

PART 4

HIGHWAY TRAFFIC SIGNALS

CHAPTER 4A. GENERAL

Section 4A.01 Types

Support:

01 The following types and uses of highway traffic signals are discussed in Part 4: traffic control signals; bicycle signal faces; pedestrian signal heads; hybrid beacons; rectangular rapid flashing beacons; emergency-vehicle traffic control signals; traffic control signals for one-lane, two-way facilities; traffic control signals for freeway entrance ramps; movable bridge traffic signals; toll plaza traffic signals; flashing beacons; lane-use control signals; and in- roadway warning lights.

Section 4A.02 Meanings of Signal Indications

Support:

01 The “Uniform Vehicle Code” (see Section 1A.06) is the primary source for the standards for the meanings of vehicular signal indications to both vehicle operators and pedestrians as provided in Sections 4A.03 and 4A.04, the standards for the meanings of separate bicycle signal face indications as provided in Section 4A.05, and the standards for the meanings of separate pedestrian signal head indications as provided in Section 4A.06.

02 The physical area that is defined as being “within the intersection” is dependent upon the conditions that are described in the definition of an intersection in Section 1C.02.

Section 4A.03 Meanings of Steady Vehicular Signal Indications

Standard:

01 The following meanings shall be given to steady highway traffic signal indications for vehicles and pedestrians:

A. Steady green signal indications shall have the following meanings:

1. Vehicular traffic facing a CIRCULAR GREEN signal indication is permitted to proceed straight through or turn right or left or make a U-turn movement except as such movement is modified by lane-use signs, turn prohibition signs, lane markings, roadway design, separate turn signal indications, or other traffic control devices.

Such vehicular traffic, including vehicles turning right or left or making a U-turn movement, shall yield the right-of-way to:

(a) Pedestrians lawfully within an associated crosswalk, and
(b) Other vehicles lawfully within the intersection.

In addition, vehicular traffic turning left or making a U-turn movement to the left shall yield the right-of-way to other vehicles approaching from the opposite direction so closely as to constitute an immediate hazard during the time when such turning vehicle is moving across or within the intersection.

2. Vehicular traffic facing a GREEN ARROW signal indication, displayed alone or in combination with another signal indication, is permitted to cautiously enter the intersection only to make the movement indicated by such arrow, or such other movement as is permitted by other signal indications displayed at the same time.

Such vehicular traffic, including vehicles turning right or left or making a U-turn movement, shall yield the right-of-way to:

(a) Pedestrians lawfully within an associated crosswalk, and
(b) Other vehicles lawfully within the intersection.

3. Pedestrians facing a CIRCULAR GREEN signal indication, unless otherwise directed by a pedestrian signal indication or other traffic control device, are permitted to proceed across the roadway within any marked or unmarked associated crosswalk. The pedestrian shall yield the right-of-way to vehicles lawfully within the intersection or so close as to create an immediate hazard at the time that the green signal indication is first displayed.

4. Pedestrians facing a GREEN ARROW signal indication, unless otherwise directed by a pedestrian signal indication or other traffic control device, shall not cross the roadway.
- B. Steady yellow signal indications shall have the following meanings:
 1. Vehicular traffic facing a steady CIRCULAR YELLOW signal indication is thereby warned that the related green movement or the related flashing arrow movement is being terminated or that a steady red signal indication will be displayed immediately thereafter when vehicular traffic shall not enter the intersection. The rules set forth concerning vehicular operation under the movement(s) being terminated shall continue to apply while the steady CIRCULAR YELLOW signal indication is displayed.
 2. Vehicular traffic facing a steady YELLOW ARROW signal indication is thereby warned that the related GREEN ARROW movement or the related flashing arrow movement is being terminated. The rules set forth concerning vehicular operation under the movement(s) being terminated shall continue to apply while the steady YELLOW ARROW signal indication is displayed.
 3. Pedestrians facing a steady CIRCULAR YELLOW or YELLOW ARROW signal indication, unless otherwise directed by a pedestrian signal indication or other traffic control device shall not start to cross the roadway.
- C. Steady red signal indications shall have the following meanings:
 1. Vehicular traffic facing a steady CIRCULAR RED signal indication, unless entering the intersection to make another movement permitted by another signal indication, shall stop at a clearly marked stop line; but if there is no stop line, traffic shall stop before entering the crosswalk on the near side of the intersection; or if there is no crosswalk, then before entering the intersection; and shall remain stopped until a signal indication to proceed is displayed, or as provided below.

Except when a traffic control device is in place prohibiting a turn on red or a steady RED-ARROW signal indication is displayed, vehicular traffic facing a steady CIRCULAR RED signal indication is permitted to enter the intersection to turn right, or to turn left from a one-way street into a one-way street, after stopping. The right to proceed with the turn shall be subject to the rules applicable after making a stop at a STOP sign. [Refer to CVC 21453](#).
 2. Vehicular traffic facing a steady RED ARROW signal indication shall not enter the intersection to make the movement indicated by the arrow and, unless entering the intersection to make another movement permitted by another signal indication, shall stop at a clearly marked stop line; but if there is no stop line, before entering the crosswalk on the near side of the intersection; or if there is no crosswalk, then before entering the intersection; and shall remain stopped until a signal indication or other traffic control device permitting the movement indicated by such RED ARROW is displayed.

~~When a traffic control device is in place permitting a turn on a steady RED ARROW signal indication, vehicular traffic facing a steady RED ARROW signal indication is permitted to enter the intersection to make the movement indicated by the arrow signal indication, after stopping. The right to proceed with the turn shall be limited to the direction indicated by the arrow and shall be subject to the rules applicable after making a stop at a STOP sign. Conflicts with CVC Section 21453(c).~~
 3. Unless otherwise directed by a pedestrian signal indication or other traffic control device, pedestrians facing a steady CIRCULAR RED or steady RED ARROW signal indication shall not enter the roadway.

Section 4A.04 Meanings of Flashing Vehicular Signal Indications

Standard:

01 The following meanings shall be given to flashing highway traffic signal indications for vehicles and pedestrians:

- A. A flashing green signal indication has no meaning and shall not be used.
- B. Flashing yellow signal indications shall have the following meanings:
 1. Vehicular traffic, on an approach to an intersection, facing a flashing CIRCULAR YELLOW signal indication is permitted to cautiously enter the intersection to proceed straight through or turn right or left or make a U-turn except as such movement is modified by laneuse signs, turn prohibition signs, lane markings, roadway design, separate turn signal indications, or other traffic control devices.

Such vehicular traffic, including vehicles turning right or left or making a U-turn, shall yield the

right-of-way to:

- (a) Pedestrians lawfully within an associated crosswalk, and
- (b) Other vehicles lawfully within the intersection.

In addition, vehicular traffic turning left or making a U-turn to the left shall yield the right-of-way to other vehicles approaching from the opposite direction so closely as to constitute an immediate hazard during the time when such turning vehicle is moving across or within the intersection.

2. Vehicular traffic, on an approach to an intersection, facing a flashing YELLOW ARROW signal indication, displayed alone or in combination with another signal indication, is permitted to cautiously enter the intersection only to make the movement indicated by such arrow, or other such movement as is permitted by other signal indications displayed at the same time.

Such vehicular traffic, including vehicles turning right or left or making a U-turn, shall yield the right-of-way to:

- (a) Pedestrians lawfully within an associated crosswalk, and
- (b) Other vehicles lawfully within the intersection.

In addition, vehicular traffic turning left or making a U-turn to the left shall yield the right-of-way to other vehicles approaching from the opposite direction so closely as to constitute an immediate hazard during the time when such turning vehicle is moving across or within the intersection.

3. Pedestrians facing any flashing yellow signal indication at an intersection, unless otherwise directed by a pedestrian signal indication or other traffic control device, are permitted to proceed across the roadway within any marked or unmarked associated crosswalk. Pedestrians shall yield the right-of-way to vehicles lawfully within the intersection at the time that the flashing yellow signal indication is first displayed.
4. When a flashing CIRCULAR YELLOW signal indication(s) is displayed as a beacon (see Chapter 4S) to supplement another traffic control device, road users are notified that there is a need to pay extra attention to the message contained thereon or that the regulatory or warning requirements of the other traffic control device, which might not be applicable at all times, are currently applicable.

C. Flashing red signal indications shall have the following meanings:

1. Vehicular traffic, on an approach to an intersection, facing a flashing CIRCULAR RED signal indication shall stop at a clearly marked stop line; but if there is no stop line, before entering the crosswalk on the near side of the intersection; or if there is no crosswalk, at the point nearest the intersecting roadway where the driver has a view of approaching traffic on the intersecting roadway before entering the intersection. The right to proceed shall be subject to the rules applicable after making a stop at a STOP sign.
2. Vehicular traffic, on an approach to an intersection, facing a flashing RED ARROW signal indication if intending to turn in the direction indicated by the arrow shall stop at a clearly marked stop line; but if there is no stop line, before entering the crosswalk on the near side of the intersection; or if there is no crosswalk, at the point nearest the intersecting roadway where the driver has a view of approaching traffic on the intersecting roadway before entering the intersection. The right to proceed with the turn shall be limited to the direction indicated by the arrow and shall be subject to the rules applicable after making a stop at a STOP sign.
3. Pedestrians facing any flashing red signal indication at an intersection, unless otherwise directed by a pedestrian signal indication or other traffic control device, are permitted to proceed across the roadway within any marked or unmarked associated crosswalk. Pedestrians shall yield the right-of-way to vehicles lawfully within the intersection at the time that the flashing red signal indication is first displayed.
4. When a flashing CIRCULAR RED signal indication(s) is displayed as a beacon (see Chapter 4S) to supplement another traffic control device, road users shall stop at a clearly marked limit line, but if none, before entering the crosswalk on the near side of the intersection, or if none, then at the point nearest the intersecting roadway where the driver has a view of approaching traffic on the intersecting roadway before entering it, and the driver may proceed subject to the rules applicable after making a stop at a stop sign are notified that there is a need to pay extra attention to the message contained thereon or that the regulatory requirements of the other traffic control device, which might not be applicable at all times, are currently applicable. Use of this signal indication shall be limited to supplementing STOP (R1-1),

~~DO NOT ENTER (R5-1), or WRONG WAY (R5-1a) signs, and to applications where compliance with the supplemented traffic control device requires a stop at a designated point. Refer to CVC 21457(a).~~

Section 4A.05 Meanings of Bicycle Symbol Signal Indications

Standard:

01 The following meanings shall be given to bicycle symbol signal indications for bicyclists:

- A. Bicyclists facing a steady GREEN BICYCLE signal indication are permitted to enter the intersection only to make the movement indicated by the lane-use arrow(s) displayed on the Bicycle Signal sign (see Section 9B.22) that is located immediately adjacent to the signal face. Bicyclists proceeding into the intersection during the display of the steady GREEN BICYCLE signal indication shall yield the right-of-way to:
 1. Pedestrians lawfully within an associated crosswalk, and
 2. Other vehicles lawfully within the intersection.
- B. Bicyclists facing a steady YELLOW BICYCLE signal indication are thereby warned that the related green movement is being terminated and that a steady RED BICYCLE signal indication will be displayed immediately thereafter when bicyclists shall not enter the intersection. The rules set forth concerning bicycle operation under the movement being terminated shall continue to apply while the steady YELLOW BICYCLE signal indication is displayed.
- C. Bicyclists facing a steady RED BICYCLE signal indication shall not enter the intersection to make the movement indicated by the lane-use arrow(s) displayed on the Bicycle Signal sign (see Section 9B.22) that is located immediately adjacent to the signal face and, unless entering the intersection to make another movement permitted by another bicycle symbol signal indication, shall stop at a clearly marked stop line; but if there is no stop line, before entering the crosswalk on the near side of the intersection; or if there is no crosswalk, then before entering the intersection; and shall remain stopped until a GREEN BICYCLE signal indication permitting the movement indicated by such RED BICYCLE signal indication is displayed.

Except when a traffic control device is in place prohibiting a turn on red, bicyclists facing a steady RED BICYCLE signal indication are permitted to enter the intersection to turn right if there are no approach lanes for motor vehicle traffic to their right. The right to proceed with the turn shall be subject to the rules applicable after making a stop at a STOP sign.
- D. A flashing GREEN BICYCLE signal indication has no meaning and shall not be used.
- E. A flashing YELLOW BICYCLE signal indication has no meaning and shall not be used.

Support:

Refer to National MUTCD website, Frequently Asked Questions (FAQs) on Part 4 – Highway Traffic Signals, for exceptions to Item E:

Standard:

- F. Bicyclists facing a flashing RED BICYCLE signal indication shall stop at a clearly marked stop line; but if there is no stop line, before entering the crosswalk on the near side of the intersection; or if there is no crosswalk, at the point nearest the intersecting roadway where the bicyclist has a view of approaching traffic on the intersecting roadway before entering the intersection. The right to proceed in the direction indicated by the lane-use arrow(s) displayed on the Bicycle Signal sign (see Section 9B.22) that is located immediately adjacent to the signal face shall be subject to the rules applicable after making a stop at a STOP sign.

Section 4A.06 Meanings of Pedestrian Signal Indications

Standard:

01 Pedestrian signal indications shall have the following meanings:

- A. A flashing WALKING PERSON (symbolizing WALK) signal indication has no meaning and shall not be used.
- B. Pedestrians facing a steady WALKING PERSON (symbolizing WALK) signal indication shall be permitted to start to cross the roadway in the direction of the signal indication, possibly in conflict with turning vehicles. Pedestrians shall yield the right-of-way to vehicles lawfully within the intersection at the

time that the WALKING PERSON (symbolizing WALK) signal indication is first shown.

- C. Pedestrians facing a flashing UPRAISED HAND (symbolizing DONT WALK) signal indication shall not start to cross the roadway in the direction of the signal indication. Any pedestrian who has already started to cross the roadway on a steady WALKING PERSON (symbolizing WALK) signal indication shall continue to proceed to the far side of the traveled way of the street or highway, unless otherwise directed by a traffic control device to proceed only to the median of a divided highway or only to some other island or pedestrian refuge area (see Section 3C.12). **Refer to CVC Section 21456(a)(2).**
- D. Pedestrians facing a steady UPRAISED HAND (symbolizing DONT WALK) signal indication shall not enter the roadway in the direction of the signal indication.

02 In reference to CVC Section 21456(a), if a pedestrian control signal showing the words "WALK" or "WAIT" or "DON'T WALK" or other approved symbol is in place, the signal shall indicate as follows:

- (1) A "WALK" or approved "Walking Person" symbol means a pedestrian facing the signal may proceed across the roadway in the direction of the signal, but shall yield the right-of-way to vehicles lawfully within the intersection at the time that signal is first shown. Except as otherwise directed by a bicycle control signal described in Section 21456.3, the operator of a bicycle facing a pedestrian control signal displaying a "WALK" or approved "Walking Person" symbol may proceed across the roadway in the direction of the signal, but shall yield the right-of-way to any vehicles or pedestrians lawfully within the intersection.
- (2) A flashing "DON'T WALK" or "WAIT" or approved "Upraised Hand" symbol with a "countdown" signal indicating the time remaining for a pedestrian to cross the roadway means a pedestrian facing the signal may start to cross the roadway in the direction of the signal, but must complete the crossing prior to the display of the steady "DON'T WALK" or "WAIT" or approved "Upraised Hand" symbol when the "countdown" ends.
- (3) A steady "DON'T WALK" or "WAIT" or approved "Upraised Hand" symbol or a flashing "DON'T WALK" or "WAIT" or approved "Upraised Hand" without a "countdown" signal indicating the time remaining for a pedestrian to cross the roadway means a pedestrian facing the signal shall not start to cross the roadway in the direction of the signal, but any pedestrian who started the crossing during the display of the "WALK" or approved "Walking Person" symbol and who has partially completed crossing shall proceed to a sidewalk or safety zone or otherwise leave the roadway while the steady "WAIT" or "DON'T WALK" or approved "Upraised Hand" symbol is showing.

Section 4A.07 Lateral Offset of Signal Supports and Cabinets

Guidance:

01 The following items should be considered when placing signal supports and cabinets:

- A. Reference should be made to the "Roadside Design Guide," 4th Edition, 2011, AASHTO, and to the U.S. Department of Justice 2010 ADA Standards for Accessible Design, September 15, 2010, 28 CFR 35 and 36, Americans with Disabilities Act of 1990.
- B. Signal supports should be placed as far as practicable from the edge of the traveled way without adversely affecting the visibility of the signal indications.
- C. Where supports cannot be located based on the recommended AASHTO clearances, consideration should be given to the use of appropriate safety devices.
- D. No part of a concrete foundation for a signal support should extend more than 4 inches above the ground level at any point. This limitation does not apply to the concrete foundation for a rigid support.
- E. In order to minimize hindrance to the passage of persons with physical disabilities, a signal support or controller cabinet should not obstruct the sidewalk, or access from the sidewalk to the crosswalk.
- F. Controller cabinets should be located as far as practicable from the edge of the roadway.
- G. On medians, the minimum clearances provided in Items A through E for signal supports should be obtained, if practicable.

Support:

02 Refer to Figures 4F-102(CA) through 4F-108(CA) for typical signal layouts for various intersections.

Section 4A.08 Use of Signs at Signalized Locations

Support:

01 Traffic signal signs are sometimes used at highway traffic signal locations to instruct or guide pedestrians, bicyclists, or motorists. Among the signs typically used at or on the approaches to signalized locations are movement prohibition signs (see Section 2B.26), lane-control signs (see Sections 2B.27 through 2B.29), pedestrian crossing signs

(see Section 2B.57), pedestrian and bicycle actuation signs (see Section 2B.58), traffic signal signs (see Sections 2B.59 and 2C.44), No Turn on Red signs (see Section 2B.60), Signal Ahead warning signs (see Section 2C.35), Street Name signs (see Section 2D.45), and Advance Street Name signs (see Section 2D.46).

Guidance:

02 *Regulatory, warning, and guide signs should be used at highway traffic signal locations as provided in Part 2 and as specifically provided elsewhere in Part 4.*

Support:

03 Section 2B.27 contains information regarding the use of overhead lane-control signs on signalized approaches where lane drops, multiple-lane turns involving combined through-and-turn lanes, or other lane-use regulations that would be unexpected by unfamiliar road users are present.

Guidance:

04 *If used, illuminated traffic signal signs should be designed and mounted in such a manner as to avoid glare and reflections that seriously detract from the signal indications. Highway traffic signal faces should be given dominant position and brightness to maximize their priority in the overall display.*

Standard:

05 **The minimum vertical clearance and horizontal offset of the total assembly of traffic signal signs (see Section 2B.59) shall comply with the provisions of Sections 4D.09 and 4D.10.**

06 **Because the potential for conflicting commands could create driver confusion, YIELD or STOP signs shall not be used in conjunction with any highway traffic signal operation, except in either of the following cases:**

A. If the signal indication for an approach is a flashing red at all times, or
B. If a minor street or driveway is located within or adjacent to an area controlled by a traffic control signal, but does not require separate traffic signal control because an extremely low potential for conflict exists.

07 **STOP signs shall not be erected at any entrance to an intersection controlled by traffic signals. Refer to CVC 21355(a).**

Option:

08 **YIELD or STOP signs may be used at a channelized turn lane if it is separated from the adjacent travel lanes moving in same direction by an island and the channelized turn lane is not controlled by a traffic control signal.**

Section 4A.09 Use of Pavement Markings at Signalized Locations

Support:

01 Pavement markings that clearly communicate the operational plan of an intersection to road users play an important role in the effective operation of highway traffic signals. By designating the number of lanes, the use of each lane, the length of additional lanes on the approach to an intersection, crosswalks, and the proper stopping points, the engineer can design the signal phasing and timing to best match the goals of the operational plan.

Guidance:

02 *Pavement markings should be used at highway traffic signal locations as provided in Part 3. If the road surface will not retain pavement markings, signs should be installed to provide the needed road user information.*

Section 4A.10 Responsibility for Operation and Maintenance

Guidance:

01 *Prior to installing any highway traffic signal, the responsibility for the maintenance of the signal and all of the appurtenances, hardware, software, and the timing plan(s) should be clearly established by the responsible agency.*

02 *To this end the agency should:*

A. Keep every controller assembly in effective operation in accordance with its predetermined timing schedule, check the operation of the controller assembly frequently enough to verify that it is operating in accordance with the predetermined timing schedule, and establish a policy to maintain a record of all timing changes and that only authorized persons are permitted to make timing changes;

B. Clean the optical system of the signal sections and replace the light sources as frequently as experience proves necessary;

C. Clean and service equipment and other appurtenances (i.e. cameras and preemption devices) as frequently as experience proves necessary;

D. Provide for alternate operation of the traffic control signal during a period of failure, using flashing mode or manual control, or manual traffic direction by proper authorities as might be required by traffic volumes or congestion, or by erecting other traffic control devices;

- E. Have properly-skilled maintenance personnel available without undue delay for all signal malfunctions and signal indication failures;*
- F. Provide spare equipment to minimize the interruption of highway traffic signal operation as a result of equipment failure;*
- G. Provide for the availability of properly-skilled maintenance personnel for the repair of all components; and*
- H. Maintain the appearance of the signal displays and equipment.*

Support:

03 Caltrans is responsible for the operation of all State highway traffic signals, regardless of whether the signal is maintained by the State or by others.