

STATE OF CALIFORNIA

Memorandum

Date: October 17, 2014

From: Public Utilities Commission

Rail Crossings and Engineering Branch

Subject: *CPUC Guidance for Use of YIELD or STOP Signs with the Crossbuck Sign at Public Passive: Highway-Rail Grade Crossings and Highway-LRT Grade Crossings*

This memorandum is to clarify the current national Manual on Uniform Traffic Control Devices (MUTCD) mandate for public passive grade crossings as referenced in the California MUTCD 2012 as well as to provide guidance on design and placement of YIELD or STOP signs in conjunction with the Crossbuck (R15-1) sign at public passive highway-rail crossings and highway-light rail transit crossings.

Introduction

The Manual on Uniform Traffic Control Devices (MUTCD) defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic. The MUTCD is published by the Federal Highway Administration (FHWA) under Title 23 Code of Federal Regulations (23 CFR), Part 655, Subpart F.

The MUTCD, which has been administered by the FHWA since 1971, is a compilation of national standards for all traffic control devices, including road markings, highway signs, and traffic signals. It is updated periodically to accommodate the nation's changing transportation needs and address new safety technologies, traffic control tools and traffic management techniques.

On December 16, 2009, a final rule adopting the 2009 Edition of the MUTCD was published in the Federal Register with an effective date of January 15, 2010. States must adopt the 2009 National MUTCD as their legal state standard for traffic control devices within two years from the effective date.

As of January 13, 2012, the California Department of Transportation (Caltrans) adopted the California Manual on Uniform Traffic Control Devices (CA MUTCD) 2012 edition to provide for uniform standards and specifications for all official traffic control devices in California. This action was taken pursuant to the provisions of California Vehicle Code Section 21400 and the recommendation of the California Traffic Control Devices Committee. Caltrans requested and received a letter to confirm substantial conformance from FHWA for the [CA MUTCD 2012](#) edition. The CA MUTCD 2012 edition includes

FHWA's MUTCD 2009 edition dated December 19, 2009, as amended for use in California.

The CA MUTCD 2012 edition supersedes and replaces the previously adopted (on January 21, 2010) CA MUTCD as well as Chapters 4, 5, 6, 8, 10, 11, 12, and the traffic signals portion of chapter 9 of the 1996 Caltrans Traffic Manual, as amended, and all previous editions thereof.

Purpose

The purpose of this memorandum is to clarify the current national MUTCD mandate for public passive grade crossings as referenced in the CA MUTCD 2012 as well as to provide guidance on design and placement of YIELD or STOP signs in conjunction with the Crossbuck (R15-1) sign at public passive highway-rail crossings and highway-light rail transit (LRT) crossings. For the remainder of this memo, passive grade crossings refer to both highway-rail and highway-LRT passive grade crossings. The traffic control at passive grade crossings is to permit safe and efficient operation of rail, LRT and highway traffic over such crossings. Roadway users approaching a passive grade crossing should be prepared to yield and stop if necessary if a train is at or approaching the crossing. The new standards to include YIELD or STOP signs at public passive crossings are intended to better inform road users that they are approaching the passive grade crossings.

By definition in 23 CFR Section 646.204, passive highway-rail crossings are those having warning devices such as signs and pavement markings located at or in advance of grade crossings to indicate the presence of a crossing but which do not change aspect upon the approach or presence of a train. In the CA MUTCD 2012, Section 1.13A Definitions, a passive crossing is defined as a grade crossing where none of the automatic traffic control devices associated with an Active Grade Crossing Warning System are present and at which the traffic control devices consist entirely of signs and/or markings.

New Standard and Target Compliance Date

- At passive grade crossings, a Crossbuck Assembly shall consist of a Crossbuck (R15-1) sign, a Number of Tracks (R15-2P) plaque, if two or more tracks are present, **and either a YIELD (R1-2) or STOP (R1-1) sign**. A YIELD or STOP sign shall be installed in compliance with the provisions of Part 2, Section 2B.10, and Figures 8B-2 and 8B-3 of the CAMUTCD 2012.
- If a Crossbuck sign is used on a highway approach to a public highway-LRT grade crossing, a Crossbuck Assembly including the **YIELD or STOP** sign shall be installed on the right-hand side of the highway on each approach to the highway-LRT grade crossing. (CAMUTCD 2012- 8B.04)

Beginning with the CA MUTCD 2012, Crossbuck signs at public passive crossings are required to include either a YIELD or a STOP sign. The signs may be placed on the same post below the Crossbuck, or may be placed immediately adjacent to the Crossbuck on a separate post.

There are approximately 1,600 passive grade crossings in California which need to be modified in the next few years to meet the new CA MUTCD 2012 standard. The target compliance date for implementation of the YIELD or STOP signs is **December 31, 2019**, as noted in CA MUTCD 2012, Table I-2.-Target Compliance Dates Established by the FHWA.

Guidance for the New Standard

The California Public Utilities Commission (CPUC/Commission) is the lead agency for coordinating the installation of YIELD and STOP signs at passive grade crossings. The Rail Crossings Engineering Branch (RCEB) of the CPUC provides the following as guidance to railroads and roadway authority agencies on handling the implementation of these changes to the passive grade crossings.

Default Choice - A YIELD sign shall be the default traffic control device for Crossbuck Assemblies on all highway approaches to passive grade crossings.

YIELD signs are required at all public passive crossings with Crossbucks **except**:

1. Where the crossing is within a Traffic Signal control.
2. Where there is an existing STOP sign for the crossing.
3. Where an engineering study determines a STOP sign should be installed at the passive grade crossing.

Determination of When to Use STOP Signs

The Crossbuck sign is a regulatory sign that requires vehicles to yield to trains and stop if necessary. However, road users may not clearly understand and comply with the regulatory requirement when just the Crossbuck sign is present at passive grade crossings. If a new STOP control is being considered for roadway traffic at a passive grade crossing that does not have an existing stop sign and only has a Crossbuck, an engineering study justifying the STOP control is required for approval by the CPUC. This crossing modification requires the submittal of a General Order (GO) 88-B application. The engineering study justifying the new stop control is to be submitted along with the GO 88-B application. If the crossing will remain a yield to train traffic condition, then, a YIELD sign must be installed at the passive grade crossing.

Engineering Study Components for STOP Signs

The engineering study and/or engineering judgment should include, among other factors, the following:

- Where the sightlines obstruct the visibility of the passive grade crossing in one or more quadrants as viewed on each approach from the location of the advanced railroad warning (W10-1) sign and a STOP sign is not already present (giving due consideration to seasonal crops or vegetation beyond the highway and railroad or LRT rights-of-ways)
- Characteristics of the highway, such as the functional classification, number of lanes, geometric conditions (crossing angle, minimum track clearance distance, clear storage distance, etc.), and vehicular traffic volumes (including percentage of trucks), proximity to industrial areas and roadway speed;
- Characteristics of the railroad including, but not limited to, frequency (including daily train traffic volumes and switching operations), type of trains, speed of trains, and the number of tracks; and
- Passive grade crossing collision history.

Installation Details

When used at a public passive crossing, the YIELD or STOP sign shall be installed in conformance with the general principles and standards for sign installations in Part 2 and Part 8 of the CA MUTCD 2012.

Minimum Vertical Clearance

The minimum height, measured vertically from the bottom of the YIELD or STOP sign to the top of the curb, or in the absence of curb, measured vertically from the bottom of the YIELD or STOP sign to the elevation of the near edge of the traveled way:

- Shall be 4 feet minimum if installed on an existing Crossbuck sign post,
- Shall be 5 feet minimum if mounted on a separate post in a rural area,
- Shall be 7 feet minimum on a new installation in area with pedestrian movements or parking whether on the same or separate post.

Retroreflective Strips

- A vertical strip of retroreflective white material, not less than 2 inches in width, shall be used on each Crossbuck support at passive grade crossings for the full length of the back of the support from the Crossbuck sign or Number of Tracks plaque to within 2 feet above the ground (CA MUTCD 2012 Section 8B.04(15)).
- The color of the retroreflective strip on the front of the support may be red (CA MUTCD 2012 Section 2A.21) or white (CA MUTCD 2012 Section 8B.03), while the color of the retroreflective strip on the back of the support shall be white. The dimensions and placement of the retroreflective strips shall be in conformance with the standards in CA MUTCD 2012 Section 8B.04.
- The vertical strip of retroreflective material may be omitted from the back sides of Crossbuck sign supports installed on one-way streets.
- The retroreflective strips should not interfere with the crash worthiness of the sign support.

Sign Placement Lateral Offset

Where a curb is present, there must be 2 feet from the edge of sign to the face of the curb. If no curb is present, provide at least 6 feet from the shoulder and at least 12 feet from the traveled lane. Please refer to Section 2A.19 and Figure 2A of CA MUTCD 2012 for detailed information.

STOP Line vs. YIELD Line Pavement Markings

Section 8B.28 of the CA MUTCD 2012 contains provisions regarding the use of stop lines or yield lines at grade crossings.

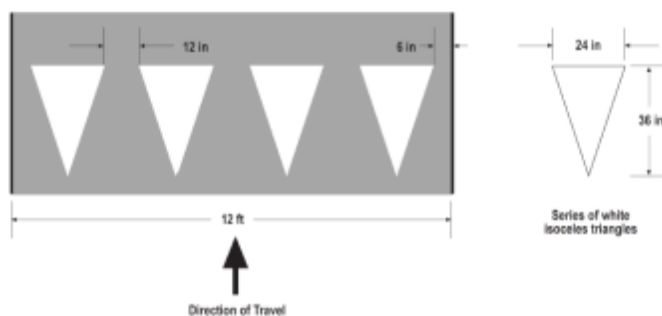
STOP Lines:

On paved roadway approaches to passive grade crossings where a STOP sign is installed in conjunction with the Crossbuck sign, a stop line should be installed to indicate the point behind which highway vehicles are required to stop or as near to that point as practical. The STOP line should be a 24 inch wide transverse line at a right angle to the traveled way and should be placed no closer than 15 feet in advance of the nearest rail.

YIELD Lines:

On paved roadway approaches to passive grade crossings where a YIELD sign is installed in conjunction with the Crossbuck sign, a yield line may be installed to indicate the point behind which highway vehicles are required to yield or stop or as near to that point as practical but no closer than 15 feet in advance of the nearest rail. YIELD lines shall consist of a row of solid white isosceles triangles pointing toward approaching vehicles extending across approach lanes to indicate the point at which the yield is intended or required to be made. The individual triangles comprising the yield line should have a base of 24 inches wide and a height of 36 inches. The space between the triangles should be 12 inches (See CA MUTCD 2012 Figure 3B-16 (CA) below). RCEB recommends that where YIELD signs are installed and the road is paved, a YIELD line be installed by the roadway agency. The CA MUTCD 2012 does not allow for the option of installing a STOP line with a YIELD sign. Therefore, any existing STOP line must be removed where a YIELD sign is installed for the passive grade crossing.

Figure 3B-16 (CA). Recommended Yield Line Layouts



STOP AHEAD and YIELD AHEAD Signs

The STOP or YIELD sign shall be installed on the near side of the intersection on the right-hand side of the approach to which it applies. Based on CA MUTCD 2012, Section 2.36, when the STOP or YIELD sign is installed at this required location and the sign visibility is restricted, a YIELD Ahead (W3-2) sign shall be installed in advance of the YIELD sign, or a STOP Ahead (W3-1) sign shall be installed in advance of the STOP sign. Visibility restriction means:

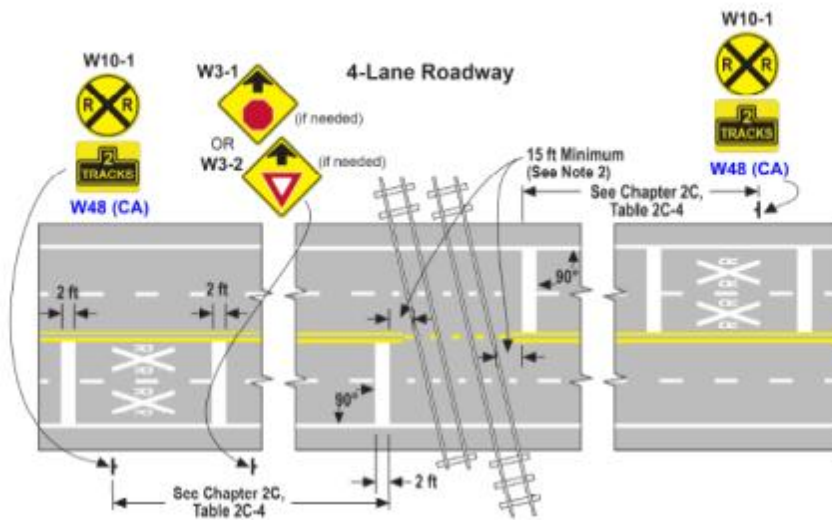
- That the YIELD or STOP sign is not visible for a sufficient distance to permit the road user to respond to the device. In practice, for railroad crossings this will mean when one is at the location of the advanced warning sign (W10 series), if you cannot see the passive signage at the crossing due to permanent obstructions (such as buildings, road curvature, etc.), the STOP/YIELD Ahead sign must be installed by the roadway authority.

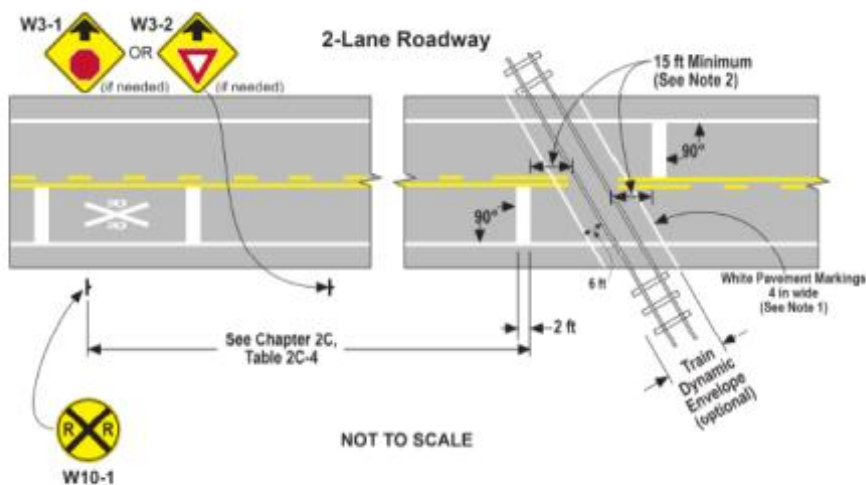
- Where the visibility of the YIELD or STOP sign at the crossing would be obstructed intermittently, such as due to foliage, parked cars, seasonal crops, etc. engineering judgment should be used to determine the treatment.
- Where visibility is not impaired, but engineering judgment determines that a STOP sign is necessary to provide additional emphasis, it may also be placed by the road authority.

If a YIELD Ahead or STOP Ahead sign is installed on the approach to the crossing, the advanced railroad crossing (W10-1) sign shall be installed upstream from the YIELD Ahead or STOP Ahead sign. The YIELD Ahead or STOP Ahead sign shall be located in accordance with Table 2C-4 of the CA MUTCD 2012. The minimum distance between the signs shall be in accordance with Section 2C.05 and Table 2C-4 of the CA MUTCD 2012.

See following example from CA MUTCD 2012 Figure 8B-6(CA):

Figure 8B-6 (CA). Example of Placement of Warning Signs and Pavement Markings at Grade Crossings (Sheet 1 of 3)





NOTES:

1. The distance between rail and the optional dynamic envelope pavement marking should be equal to 6 ft unless otherwise advised by the operating railroad.
2. Minimum 8 ft from the gate (if present), but no closer than 15 ft from the nearest rail. See Section 8B.28.
3. Longitudinal markings can be extended across the tracks at offset, skewed, complex, multilegged, curved roadway or multiple track crossings. See Section 8B.27.

Reporting Requirements

The CPUC requires a GO 88-B or a Form G from the railroad and/or roadway agency be submitted for the following:

1. A Commission GO 88-B, titled *Request for Authority to Modify a Crossing*, **must be filed** by the roadway agency when:

A new STOP control is being installed at a passive grade crossing where there was no STOP sign before.

2. A Commission Standard Form G, titled *Report of Changes at Highway Grade Crossings and Separations* must be filed for changes at all crossing locations not requiring a GO 88-B. Form G requirements and forms can be obtained at the CPUC web site Form G page at

<http://www.cpuc.ca.gov/PUC/safety/Rail/Crossings/formg.htm>. This report may be submitted electronically to rceb@cpuc.ca.gov as outlined on the web page.

A. Form G by Railroad

The railroad's report must indicate

1. Whether the YIELD/STOP sign was installed on the Crossbuck post or on a separate post of the passive grade crossing;
2. United States Department of Transportation (DOT) Number; and

3. Street name.

B. Form G by Road Authority

The Road Authority's report must indicate:

1. Whether a YIELD/STOP Ahead sign was installed at the passive grade crossing;
2. If a YIELD line pavement marking or STOP line was installed at the passive grade crossing, or No pavement marking installed, or removed existing STOP line after YIELD sign was installed by the railroad.
3. DOT Number; and
4. Street name.

Reporting of YIELD/STOP Signs Installation

In most cases, the railroads will be the party responsible to install and maintain the YIELD or STOP sign with the Crossbuck Assembly at the railroad crossing. The railroads should provide notification to the responsible local agency and the CPUC at least 60 days prior to placement of any YIELD sign. For a new stop control at the passive grade crossing, the roadway agency shall request that the railroad install the new stop sign in accordance with current CA MUTCD standards. The railroad shall notify the local agency and the CPUC at least 60 days prior to placement of any new STOP sign. CPUC can provide contact information for local agencies to the railroads. This will allow the local agencies time to review and plan for additional signage and marking changes for the passive grade crossings. Railroads may install a YIELD or STOP sign and report the change via a Form G for all locations without further review. The local roadway agency is responsible for submitting the GO 88-B for new stop control for roadway users.

Note: Since the railroad will be visiting the passive grade crossings, RCEB advises railroads to take the opportunity and maintain other signs like the Emergency Notification Signs (I-13), number of tracks signs (R15-2) and worn Crossbuck signs (R15-1).

Reporting of STOP Line or YIELD Line Pavement Markings

Pavement markings are typically the responsibility of the agency with jurisdiction over the roadway. The installation of STOP lines or YIELD lines for passive grade crossings should be installed by the roadway authority. The roadway authority shall then file the Form G for changes to the passive grade crossing. A Form G is not required for the maintenance of existing pavement markings. The roadway authority should also notify

any removal of existing STOP limit lines where a YIELD sign was installed at a passive grade crossing with a Crossbuck Assembly.

Reporting Changes of Advanced Warning Signage

Advance warning signage is typically installed and maintained by the agency with jurisdiction over the roadway. The roadway authority shall file a Form G to notify the CPUC of any YIELD AHEAD or STOP AHEAD advanced warning sign installations. The installation of these signs may also require the relocation of the advanced railroad crossing (W10-1) signs, and number of tracks (W48) signs where applicable.

Note: Since the roadway authority will be visiting the passive grade crossings, RCEB advises roadway agencies to take the opportunity and maintain other signs and pavement markings: like the W10-1 series advanced warning signs, parking restriction signs near the crossing, RXR pavement markings, etc.