

CHAPTER 4S. FLASHING BEACONS

Section 4S.01 General Design and Operation of Flashing Beacons

Support:

- 01 A flashing beacon is a highway traffic signal with one or more signal sections that operates in a flashing mode. It can provide traffic control when used as an Intersection Control Beacon (see Section 4S.02) or it can provide warning when used in other applications (see Sections 4S.03, 4S.04, and 4S.05).

Standard:

- 02 **Flashing beacon units, their mountings, signal visors, and backplates shall comply with the provisions of Chapters 4D and 4E, except as otherwise provided in this Chapter.**
- 03 **Beacons shall be flashed at a rate of not less than 50 or more than 60 times per minute. The illuminated period of each flash shall be a minimum of $\frac{1}{2}$ and a maximum of $\frac{2}{3}$ of the total cycle.**
- 04 **A beacon shall not be included within the border of a sign except for Interchange Exit Direction signs with advisory speed panels (see Section 2E.25).**
- 05 **There shall be two nominal diameter sizes for flashing beacon signal indications: 8 inches and 12 inches.**

Guidance:

- 06 *If used to supplement a warning or regulatory sign, the edge of the beacon signal housing should normally be located no closer than 12 inches outside of the nearest edge of the sign or from the nearest edge of any of the signs and plaques in a sign assembly.*

Option:

- 07 An automatic dimming device may be used to reduce the brilliance of flashing yellow signal indications during night operation.
- 08 Backplates (see Section 4D.06) may be used with flashing beacons.

Support:

- 09 Typical applications for flashing beacons include the following:

- A. Signal Ahead
- B. Stop Signs
- C. Speed Limit Signs
- D. Other Warning and Regulatory Signs
- E. Schools
- F. Fire Stations
- G. Intersection Control
- H. Freeway Bus Stops
- I. At Intersections where a more visible warning is desired.

- 10 Typical uses include:

- A. Obstructions in or immediately adjacent to the roadway.
- B. Supplemental to advance warning signs.
- C. At mid-block crosswalks.
- D. At intersections where a warning is appropriate.

Option:

- 11 Only warning, regulatory or construction signs may be supplemented by flashing beacons.

Standard:

- 12 **The cost of installing a Warning or Regulatory Sign Flashing Beacon on a State highway shall be at 100% State expense.**

Section 4S.02 Intersection Control Beacon

Standard:

- 01 **An Intersection Control Beacon shall consist of one or more signal faces directed toward each approach to an intersection. Each signal face shall consist of one or more signal sections of a standard traffic signal face, with flashing CIRCULAR YELLOW or CIRCULAR RED signal indications in each signal face. They shall be installed and used only at an intersection to control two or more directions of travel.**

- 02 **Application of Intersection Control Beacon signal indications shall be limited to the following:**
- A. **Yellow on one route (normally the major street) and red for the remaining approaches for existing installations that are controlled by STOP signs, or**
 - B. **Red for all approaches at new installations (if all of the intersection approaches are controlled by STOP signs).**
- 03 **Flashing yellow signal indications shall not face conflicting vehicular approaches.**
- 04 **A STOP sign (see Section 2B.04) shall be used on approaches to which a flashing red signal indication is displayed on an Intersection Control Beacon.**
- 05 **If two horizontally-aligned red signal indications are used on an approach for an Intersection Control Beacon, they shall be flashed simultaneously to avoid being confused with grade crossing flashing-light signals. If two vertically-aligned red signal indications that have a physical separation between them are used on an approach for an Intersection Control Beacon, they shall be flashed alternately.**
- 06 **Twelve-inch signal indications shall be used for Intersection Control Beacons facing approaches where:**
- A. **Road users view both Intersection Control Beacon and lane-use control signal indications simultaneously; or**
 - B. **The nearest Intersection Control Beacon signal face is more than 120 feet beyond the stop line, unless a supplemental near-side Intersection Control Beacon signal face is provided.**

Guidance:

- 07 *Twelve-inch signal indications should be used for Intersection Control Beacons facing approaches where:*
- A. *The posted or statutory speed limit or the 85th-percentile approach speed is higher than 40 mph, or*
 - B. *Where only post-mounted flashing beacon signal faces are used.*
- 08 *An Intersection Control Beacon should not be mounted on a pedestal in the roadway unless the pedestal is within the confines of a traffic or pedestrian island.*

Option:

- 09 Supplemental signal indications may be used on one or more approaches in order to provide adequate visibility to approaching road users.
- 10 Intersection Control Beacons may be used at intersections where traffic or physical conditions do not justify conventional traffic control signals but crash rates indicate the possibility of a special need.
- 11 An Intersection Control Beacon is generally located over the center of an intersection; however, it may be used at other suitable locations.

Standard:

- 12 **New installations of overhead intersection control flashing beacon shall consist of red indications for each approach.**
- 13 **The cost of installing an Intersection Control Beacon and intersection lighting shall be shared with the local agency in the same manner as a traffic signal.**

Option:

- 14 Yellow flashing beacons may be used with Signal Ahead (W3-3) signs in advance of:
- A. An isolated traffic signal on either a conventional highway or on an expressway in a rural area.
 - B. The first traffic signal approaching an urban area.
 - C. Any traffic signal with limited approach visibility, or where approach speeds exceed 50 mph.
- 15 On divided highways where the median is 8 feet wide, or greater, the installation may consist of:
- A. Two Type 1 standards, each with a Signal Ahead (W3-3) sign and a 12-inch signal face, with one standard located in the median and the other off of the right shoulder; or
 - B. A Type 9 cantilever flashing beacon installation with a Signal Ahead (W3-3) sign and two 12-inch signal faces as shown in Caltrans' Standard Plans. See Section 1A.05 for information regarding this publication.
- 16 The above installation designs may result in noncompliance with Caltrans' Highway Design Manual mandatory standards for horizontal clearance and shoulder width, and the advisory design standard for clear recovery zones. If such nonstandard features cannot be avoided, the designer must obtain approval in accordance with Topic 82 of Caltrans' Highway Design Manual and the current instructions pertaining to exceptions from mandatory and advisory design standards. See Section 1A.05 for information regarding this publication.

17 On undivided highways or on highways where the median is less than 8 feet wide, the installation may consist of a single standard located off of the right shoulder or Type 9 cantilever flashing beacon installation as described for use on divided highways, or it may be a Type 15-FBS flashing beacon installation.

Support:

18 The cost of installing a Signal Ahead Flashing Beacon is normally included in the traffic signal project and the cost shared with the local agency.

Section 4S.03 Warning Beacon

Support:

01 Typical applications of Warning Beacons include the following:

- A. As supplemental emphasis to signs or object markers on or in front of obstructions that are in or immediately adjacent to the roadway;
- B. As supplemental emphasis to warning signs;
- C. As emphasis for midblock crosswalks;
- D. As supplemental emphasis to regulatory signs, except STOP, DO NOT ENTER, WRONG WAY, and SPEED LIMIT signs; and
- E. In conjunction with a regulatory or warning sign that includes the phrase WHEN FLASHING in its legend or on a supplemental plaque to indicate that the regulation is in effect or that the condition is present only at certain times. Section 2A.12 prohibits the use flashing light-emitting diode (LED) units within the legend or border of the sign in conjunction with the phrase WHEN FLASHING in its legend or on a supplemental plaque.

Standard:

02 **A Warning Beacon shall consist of one or more signal sections of a standard traffic signal face with a flashing CIRCULAR YELLOW signal indication in each signal section.**

03 **A Warning Beacon shall be used only to supplement an appropriate warning or regulatory sign or marker.**

04 **Warning Beacons, if used at intersections, shall not face conflicting vehicular approaches.**

Guidance:

05 *The condition or regulation justifying Warning Beacons should largely govern their location with respect to the roadway.*

06 *If an obstruction is in or adjacent to the roadway, illumination of the lower portion or the beginning of the obstruction or illumination of the sign on or in front of the obstruction, in addition to the beacon, should be considered.*

07 *Warning Beacons should be operated only during those periods or times when the condition or regulation exists.*

Option:

08 If Warning Beacons have more than one signal section, they may be flashed either alternately or simultaneously.

09 A Warning Beacon interconnected with a traffic signal controller assembly may be used with a BE PREPARED TO STOP (W3-4) sign and a WHEN FLASHING (W16-13P) plaque (see Section 2C.35).

10 Warning Beacons that are actuated by pedestrians, bicyclists, or other road users may be used as appropriate to provide additional warning to vehicles approaching a crossing or other location.

Guidance:

11 *An audible information device should be used with pedestrian-actuated Warning Beacons to assist pedestrians with vision disabilities.*

Standard:

12 **If an audible information device is used in conjunction with a pedestrian-actuated Warning Beacon at a pedestrian crossing, the audible information device shall not use vibrotactile indications or percussive indications.**

Guidance:

13 *If an audible information device is used in conjunction with a pedestrian-actuated Warning Beacon at a pedestrian crossing, the audible message should be a speech message that says, "Warning lights are flashing." The audible message should be spoken twice.*

Section 4S.04 Speed Limit Sign Beacon

Standard:

01 **A Speed Limit Sign Beacon shall be used only to supplement a Speed Limit sign.**

02 **A Speed Limit Sign Beacon shall consist of one or more signal sections of a standard traffic control signal**

face, with a flashing CIRCULAR YELLOW signal indication in each signal section. If two or more signal indications are used, they shall be alternately flashed.

Option:

- 03 A Speed Limit Sign Beacon may be used with a fixed or variable Speed Limit sign. If applicable, a flashing Speed Limit Sign Beacon (with an appropriate accompanying sign) may be used to indicate that the displayed speed limit is in effect.

Guidance:

- 04 *When a Speed Limit Sign Flashing Beacon is installed at the request of a local agency, or installed by the local agency under an encroachment permit the costs of installing and maintaining the beacon should be at 100% local agency expense.*

Section 4S.05 Stop Beacon

Standard:

- 01 A Stop Beacon shall be used only to supplement a STOP sign, a DO NOT ENTER sign, or a WRONG WAY sign.
- 02 A Stop Beacon shall consist of one or more signal sections of a standard traffic signal face with a flashing CIRCULAR RED signal indication in each signal section. If two horizontally-aligned signal indications are used for a Stop Beacon, they shall be flashed simultaneously to avoid being confused with grade crossing flashing-light signals. If two vertically-aligned signal indications are used for a Stop Beacon, they shall be flashed alternately.
- Guidance:**

- 03 *The edge of the signal housing of a Stop Beacon should be not less than 12 inches or more than 24 inches from the nearest edge of the STOP sign, DO NOT ENTER sign, or WRONG WAY sign that it supplements.*

Support:

- 04 A Stop Sign Flashing Beacon consists of one or two signal sections with a flashing circular red indication in each section.

Standard:

- 05 The bottom of the housing of a Stop Sign Flashing Beacon shall not be less than 12 inches nor more than 24 inches above the top of the stop sign.
- 06 The cost of installing a Stop Sign Beacon shall be shared with the local agency in the same manner as a traffic signal.

Section 4S.101(CA) Flashing Beacons at School Crosswalks

Option:

- 01 Flashing beacons at school crosswalks may be installed on State highways in accordance with CVC Sections 21372 and 21373.
- 02 Flashing yellow beacons may be installed to supplement standard school signing and markings for the purpose of providing advanced warning during specified times of operation when justified.
- 03 A flashing yellow beacon may be justified when ALL of the following conditions are fulfilled:
- A. The uncontrolled school crossing is on the "Suggested Route to School"; and
 - B. At least 40 school pedestrians use the crossing during each of any two hours (not necessarily consecutive) of a normal school day; and
 - C. The crossing is at least 600 feet from the nearest alternate crossing controlled by traffic signals, stop signs or crossing guards; and
 - D. The vehicular volume through the crossing exceeds 200 vehicles per hour in urban areas or 140 vehicles per hour in rural areas during the same hour the students are going to and from school during normal school hours; and
 - E. The critical approach speeds exceeds 35 mph or the approach visibility is less than the stopping sight distance.

Standard:

- 04 If school authorities are to operate flashing yellow beacon, an inter-agency agreement shall be executed to assure designations of a responsible adult to operate the beacon controls and to provide accessibility for necessary equipment maintenance.
- 05 Where traffic signals and/or flashing beacons are justified only by the School Area Traffic Signal Warrant on a State highway, the installation shall be at 100% State expense. When any other warrant is met also, the cost is shared in the usual manner.

Support:

06 Figure 4L-101(CA) shows the worksheet for flashing beacon at school crossings.

Section 4S.102(CA) Flashing Beacons for Fire Stations

Option:

01 Flashing beacons at fire station driveways or at intersections immediately adjacent to a fire station may be installed on State highways.

Standard:

02 **The flashing beacon shall be used only to supplement an appropriate warning or regulatory sign. The flashing beacon shall be actuated from a non-illuminated condition by a switch at the fire station.**

03 **The costs of installing and maintaining the flashing beacon for the fire station shall be at 100% local agency or fire department expense.**

Section 4S.103(CA) Flashing Beacons at Bus Stops on Freeway Interchanges

Option:

01 At locations of approved bus stops within interchange areas, a flashing beacon may be provided near the top of a lighting standard to provide a flag stop.

Standard:

02 **The following design and operational requirements shall be met:**

- A. A push button shall be provided on the lighting standard with a sign explaining the purpose and operation. The sign shall state that if no bus has arrived within 15 minutes (or other time) after the button has been actuated it will be necessary to actuate it again.**
- B. The flashing beacon shall consist of a 8-inch, signal section with an uncolored or white lens mounted on the lighting standard in such a position that an approaching bus driver can see it on the freeway.**
- C. The operation of the control shall be such that the flashing beacon will operate for 15 minutes after the button has been actuated and then go out.**

03 **The cost of installing and maintaining Flashing Beacons at Bus Stops on Freeway Interchanges shall be 100% State expense.**