PART 3
MARKINGS
CHAPTER 3A. GENERAL

Section 3A.01 Standardization of Application

Support:

01 Markings are used to supplement other traffic control devices such as signs, signals, and other markings. In other instances, markings are used alone to effectively convey regulations, warnings, or guidance in ways not obtainable by the use of other devices.

02 Markings can take many forms, including road surface markings, curb markings, delineators, colored pavements, and channelizing devices.

Standard:

03 **Each standard marking shall be used only to convey the meaning prescribed for that marking in this Manual, including when used for applications not described in this Manual.**

04 **Except as provided in Chapter 3H, markings that must be visible at night shall be retroreflective unless the markings are adequately visible under street or highway lighting. All markings on Interstate highways shall be retroreflective.**

05 **Markings that are no longer applicable for roadway conditions or restrictions and that might cause confusion for the road user shall be removed or obliterated to be unidentifiable as a marking as soon as practicable.**

Guidance:

05a *Local authorities may apply lines, arrows, or other symbols to street or highway surfaces to guide visitors and tourists to local points of interest, provided Caltrans approves such markings (CVC 21374).*

Option:

06 Until they can be removed or obliterated, markings that are no longer applicable for roadway conditions or restrictions may be temporarily masked with non-reflective, preformed tape that is approximately the same color as the pavement surface.

Support:

07 For faded asphalt concrete pavement, grinding out obsolete markings is the preferred method to ensure clear pavement and eliminate any potential visual confusion for drivers.

08 Use of black tape for temporary "masking" is effective for new Asphalt Concrete pavement. However, for faded Asphalt Concrete pavement or Portland Cement Concrete pavements, black "masking" pavement markings could appear as a stripe in low light conditions and result in confusion to road users.

Section 3A.02 Materials

Guidance:

01 *The materials used for markings should provide the specified color throughout their useful life.*

02 *Consideration should be given to selecting pavement marking materials that will minimize tripping or loss of traction for road users, including pedestrians, bicyclists, and motorcyclists.*

Option:

03 Marking systems that consist of clumps or droplets of material with visible open spaces of bare pavement between the material droplets, which can function in a manner that is similar to the marking systems that completely cover the pavement surface, may be used as pavement markings if they meet the other pavement marking requirements of the highway agency.

Section 3A.03 Colors

Standard:

01 **Markings shall be yellow, white, red, blue, green, or purple. The colors for markings shall conform to the standard highway colors.**

01a **The color of curb markings shall conform to CVC 21458.**

01b **Lines, arrows, or other symbols on the street or highway surface to guide visitors and tourists shall be distinct in color**

from official traffic control devices (CVC 21374).

Option:

02 Black markings may be used in combination with the colors mentioned in Paragraph 1 of this Section to enhance the contrast with a light-colored pavement.

02a If the material used for centerline marking is paint, a 3-inch-wide black line may be placed between the 4-inch-wide yellow lines on streets and highways under local jurisdiction.

Standard:

02b **If the material used for centerline marking is paint, a 3-inch-wide black line shall be placed between the 4-inch-wide yellow lines on State highways.**

03 **When used, yellow markings for longitudinal lines shall delineate:**

- **A. The separation of traffic traveling in opposite directions,**
- **B. The left-hand edge of the roadways of divided highways and one-way streets or ramps, or**
- **C. The separation of two-way left-turn lanes and reversible lanes from other lanes.**

04 **When used, white markings for longitudinal lines shall delineate:**

- **A. The separation of traffic flows in the same direction,**
- **B. The right-hand edge of the roadway, or**
- **C. Both the right-hand edge and left-hand edge of a reversible roadway.**

05 **When used, red raised pavement markers or delineators shall delineate:**

- **A. Truck escape ramps, or**
- **B. One-way roadways, ramps, or travel lanes that shall not be entered or used in the direction from which the markers are visible.**

06 **When used, blue markings shall supplement white markings for parking spaces for persons with disabilities.**

07 **When used, purple markings shall be in accordance with the provisions of Chapter 3F to identify toll plaza approach lanes restricted to use only by vehicles with registered electronic toll collection accounts.**

08 **When pavement markings that simulate route signs are used (see Section 3B.22), the colors shall be the same as those that are used for the route signs (see Section 2D.11).**

Support:

09 Provisions regarding colored pavements are contained in Chapter 3H.

Section 3A.04 Functions, Widths, and Patterns of Longitudinal Pavement Markings

Standard:

01 **The general functions of longitudinal lines shall be as follows:**

- **A. A double line indicates maximum or special restrictions.**
- **B. A solid line discourages or prohibits crossing (depending on the specific application).**
- **C. A broken line indicates a permissive condition.**
- **D. A dotted lane line provides warning of a downstream change in lane function.**
- **E. A dotted line used as a lane line or edge line extension guides vehicles through an intersection, a taper area, or an interchange ramp area.**

02 **The widths and patterns of longitudinal lines shall be as follows:**

- **A. Normal line—4 to 6 inches wide.**
- **B. Wide line—at least twice the width of a normal line.**
- **C. Double line—two parallel lines separated by a discernible space. The pavement surface shall be visible between the lines in the same way that it is visible outside the lines, except where contrast markings are used in combination with the double line (see Section 3A.03).**
- **D. Broken line—normal width line segments separated by gaps.**
- **E. Dotted line—noticeably shorter line segments separated by shorter gaps than used for a broken line. The width of a dotted line extension shall be at least the same as the width of the line it extends.**

02a **All longitudinal traffic lines for lane lines, edge lines, and centerlines on state highways shall be 6 inches wide.**

02b **All longitudinal traffic lines on local agency roadways shall be a minimum of 4 inches wide.**

Option:

02c Longitudinal traffic lines on local agency roadways may be 6 inches wide.

Guidance:

03 *To be recognized as a double line rather than two separate, disassociated single lines, the discernible space separating the parallel lines of a double line should not exceed two times the line width of a single line.*

Support:

04 The width of the line indicates the degree of emphasis.

05 Increasing edge line width from 4 inches to 6 inches has been shown to be a beneficial countermeasure to enhance safety at locations with a history of run-off-the-road crashes (see Section 3B.09). Wider normal lines with a 6-inch width instead of the minimum 4-inch width can be beneficial to both human drivers and driving automation systems (see Section 5B.02).

~~*Guidance:*~~

06 ~~*Broken lines should consist of 10-foot line segments and 30-foot gaps, or dimensions in a similar ratio of line segments to gaps as appropriate for traffic speeds and the need for delineation.*~~

07 ~~*A dotted line used as a lane line (see Section 3B.07) should consist of 3-foot line segments and 9-foot gaps. A dotted line for line extensions within an intersection, taper area, or interchange ramp area (see Section 3B.11) should consist of 2-foot line segments and 2-foot to 6-foot gaps.*~~

Standard:

07a **The widths and patterns of longitudinal lines shall conform to the details shown in Figures 3A-101(CA) through 3A-114(CA).**

Support:

08 Section 5B.02 contains information on pavement marking considerations for driving automation systems.

Section 3A.05 Maintaining Minimum Pavement Marking Retroreflectivity

Standard:

01 **Except as provided in Paragraph 5 of this Section, a method designed to maintain retroreflectivity at or above 50 mcd/m^2/lx under dry conditions shall be used for longitudinal markings on roadways with speed limits of 35 mph or greater.**

Guidance:

02 *Except as provided in Paragraph 5 of this Section, a method designed to maintain retroreflectivity at or above 100 mcd/m^2/lx under dry conditions should be used for longitudinal markings on roadways with speed limits of 70 mph or greater.*

03 *The method used to maintain retroreflectivity should be one or more of those described in "Methods for Maintaining Pavement Marking Retroreflectivity" (FHWA-SA-22-028), 2022 Edition, FHWA or developed from an engineering study based on the values in Paragraphs 1 and 2 of this Section.*

Support:

04 Retroreflectivity levels for pavement markings are measured with an entrance angle of 88.76 degrees and an observation angle of 1.05 degrees. This geometry is also referred to as 30-meter geometry. The units of pavement marking retroreflectivity are reported in mcd/m^2/lx, which means millicandelas per square meter per lux.

Option:

05 The following markings may be excluded from the provisions established in Paragraphs 1 and 2 of this Section:

A. Markings where ambient illumination assures that the markings are adequately visible;
B. Markings on streets or highways that have an ADT of less than 6,000 vehicles per day; markings to alert possible wrong-way drivers, as shown in Figure 3A-102(CA) and Figure 3A-105(CA), Details 9A, 12A, and 25A;
C. Dotted extension lines that extend a longitudinal line through an intersection, major driveway, or interchange area (see Section 3B.11);
D. Curb markings;
E. Parking space markings; and
F. Shared-use path markings.

Support:

06 The provisions of this Section do not apply to non-longitudinal pavement markings including, but not limited to, the following:

A. Transverse markings;
B. Word, symbol, and arrow markings;
C. Crosswalk markings; and
D. Chevron, diagonal, and crosshatch markings.

07 Special circumstances will periodically cause pavement marking retroreflectivity to be below the minimum levels. These circumstances include, but are not limited to, the following:

A. Isolated locations of abnormal degradation;
B. Periods preceding imminent resurfacing or reconstruction;
C. Unanticipated events such as equipment breakdowns, material shortages, and contracting problems; and
D. Loss of retroreflectivity resulting from snow maintenance operations.

08 When such circumstances occur, compliance with Paragraphs 1 and 2 of this Section is still considered to be achieved if a reasonable course of action is taken to resume maintenance of minimum retroreflectivity in a timely manner according to the maintaining agency's method(s), policies, and procedures.