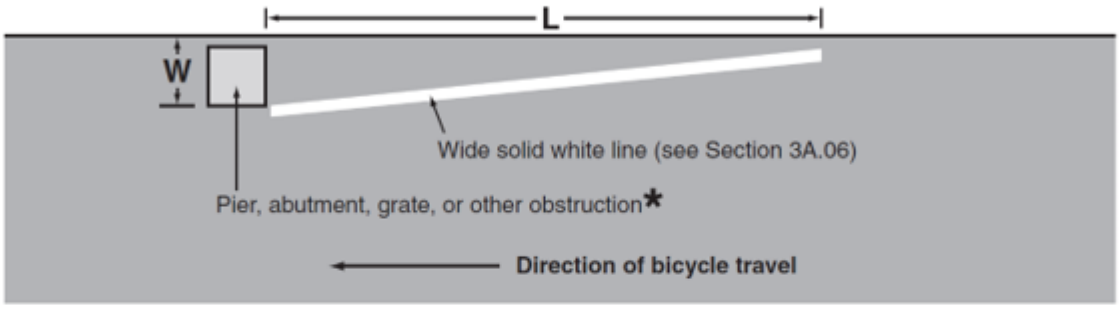


Figure 9C-8. Examples of Obstruction Pavement Markings



A - Obstruction within the path



B - Obstruction at edge of path or roadway

L = WS, where W is the offset in feet and S is bicycle approach speed in mph

* Provide an additional foot of offset for a raised obstruction and use the formula L = (W+1) S for the taper length

Figure 9C-9. Shared Lane Marking

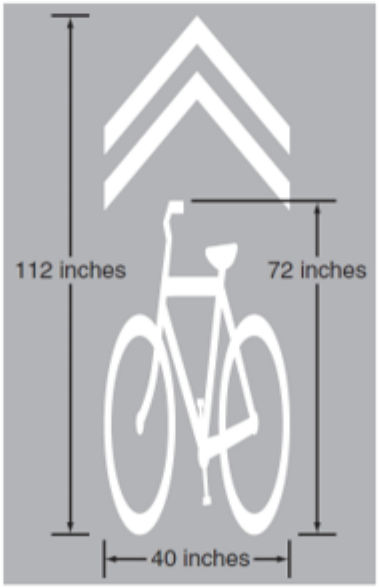


Figure 9C-101 (CA). Marking Details for Bicycle Lanes

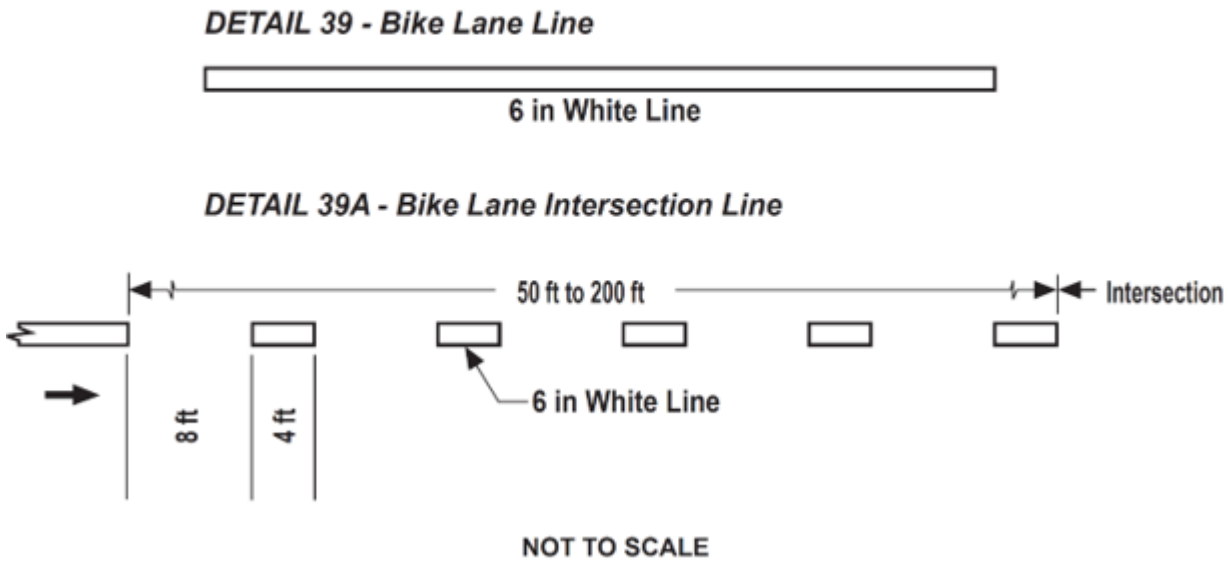


Figure 9C-102 (CA). Examples of Bicycle Lane Treatment Where Vehicle Parking is Prohibited/Permitted

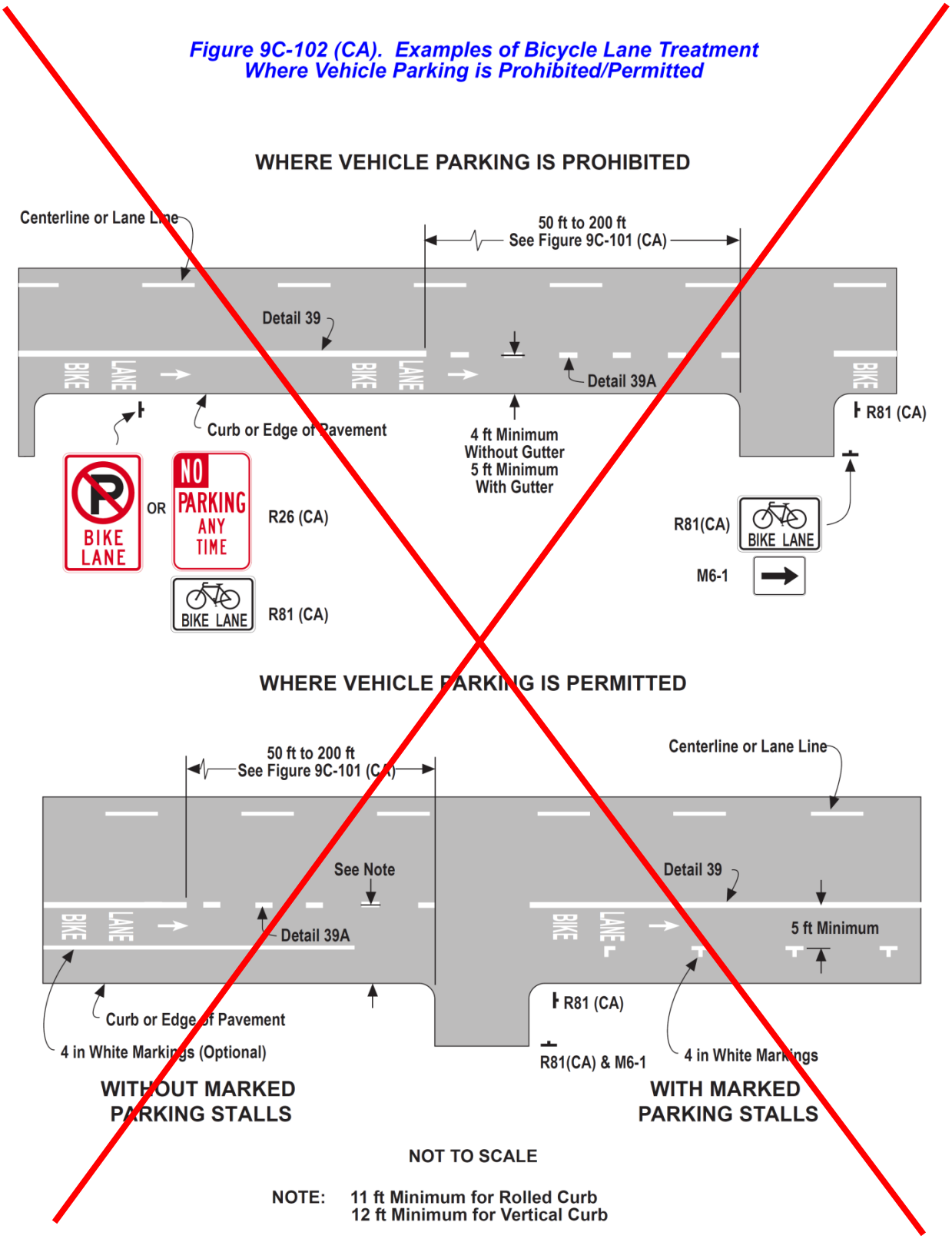
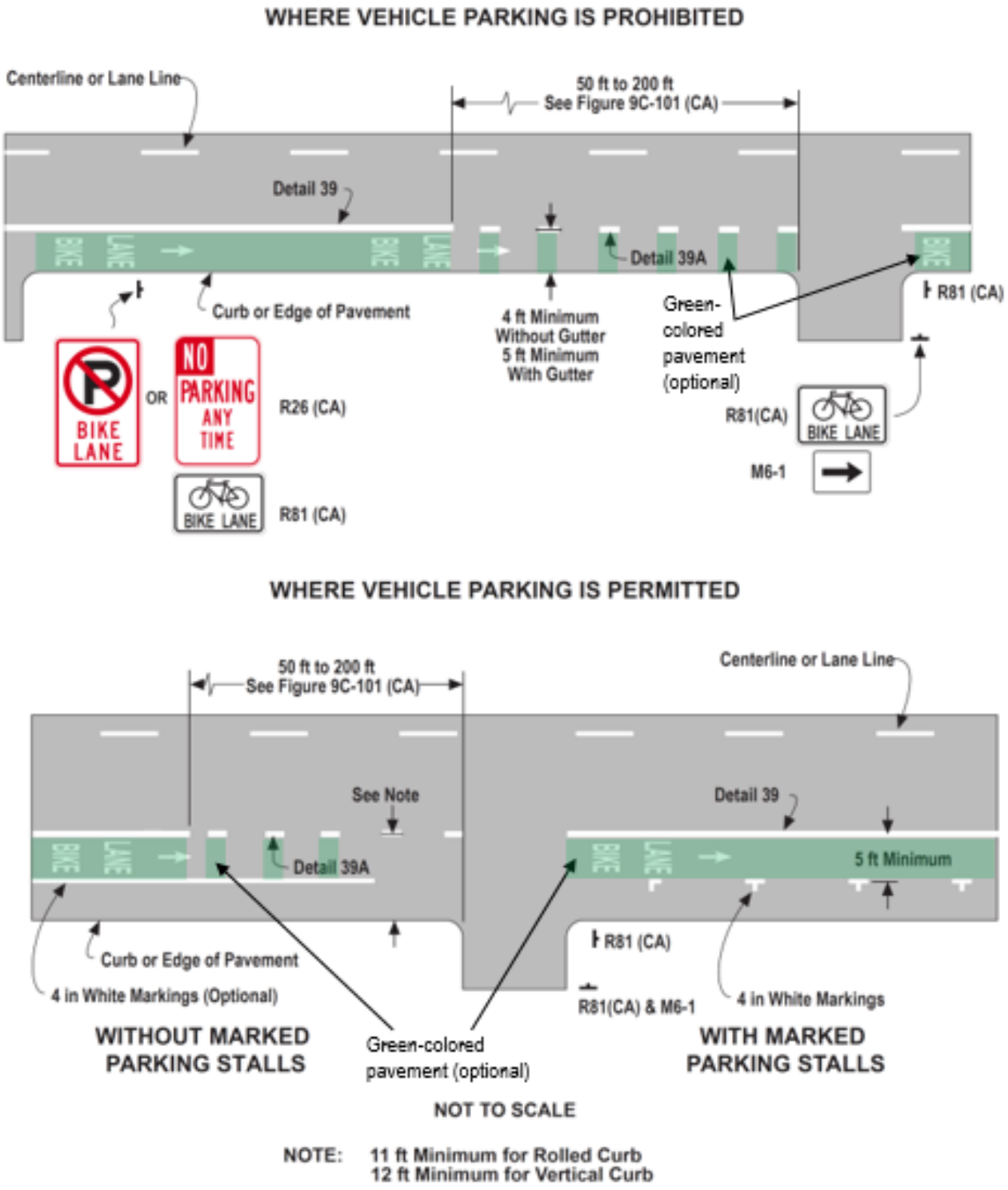


Figure 9C-102 (CA). Examples of Bicycle Lane Treatment Where Vehicle Parking is Prohibited/Permitted



NOTE: 11 ft Minimum for Rolled Curb
12 ft Minimum for Vertical Curb

Figure 9C-103 (CA). Example of Bicycle Lane Treatment Through an Interchange

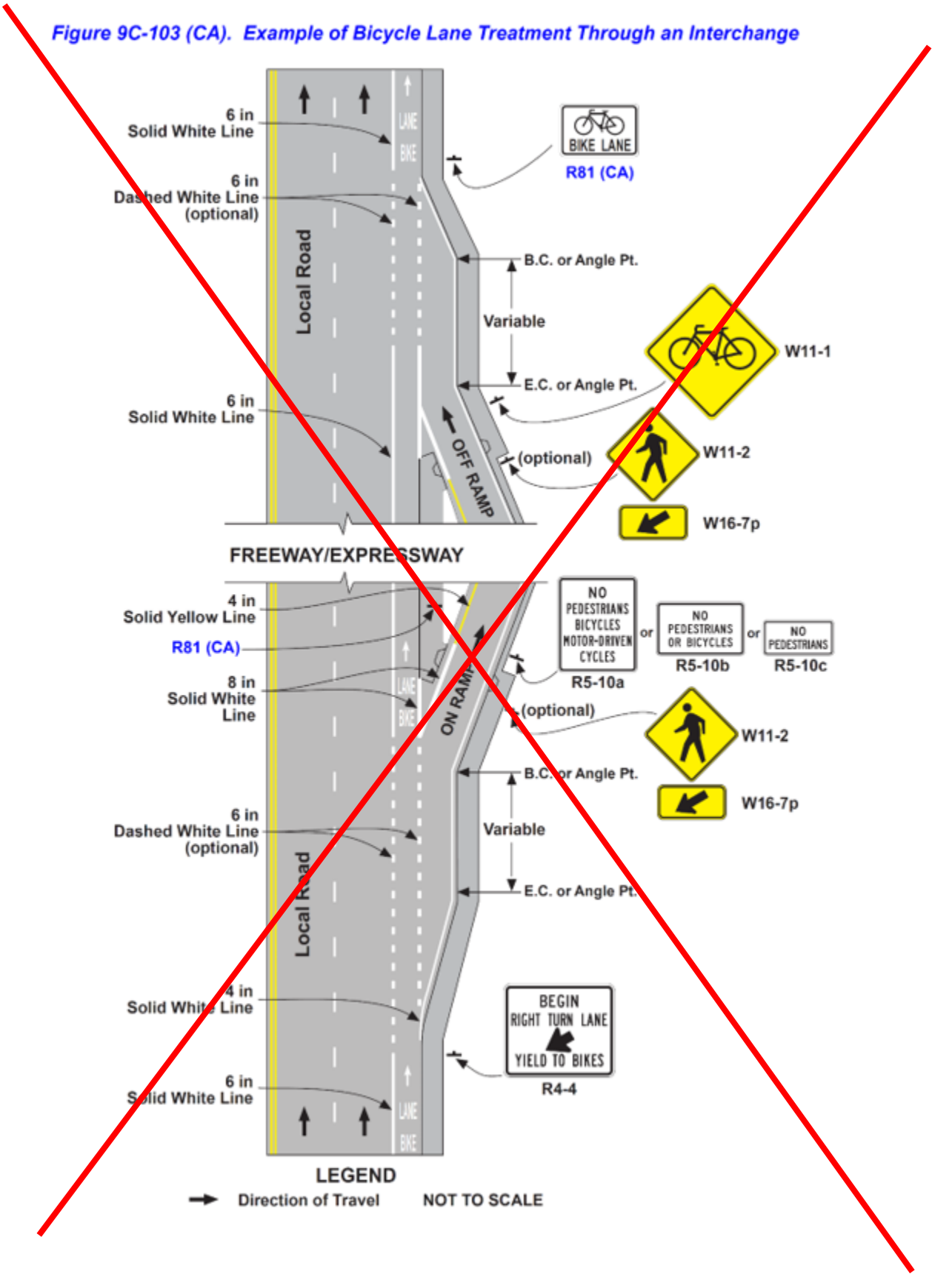


Figure 9C-103 (CA). Example of Bicycle Lane Treatment Through an Interchange

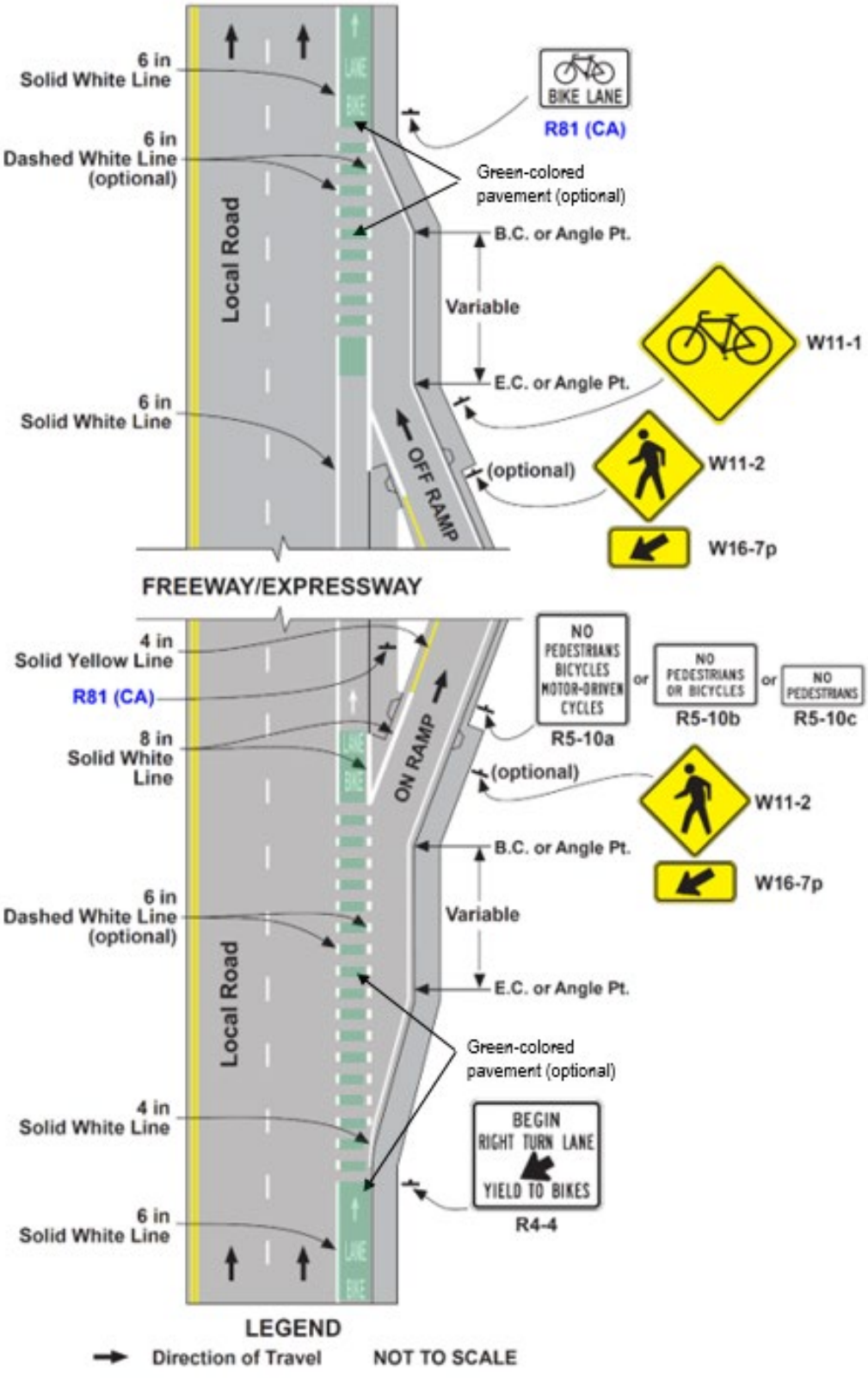
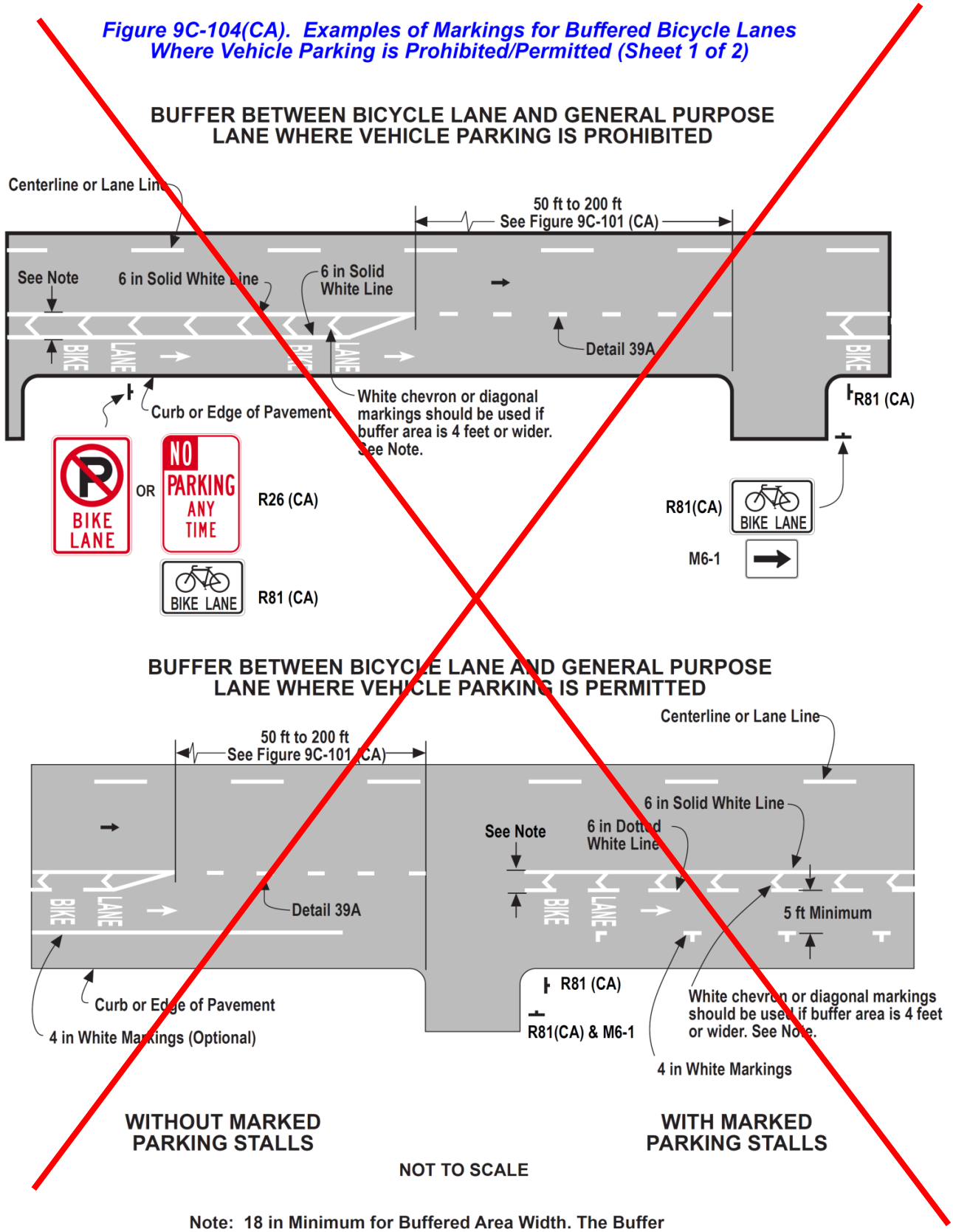
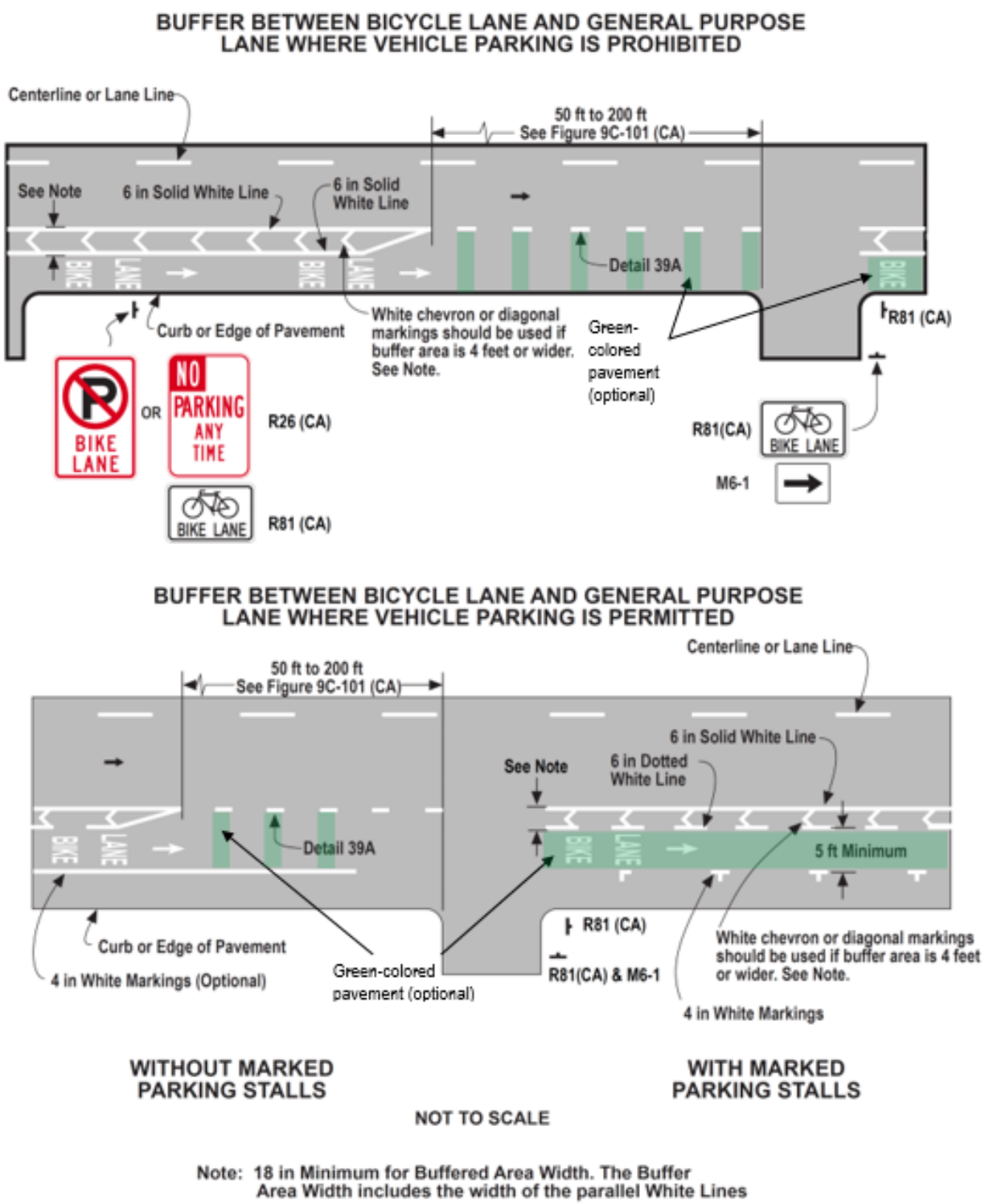


Figure 9C-104(CA). Examples of Markings for Buffered Bicycle Lanes Where Vehicle Parking is Prohibited/Permitted (Sheet 1 of 2)



Note: 18 in Minimum for Buffered Area Width. The Buffer Area Width includes the width of the parallel White Lines

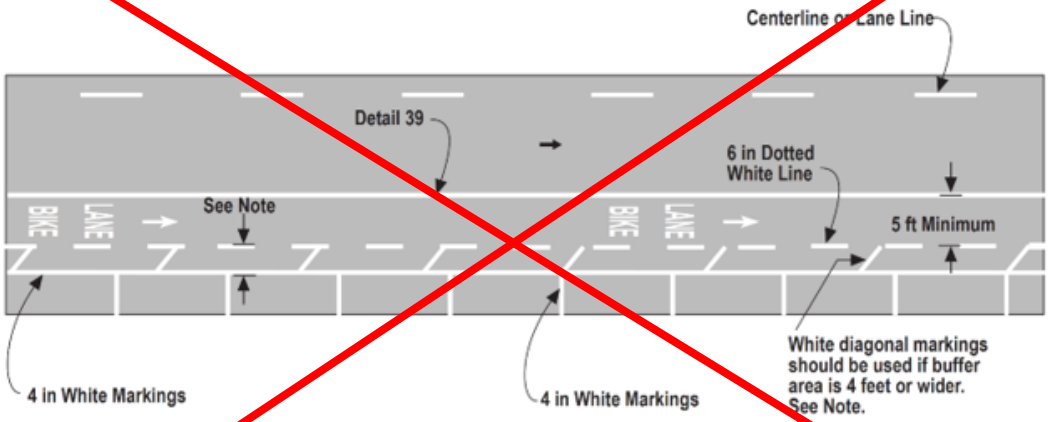
Figure 9C-104(CA). Examples of Markings for Buffered Bicycle Lanes Where Vehicle Parking is Prohibited/Permitted (Sheet 1 of 2)



Note: 18 in Minimum for Buffered Area Width. The Buffer Area Width includes the width of the parallel White Lines

Figure 9C-104(CA). Examples of Markings for Buffered Bicycle Lanes Where Vehicle Parking is Prohibited/Permitted (Sheet 2 of 2)

BUFFER BETWEEN BICYCLE LANE AND PARKING LANE



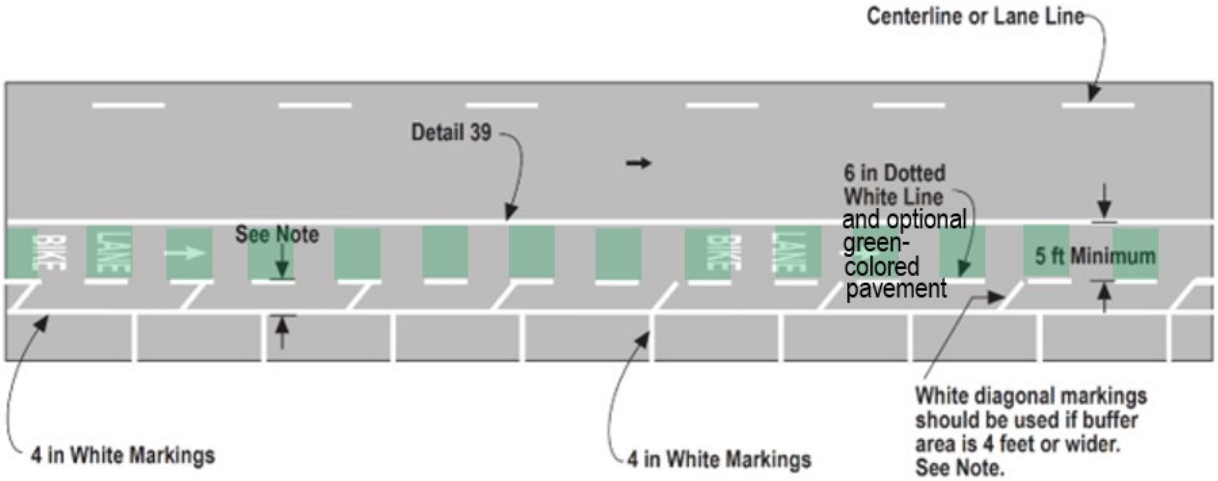
WITH PARKING STALLS

NOT TO SCALE

Note: 18 in Minimum for Buffered Area Width. The Buffer Area Width includes the width of the parallel White Lines.

Figure 9C-104(CA). Examples of Markings for Buffered Bicycle Lanes Where Vehicle Parking is Prohibited/Permitted (Sheet 2 of 2)

BUFFER BETWEEN BICYCLE LANE AND PARKING LANE

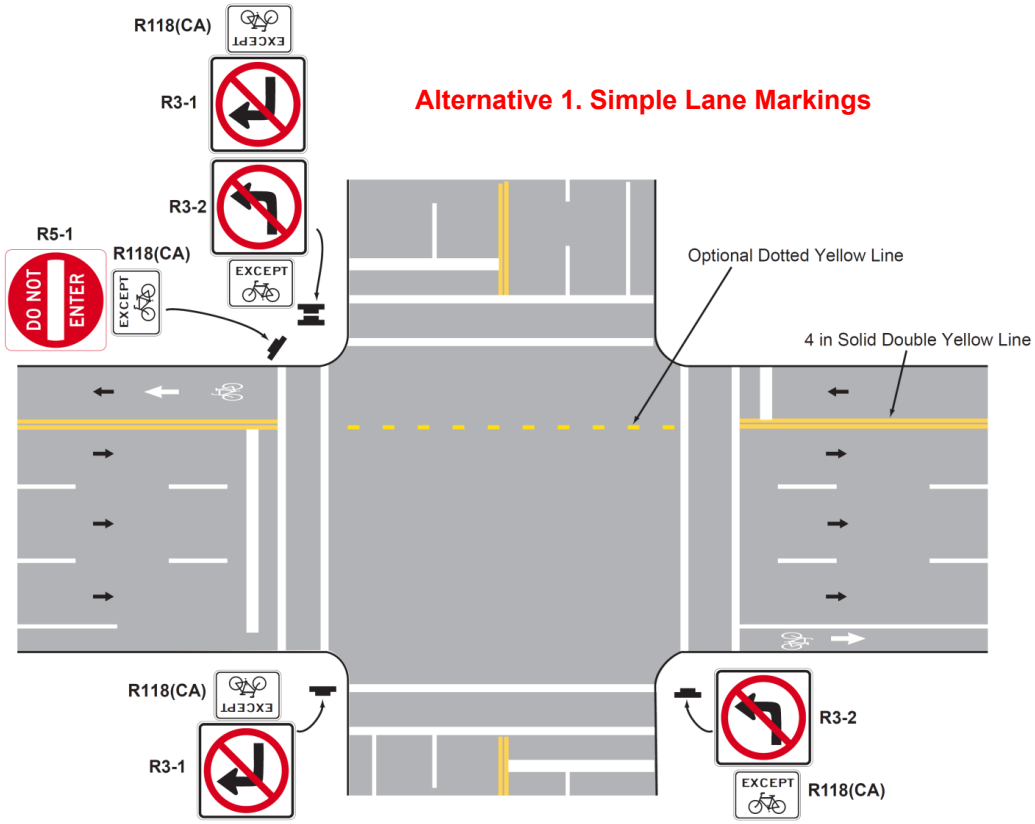


WITH PARKING STALLS

NOT TO SCALE

Note: 18 in Minimum for Buffered Area Width. The Buffer Area Width includes the width of the parallel White Lines.

Figure 9C-105 (CA). Example of Contraflow Bicycle Lanes



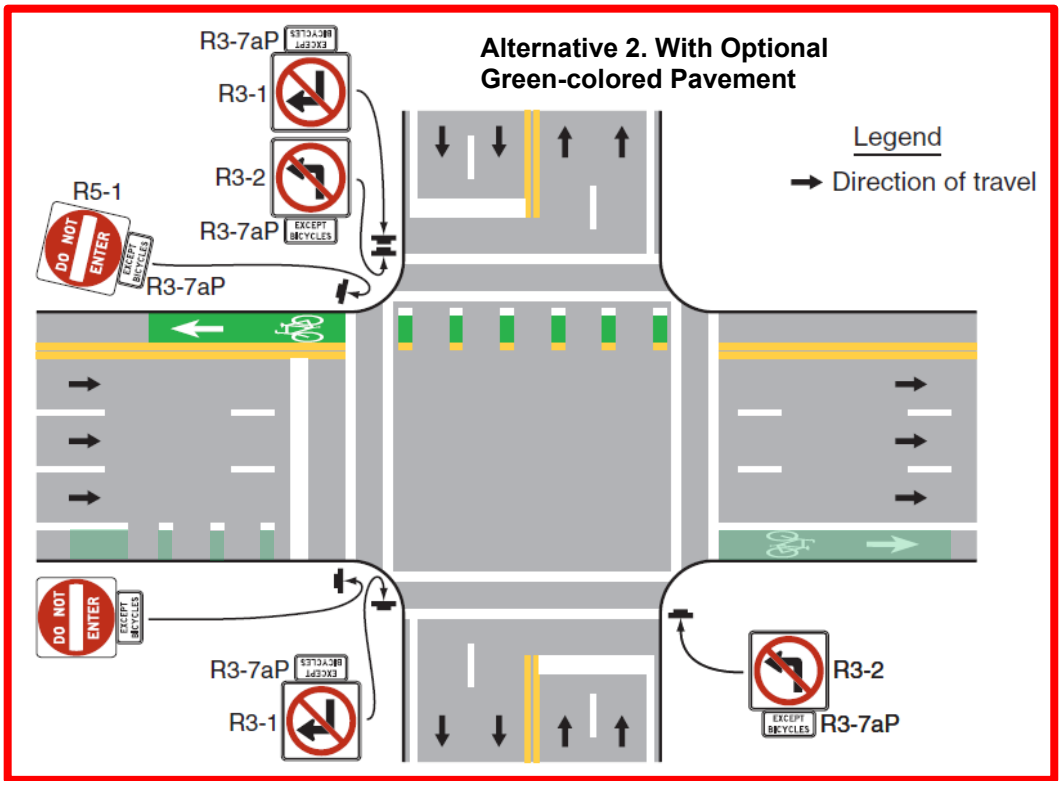

Alternative 2. With Optional Green-colored Pavement
Legend
Direction of travel
R3-7aP
R3-1
R3-2
R3-7aP
R5-1
DO NOT ENTER
EXCEPT BICYCLES
R3-7aP
DO NOT ENTER
EXCEPT BICYCLES
R3-7aP
R3-1
R3-2
EXCEPT BICYCLES
R3-7aP

Figure 9C-106(CA). Examples of Bicycle Lane Extensions Through an Intersection

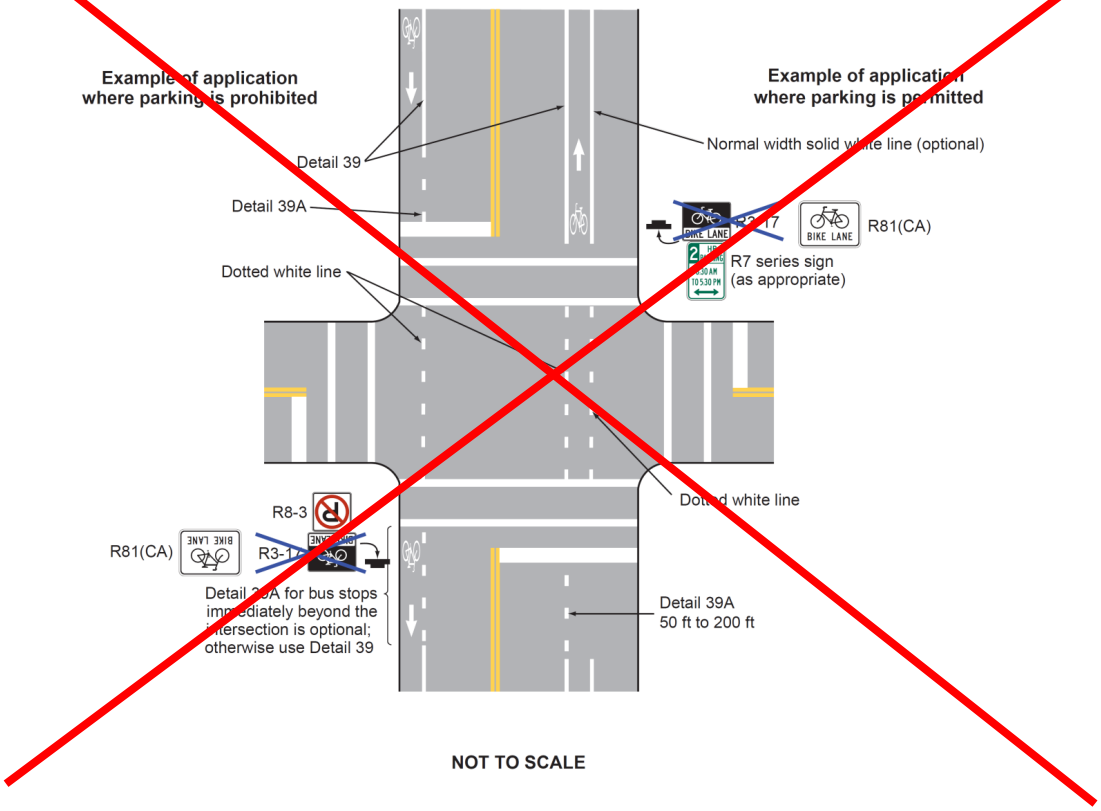


Figure 9C-106(CA). Examples of Bicycle Lane Extensions Through an Intersection

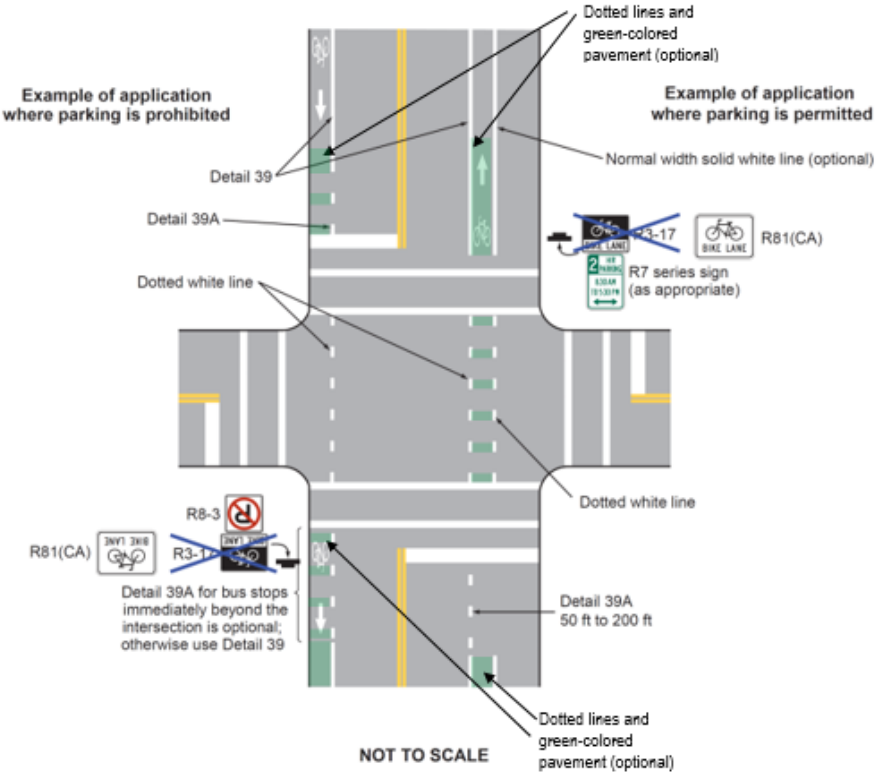


Figure 9C-107 (CA). Example of Marking for a One-Lane Roundabout with Shared Lane Markings and Bicycle Lanes

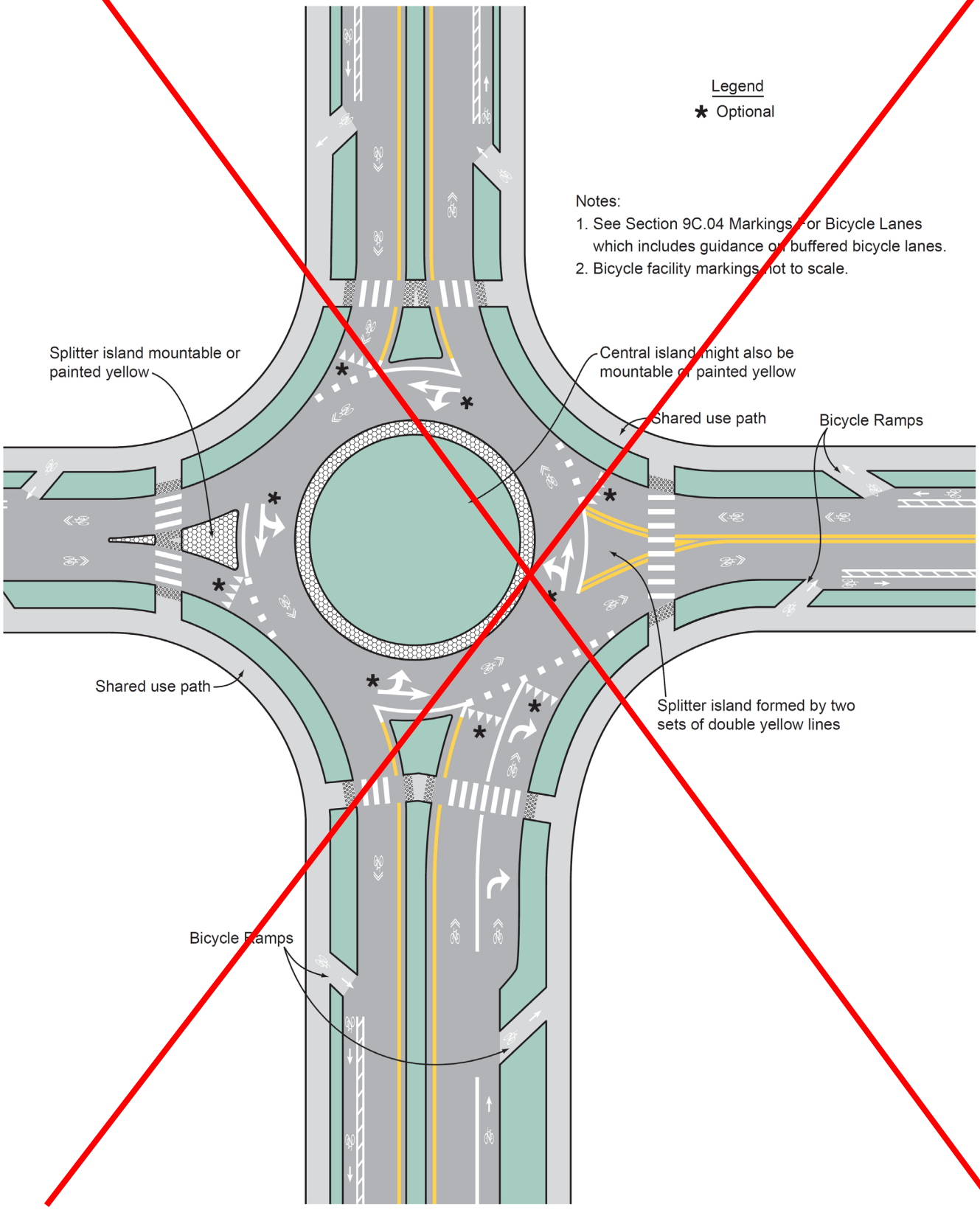


Figure 9C-107 (CA). Example of Marking for a One-Lane Roundabout with Shared Lane Markings and Bicycle Lanes

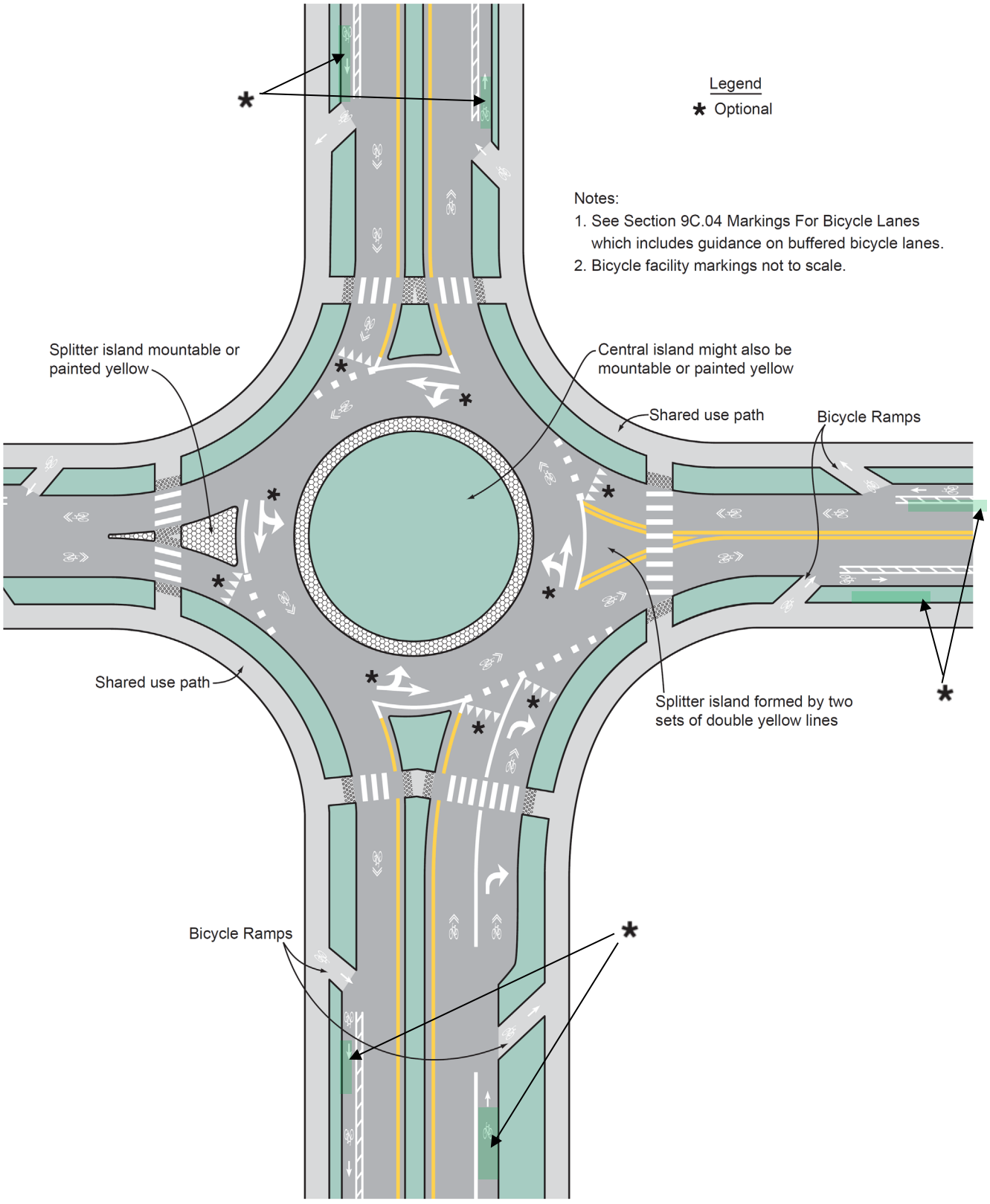


Figure 9C-108 (CA). Example of Placement of Shared Lane Markings

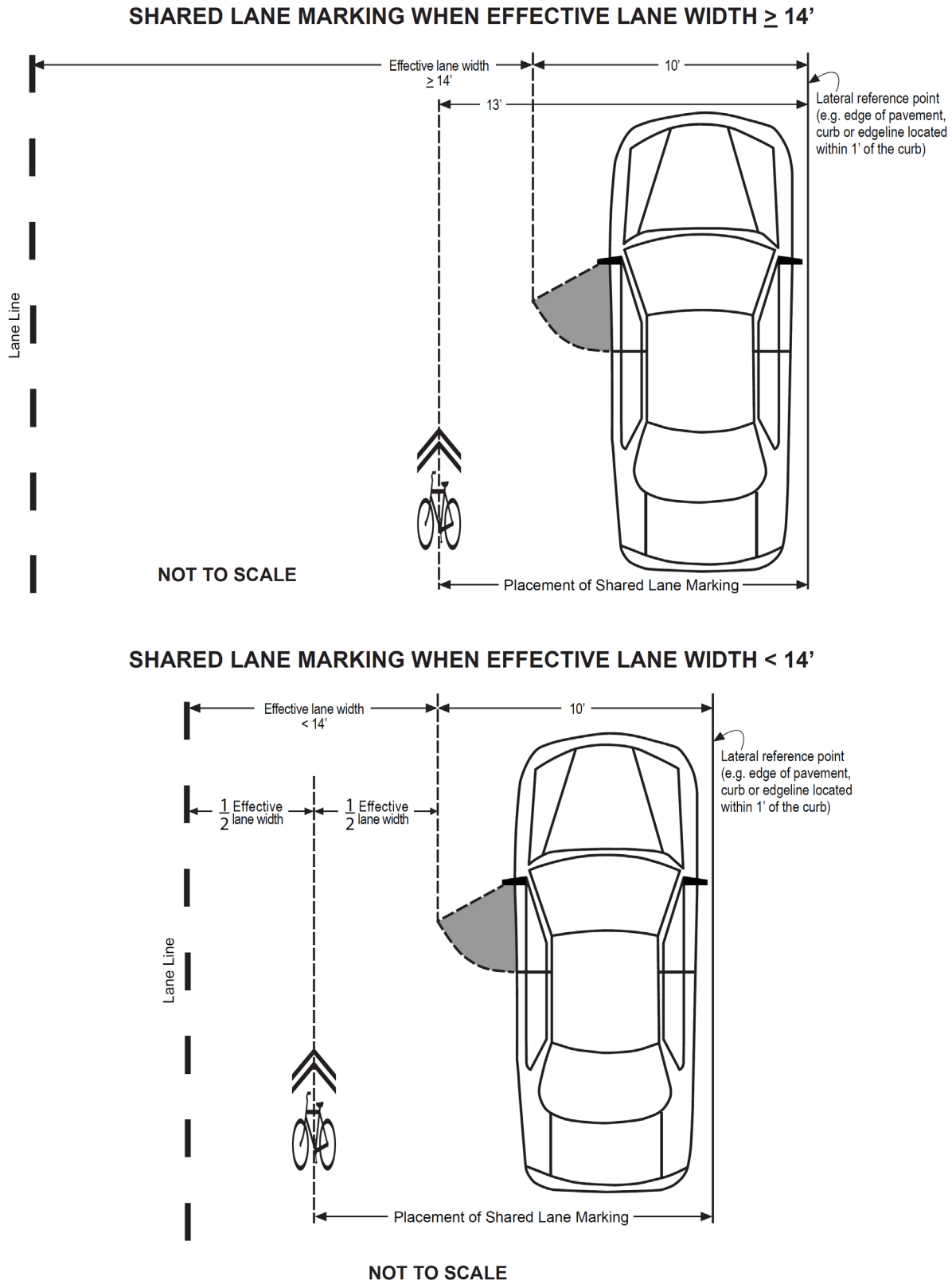
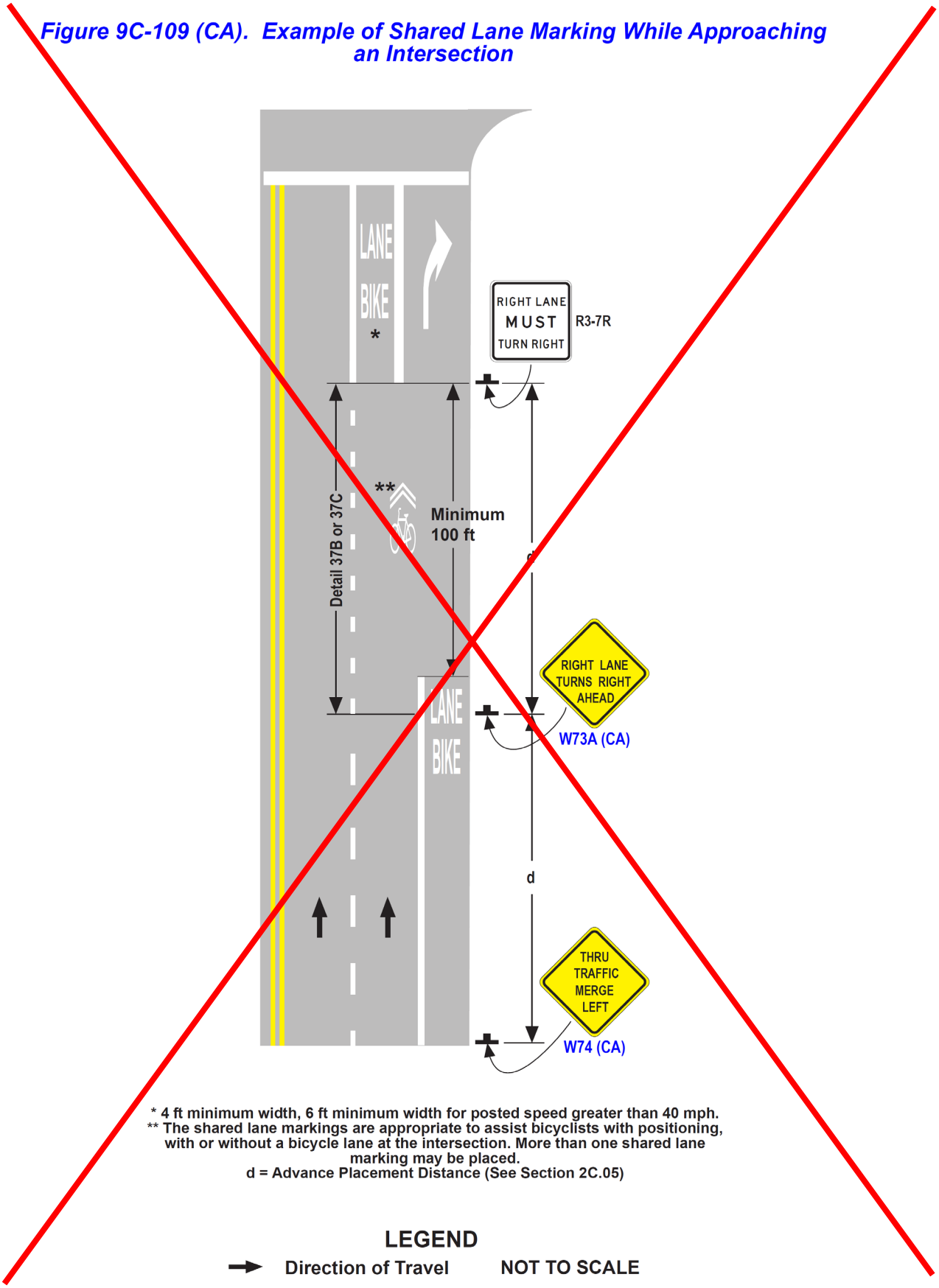


Figure 9C-109 (CA). Example of Shared Lane Marking While Approaching an Intersection



* 4 ft minimum width, 6 ft minimum width for posted speed greater than 40 mph.
** The shared lane markings are appropriate to assist bicyclists with positioning, with or without a bicycle lane at the intersection. More than one shared lane marking may be placed.
d = Advance Placement Distance (See Section 2C.05)

LEGEND

→ Direction of Travel NOT TO SCALE

Figure 9C-109 (CA). Example of Shared Lane Marking While Approaching an Intersection

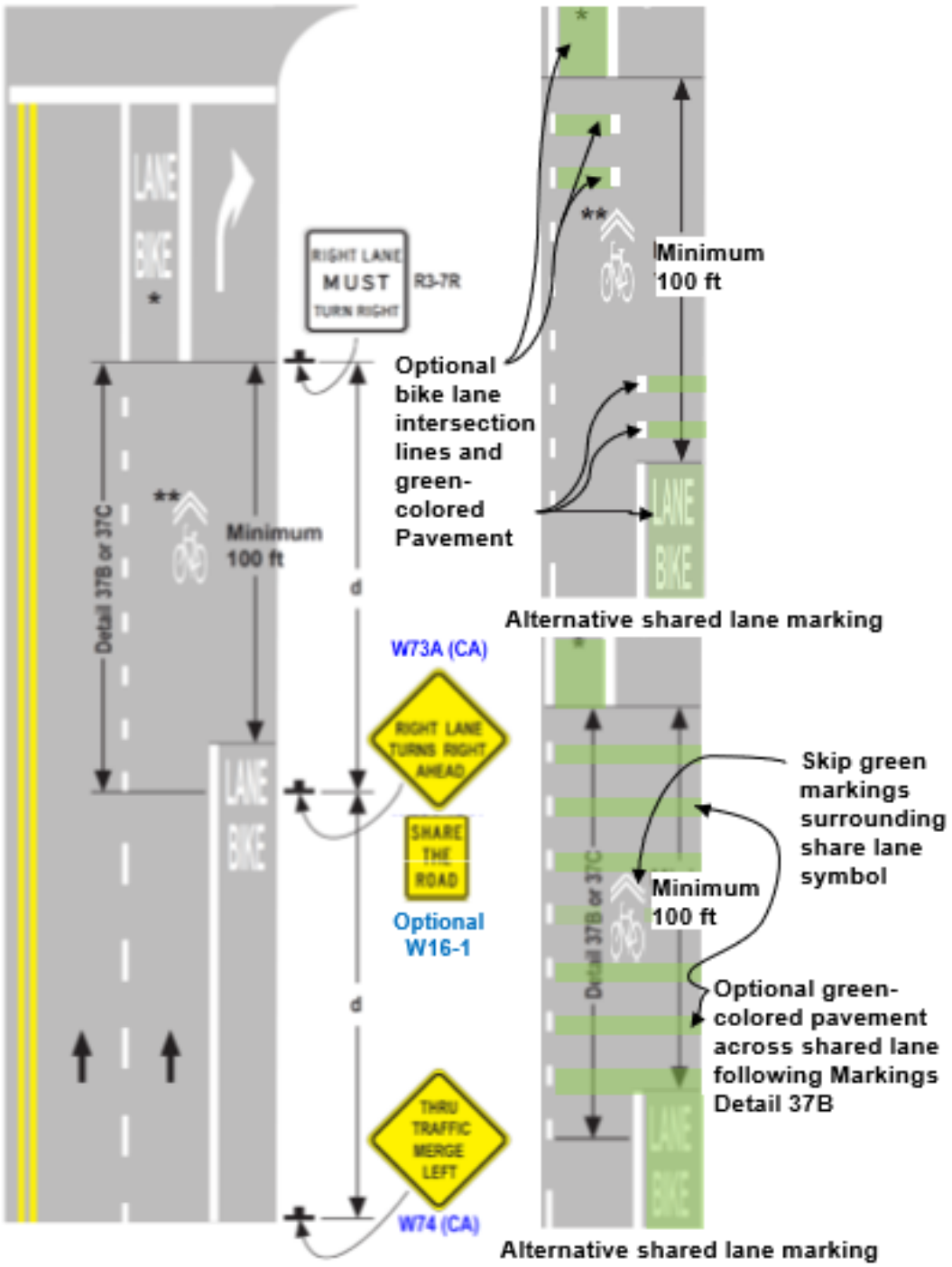
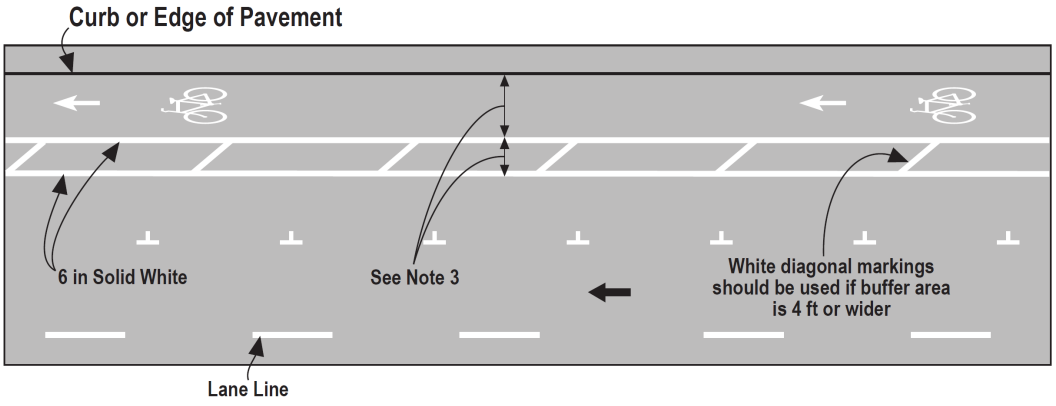
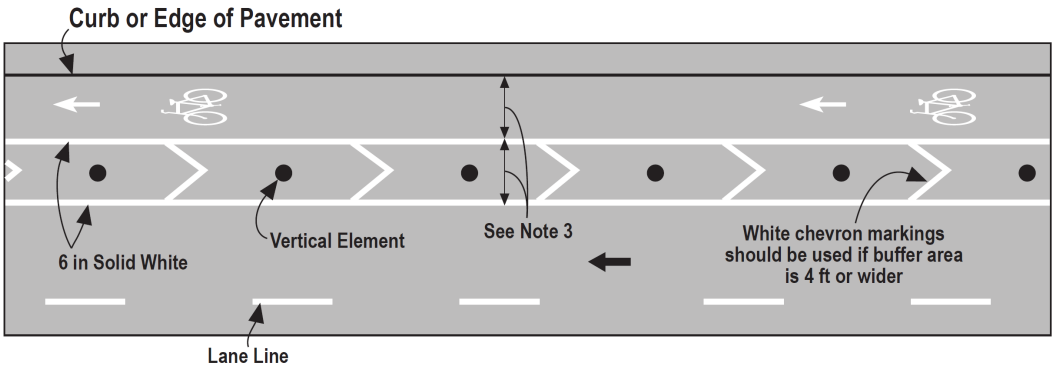


Figure 9C-110 (CA). Examples of Markings for Separated Bikeways (Sheet 1 of ~~2)~~ 4)

One-Way Separated Bikeway With On-Street Parking



One-Way Separated Bikeway On Street With No Parking



NOT TO SCALE

NOTES:

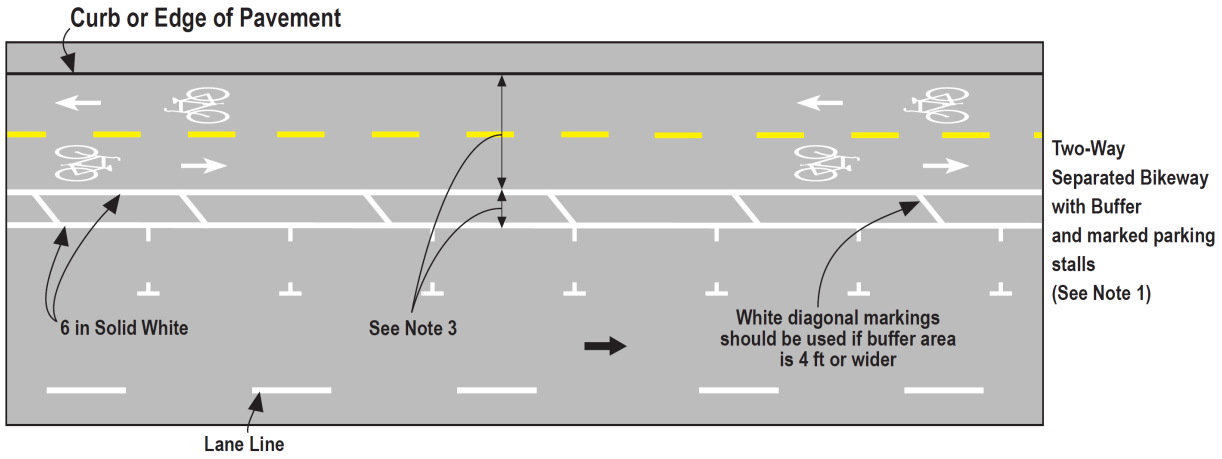
1. **See Figure 3B-21(CA) for examples of parking space markings.**

2. **Vertical elements in the buffer are an important separation feature of the Separated Bikeway. These may include grade separation, flexible posts, inflexible physical barriers, or on-street parking. See DIB 89 for more information.**

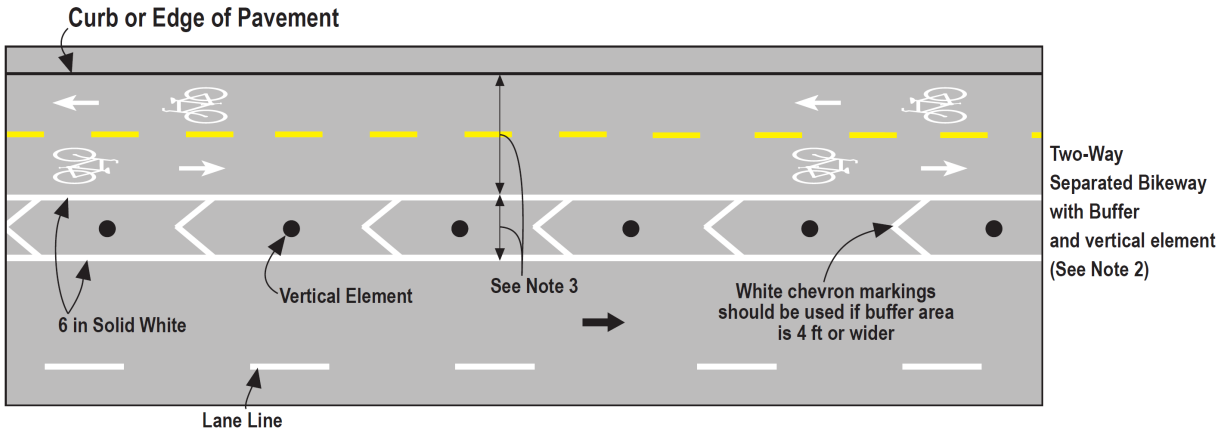
3. **See DIB 89 for separated bikeway width and buffer width.**

Figure 9C-110 (CA). Examples of Markings for Separated Bikeways (Sheet 2 of ~~2)~~ 4)

Two-Way Separated Bikeway With On-Street Parking



Two-Way Separated Bikeway With No Parking



NOT TO SCALE

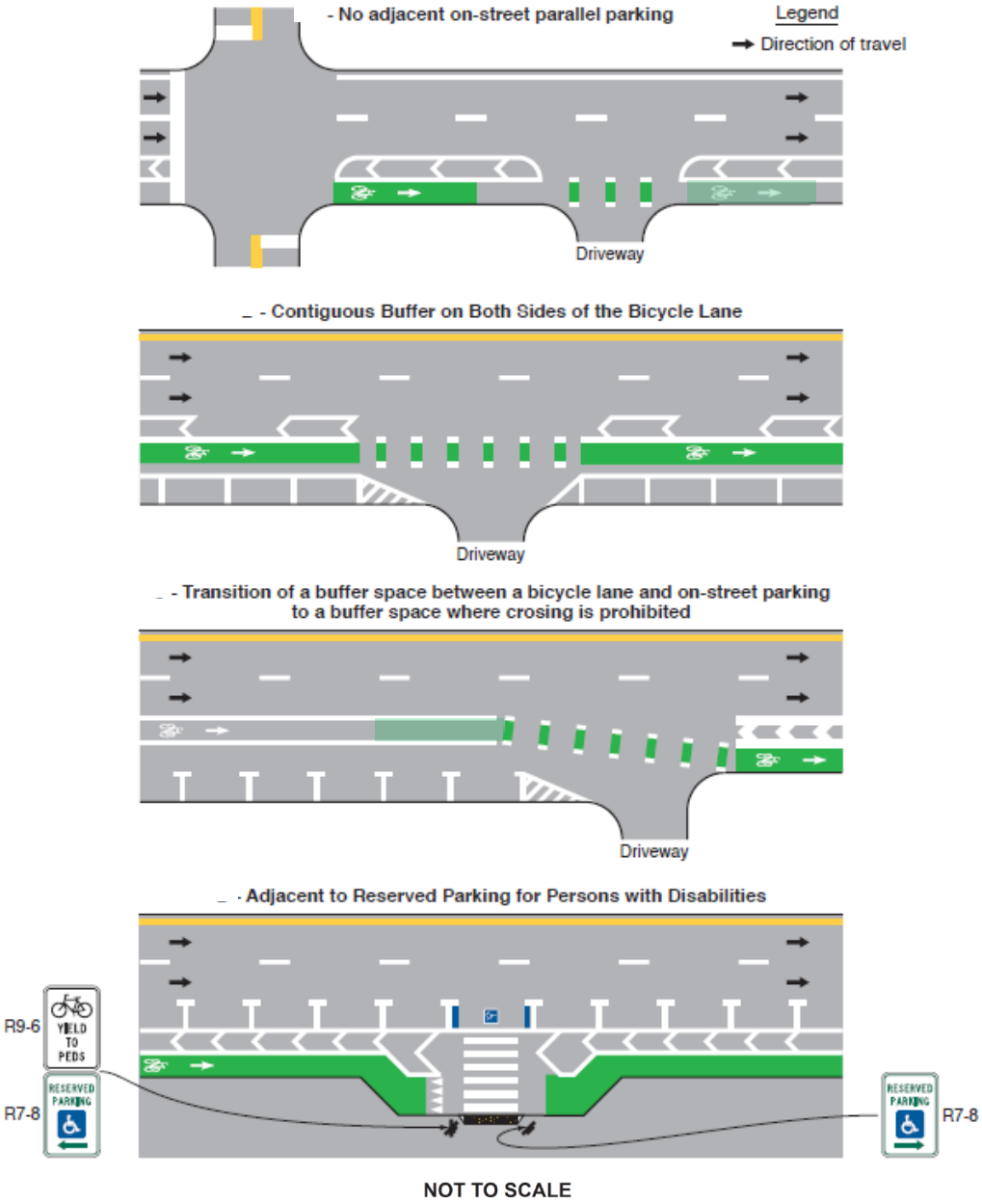
NOTES:

1. **See Figure 3B-21(CA) for examples of parking space markings.**

2. **Vertical elements in the buffer are an important separation feature of the Separated Bikeway. These may include grade separation, flexible posts, inflexible physical barriers, or on-street parking. See DIB 89 for more information.**

3. **See DIB 89 for separated bikeway width and buffer width.**

Figure 9C-110 (CA). Example of Markings for Separated Bikeways (Sheet 3 of 4)



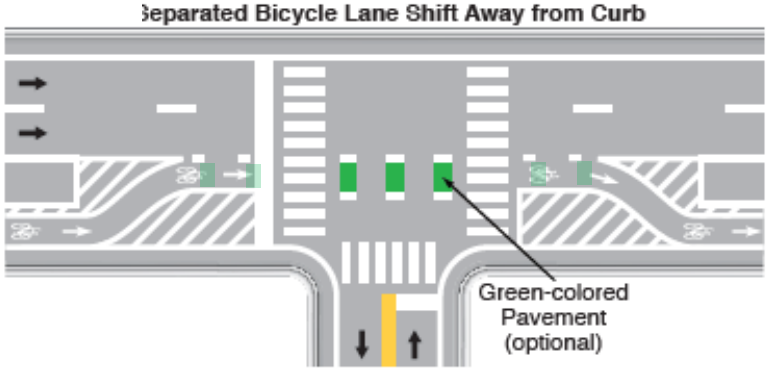
NOT TO SCALE

NOTES:

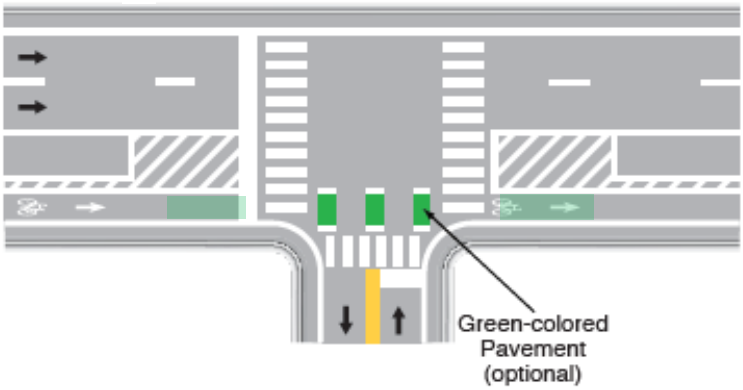
1. See Figure 3B-21(CA) for examples of parking space markings.
2. Vertical elements in the buffer are an important separation feature of the Separated Bikeway. These may include grade separation, flexible posts, inflexible physical barriers, or on-street parking. See DIB 89 for more information.
3. See DIB 89 for separated bikeway width and buffer width.
4. Optional green-colored pavement shown.

Figure 9C-110 (CA). Example of Markings for Separated Bikeways
(Sheet 4 of 4)

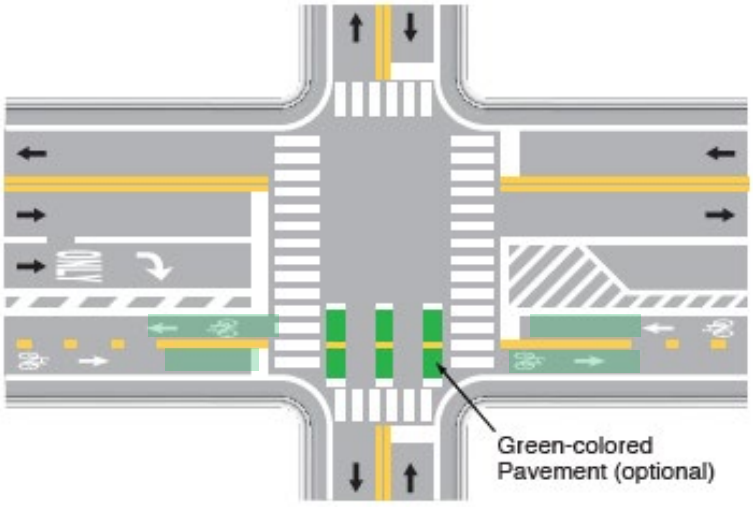
Separated Bicycle Lane Shift Away from Curb



Separated Bicycle Lane at Intersection



Separated Two-Way Bicycle Lane at Intersection



NOT TO SCALE

NOTES:

1. See Figure 3B-21(CA) for examples of parking space markings.
2. Vertical elements in the buffer are an important separation feature of the Separated Bikeway. These may include grade separation, flexible posts, inflexible physical barriers, or on-street parking. See DIB 89 for more information.
3. See DIB 89 for separated bikeway width and buffer width.

Figure 9C-111 (CA). Example of Intersection Pavement Markings and Signs—Bicycle Traveling Straight From Left Turn and Right Turn Only Lanes - One Way

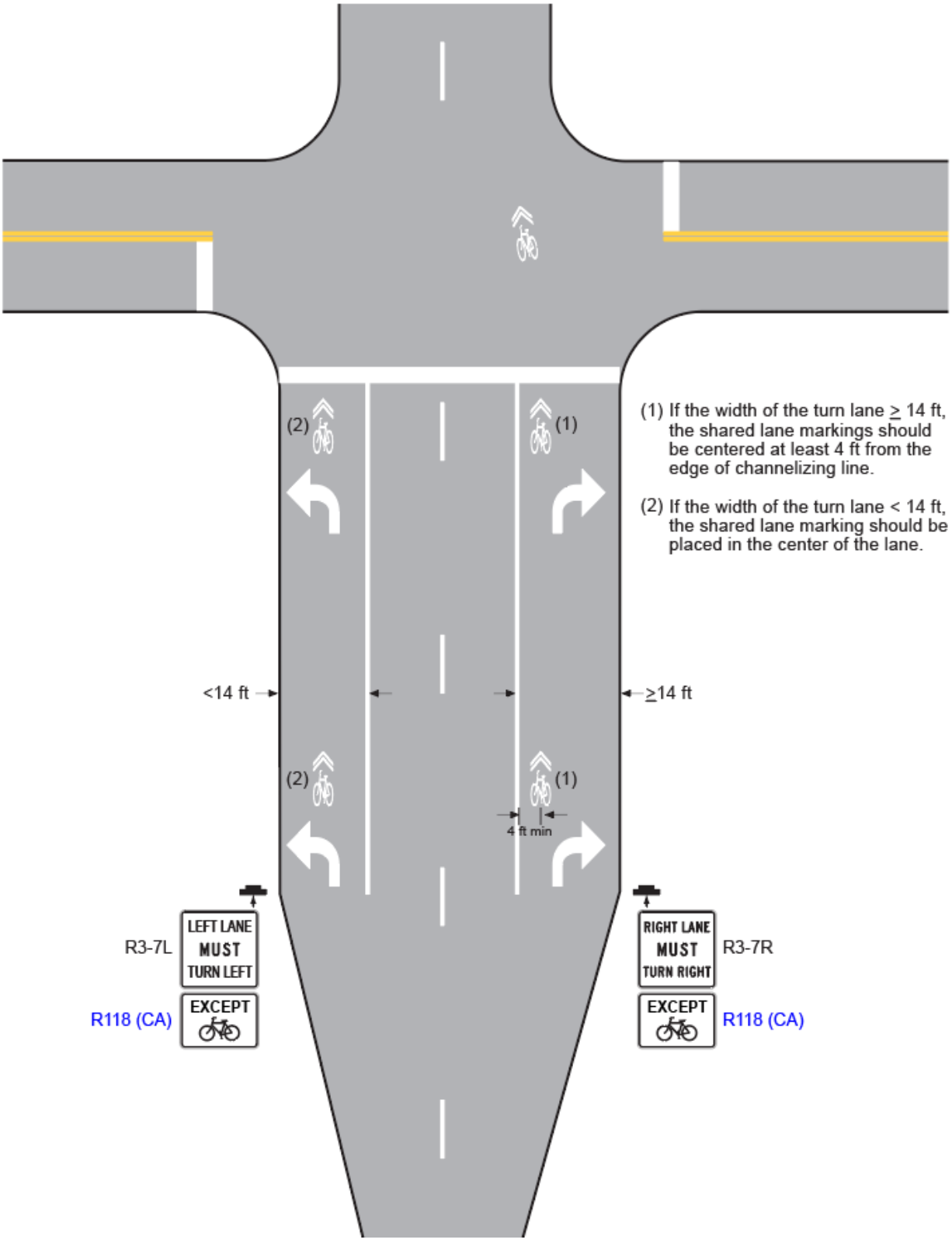
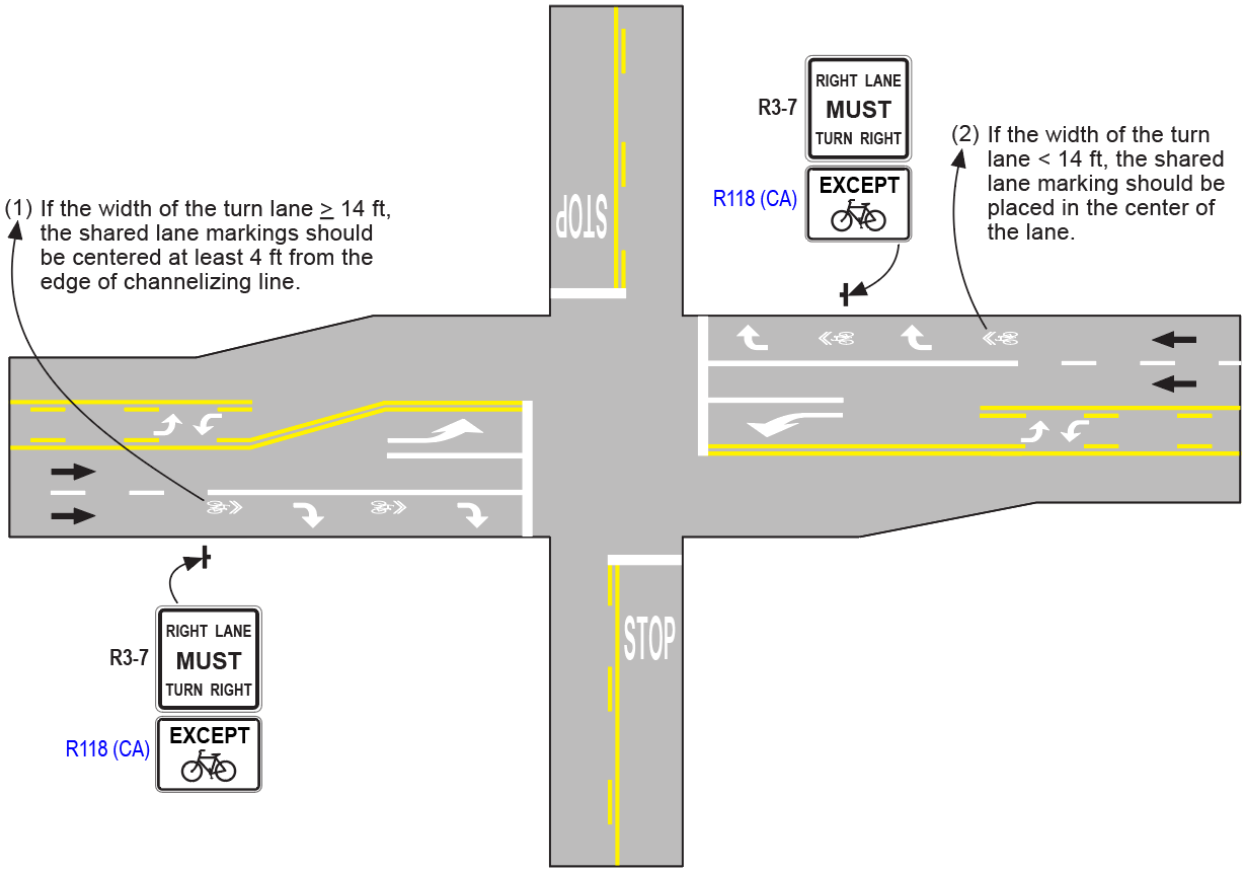


Figure 9C-112 (CA). Example of Intersection Pavement Markings and Signs—Bicycle Traveling Straight From Right Turn Only Lanes



CHAPTER 9D. SIGNALS

Section 9D.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, bicyclists may be counted as either vehicles or pedestrians.

Support:

03 Also refer Part 4 of this Manual for highway traffic signals, in particular:

A. Section 4D.104(CA) – Optional Use of Bicycle Signal Faces.
B. Section 4D.105(CA) – Bicycle Detectors.

Section 9D.02 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.**