

MUTCD 2003

CALIFORNIA SUPPLEMENT

May 20, 2004

PART 9

TRAFFIC CONTROLS FOR BICYCLE FACILITIES



STATE OF CALIFORNIA
BUSINESS, TRANSPORTATION AND HOUSING AGENCY
DEPARTMENT OF TRANSPORTATION

PART 9. TRAFFIC CONTROLS FOR BICYCLE FACILITIES**TABLE OF CONTENTS**

		<u>Page</u>
CHAPTER 9A.	GENERAL	
Section 9A.03	Definitions Relating to Bicycles	9A-1
Section 9A.05	Relation to Other Documents	9A-1
Section 9A.06	Placement Authority	9A-1
Section 9A.101	Traffic Controls for Bicycle Facilities at Rail Crossings	9A-2
CHAPTER 9B.	SIGNS	
Section 9B.01	Application and Placement of Signs	9B-1
Section 9B.04	Bicycle Lane Signs (R3-17, R3-17a, R3-17b)	9B-1
	Comments on MUTCD Figure 9B-2	9B-1
Section 9B.07	NO MOTOR VEHICLES Sign (R5-3)	9B-1
Section 9B.08	No Bicycles Sign (R5-6)	9B-1
Section 9B.10	Bicycle Regulatory Signs (R9-5, R9-6, R10-3)	9B-1
	Comments on MUTCD Figure 9B-3	9B-2
Section 9B.18	Other Bicycle Warning Signs	9B-2
Section 9B.20	Bicycle Route Signs (M1-8, M1-9)	9B-3
Section 9B.101	Freeway Bicycle Signs	9B-3
CHAPTER 9C.	MARKINGS	
Section 9C.02	General Principles	9C-1
Section 9C.03	Marking Patterns and Colors on Shared-Use Paths	9C-1
Section 9C.04	Markings for Bicycle Lanes	9C-1
	Comments on MUTCD Figure 9C-7	9C-7
Section 9C.101	Barrier Posts on Class I Bikeways	9C-7
Section 9C.102	Rumble Strips	9C-7
CHAPTER 9D.	SIGNALS	
Section 9D.01	Application	9D-1
<u>FIGURES</u>		
CHAPTER 9B.	SIGNS	
Figure 9B-101	California Signs for Bicycle Facilities	9B-2
CHAPTER 9C.	MARKINGS	
Figure 9C-101	Markings for Bicycle Lanes	9C-2
Figure 9C-102	Examples of Bicycle Lane Treatment Where Vehicle Parking is Prohibited/Permitted	9C-4
Figure 9C-103	Examples of Bicycle Lane Treatment at Right Turn Only Lanes	9C-5
Figure 9C-104	Examples of Bicycle Lane Treatment through Interchanges	9C-6
Figure 9C-105	Word, Arrow, and Symbol Pavement Markings for Bicycle Lanes	9C-8

Figure 9C-106	Barrier Post Markings	9C-9
Figure 9C-7 (CA)	Bicycle Detector Symbol Pavement Marking for Bicycle Lanes	9C-10

CHAPTER 9A. GENERAL

Section 9A.03 Definitions Relating to Bicycles

The following is added to this section:

Standard:

The following words and phrases, when used in Part 9 of this Supplement, shall have the following meanings:

1. **Bikeway** – All facilities that provide primarily for bicycle travel. Refer California Streets and Highways Code Section 890.4.
2. **Bike Lane** – See Class II Bikeway.
3. **Bike Path** – See Class I Bikeway.
4. **Bike Route** – See Class III Bikeway.
5. **Class I Bikeway (Bike Path)** – Provides a completely separated right of way for the exclusive use of bicycles and pedestrians with crossflow minimized. Refer California Streets and Highways Code Section 890.4.
6. **Class II Bikeway (Bike Lane)** – Provides a striped lane for one-way bike travel on a street or highway. Refer California Streets and Highways Code Section 890.4.
7. **Class III Bikeway (Bike Route)** – Provides for shared use with pedestrian or motor vehicle traffic. Refer California Streets and Highways Code Section 890.4.
8. **Nonmotorized Traffic** – Bicycle and pedestrian component of traffic.
9. **Shared Roadway (No Bikeway Designation)** – A roadway that permits bicycle use but is not officially designated as a bikeway.

Section 9A.05 Relation to Other Documents

The following is added to this section:

Support:

The following is added to the list of informational documents in this section:

- D. “Highway Design Manual”, 2001 Edition (Department of Transportation)

Section 9A.06 Placement Authority

The following is added to this section:

Support:

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

1. Section 887 – Definition of nonmotorized transportation facility.
2. Section 887.6 – Agreements with local agencies to construct and maintain nonmotorized transportation facilities.
3. Section 888 – Severance of existing major nonmotorized route by freeway construction.
4. Section 888.2 – Incorporation of nonmotorized transportation facilities in the design of freeways.
5. Section 890.2 – Definition of bicycle.
6. Section 890.4 – Definitions of Class I, II, and III bikeways.
7. Section 890.6 – The Department of Transportation, 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.
8. Section 890.8 - The Department of Transportation to establish uniform specifications and symbols for signs, markers, and traffic control devices for bikeways and roadways where bicycle travel is permitted.
9. Section 891 – Local agencies must comply with design criteria and uniform specifications and symbols for signs, markers, and traffic control devices established by the Department of Transportation.

10. Section 891.2 – Local agencies bicycle transportation plan.
11. Section 892 – Use of abandoned right of way as a nonmotorized transportation facility.
The following references from the California Vehicle Code relate to bicycles:
 1. Section 231 – Definition of bicycle.
 2. Section 21100 – Local rules and regulations of bicycles on public sidewalks.
 3. Section 21113 – Use of bicycles on public grounds.
 4. Section 21200 – Laws applicable to bicycle use and peace officer exemption.
 5. Section 21202 – Operation on roadway.
 6. Section 21206 – Local Regulation.
 7. Section 21207 – Bicycle lanes.
 8. Section 21207.5 – Prohibited operation of motorized bicycles.
 9. Section 21208 – Permitted movements from bicycle lanes.
 10. Section 21209 – Motor vehicles and motorized bicycles in bicycle lanes.
 11. Section 21210 – Bicycle parking.
 12. Section 21211 – Obstruction of bikeways or bicycle paths or trails.
 13. Section 21212 – Youth bicycle helmets.
 14. Section 21229 – Operation of motorized scooters in bicycle lanes.
 15. Section 21230 – Operation of motorized scooters on bicycle paths, trails or bikeways.
 16. Section 21456.2 – Bicycles and traffic signals.
 17. Section 21456.3 – Bicycle signals.
 18. Section 21650.1 – Bicycle operated on roadway or highway shoulder.
 19. Section 21717 – Turning across bicycle lane.
 20. Section 21750 – Overtake and pass to left.
 21. Section 21960 – Use of freeway shoulder by bicyclists.
 22. Section 21966 – Pedestrians in bicycle lanes.

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

Standard:

Any bicycle facility traversing an at-grade railroad crossing shall conform to Parts 8 and 10.

CHAPTER 9B. SIGNS

Section 9B.01 Application and Placement of Signs

The following is added to this section:

Support:

California signs for bicycle facilities are shown in Figure 9B-101 of this Supplement.

Section 9B.04 Bicycle Lane Signs (R3-17, R3-17a, R3-17b)

The following is added to this section:

Standard:

This section is deleted and replaced with the following:

The Bike Lane (CA Code R81) sign shall be placed at the beginning of each designated Bike Lane and along each Bike Lane at every arterial street, at all major changes in direction, and at maximum 800 m (1/2 mile) intervals. The R81 (CA Code) sign shall be used to regulate bicycle and motor vehicle traffic, in accordance with CVC Sections 21207, 21207.5, 21208, 21209 and 21717.

Option:

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

Figure 9B-2 Regulatory Signs for Bicycle Facilities

Standard:

The following signs shall not be used in California and are deleted and replaced as follows:

- **NO MOTOR VEHICLES (R5-3). Use R44A (CA Code) sign, instead. Refer Section 9B.07 of this Supplement.**
- **Bicycle Regulatory Sign R9-5. Use R62C (CA Code) sign, instead. Refer Section 9B.10 of this Supplement.**

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

Standard:

This section is deleted and replaced with the following:

Option:

The Bike Path Exclusion (CA Code R44A) sign may be used to identify a bike path 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:

The R44A (CA Code) sign is shown in Figure 9B-101.

Section 9B.08 No Bicycles Sign (R5-6)

Option:

In Paragraph 1 ("Where bicyclists..."), the word "should" is changed to "may".

Section 9B.10 Bicycle Regulatory Signs (R9-5, R9-6, R10-3)

Standard:

The R9-5 sign is deleted in this section. The Bike/Push Button for Green Light (CA Code R62C) sign shall be used instead.

Figure 9B-101. California Signs for Bicycle Facilities



Figure 9B-3 Warning Signs for Bicycle Facilities

Standard:

No sign shall have a metric unit or message, except per CVC 21351.3. Hence, the Low Clearance (W12-2) sign shall not be used in California with a metric message unless specifically allowed per CVC 21351.3.

Section 9B.18 Other Bicycle Warning Signs

The following is added to this section:

Support:

Refer Section 8B.19 for Skewed Crossing Sign (W10-12).

Section 9B.20 Bicycle Route Signs (M1-8, M1-9)

The following is added to this section:

Option:

The Bicycle Route Number Marker (CA Code SG45) 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 Code) sign on State highways is responsible for furnishing, installing and maintaining the signs.

Guidance:

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 Code) signs on State highways.

Option:

The Bicycle Route Name Marker (CA Code S17) 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.

Section 9B.101 Freeway Bicycle Signs

Support:

Refer Section 2B.36 and CVC 21960 for restrictions on use of freeways.

Refer Section 2B.36 for PEDESTRIANS BICYCLES MOTOR-DRIVEN CYCLES PROHIBITED (R5-10a) sign.

Standard:

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

Guidance:

The PEDESTRIANS BICYCLES MOTOR-DRIVEN CYCLES PROHIBITED (R5-10a) sign should be placed beyond the exit ramp gore as a follow-up message to the R44B (CA Code) sign.

Standard:

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

Support:

The R44B and R44C (CA Codes) signs are shown in Figure 9B-101.

CHAPTER 9C. MARKINGS

Section 9C.02 General Principles

The following is added to this section:

Standard:

On State highways, markings material shall conform to Sections 84-2.02 and 84-3.02 of the Standard Specifications published by the Department of Transportation.

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

The following is added to this section:

Support:

Class III Bikeways (Bike Route) are shared routes and do not require pavement markings. In some instances, a 100 mm (4 in) 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.

Section 9C.04 Markings for Bicycle Lanes

Guidance:

In Paragraph 8 (“When the right ...”), the phrase “at least 100 feet” is changed to “30 to 60 m (100 to 200 ft)”.

The following is added to this section:

Option:

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

Bicycle Lane Markings on Class II Bikeways (Bike Lane)

Guidance:

Bicycle lane markings on Class II Bikeways (Bike Lane) should be placed a constant distance from the outside motor vehicle lane. Bike lanes with parking permitted (3.3 m (11 ft) to 3.9 m (13 ft) between the bike lane line and the curb) 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:

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

Guidance:

Where motor vehicle 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 right turns are permitted, the solid stripe should terminate 30 m (100 ft) to 60 m (200 ft) prior to the intersection.

Option:

A dashed line, as shown in Figure 9C-102, may be carried to, or near, the intersection. Where city blocks are short (less than 120 m (400 ft)), the length of dashed stripe may be 30 m (100 ft).

Guidance:

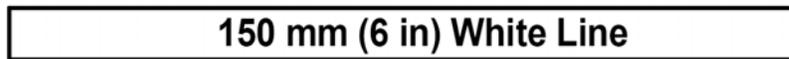
Where blocks are longer or vehicle speeds are high (greater than 60 km/h (35 mph)), the length of dashed stripe should be increased to 60 m (200 ft).

Standard:

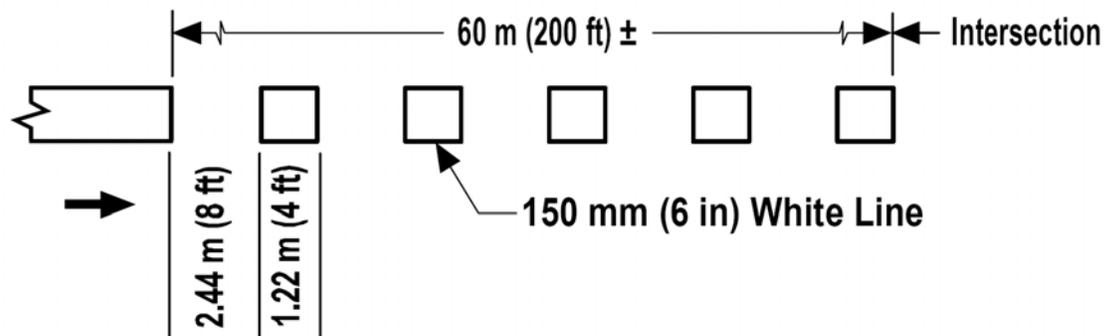
Raised barriers (e.g., raised traffic bars and asphalt concrete dikes) or raised pavement markers shall not be used to delineate bike lanes on Class II Bikeways (Bike Lane).

Figure 9C-101. Markings for Bicycle Lanes

DETAIL 39 - Bike Lane Line



DETAIL 39A - Bike Lane Intersection Line



NOT TO SCALE

Support:

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

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.

Bicycle Lane Treatment at Right Turn Only Lanes

Guidance:

Markings shown in Figure 9C-103 of this Supplement should be used for bike lanes crossing a motorist right-turn-only lane.

Support:

When confronted with such intersections, bicyclists will have to merge with right-turning motorists. Since bicyclists are typically traveling at speeds less than motorists, they need to signal and merge where there is sufficient gap in right-turning traffic, rather than at any predetermined location.

Guidance:

For this reason, all delineation should be dropped at the approach of the right-turn lane. A pair of parallel lines (delineating a bike lane crossing) to channel the bike merge should not be used, as bicyclists

will be encouraged to cross at a predetermined location, rather than when there is a safe gap in right-turning traffic.

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:

A Bicycle Crossing (W11-1) sign may be used to warn motorists of the potential for bicyclists crossing their path. See Section 9B.17.

When a bike lane approaches a ramp intersection that intersects the local facility at or close to 90° (typical of a compact or spread diamond configuration), then Figure 9C-103 may be the appropriate method of getting bike lanes through the interchange.

Guidance:

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-104 should be used.

Bicycle Lane Treatment through Interchanges

Support:

Markings for a bike lane through a typical interchange are shown in Figure 9C-104 of this Supplement.

Guidance:

The 150 mm (6 in) bike lane stripe should be dropped 30 m (100 ft) prior to the ramp intersection as shown in Figure 9C-104 to allow for adequate weaving distance.

Option:

Figure 9C-104 may also be used where the preferred designation is a Class III Bikeway (Bike Route), with the Bike Lane (CA Code R81) signs being replaced with Bike Route (D11-1) signs and the bike lane delineation eliminated. A 100 mm (4 in) stripe may be used to delineate the shoulder through out the bike route designation.

Standard:

Signing and striping as shown in Figure 9C-104 shall be repeated at additional onramps within the interchange.

Guidance:

Where the onramps intersect at the local road at or near 90°, the striping should be per Figure 9C-103.

Standard:

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 1.2 m (4 ft), or 1.5 m (5 ft) 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:

Markings for a bike lane where vehicle parking is prohibited or permitted are shown in Figure 9C-102 of this Supplement.

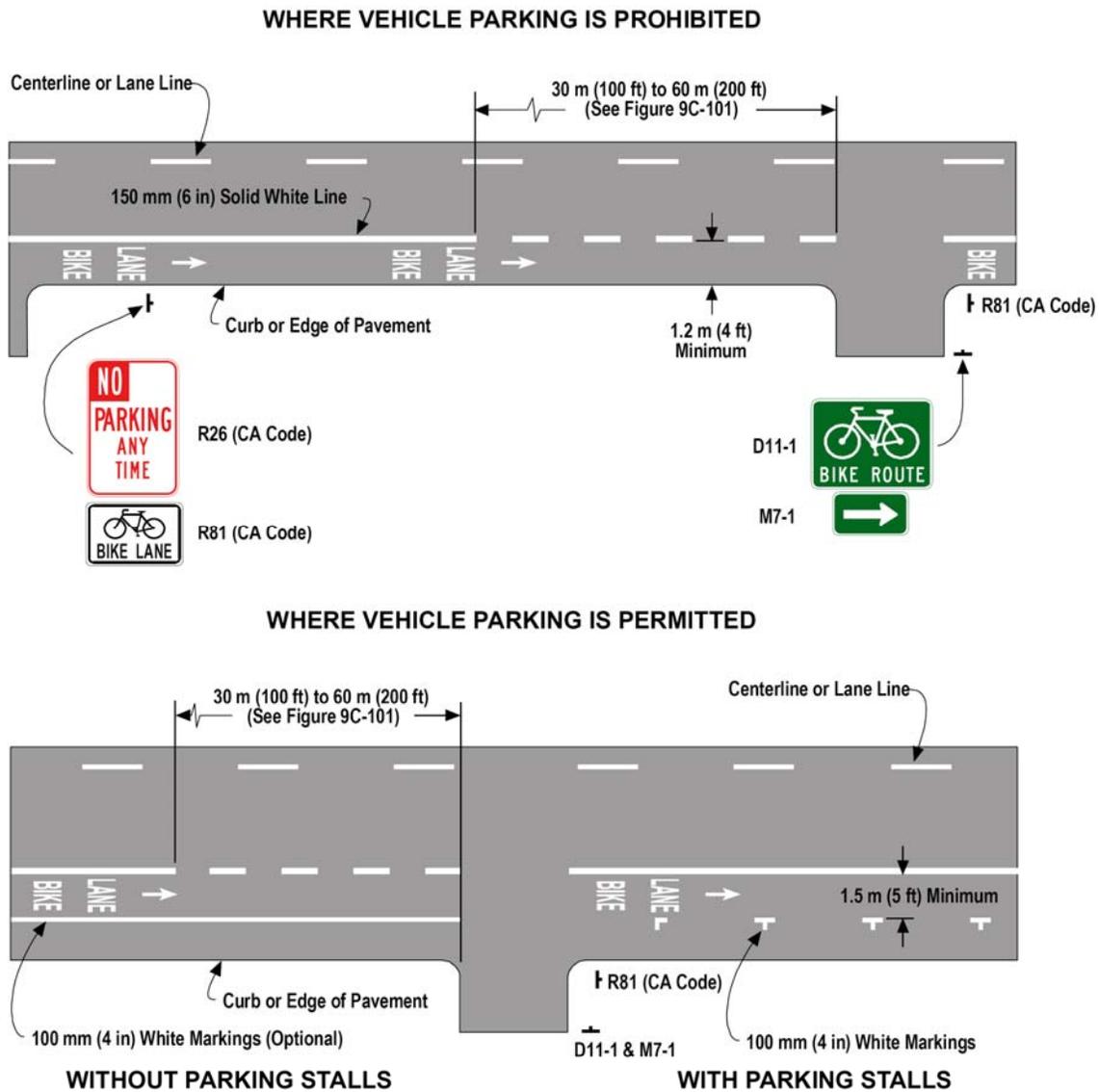
Standard:

Where motorist right turns are permitted, the solid bike lane shall either be dropped entirely, or dashed (Refer Bike Intersection lane, Detail 39A, shown in Figure 9C-101) beginning at a point between 30 m (100 ft) and 60 m (200 ft) in advance of the intersection.

Option:

In areas where parking stalls are not necessary (because parking is light), a 100 mm (4 in) 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.

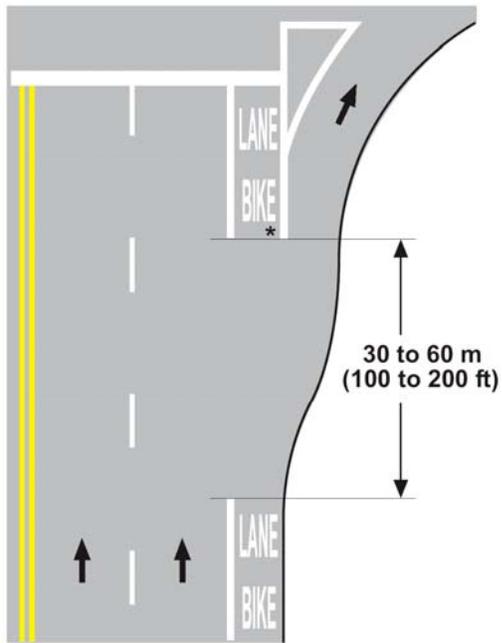
Figure 9C-102. Examples of Bicycle Lane Treatment Where Vehicle Parking is Prohibited/Permitted



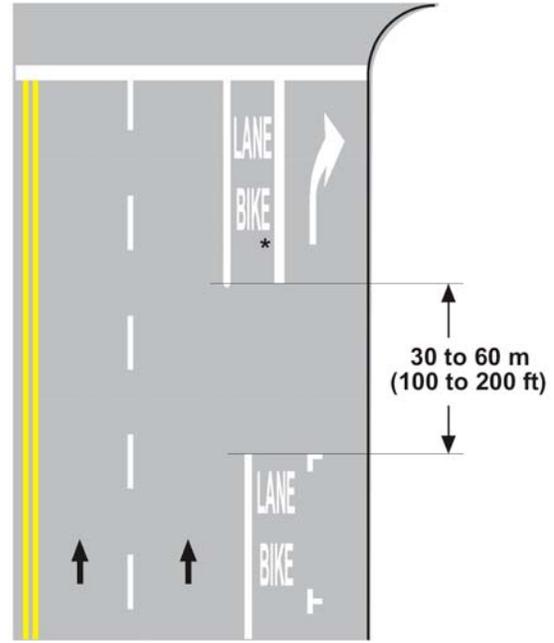
NOT TO SCALE

NOTE: For rolled curb and curb and gutter applications, refer to the Department of Transportation's Highway Design Manual, Figure 1003.2A.

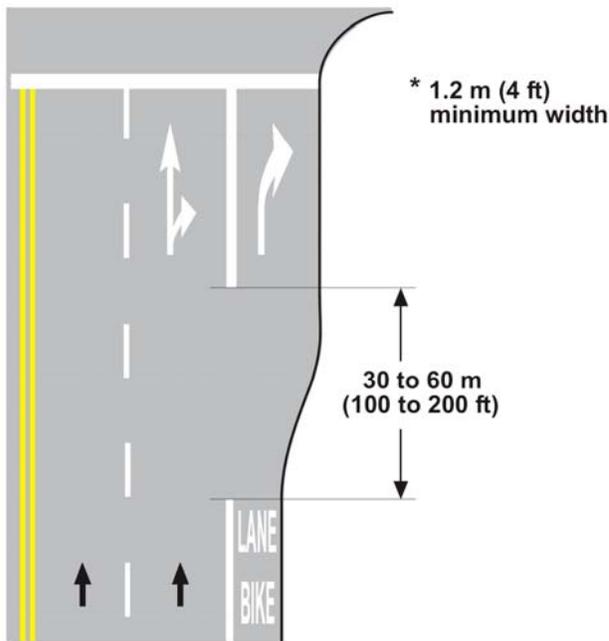
Figure 9C-103. Examples of Bicycle Lane Treatment at Right Turn Only Lanes



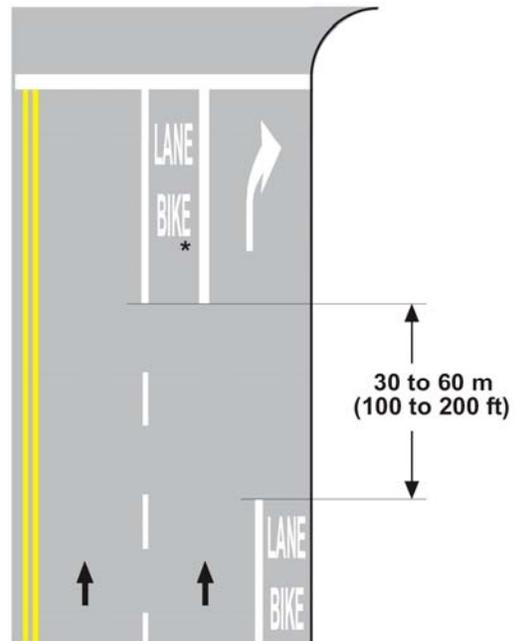
a - Right-Turn-Only Lane



b - Parking Area Becomes Right-Turn-Only Lane



c - Optional Double Right-Turn-Only Lane

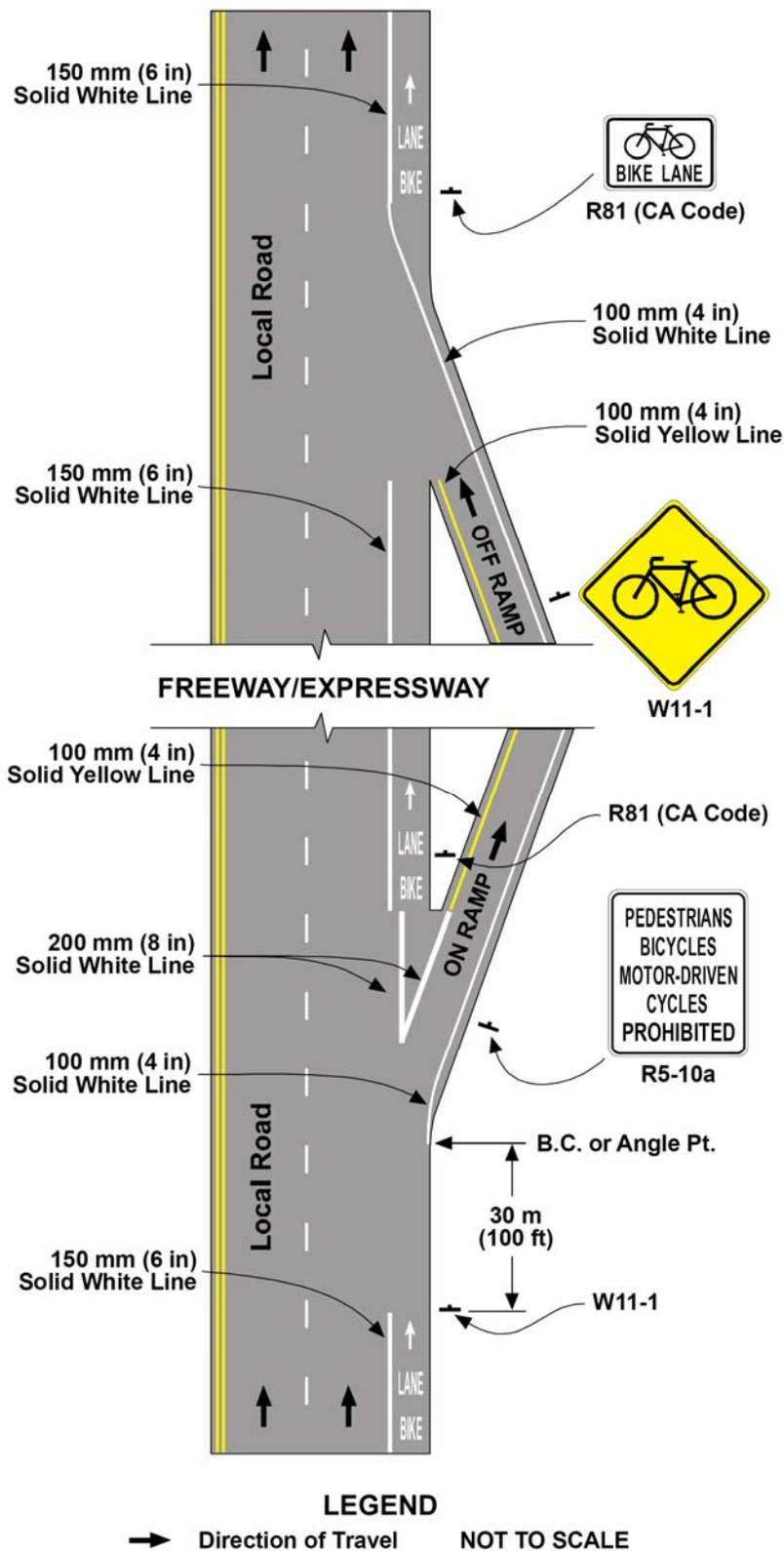


d - Right Lane Becomes Right-Turn-Only Lane

LEGEND

➔ Direction of Travel NOT TO SCALE

Figure 9C-104. Examples of Bicycle Lane Treatment Through Interchanges



BIKE LANE Pavement Markings**Standard:**

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

Option:

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

Support:

An example of BIKE LANE pavement markings is shown in Figure 9C-102.

Option:

Optional word, arrow and symbol markings shown in Figure 9C-105 may be used.

Figure 9C-7. Example of Bicycle Detector Pavement Marking**Standard:**

MUTCD Figure 9C-7 is deleted and replaced with Figure 9C-7 (CA).

Section 9C.101 Barrier Posts on Class I Bikeways**Support:**

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 night (i.e., install reflectors or reflectorized tape).

Guidance:

An envelope around the barriers should be striped as shown in Figure 9C-106. If sight distance is limited, special advance warning signs or painted pavement warnings should be provided. Where more than one post is necessary, 1.5 m (5 ft) 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:

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

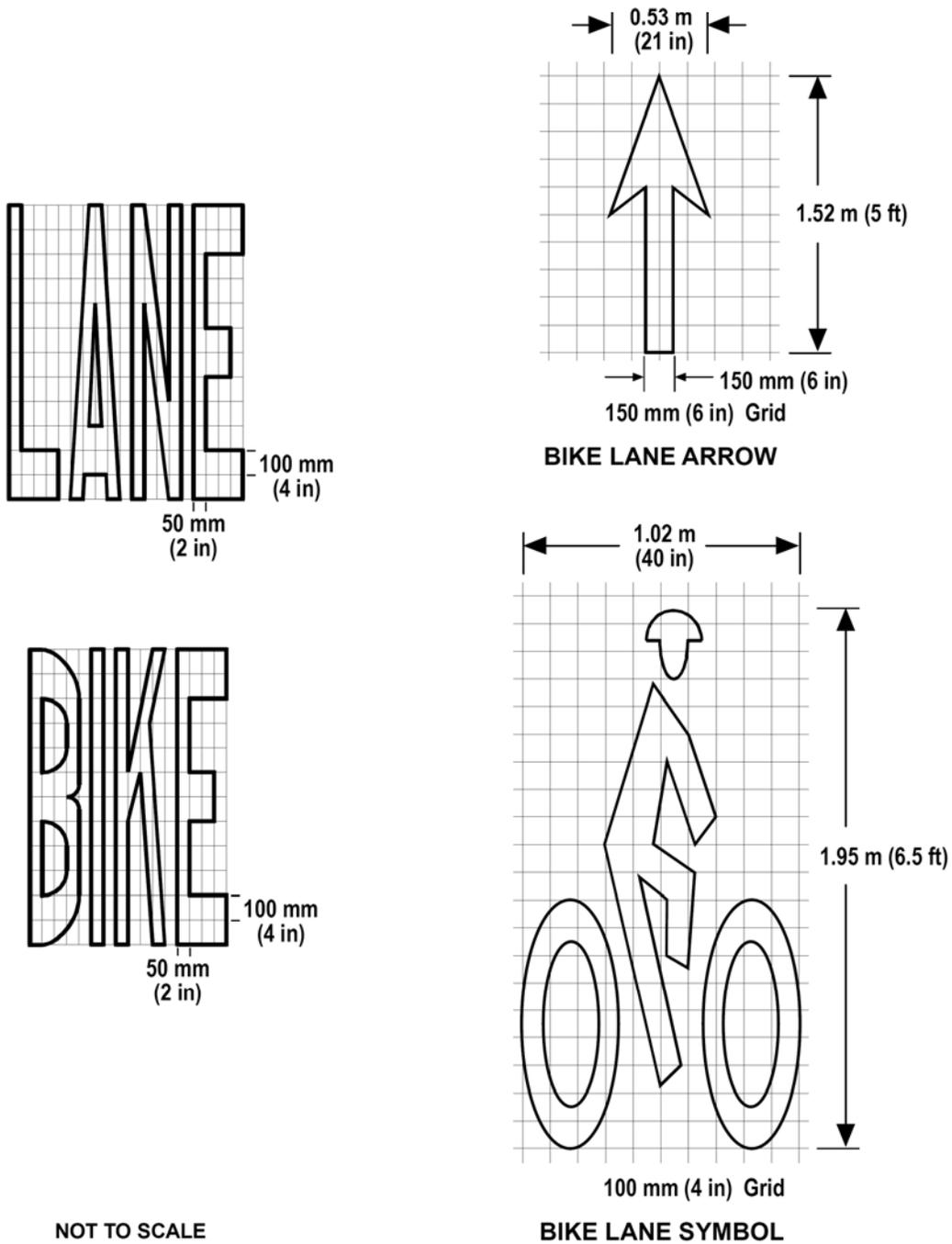
Guidance:

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

Section 9C.102 Rumble Strips**Support:**

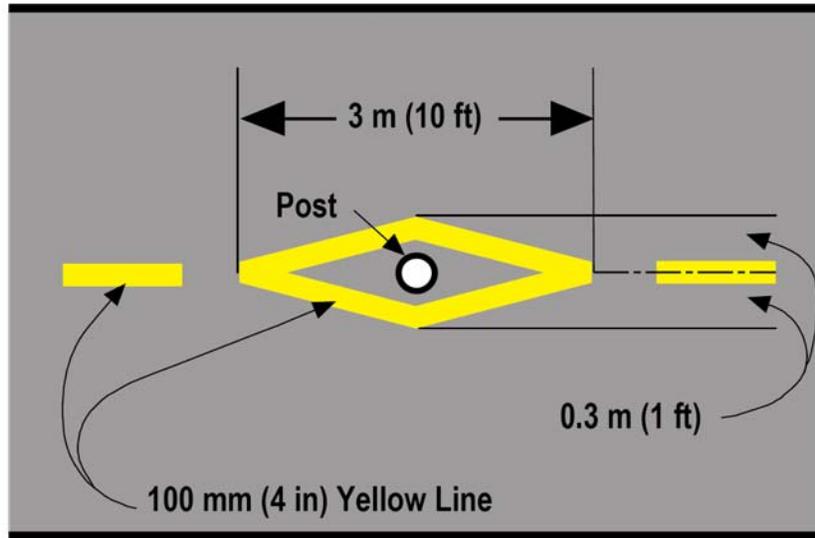
Shoulder rumble strips are not suitable as a riding surface for bicycles. Refer to Section 3B.106 of this Supplement for more information on rumble strips and bicyclists.

Figure 9C-105. Word, Arrow, and Symbol Pavement Markings for Bicycle Lanes



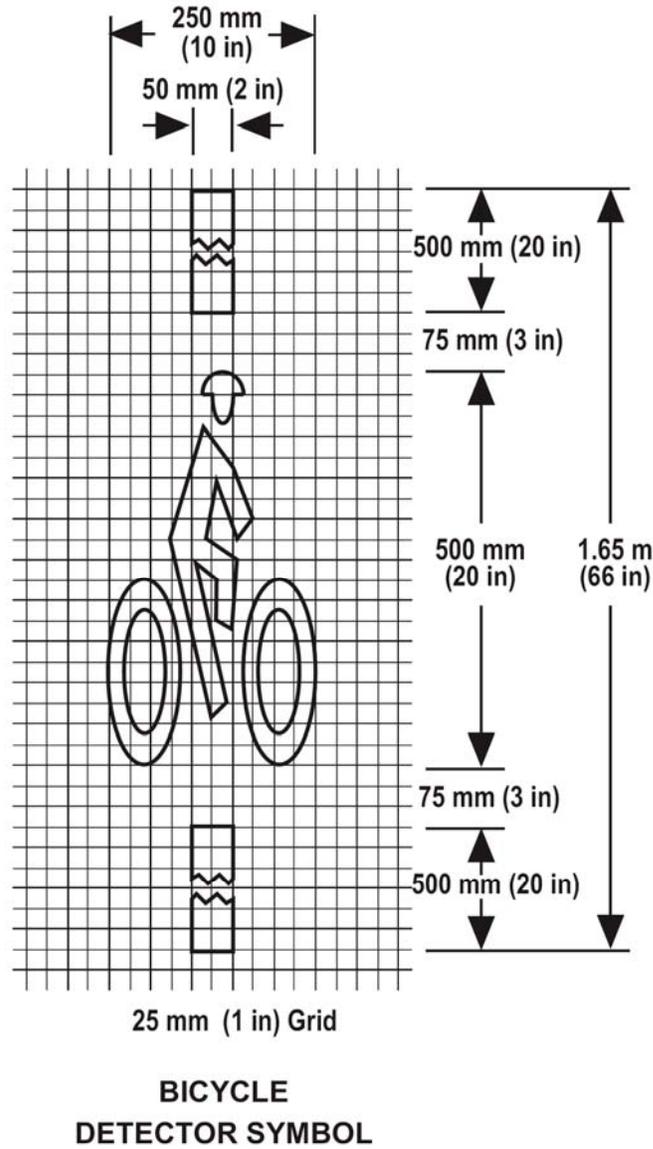
NOTE: The design details for various arrows and symbols are also shown in the Standard Plans published by the Department of Transportation.

Figure 9C-106. Barrier Post Markings



Barrier Post Markings

Figure 9C-7 (CA). Example of Bicycle Detector Pavement Marking



NOT TO SCALE

NOTE: The design details for various arrows and symbols are also shown in the Standard Plans published by the Department of Transportation.

CHAPTER 9D. SIGNALS

Section 9D.01 Application

The following is added to this section:

Support:

Also refer Part 4 of this Supplement for highway traffic signals.