

CALIFORNIA TRAFFIC CONTROL DEVICES COMMITTEE (CTCDC) AGENDA
September 25th, 2014 Meeting (9:00 am to until Finish)
Caltrans District 4 Office, 111 Grand Ave (Auditorium), Oakland, CA 94612

The Meeting is open, and public/local agencies are invited to attend. For further information regarding this meeting, please contact Devinder Singh at (916) 654-4715, or at Devinder.singh@dot.ca.gov. Electronic copies of this meeting Agenda and minutes of the previous meetings are available at <http://www.dot.ca.gov/hq/traffops/engineering/ctcdc/index.htm>

Organization Items

- 1 Introduction**
- 2 Membership** – Jay Walters nominated as a Voting Member to represent Northern CA Cities by the League of CA Cities (LOCC)
- 3 Approval of Minutes of the May 14, 2014 Meetings**
- 4 Public Comments**

At this time, members of the public may comment on any item not appearing on the agenda. Matters presented under this item cannot be discussed or acted upon by the Committee at this time. For items appearing on the agenda, the public is invited to make comments at the time the item is considered by the Committee. Any person addressing the Committee will be limited to a maximum of five (5) minutes so that all interested parties have an opportunity to speak. When addressing Committee, please state your name, address, and business or organization you are representing for the record.

4a Presentation by California State Transportation Agency

Honorable Kate White, Deputy Secretary of Environmental Policy and Housing Coordination

Agenda Items

5 Public Hearing

Prior to adopting rules and regulations prescribing uniform standards and specifications for all official traffic control devices placed pursuant to Section 21400 of the California Vehicle Code (CVC), the Department of Transportation is required to consult with local agencies and hold public hearings.

		Page #s
13-05	Proposal to amend Sections 2C.37 & 4I.03 of the CA MUTCD to add Activated Blank-out METER ON & PREPARE TO STOP Sign -submitted by Caltrans	(Continued) (Tong) 9-15
14-05	Adopt Interim Approval issued by the FHWA for Optional Use of a Bicycle Signal Face (1A-16) – submitted by Caltrans Non-motorized Member	(Continued) (Ciccarelli) 16-31
14-15	Proposal to Amend various Sections 2A.15, 3B.18, 4E.06, 7A.01 7B.01, 7B.12 & 7C.02 of CA MUTCD – Submitted by Caltrans District 4	(Introduction) (Ciccarelli) 32-40
14-16	Proposal to Amend Section 4C.01, Studies & Factors for Justifying Traffic Control Signals – Submitted by Caltrans	(Introduction) (Tong) 41-44
14-17	Proposal to create an ALT FUEL VEHICLE PARKING ONLY sign by amending Section 2I.05 - submitted by Caltrans	(Introduction) (Tong) 45-46

- 14-18 Proposal to create a New Regulatory & Warning Sign, Motorist Give 3 FT to Bike (Rxx(CA) & W11-XXP(CA)
- submitted by Caltrans Non-motorized Member (Introduction)
(Cicarelli) [47-57](#)
- 14-19 Proposal to amend CA Blue text from Section 6F.85, Temporary Traffic Barriers – submitted by Caltrans (Introduction)
(Tong) [58-59](#)
- 14-20 Proposal to adopt Buffered Bicycle Lane, Contra Flow Bicycle Lane and Intersection Bicycle Lane Markings by amending Section 9C.04 of CA MUTCD– Submitted by Caltrans (Introduction)
(Cicarelli) [60-67](#)

6 Request for Experimentation- None

7 Discussion Items - None

8 Information Items

- 14-02 Proposal to adopt “PRESERVE AMERICA” sign by adding a new Section 2D .104(CA) to the CA MUTCD- Submitted by Tuolumne Co) (Continued)
(Marshall) [68-70](#)
- 13-08 Minimum Yellow Change Interval Timing Compliance dates [71](#)

9 Tabled Items

- 14-03 CA MUTCD Illumination policy change on Overhead Guide Signs (Proposal to amend Section 2D.03 and 2E.6) – **Item will be withdrawn**
- 14-06 Proposal to amend Section 7B.15 of the CA MUTCD to define “WHEN CHILDREN ARE PRESENT” sign – **Item will be withdrawn**

10 Next Meeting

11 Adjourn

ITEM UNDER EXPERIMENTATION

- 09-9 Experiment with Steady Red Stop Line Light (Greenwood)
Status: LADOT prepared a draft evaluation report which indicated that the Steady Red Stop Lights at two intersections did reduce vehicle/bus and vehicle/train conflicts based on the camera surveillance data. However, the “Control Intersections” (locations where no Steady Red Stop Lights were installed) also showed similar improvements. Further analysis of more data will be conducted in the next twelve months.
 See report on the following website.
<http://www.dot.ca.gov/hq/traffops/engineering/ctcdc/status.htm>
- 09-21 Experiment with Separated/Protected Bikeway (Greenwood)
 On the Left Side of Two One-Way Streets in the City of Long Beach (Rte 9-112E)
Status: No new update. See report on the following website.
<http://www.dot.ca.gov/hq/traffops/engineering/ctcdc/status.htm>
- 10-3 Experiment with Second Train Warning Sign “Additional Train May (Greenwood)
 Approach” with a Symbol Sign (Submitted by City of Riverside)
Status: See report on the following website:
<http://www.dot.ca.gov/hq/traffops/engineering/ctcdc/reports/Final%20Report%20Additional%20Train%20May%20Approach%20Sign.pdf>
- 11-3 Experiment with Buffered Bicycle Lanes on 2nd St.between Bayshore (Greenwood)
 & PCH in Naples
Status: No update.
- 11-12 Experiment with Circular Rapid Flashing Beacon and RRFB (Greenwood)
Status: No update.
- 11-13 Experiment with a Sign “RECKLESS DRIVING PROHIBITED” (Winter)
Status: (04-09-14) The County of Los Angeles Department of Public Works recently completed its experimental phase of the “Reckless Driving Prohibited” sign and is currently in the process of gathering data from the local law enforcement agencies (United States Forest Service, Los Angeles County Sheriff’s Department, and the California Highway Patrol). This data is needed in order to prepare the final report, which is tentatively scheduled to be completed by June 5, 2014. Please forward any future correspondences regarding the experimental sign directly to me. Thank you.
 Arnel G. Dulay, P.E., T.E.
 Head, Traffic Investigations II Section
 Traffic and Lighting Division
 (626) 300-4748; Dulay, Arnel [ADULAY@dpw.lacounty.gov]
- 11-19 Experiment with 2nd advance California Welcome Center Destination Sign (Benton)
Status: No update.
- 12-9 Request to Experiment with Yellow LED Border on Pedestrian Signal (Benton)
Status: (4-1-2014)
 Since the last status update sent to FHWA (and copied to the CTCDC) on January 13, 2014, we have continued to make progress on this experiment. All of the before/after video data has been collected for the 5 intersection study. As noted in previous updates, the amount of video data to review is considerable. The first two intersections completed were studied for seven consecutive days in each scenario (14 days

total). Based on the amount of information gathered from those studies, it was decided that the remaining three intersections would only be reviewed for five consecutive days (10 days total). Here is a summary of where we currently stand at each location:

Intersection	Review Period (Days)	% Complete
Churn Creek Rd/Hartnell Ave	14	100
Shasta Street/ Pine Street	10	60
Eureka Way/Market Street	10	50
Market Street/ Shasta Street	14	100
Market Street/Tehama Street	10	50

The data from the video reviews will be entered into spreadsheets and the results will be presented in the final report. We anticipate completing the final report this summer.

Let me know if you have any questions. Thanks.

Rob Stinger, P.E.

Chief - Traffic Engineering & Operations
 Caltrans District 2
 530-225-3229

- 12-18 Request to experiment with Red Colored Transit-only Lanes (SF) (Patterson) **Status: (4-2-14)** In addition to the March 2013 installation of red transit-only lanes on Church Street between 16th Street and Duboce Avenue that we previously reported on, the SFMTA installed red transit-only lanes on 3rd Street between Market and Townsend streets in March 2014 (pictures attached). We used pre-formed thermoplastic on 3rd Street, which

We will compare with the spray-on treatment that was applied on Church Street. We are planning to complete installations on the following additional corridors over the next two months, and are currently completing the “before” data collection prior to implementation:

- Geary Street between Gough and Market streets
- O’Farrell Street between Gough and Market streets
- Market Street between 5th and 12th streets

We are currently working on a formal evaluation of the Church Street installation, but here are some preliminary findings:

- During peak hours, light rail transit vehicle travel times along the segment of Church Street where red lanes were implemented have been reduced by approximately 10%.
- Controlling for relative levels of congestion, motorist violation rates within the red transit-only lanes on Church Street are about ½ as high as violation rates on Judah Street (another corridor with light rail service and transit-lane lanes that are not red).





Dustin White
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- 12-19 Request to Experiment with Highlighted Shared Lane Markings (LA City) (Bahadori)
Status: (3-27-14) On the Highlighted Sharrow Study Los Angeles have conducted the pre-sharrow part of the study but have put the entire experiment on hold pending a letter from the FHWA which is no longer approving experiments using green on bike treatments. The City have been waiting for guidance from Caltrans/CTCDC on how should proceed
- 12-21 Request to Experiment with In-Roadway Warning Lights (IRWL) System that would supplement existing traffic signals along the Metro Gold Line (LA Metro) (Winter)
Status (1-2-14) • Metro, Los Angeles County DPW and Los Angeles City DOT have each submitted their final comments on the 100% Plans & Specs in December 2013. These plans are expected to be approved in January 2014
- Construction solicitation scheduled for release in February 2014
 - Contract award is anticipated in May 2014, pending Metro Board approval.
 - Construction to begin in June 2014 and take 3 months to complete.
 - Once the illuminated markers are in place, Metro will be preparing bi-annual progress reports to track their performance. This reporting will include a review of their effectiveness at reducing the average monthly number of left-turn violations.

12-25 Request for permission to experiment with various Bicycle Treatments (Winter)
(Santa Monica)

Status: See report on the following website:

<http://www.dot.ca.gov/hq/traffops/engineering/ctcdc/exp/city-of-santa-monica-update-bike-ctcdc-buffered-lanes-04-09-2014.pdf>

13-01 Request to Experiment with Green & Shared Roadway Bicycle Markings – Proposed by the City of Oakland (Patterson)
Status: (3-28-14) Milestones:

- Data collection to document the existing condition was completed during the week of Sunday, April 28, 2013.
- Stage #1 construction (installation of standard treatments) was completed on July 19, 2013. This stage included: sharrows, parking edge line stripes (Detail 27B), and “Bicycles May Use Full Lane” (R4-11) signs. Data collection for the Stage #1 condition (standard treatments) was completed over the week ending August 20, 2013.
- Stage #2 construction (installation of the experimental green band) was completed on September 10, 2013. Sharrows were reinstalled on top of the green band by September 15, 2013. Data collection for the Stage #2 condition (experimental treatment) was completed the week ending October 24.
- Data analysis is now underway.

The final phase of data collection was complicated by a strike by transit workers at the Bay Area Rapid Transit District (BART). Data collection occurred from October 17 to October 24. The BART strike occurred from October 18 through October 21. To the extent feasible, data collection was shifted to avoid the strike. However, data collection could not be delayed to the end of October (nor into November) due to earlier sunsets bringing darker conditions to the PM peak period. The bulk of the weekday video data was collected after the strike. However, the total volumes of cyclists and motorists were lower than typical both during and immediately after the strike. This outcome was anticipated given the proximity of the data collection to the MacArthur BART station. The City is considering additional follow-up counts (e.g., one year after) as a means to factor out the effects of the BART strike.

Jason Patton, PhD

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13-02 Request to Experiment with Bike Boxes and Wide Bike Strip Stripe (Patterson)
-Proposed by the City of Davis

Status :(3-28-14) FHWA did not consider the use of the 12” wide stripe as requiring an experiment.

“The City is not precluded by Figure 9C-3 in the national MUTCD from using a 12-inch longitudinal solid white pavement marking as proposed in your submission. Paragraphs 1, 2 and 6 of Section 3A.06 and Paragraph 20 in Section 3B.04 in the MUTCD allow an agency to currently implement this device as proposed. Thus, the FHWA does not consider this device to be experimental and deletes reference to it in your submission. The City may use it at any time in accordance with the aforementioned applicable provisions and also in accordance with Paragraph 1 of Section 3B.04.”

If this is consistent with the CTCDC’s perspective, we should update the title of our experiment to only include the bike boxes.

The City of Davis will be installing our bike boxes this spring (May). FHWA has approved the experiment as well. Below is the experiment documentation and reporting protocol. Documentation of existing conditions has been conducted. UC Davis will be assisting the City of Davis with this endeavor.

“Evaluation of the experiment would begin the first week after installation. Observations of the Bike Box experiments on B Street and A Street will be conducted at two peak times (Morning / Evening) one day a week for two months (Wednesdays). Each observation session will be one-hour in duration. Following the first two months of the experiment, observations will be decreased to one day a month for the remaining 10 months of the experiment (3rd Wednesday of week). It is hypothesized that the first two months of the experiment will be the most critical in terms of gathering data related to bicycle & motorist behavior. It is anticipated that after the facility has been installed for a couple of months the rate of potential conflicts will decrease due to learned behavior and an increased user knowledge of how the facility functions.”

Submitted by David Kemp

13-05 Proposal to amend Sections 2C.37 and 4I.03 of the CA MUTCD 2012 to add Activated Blank-Out (ABO) METER ON & PREPARE TO STOP signs

RECOMMENDATION: Caltrans requests that the Committee recommend to amend Section 2C.37 and Section 4I.03 as proposed, and to include figures and sign codes for the “METER ON” and “PREPARE TO STOP” activated blank-out signs used for ramp metering.

AGENCY MAKING REQUEST/SPONSOR: Caltrans, Duper Tong, Voting Member

BACKGROUND: On March 21, 2013, the *California Traffic Control Devices Committee* (CTCDC) voted to recommend agenda item #13-05 to amend sections 2C.37 and 4I.03 in the California MUTCD, but work with FHWA to address concerns shared at the meeting with one of the signs in the proposal. Overhead activated blank-out (ABO) signs used on high-volume onramps and metered freeway to freeway connectors were recommended to include in the next update to the CA MUTCD. Also, Caltrans was requested to work with FHWA to resolve concerns for the white on black, flashing LED “METER ON” sign (shown as Figure 8 in the original agenda item) that is mounted within pedestrian signal heads in thousands of units throughout the State. During the past year and half, Caltrans has worked with FHWA CA Division Office representatives to address concerns with the flashing message, white LED “METER ON” sign, and proposes changes to retrofit upwards of 3,962 units, in use across California.

With changes outlined in the attached table for the W88-1(CA) ABO sign, Caltrans staff has developed updated specifications for this sign.

PROPOSAL: Include the figures of the METER ON and PREPARE TO STOP signs, and assign sign codes for these activated blank-out (ABO) signs in Section 2C.37 and Section 4I.03. In addition to recommended overhead ABO signs from the 3/21/2013 CTCDC, Caltrans proposes updated specifications, policy language, figure, and sign code for the roadside-mounted METER ON (W88-1(CA)) sign.

Section 2C.37 Advance Ramp Control Signal Signs (W3-7 and W3-8)

Option:

01 A RAMP METER AHEAD (W3-7) sign (see Figure 2C-6) may be used to warn road users that a freeway entrance ramp is metered and that they will encounter a ramp control signal (see Chapter 4I).

Guidance:

02 When the ramp control signals are *in operation* ~~operated only during certain periods of the day~~, a RAMP METERED WHEN FLASHING (W3-8) sign (see Figure 2C-6), *or an activated blank-out “METER ON” (W88-1(CA), W88-2(CA), W88-3(CA)), and/or an activated blank-out “PREPARE TO STOP” (W89(CA)) sign* should be installed in advance of the ramp control signal near the entrance to the ramp, or on the arterial on the approach to the ramp, to alert road users to the presence and operation of ramp meters.

Standard:

03 ~~If used,~~ the RAMP METERED WHEN FLASHING sign shall be supplemented with a warning beacon (see Section 4L.03) that flashes when the ramp control signal is in operation.

Section 4I.03 Operation of Freeway Entrance Ramp Control Signals

Guidance:

01 Operational strategies for ramp control signals, such as periods of operation, metering rates and algorithms, and queue management, should be determined by the operating agency prior to the installation of the ramp control signals and should be closely monitored and adjusted as needed thereafter.

02 When the ramp control signals are *in operation* ~~operated only during certain periods of the day~~, a RAMP METERED WHEN FLASHING (W3-8) sign (see Section 2C.37) *or an activated blank-out “METER ON” (W88-1(CA), W88-2(CA), W88-3(CA)), and/or an activated blank-out “PREPARE TO STOP” (W89(CA)) sign*

should be installed in advance of the ramp control signal near the entrance to the ramp, or on the arterial on the approach to the ramp, to alert road users to the presence and operation of ramp meters.

Standard:

03 If used, the RAMP METERED WHEN FLASHING sign shall be supplemented with a warning beacon (see Section 4L.03) that flashes when the ramp control signal is in operation.

Ramp Meter Activated Blank-Out Signs	
Sign Code	Figure
W88-1 (CA)	
W88-2 (CA)	
W88-3 (CA)	
W89 (CA)	

Changes made to the METER ON (W88-1(CA)) ABO sign assembly include the following:

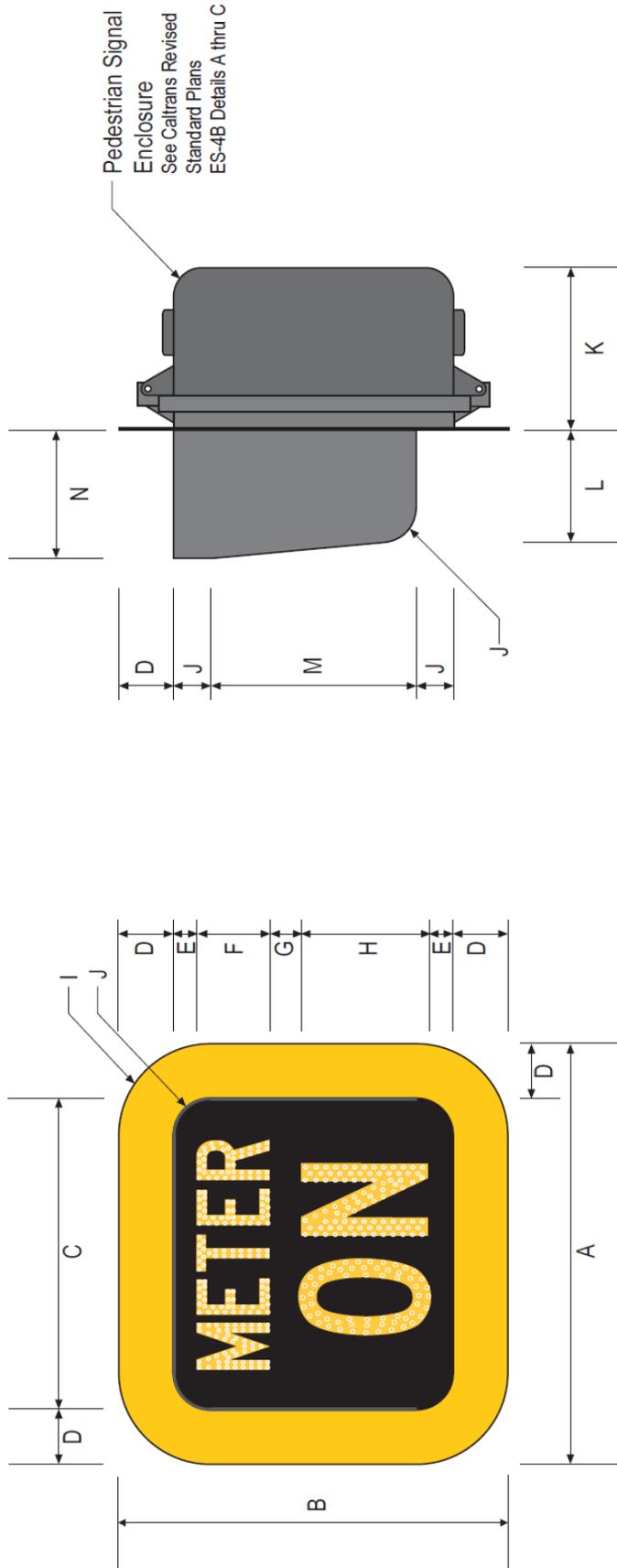
Before



After



Colors	White LED on Black background	Amber LED on Black Background With retroreflective fluorescent Yellow border
Display	METER ON (flashing, when activated At 50-60 hertz)	METER ON (Steady on, when activated)
Border	None	3-inch perimeter Enhanced Conspicuity Treatment
Ambient Light Mitigation	Z-Screen, or “Egg Crate”	7-inch, tapered visor With no Z-screen to obscure legend on top and sides
Dimensions	17” W x 14.25” D	23” W x 21.25” D



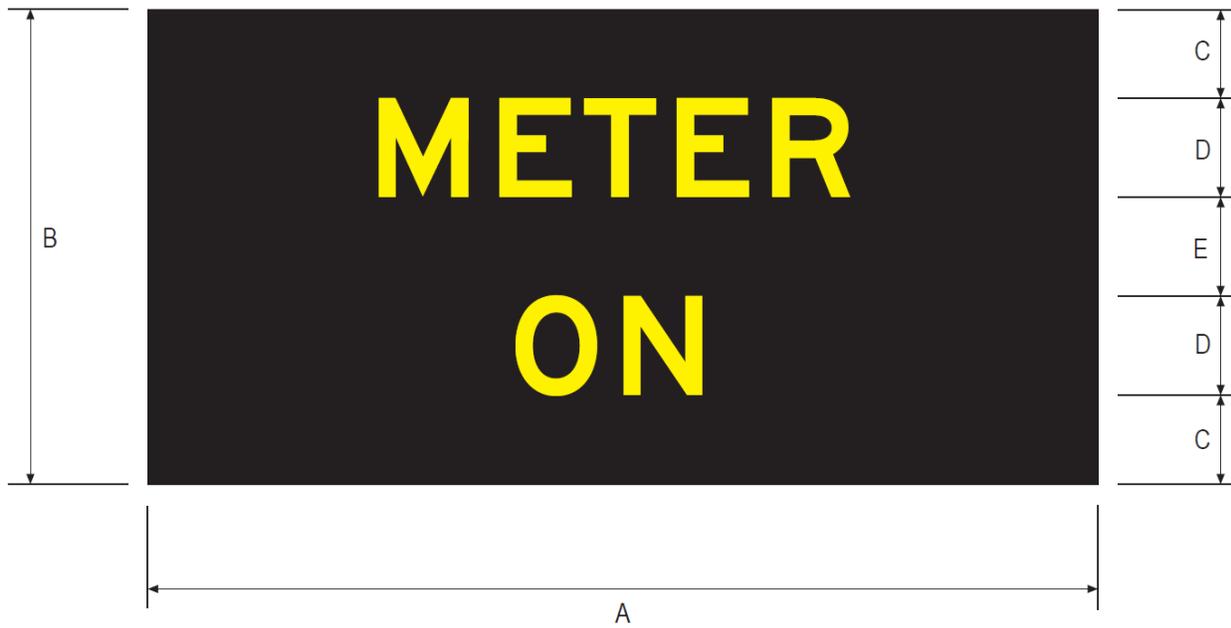
**W88-1 (CA)
ACTIVATED BLANK-OUT**

ENGLISH UNITS (INCHES)

A	B	C	D	E	F	G	H	I	J	K	L	M	N
23	21.25	17	3	1.25	4C	1.75	7C	5	2	8.75	6.125	11.25	7

COLORS: BORDER - RETROREFLECTIVE FLUORESCENT YELLOW
 LEGEND - AMBER LED (STEADY ON, NON-FLASHING WHEN ACTIVATED, LED CHROMATICITY WAVELENGTH OF 590-600 nm)
 BACKGROUND - BLACK

DRAFT 8/7/2014



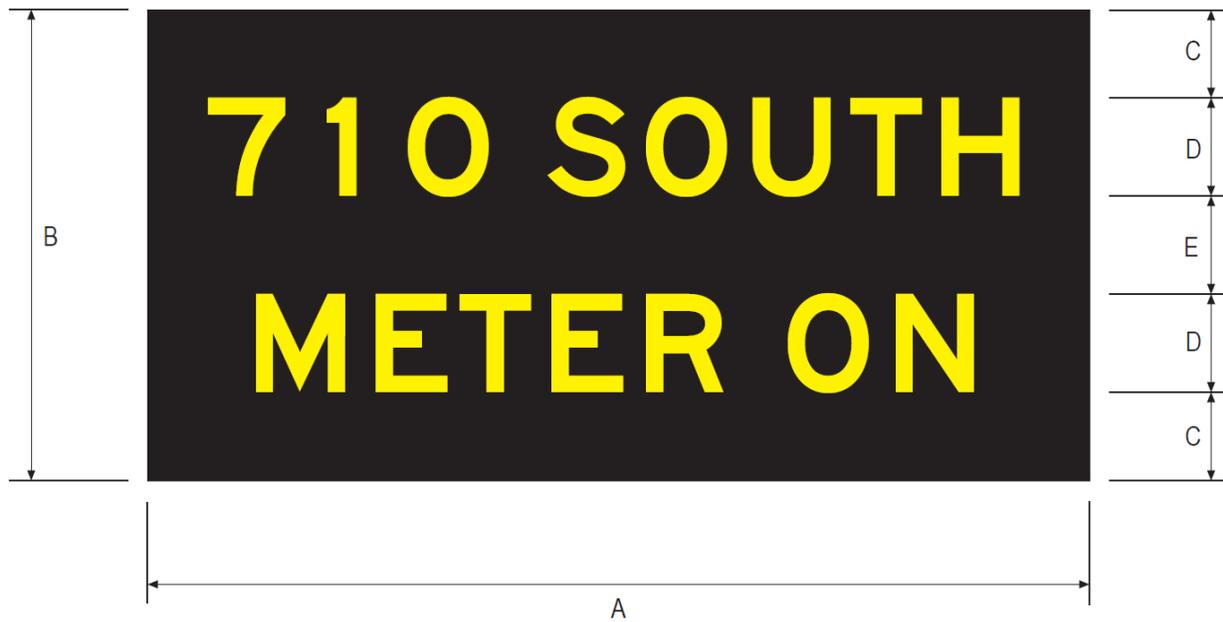
W88-2 (CA) Activated Blank-Out

ENGLISH UNITS

A	B	C	D	E
96	48	8.75	10E	9.5

**COLORS: LEGEND - AMBER LED (STEADY ON, NON-FLASHING WHEN ACTIVATED,
LED CHROMATICITY WAVELENGTH OF 590-600 nm)
BACKGROUND - BLACK**

8/1/2014



W88-3 (CA) Activated Blank-Out

ENGLISH UNITS

A	B	C	D	E
96	48	8.75	10E	9.5

COLORS: LEGEND - AMBER LED (STEADY ON, NON-FLASHING WHEN ACTIVATED,
LED CHROMATICITY WAVELENGTH OF 590-600 nm)
BACKGROUND - BLACK

8/1/2014



W89 (CA) Activated Blank-Out

ENGLISH UNITS

A	B	C	D	E
96	48	8.75	10E	9.5

**COLORS: LEGEND - AMBER LED (STEADY ON, NON-FLASHING WHEN ACTIVATED,
LED CHROMATICITY WAVELENGTH OF 590-600 nm)
BACKGROUND - BLACK**

8/1/2014

14-05 Adopt Interim Approval issued by the FHWA for Optional Use of a Bicycle Signal Face (1A-16)

Recommendations: CTCDC non-motorized members John Cicarelli requests that the Committee makes recommendations to adopt the policy for Optional Use of a Bicycle Signal Face as described under the proposal.

Requesting and Sponsor Agency: John Cicarelli, Caltrans Non-motorized Member

Background: During the February 19th and May 14th, 2014 CTCDC meetings, John Cicarelli, Caltrans Non-motorized member had discussed proposed language with the CTCDC members.

John proposed a policy by modifying the current CA MUTCD, Section 4D.014(CA) Bicycle Signals, and the Interim Approval issued by FHWA. To see the **FHWA** Interim Approval Memo, please visit on the following website:

http://mutcd.fhwa.dot.gov/resources/interim_approval/ia16/ia16.pdf

Subject	Request for CTCDC Agenda Item: Bicycle Signal Faces	Date	8/12/2014
To	Devinder Singh, Executive Secretary California Traffic Control Devices Committee (CTCDC)		

History

CTCDC first addressed Bicycle Signals in 1990 (Item 90-7) in a proposed experiment by the City of Davis. Davis has several locations where high volumes of bicycle traffic enter and leave signalized intersections as the fourth leg of what is otherwise a T intersection. In 1996 Davis reported successful outcomes, and CTCDC asked the City, with assistance from CBAC, to develop proposed warrants, standards and draft legislation for the device. In 1999 warrants were recommended for use when a separate bicycle signal phase is needed.

In 2000 Caltrans developed a Standard Plan. By 2002 the Caltrans Traffic Manual had incorporated Bicycle Signal Heads in Chapter 9, Traffic Signals and Lighting. Traffic Manual content was incorporated into the California's MUTCD in the 2006 edition, in Sections 4C.102(CA) Bicycle Signal Warrant and 4D.104(CA) Bicycle Signals. 4C.102(CA) has three warrant conditions:

- volume (peak hour motor vehicles x bicycles)
- collision history
- geometry

Recent FHWA and NCUTCD Activity

The US (FHWA) MUTCD previously did not address Bicycle Signal Faces. In December 2013 FHWA issued Interim Approval #16 for Bicycle Signal Faces, with many more configurations and operational choices than in the CA MUTCD. In response, the National Council on Uniform Traffic Control Devices (NCUTCD) Signals Technical Committee (STC) and Bicycle Technical Committee (BTC) began working jointly on a MUTCD proposal covering the layout, meaning and operation of Bicycle Signal Faces. That proposal was reviewed by NCUTCD Sponsor organizations, and at its June 2014 meeting the NCUTCD Council forwarded the approved proposal to FHWA.

CA MUTCD Proposal

This memo:

- Proposes CA MUTCD content for Bicycle Signal Faces based in large part on the NCUTCD proposal likely to appear in the next (2016?) FHWA MUTCD, with certain California exceptions and additions;
- Adds CA-specific content for use of Bicycle Signal Faces with Pedestrian Hybrid Beacons (PHBs), a context not well addressed in the NCUTCD proposal. This includes a CA-specific Figure xx-2 showing recommended phasing for use with a PHB.

The following pages are the NCUTCD proposal, with its original line numbers removed and California differences added (indicated in **GREEN TEXT**).



National Committee on Uniform Traffic Control Devices

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NOTE: This is a recommendation to FHWA on changes to the MUTCD by the National Committee on Uniform Traffic Control Devices (NCUTCD). This recommendation is not a revision to the MUTCD and does not constitute official standards, guidance, or options. No proposed revision to the MUTCD is effective unless and until approved by FHWA through an Interim Approval or through the Federal rulemaking process.

TECHNICAL COMMITTEE:	Bicycle Technical Committee and Signals Technical Committee
TOPIC:	Recommendation – Bicycle Signal Faces
STATUS/DATE OF ACTION:	Recommended to send to sponsors following the January 2014 NCUTCD meeting
Technical Committee Vote:	BTC – 19-1-0 STC – 35-0-0
Transmitted to Sponsors:	March 2014
Council Approval:	June 28, 2014
ORIGIN OF REQUEST:	Various
AFFECTED SECTIONS OF MUTCD:	Various portions of Parts 1, 4, & 9

SUMMARY:

An Interim Approval has been issued for the optional use of a bicycle signal face (IA-16). This joint technical committee recommendation provides proposed MUTCD language to update the existing MUTCD standards, guidance, and options to add provisions for bicycle signal faces to control certain bicycle movements. This recommendation is based on the Interim Approval.

DISCUSSION:

The concept of providing separate signal faces to control bicycle movements at traffic control signals has been a topic of discussion in recent years. Informal working group sessions have been held at National Committee meetings to discuss this topic and work toward the development of proposed MUTCD language. However, following the June 2013 NCUTCD meeting, FHWA indicated their intent to issue an Interim Approval by the end of 2013 to allow the optional use of bicycle signal faces. There was insufficient time for the NCUTCD technical committees to develop proposed language, submit it to the sponsoring organizations for review, and refine and present it to the NC Council for a vote prior to the time FHWA needed a response. Therefore, the Bicycle Technical Committee (BTC) and the Signals Technical Committee (STC) worked jointly to develop a joint technical committee recommendation that was submitted to FHWA in November 2013. That joint technical

committee recommendation was sent to sponsors as an information item at the time it was submitted to FHWA. The Interim Approval was issued December 24, 2013.

At the January 2014 NCUTCD meeting, the BTC and STC held a special joint session to discuss the Interim Approval and develop proposed language for inclusion in the Notice of Proposed Amendment (NPA) for the next MUTCD. The following is presented as a joint technical committee recommendation to add provisions for the use of bicycle signal faces to the MUTCD. Most of the language is new and is proposed to be in a new MUTCD chapter. However, there are some minor changes needed to existing MUTCD sections to incorporate the new chapter.

There are some items that should be considered when reviewing this recommendation.

1. While the current MUTCD does not specifically address bicycle signal faces, Section 4D.07 references “circular indications in a signal face installed for the sole purpose of controlling a bikeway or a bicycle movement”. Although no similar reference exists for the use of arrow indications to control a bikeway or a bicycle movement, there is also nothing prohibiting arrow indications for that application. Therefore, the use of bicycle signal faces with all circular indications or all arrow indications have been included in the recommendation. Since straight through yellow arrows and red arrows are not permitted, the use of bicycle signal faces with all arrow indications has been limited to all left or all right arrows.
2. A new definition has been included for a “bicycle symbol signal indication”. This definition is for a red, yellow, or green signal indication that displays a bicycle symbol rather than a circular indication. It is important to note the difference and distinction between a “bicycle symbol signal indication” and a “bicycle signal indication”. A “bicycle signal indication” simply refers to an indication in a bicycle signal face. This could be a circular indication, an arrow indication, or a bicycle symbol signal indication. However, a “bicycle symbol signal indication” refers specifically to an indication that displays a red, yellow, or green bicycle symbol.
3. The two illustrations from the Interim Approval were included as figures in the joint Technical Committee Recommendation that was sent to sponsors. However, during the joint BTC/STC session at the meeting, the committees felt that combinations of arrow indications and bicycle symbol indications in the same signal face should not be allowed. The recommendation language was therefore revised to delete references to such combinations of indications in a bicycle signal face and Attachment 1A-16-2 from the IA that included [such] signal faces was deleted from the recommendation. Attachment 1A-16-1 was revised to show bicycle signal faces that include only circular indications, only bicycle symbol indications, only left arrow indications, or only right arrow indications.
4. The following concerning the use of bicycle signal faces is included as #1 in the Interim Approval:
However, if an agency opts to use bicycle signal faces under this Interim Approval, such use shall be limited to situations where bicycles moving on a green or yellow signal indication in a bicycle signal face are not in conflict with any simultaneous motor vehicle movement at the signalized location, including right (or left) turns on red.

The BTC & STC felt this is unnecessarily restrictive and included less restrictive language. When sent to Sponsors, the second Guidance paragraph in Section xx.02 was listed as a Standard. This was changed to Guidance during the joint BTC/STC session. It was felt that an agency may desire to provide a bicycle signal face at each signalized location along a route with a bicycle lane or separate bicycle facility to provide consistency indications provided to control the bicycle movements at successive signalized locations.

5. Several revisions considered editorial were made based on Sponsor comments. In addition, the following modifications were presented to and approved by National Committee in the final recommendation:
 - Added an Option to specifically allow the use of a bicycle signal face at a mid-block signal that does not have a motor vehicle movement parallel to the bicycle crossing.
 - Added an Option to specifically allow the use of a BICYCLE SIGNAL: with a bicycle signal face that contains only bicycle symbol indications. This sign is required for a bicycle signal face that does not contain all bicycle symbol indications and the technical committees felt it was important to note that, while not required, a sign is allowed when all of the indications in a bicycle signal face are bicycle symbol indications.

- Included sign sizes other than those included in the Interim Approval in order to improve visibility and layout.
- Included a Standard that prohibits exclusive and simultaneous bicycle movements from perpendicular directions rather than using the language included in the IA. This is to allow an exclusive diagonal bicycle movement through an intersection, but not a “scramble” phase that could have conflicting perpendicular bicycle movements.

NOTE: The California-specific content of this modified NCUTCD proposal specifies that a flashing yellow bicycle signal indication shall be displayed on all approaches with conflicting perpendicular bicycle movements during such a “scramble” phase.

- Included Guidance that a bicycle signal face should not be used with a hybrid beacon. This was included as a Standard in the IA. It was felt that bicycle faces could be used with a hybrid beacon as long as the requirements of the hybrid beacon are satisfied, primarily the required sequence of indications.

NOTE: The California-specific content of this modified NCUTCD proposal includes a phasing sequence for use with a pedestrian hybrid beacon.

RECOMMENDED CHANGES TO THE CALIFORNIA MUTCD:

Recommended changes to the California MUTCD consist of all changes listed in the RECOMMENDED CHANGES TO THE MUTCD sections that follow, except those delimited by green lines such as these:

<BEGIN CALIFORNIA-ONLY>

<END CALIFORNIA-ONLY>

California-specific commentary appears in **Green Highlight**.

RECOMMENDED CHANGES TO THE MUTCD:

Other than minor changes in Section 4D.06, there is no existing FHWA MUTCD language proposed for deletion as part of this recommendation. The deletions in 4D.06 are shown in red strikethrough (~~red strikethrough~~). Proposed additions are shown using red underline (red underline). Some text in the draft recommendation is in yellow highlight. Yellow highlighting indicates text that is providing supplemental information related to the recommendation, but is not part of the recommended text.

Add the following two new definitions (Standards) in Section 1A.13 following definition 23 Bicycle Lane:

Section 1A.13 Definitions

Standard:

xx. Bicycle Signal Face - a signal face, consisting of three or more signal sections, that exclusively controls a bicycle movement from a designated bicycle lane or from a separate facility such as a shared use path, and that displays signal indications that are applicable only to the bicycle movement.

xx. Bicycle Symbol Signal Indication - a red, yellow, or green signal indication that displays a bicycle symbol rather than a circular or arrow indication.

<BEGIN CALIFORNIA-ONLY>

Delete CA MUTCD section 4C.102(CA) Bicycle Signal Warrant. Rationale:

- The NCUTCD proposal contains no conditions comparable to 4C.102(CA)'s Volume or Collision warrant.

- Proposed new section XX.03 Warrants for Bicycle Signal Faces, in proposed new Chapter XX Bicycle Signal Faces, states that “[n]o new traffic signal warrant(s) specific to bicycle signal faces or in addition to those already provided in Chapter 4C are established”.
- 4C.102(CA)’s Geometric warrant is replaced by the NCUTCD proposal’s new Sections 4D.04 and 9D.03.

~~Section 4C.102(CA) Bicycle Signal Warrant~~

~~Guidance:~~

~~01 A bicycle signal should be considered for use only when the volume and collision or volume and geometric warrants have been met:~~

~~1. Volume; When $W = B \times V$ and $W > 50,000$ and $B > 50$.~~

~~Where: W is the volume warrant. B is the number of bicycles at the peak hour entering the intersection. V is the number of vehicles at the peak hour entering the intersection. B and V shall use the same peak hour.~~

~~2. Collision; When 2 or more bicycle/vehicle collisions of types susceptible to correction by a bicycle signal have occurred over a 12-month period and the responsible public works official determines that a bicycle signal will reduce the number of collisions.~~

~~3. Geometric;~~

~~(a) Where a separate bicycle/ multi-use path intersects a roadway.~~

~~(b) At other locations to facilitate a bicycle movement that is not permitted for a motor vehicle.~~

~~Delete CA MUTCD section 4D.104(CA) Bicycle Signals. Rationale:~~

- ~~The NCUTCD proposal includes substantially more detail and options.~~

~~Section 4D.104(CA) Bicycle Signals~~

~~Support:~~

~~01 A bicycle signal (see Figure 4D-112(CA)) is an electrically powered traffic control device that may only be used in combination with an existing traffic signal. Bicycle signals shall direct bicyclists to take specific actions and may be used to improve an identified safety or operational problem involving bicycles. Refer to CVC 21450.~~

~~Standard:~~

~~02 Only green, yellow and red lighted bicycle symbols, shall be used to implement bicycle movement at a signalized intersection. The application of bicycle signals shall be implemented only at locations that meet Department of Transportation Bicycle Signal Warrants (see Section 4C.102(CA)).~~

~~03 A separate signal phase for bicycle movement shall be used.~~

~~Guidance:~~

~~04 Alternative means of handling conflicts between bicycles and motor vehicles should be considered first.~~

~~05 Two alternatives that should be considered are:~~

~~A. Striping to direct a bicyclist to a lane adjacent to a traffic lane such as a bike lane to left of a right-turn-only lane.~~

~~B. Redesigning the intersection to direct a bicyclist from an off-street path to a bicycle lane at a point removed from the signalized intersection.~~

~~06 A bicycle signal phase should be considered only after these and other less restrictive remedies have had an adequate trial with enforcement and with the result that the collision frequency has not been reduced.~~

<END CALIFORNIA-ONLY>

Add the following new Section 4D.04 following existing Section 4D.03 and renumber later sections in Chapter 4D.

Note: Any references to 4D in this document refer to the existing 4D section numbers, not renumbered section numbers.

Section 4D.04 Provisions for BicyclistsOption:

Where it is desired to provide separate signal indications to control bicycle movements at a traffic control signal, bicycle signal faces may be used (see Chapter XX).

Modify Paragraph 01 in Section 4D.06 to not require circular or arrow indications for bicycle symbol signal indications.

Section 4D.06 Signal Indications – Design, Illumination, Color, and Shape**Standard:**

01 Each signal indication, shall be circular or arrow except those used for pedestrian signal heads, ~~and lane-use control signals, and bicycle symbol signal indications shall be circular or arrow.~~

Add the following new Section 9D.03.

Section 9D.03 Provisions for BicyclistsOption:

Where it is desired to provide separate signal indications to control bicycle movements at a traffic control signal, bicycle signal faces may be used (see Chapter XX).

Add the following new chapter for bicycle signal faces. NOTE: All of the following is new.

CHAPTER XX. BICYCLE SIGNAL FACES**Section XX.01 General**Support:

See Section 1A.13 for the definitions of bicycle signal face and bicycle symbol signal indication.

Section XX.02 Use of Bicycle Signal FacesSupport:

The use of a bicycle signal face is optional.

A bicycle signal face can be used to provide separate control of the bicycle movement for various situations such as the following:

- A. Bicyclist non-compliance with the previous traffic control.
- B. Provide a leading or lagging bicycle interval.
- C. Continue the bicycle lane on the right-hand side of an exclusive turn lane that would otherwise be in non-compliance with Paragraph 6 of Section 9C.04.
- D. Augment the design of a contra-flow bicycle facility.
- E. Provide for unusual or unexpected arrangements of the bicycle movement through complex intersections, conflict areas, or signal control.

< BEGIN CALIFORNIA-ONLY >

- F. Provide for bicycle movements parallel to the pedestrian crossing movements controlled by a Pedestrian Hybrid Beacon.

< END CALIFORNIA-ONLY >Guidance:

Agencies should exercise consistency with the decision to introduce bicycle signal faces to a roadway or bikeway network and use caution with any non-systematic policy to use bicycle signal faces.

Support:

The use of bicycle traffic signal faces containing bicycle symbol indications and bicycle signal faces containing circular indications in the same corridor or jurisdiction could create comprehension issues by the roadway user or violate bicyclist expectation.

Guidance:

A bicycle signal face should only be used to control bicycle movements from a designated bicycle lane or from a separate facility such as a shared use path, and, other than as provided in the Option below, only where the bicycle movement controlled by the bicycle signal face is sometimes allowed to proceed or sometimes required to stop at times when other traffic, making the same movement, and controlled by other vehicular signal faces, is required to stop or allowed to proceed respectively.

<BEGIN NCUTCD CONTENT DELETED FOR CALIFORNIA>

Option:

A bicycle signal face may be used at a mid-block traffic control signal where there are no motor vehicle movements parallel to the bicycle crossing.

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Option:

A bicycle signal face may be used at a mid-block traffic control signal or Pedestrian Hybrid Beacon.

Guidance:

When a bicycle signal face is used to control bicycle movements in the direction parallel to the pedestrian crossing movement of a Pedestrian Hybrid Beacon, the phasing should be as described in Figure xx-2 (see Section XX.13).

<END CALIFORNIA-ONLY >

Section XX.03 Warrants for Bicycle Signal Faces

Support:

No new traffic signal warrant(s) specific to bicycle signal faces or in addition to those already provided in Chapter 4C are established. Retrofitting existing traffic signals with bicycle signal faces is analogous to retrofitting existing traffic signals with pedestrian signals where such a determination is not required through an engineering study.

Standard:

New designs or installations for any traffic control signal shall be based on an engineering study in accordance with Paragraph 1 of Section 4C.01. For the purposes of an engineering study, the appropriate warrant(s) provided in Chapter 4C shall be followed.

Guidance:

The need to incorporate bicycle signal faces into a new location or design should be established through the engineering study performed in accordance with Paragraph 1 of Section 4C.01 to determine that the installation of a traffic control signal is justified.

Engineering judgment should be exercised in determining whether or not it would be advantageous or beneficial to install a bicycle signal face(s) or pedestrian signals at an existing traffic control signal.

Support:

For the purpose of warrant analyses, provisions for classifying bicycles are provided in Paragraph 15 of Section 4C.01 and Paragraph 2 of Section 9D.01.

Section XX.04 BICYCLE SIGNAL Sign

Support:

The purpose of the BICYCLE SIGNAL (R10-10b) sign is to inform road users that the signal indications in the bicycle signal face are intended only for bicyclists.

Standard:

A BICYCLE SIGNAL (R10-10b) sign shall be installed adjacent to (including above or below) a bicycle signal face unless all indications in that face are bicycle symbol signal indications.

Option:

A BICYCLE SIGNAL sign may be installed, based on engineering judgment, adjacent to a bicycle signal face consisting of all bicycle symbol indications.

<BEGIN CALIFORNIA-ONLY>

Guidance:

A BICYCLE SIGNAL sign should be installed where a parallel motor vehicle movement is controlled by a STOP or YIELD sign.

<END CALIFORNIA-ONLY>

Standard:

Except when used with a supplemental near side bicycle signal face containing 4-inch indications, the BICYCLE SIGNAL sign shall be a minimum size of 18 inches x 24 inches as shown in Figure xx.

Option:

A BICYCLE SIGNAL sign that is a minimum size of xx inches x xx inches may be used with a supplemental near-side bicycle signal face containing 4-inch indications.

Section XX.05 Meaning of Bicycle Signal Indications**Standard:**

Steady and flashing RED BICYCLE and YELLOW BICYCLE signal indications and steady GREEN BICYCLE signal indications shall have the same meanings as described in Paragraph 3 of Section 4D.04 for steady and flashing CIRCULAR RED and CIRCULAR YELLOW indications and steady CIRCULAR GREEN signal indications except that the bicycle signal indications shall only be applicable to bicyclists within the designated bicycle facility.

Section XX.06 Application of Bicycle Signal Indications**Standard:**

Steady bicycle signal indications shall be applied as follows:

- A. A steady RED BICYCLE signal indication shall be displayed when it is intended to prohibit bicycle traffic from entering the intersection or other controlled area. Turning after stopping shall be permitted as stated in Item C.1 in Paragraph 3 of Section 4D.04.
- B. A steady YELLOW BICYCLE signal indication shall be displayed following a GREEN BICYCLE signal indication in the same signal face. A YELLOW BICYCLE signal indication or a steady YELLOW ARROW indication shall be displayed following a GREEN ARROW in the same signal face. A yellow indication shall not be displayed in conjunction with the change from the RED BICYCLE signal indication to a green signal indication. The YELLOW BICYCLE indication shall be followed by a RED BICYCLE signal indication.
- C. A steady GREEN BICYCLE signal indication shall be displayed only when it is intended to permit bicyclists to proceed in any direction that is lawful and practical.

Section XX.07 Layout of Bicycle Signal Faces**Option:**

Bicycle signal faces may be oriented vertically or horizontally.

<BEGIN NCUTCD CONTENT NEEDING EDIT CORRECTION>

Support:

See Figures XX-1 and XX-2 for typical arrangements of signal sections in bicycle signal faces.

<END NCUTCD CONTENT NEEDING EDIT CORRECTION>

<BEGIN REPLACEMENT CONTENT WITH EDIT CORRECTION>

Support:

See Figure XX-1 for typical arrangements of signal sections in bicycle signal faces.

<END REPLACEMENT CONTENT WITH EDIT CORRECTION>

Standard:

Bicycle signal faces shall consist of one of the following:

- A. All bicycle symbol signal indications.
- B. All circular indications, or
- C. All left arrow or all right arrow indications.

The layouts and arrangements of the bicycle signal face shall be in accordance with the following provisions:

- A. Only the bicycle symbol shown on Page 6-7 in the 2004 Standard Highway Signs book shall be used for bicycle symbol signal indications. The bicycle symbol shall only be positioned horizontally and shall face to the left.
- B. The RED BICYCLE, YELLOW BICYCLE, and GREEN BICYCLE symbol signal indications shall be in the same relative position to each other as specified for the CIRCULAR RED, CIRCULAR YELLOW, and CIRCULAR GREEN signal indications respectively, in Sections 4D.09 and 4D.10.
- C. Circular signal indications and bicycle symbol signal indications shall not be used in the same bicycle signal face.
- D. Bicycle symbol signal indications and arrow signal indications shall not be used in the same bicycle signal face.
- E. As a specific exception to Paragraph 5 of Section 4D.09, two YELLOW BICYCLE signal indications or two GREEN BICYCLE signal indications shall not be arranged horizontally adjacent to each other at right angles to the basic straight line arrangement to form a clustered signal face.
- F. Single sections for continuous movements that would implement the bicycle symbol as illustrated in Group C of Figure 4D-2 shall not be used.

Section XX.08 Size of Bicycle Signal Faces

Standard:

The provisions of Section 4D.07 apply to the sizes of bicycle signal faces except as follows:

- A. There shall be three nominal diameter sizes for bicycle signal indications: 4 inches, 8 inches, and 12 inches.
- B. The bicycle symbol used for bicycle symbol signal indications shall be proportioned to fit within the signal lens.
- C. All signal indications in a bicycle signal face shall be of the same size.
- D. Four-inch signal indications shall only be used in supplemental, post-mounted, near-side bicycle signal faces.

Option:

As a specific exception to Paragraph 2 in Section 4D.07, 4-inch and 8-inch arrow signal indications may be used in bicycle signal faces.

If used, 4-inch signal indications may exclude the accompanying visor(s) and backplate.

Near-side bicycle signal faces may alternatively be either 8-inch or 12-inch.

Section XX.09 Placement of Bicycle Signal Faces

Standard:

The provisions of Sections 4D.13 through 4D.16 shall apply to the placement of the bicycle signal faces except as follows:

- A. As a specific exception to Item A in Paragraph 1 of Section 4D.11, a minimum of one primary bicycle signal face shall be provided to control traffic for the bicycle movement, even if a bicycle through movement exists.

B. The primary bicycle signal face shall have either 8-inch or 12-inch signal indications, even if it is located at the near side of the signal-controlled location.

C. When the primary bicycle signal face is located more than 120 feet beyond the stop line, a supplemental near-side bicycle signal face shall be provided.

Guidance:

When the primary bicycle signal face is located more than 80 feet and up to 120 feet beyond the stop line, a supplemental near-side bicycle signal face should be provided.

Bicycle signal faces should be placed such that visibility is maximized for bicyclists and minimized for adjacent or conflicting vehicle movements not controlled by the bicycle signal face. In cases where drivers not controlled by the bicycle signal face might be confused by viewing the bicycle signal indications, such as when the start or end of a green bicycle signal indication occurs at a different time than the start or end of a green signal indication for a concurrent adjacent vehicle movement controlled by other than the bicycle signal face, consideration should be given to using visibility-limited bicycle signal faces.

A bicycle signal face should be separated vertically or horizontally from the nearest vehicular traffic signal face for the same approach by at least 3 feet.

Section XX.10 Mounting Height of Bicycle Signal Faces

Standard:

The provisions of Section 4D.15 apply to the mounting height of bicycle signal faces except as follows:

A. The bottom of the signal housing (including brackets) of a bicycle signal face that is not located over a roadway shall be a minimum of 7 feet above the sidewalk or ground, except where a BICYCLE SIGNAL (R10-10b) sign is installed below the bicycle signal face. If a BICYCLE SIGNAL (R10-10b) sign is installed below the bicycle signal face, the minimum mounting height to the bottom of the sign shall be 6 feet. If the bottom of the sign is mounted less than 7 feet above a pedestrian sidewalk or pathway, the supplemental sign shall not project more than 4 inches into the pedestrian facility.

B. If 4-inch signal indications are used in a supplemental, post-mounted, near-side bicycle signal face, the bottom of the signal housing (including brackets) shall be a minimum of 4 feet and a maximum of 8 feet above the sidewalk or ground. Bicycle signal faces with 4" signal indications installed above a pedestrian sidewalk or pathway shall not project more than 4 inches into the pedestrian facility.

Section XX.11 Intensity and Light Distribution of Bicycle Signal Faces

Guidance:

Except for the 4-inch nominal size of the lens diameter, the intensity and distribution of light from each illuminated bicycle signal face should be similar to that recommended for vehicular traffic signal faces in accordance with Paragraph 10 of Section 4D.06 to the extent practicable.

Section XX.12 Backplates for Bicycle Signal Faces

Option:

Backplates may be used with bicycle signal faces.

Standard:

If backplates are used, ancillary legends of any kind that identify the purpose or operation of the bicycle signal face shall not be placed on the backplate.

Section XX.13 Operation of Bicycle Signal Faces

Standard:

If a bicycle signal face contains a green arrow that would otherwise be readily visible to drivers in the adjacent lane(s) controlled by other than the bicycle signal face, the bicycle signal face shall be visibility-limited.

The mode of operation of the bicycle signal faces at a traffic control signal shall be the same as the mode of operation of the other traffic signal faces. Bicycle signal faces shall operate in the steady (stop-and-go) mode when

the other traffic signal faces are operating in the steady (stop-and-go) mode. Bicycle signal faces shall operate in the flashing mode when the other signal faces are operating in the flashing mode, whether programmed or due to a malfunction.

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Bicycle signal faces shall not be placed in a dark mode when other vehicular traffic signal faces are operating in the flashing mode.

<END NCUTCD CONTENT DELETED FOR CALIFORNIA>

<BEGIN CALIFORNIA-ONLY (REPLACES ABOVE NCUTCD CONTENT) >

Bicycle signal faces shall not be placed in a dark mode when other vehicular traffic signal faces for the same approach are operating in the flashing mode.

When used to control simultaneous bicycle movements from perpendicular directions, all bicycle signal faces for those approaches shall display a flashing YELLOW indication or flashing YELLOW ARROW indication as appropriate.

<END CALIFORNIA-ONLY>

As a specific exception to Paragraph 10 of Section 4D.05, the simultaneous display of a straight-through GREEN ARROW signal indication in a bicycle signal face and a CIRCULAR RED signal indication in another vehicle signal face for the same approach shall be permitted.

<BEGIN CALIFORNIA-ONLY>

Guidance:

When a bicycle signal face is used to control bicycle movements in the direction parallel to the pedestrian crossing movement of a Pedestrian Hybrid Beacon, the phasing should be as described in Figure xx-2.

<END CALIFORNIA-ONLY>

Section XX.14 Yellow Change and Red Clearance Intervals for Bicycle Signal Faces

Standard:

The provisions of Section 4D.26 shall apply to the duration of the yellow change and the red clearance intervals of a bicycle signal phase except as follows:

- A. The minimum duration of the yellow change interval shall be 3 seconds.
- B. The exclusive function of the yellow change interval shall be to warn bicyclists approaching a signalized location that their permission to proceed is being terminated after which they will be directed to stop.

Support:

Providing clearance time for a bicyclist to travel through the intersection or conflict area is the purpose of the red clearance interval rather than the yellow change interval.

Guidance:

The maximum duration of the yellow change interval should be 6 seconds.

If discernible non-concurrent activations or terminations of phases for bicycles controlled by bicycle signal faces and other vehicular traffic controlled by other signal faces are necessary, visibility-limiting devices should be used on the bicycle signal face.

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Section XX.15 Prohibited Use of Bicycle Signal Faces

Standard:

Bicycle signal faces shall not be used to control exclusive and simultaneous bicycle movements from perpendicular directions.

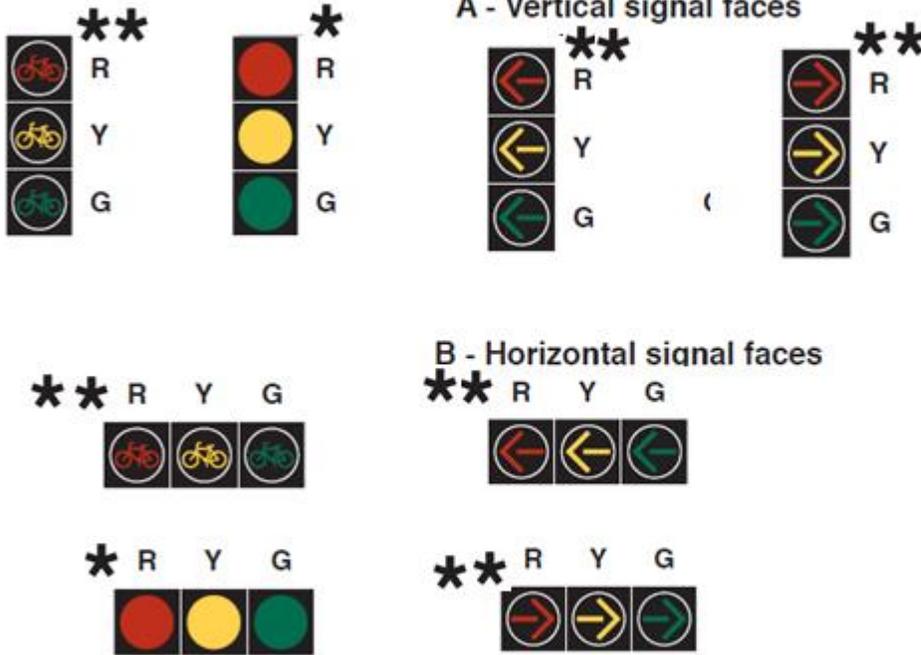
Guidance:

Bicycle signal faces should not be used in any manner with respect to the design and operation of a hybrid beacon.

<END NCUTCD CONTENT DELETED FOR CALIFORNIA>

Figure xx-1

Typical Arrangements of Signal Sections in Bicycle Signal Faces

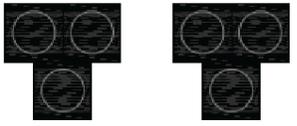
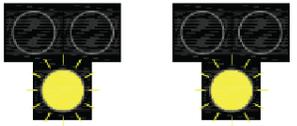
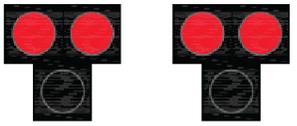
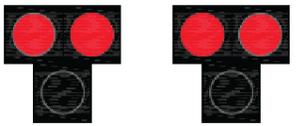


* BICYCLE SIGNAL sign required

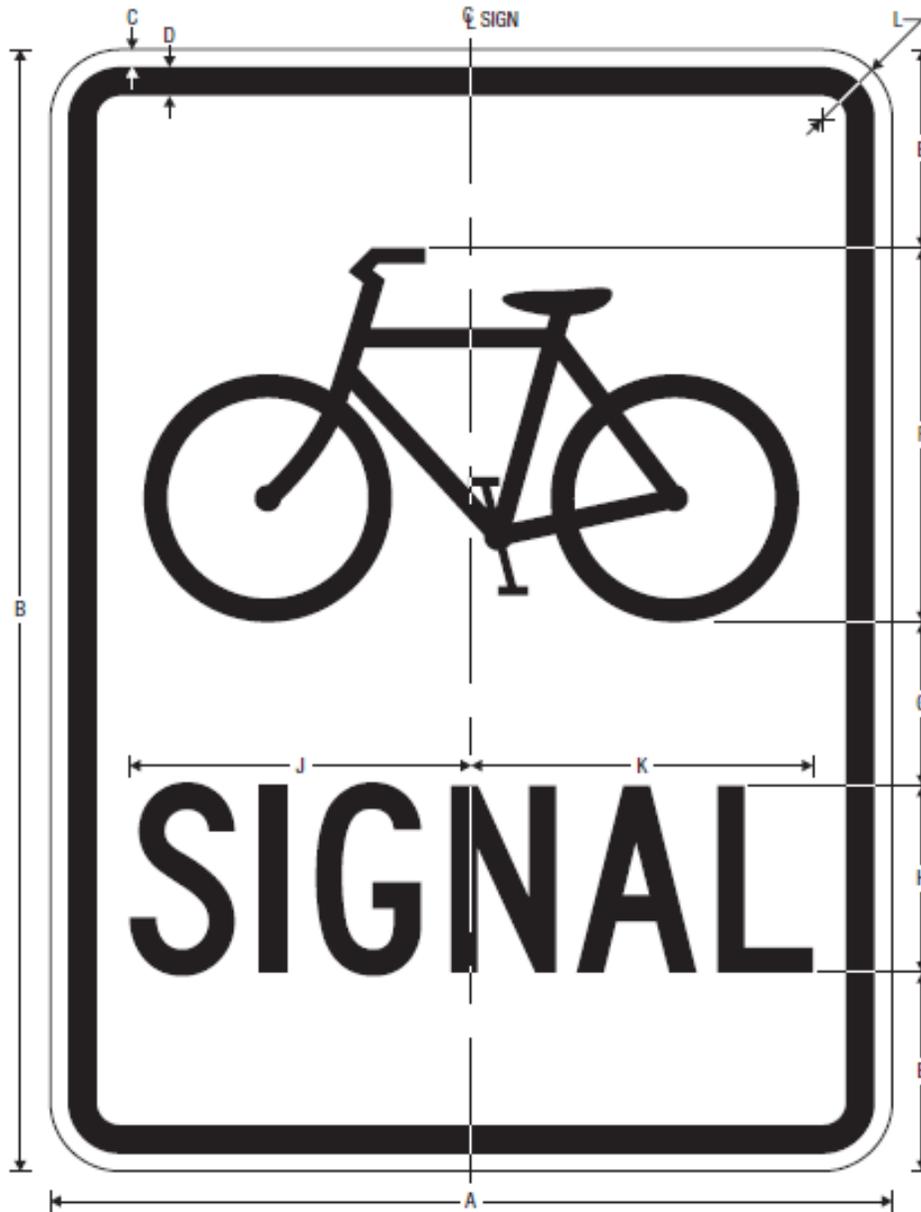
** BICYCLE SIGNAL sign optional

Figure xx-2

Typical Bicycle Signal Face Phasing for Use With Pedestrian Hybrid Beacon

<p>Phase 0 (Unactivated Beacon)</p> <p>Remains in this phase until pedestrian push button (PPB) is activated or a bike is detected</p>	 <p>All Beacon Faces Dark ("Free Flow Conditions")</p>	 <p>Steady Red Steady "Don't Walk"</p>
<p>Phase 1 (Motorists Slow Down)</p> <p>Motorists: Flashing Yellow alerting them to Slow Down, pedestrians or bicyclists have activated the Pedestrian Hybrid Beacon (PHB).</p> <p>Bike Signal: Solid Red ("Wait") Indication.</p> <p>Pedestrian Signal: Upraised Hand ("Wait") Indication.</p> <p>Proposed Duration: 4 seconds</p>	 <p>Flashing Yellow ("Slow Down")</p>	 <p>Steady Red Steady "Don't Walk"</p>
<p>Phase 2 (Motorists Prepare to Stop)</p> <p>Motorists: Solid Yellow alerting them to Prepare to Stop. Bikes and Pedestrians still have steady red ("Wait") indications.</p> <p>Bike Signal: Solid Red ("Wait") Indication.</p> <p>Pedestrian Signal: Upraised Hand ("Wait") Indication.</p> <p>Proposed Duration: 3 seconds</p>	 <p>Steady Yellow ("Prepare to Stop")</p>	 <p>Steady Red Steady "Don't Walk"</p>
<p>Phase 3A (Bike/Ped Green Indication)</p> <p>Motorists: Solid Red, requiring them to Stop.</p> <p>Bike Signal: Solid Green ("Proceed")</p> <p>Pedestrian Signal: "Walk" Indication</p> <p>Proposed Duration: 7 s (min) to 16 s (max). Green time to be extended when an additional bike is detected approaching intersection after PHB phasing is already activated.</p>	 <p>Steady Red ("Stop", Pedestrians/Bikes Crossing)</p>	 <p>Steady Green Steady "Walk" Indication</p>
<p>Phase 3B (Bike Yellow Change Interval)</p> <p>Motorists: Solid Red, requiring them to Stop.</p> <p>Bike Signal: Steady Yellow ("yellow change interval").</p> <p>Pedestrian Signal: "Walk" Indication</p> <p>Proposed Duration: 3 seconds</p>	 <p>Steady Red ("Stop", Pedestrians/Bikes Crossing)</p>	 <p>Steady Yellow Steady "Walk" Indication</p>
<p>Phase 4A (4-Way Stop Condition)</p> <p>Motorists: Alternating Flashing Red, requiring them to Stop, then proceed with Caution if Clear.</p> <p>Bike Signal: Flashing Red (Stop, then proceed).</p> <p>Pedestrian Signal: Countdown phase continues.</p> <p>Proposed Duration: 14 seconds</p>	 <p>Alternating Flashing Red ("Stop, Proceed with Caution when Clear")</p>	 <p>Flashing Red Flashing Upraised Hand & Countdown</p>
<p>Phase 4B (Bike/Ped Red Clearance Interval)</p> <p>Motorists: Alternating Flashing Red, requiring them to Stop, then proceed with Caution if Clear.</p> <p>Bike Signal: Solid Red ("Wait") Indication.</p> <p>Pedestrian Signal: Upraised Hand ("Wait") Indication.</p> <p>Proposed Duration: 3 seconds</p>	 <p>Alternating Flashing Red ("Stop, Proceed with Caution when Clear")</p>	 <p>Steady Red Steady "Don't Walk"</p>

BICYCLE SIGNAL Sign Issued by FHWA



R10-10b
Bicycle SIGNAL

* Reduce character spacing 20%.

A	B	C	D	E	F	G	H	J	K	L
12	18	0.375	0.375	4	5	2.5	2.5 C*	4.564	4.564	1.5
18	24	0.375	0.625	4.25	8	3.5	4 C*	7.303	7.302	1.5

COLORS: LEGEND, BORDER – BLACK
BACKGROUND – WHITE (RETROREFLECTIVE)

See following page for alternate design/size proposed to be used in place of this

Proposed alternate BICYCLE SIGNAL sign design/size



Bicycle Signal (R10-xx) sign - 24" x 24"
 10" symbol, 6" B text
 (design could also be used for a 6" x 6" size
 under 4" near-side indications with
 a 2.5" symbol and 1.5" B text)



Bicycle Signal (R10-xx) sign - 18" x 24"
 8" symbol, 4" B text

Note: The text includes an Option for the use of a smaller size BICYCLE SIGNAL sign with signal faces that have 4-inch indications. However, a size was not determined at the time this item was presented to the National Committee Council so the size is unspecified. Therefore, a sign design/size needs to be developed for the small size signal face.

This sign would be used with near-side supplemental bicycle signals with 4" indications and therefore the sign and signal face may be mounted relatively low. Considering possible impacts on pedestrian traffic and that the sign is intended for bicyclists that are at or near the signal face, it is anticipated that a relatively small minimum size would be acceptable. The use of a BICYCLE SIGNAL sign with a signal face with 4-inch indications would be optional unless the signal face contained something other than all bicycle symbols.

14-15 Proposal to Amend various Sections of the CA MUTCD:

1. Section of 2A.15 Enhanced Conspicuity for Standard Signs, Proposed to add Option statement.
2. Section 3B.18 Crosswalk Markings, Proposed to modify Guidance and change Option to Guidance.
3. Section 4E.06 Pedestrian Intervals and Signal Phases, Proposed to delete CA Blue text and change Option to Guidance.
4. Section 7A.01 Need for Standards, Proposed to undelete National MUTCD text and delete CA Blue text from Option
5. Section 7B.01 Size of School Signs, Proposed to change National MUTCD Standard from 30 MPH to 25 MPH.
6. Section 7B.12 School Crossing Assembly, Proposed to add Option Statement.
7. Section 7C.02 Crosswalk Markings, Proposed to add Guidance Statement.

Recommendations: Caltrans District 4 Pedestrian Advisory Committee requests that the CTCDC make recommendations to amend above mentioned Sections as described under the proposals.

Requesting Agency: Caltrans District 4 Pedestrian Advisory Committee

Sponsor: John Ciccarelli, Caltrans Non-motorized Voting Member

1. Section 2A.15 Enhanced Conspicuity for Standard Signs

- **Summary (Executive Summary) –**

Section 2A.15 (01): Move the language in Subsection L to a new Subsection M (“Using other methods that are specifically allowed for certain signs as described elsewhere in this Manual”). Add as the new Section L, “For applicable sign types and colors, using a sign with its color in a fluorescent version. See Sections 2A.10, 2C.03, and 7B.07 for further guidance on this.”

Using a fluorescent background is one of the most effective ways for making a sign more conspicuous. In particular, the use of a fluorescent yellow-green background for pedestrian warning signs is an important tool to make these signs more noticeable to drivers, especially in school zones.

- **Background** – The option of using signs with a fluorescent background seems to have been overlooked for inclusion on the list of ways to make signs more conspicuous in Section 2A.15, perhaps because this option is relatively new. Instead, only the older technique of adding a fluorescent yellow retroreflective sheeting strip to the sign perimeter is included on this list.

- **Discussion** – Using a fluorescent sign background is an effective, low cost safety countermeasure, but only if traffic safety professionals are aware of this option. It should therefore be included on the list of measures for making signs more conspicuous.

- **Attachment** – See Safety Effects of Fluorescent Yellow Warning Signs at Hazardous Sites by Eccles and Hummer, July 2000 (<http://apps.usd.edu/coglab/schieber/pdf/Eccles-Hummer-2000.pdf>).

Proposal:**Section 2A.15 Enhanced Conspicuity for Standard Signs**

Option:

01 Based upon engineering judgment, where the improvement of the conspicuity of a standard regulatory, warning, or guide sign is desired, any of the following methods may be used, as appropriate, to enhance the sign's conspicuity (see Figure 2A-1):

- A. Increasing the size of a standard regulatory, warning, or guide sign.
- B. Doubling-up of a standard regulatory, warning, or guide sign by adding a second identical sign on the left-hand side of the roadway.
- C. Adding a solid yellow or fluorescent yellow rectangular "header panel" above a standard regulatory sign, with the width of the panel corresponding to the width of the standard regulatory sign. A legend of "NOTICE," "STATE LAW," or other appropriate text may be added in black letters within the header panel for a period of time determined by engineering judgment.
- D. Adding a NEW plaque (see Section 2C.62) above a new standard regulatory or warning sign, for a period of time determined by engineering judgment, to call attention to the new sign.
- E. Adding one or more red or orange flags (cloth or retroreflective sheeting) above a standard regulatory or warning sign, with the flags oriented so as to be at 45 degrees to the vertical.
- F. Adding a solid yellow, a solid fluorescent yellow, or a diagonally striped black and yellow (or black and fluorescent yellow) strip of retroreflective sheeting at least 3 inches wide around the perimeter of a standard warning sign. This may be accomplished by affixing the standard warning sign on a background that is 6 inches larger than the size of the standard warning sign.
- G. Adding a warning beacon (see Section 4L.03) to a standard regulatory (other than a STOP or a Speed Limit sign), warning, or guide sign.
- H. Adding a speed limit sign beacon (see Section 4L.04) to a standard Speed Limit sign.
- I. Adding a stop beacon (see Section 4L.05) to a STOP sign.
- J. Adding light emitting diode (LED) units within the symbol or legend of a sign or border of a standard regulatory, warning, or guide sign, as provided in Section 2A.07.
- K. Adding a strip of retroreflective material to the sign support in compliance with the provisions of Section 2A.21.
- L. ~~Using other methods that are specifically allowed for certain signs as described elsewhere in this Manual.~~ For applicable sign types and colors, using a sign with its color in a fluorescent version. See Sections 2A.10, 2C.03, and 7B.07 for further guidance.
- M. Using other methods that are specifically allowed for certain signs as described elsewhere in this Manual.

Additional Supporting Document:

Please see title page and page with abstract (first and second pages) at

<http://apps.usd.edu/coglab/schieber/pdf/Eccles-Hummer-2000.pdf>

2. Section 3B.18 Crosswalk Markings

- **Summary (Executive Summary)** – The proposed change to subsection 09 would clarify its intent, leading to more consistent application of the guidance in Section 3B.18 across jurisdictions within California. The proposed change to subsection 14 would provide more positive guidance and encouragement for use of higher visibility crosswalks where conditions warrant them.

- **Background** –

Subsection 09: the existing language provides a negative statement about marking crosswalks. The negative sentence construction has led to confusion and misunderstanding about the intent of the statement, wherein many practitioners interpret it to mean that new marked crosswalks should not be provided at uncontrolled crossing locations under the conditions specified in A and B. Many overlook that the negative statement applies to new crosswalks *alone* and instead interpret it as discouraging the marking of crosswalks in general, with or without other enhancements.

Subsection 14: the existing language is inconsistent with recent FHWA-sponsored research on the great difference in visibility between crosswalks with only transverse markings and crosswalks with longitudinal markings (*Crosswalk Marking Field Visibility Study* by Fitzpatrick et al, Pub. # FHWA-HRT-10-068, Nov 2010). This study found that longitudinal (continental) markings were detectable at about twice the distance upstream as transverse markings during daytime conditions. The study therefore recommended making longitudinal markings (bar pairs and continental) the default for all crosswalks across uncontrolled locations. Leaving subsection 14 as an option statement, without encouragement through the use of “should”, is therefore inconsistent with the results of this FHWA study.

- **Discussion** – Crosswalk markings can be used to indicate the safest side for crossing a street at uncontrolled crossing locations where a controlled intersection is not within a reasonable walking distance. Where pedestrian trip generators and destinations are located across the street from each other, and controlled crossing locations are not within a reasonable walking distance, the marking of a crosswalk, with appropriate enhancements where the AADT and speeds are higher (as described in A and B above), provides needed pedestrian access and alerts drivers to the presence of pedestrians. Longitudinal markings are one type of crosswalk visibility enhancement that has been proven effective and that should be encouraged for uncontrolled crossing locations, where added visibility of the crosswalk is desired, and where a crosswalk might not be expected.

- **Attachment** – For subsection 09 and 14, see Page 51 of *Safety Effects of marked Versus Unmarked Crosswalks at Uncontrolled Crossing Locations* by Zegeer et al, Pub. # FHWA-HRT-04-100, Sept 2005 (<https://www.fhwa.dot.gov/publications/research/safety/04100/04100.pdf>). For subsection 14, see FHWA TechBrief for *Crosswalk Marking Field Visibility Study* by Fitzpatrick et al, Nov 2010 (<https://www.fhwa.dot.gov/publications/research/safety/pedbike/10067/10067.pdf>).

Proposal:

Section 3B.18 Crosswalk Markings

09 New marked crosswalks **across uncontrolled roadways should include** ~~alone, without~~ other measures designed to reduce traffic speeds, shorten crossing distances, enhance driver awareness of the crossing, and/or provide active warning of pedestrian presence, ~~should not be installed across uncontrolled roadways~~ where the speed limit exceeds 40 mph and either:

- A. The roadway has four or more lanes of travel without a raised median or pedestrian refuge island and an ADT of 12,000 vehicles per day or greater; or
- B. The roadway has four or more lanes of travel with a raised median or pedestrian refuge island and an ADT of 15,000 vehicles per day or greater.

~~Option:~~ Guidance

14 When diagonal or longitudinal lines are used to mark a crosswalk, the transverse crosswalk lines may be omitted. This type of marking ~~may~~ **should** be used at locations where substantial numbers of pedestrians cross without any other traffic control device, at locations where physical conditions are such that added visibility of the crosswalk is desired, or at places where a pedestrian crosswalk might not be expected.

Additional Supporting Document:

Please see cover page and pages 51-53 at

<https://www.fhwa.dot.gov/publications/research/safety/04100/04100.pdf>

3. Section 4E.06 Pedestrian Intervals and Signal Phases

- **Summary (Executive Summary)** – The 2012 CA MUTCD allows a walking speed as high as 4 feet per second as long as an engineering study documents that this is sufficient to accommodate the walking speed of the 15th percentile pedestrian. This section of the CA MUTCD should be restored to the language in the federal MUTCD. In addition, the language in Subsection 10a, which discusses providing for a walking speed of 2.8 feet per second, should have the heading "Guidance" rather than "Option".
- **Background** – Caltrans uses a maximum walking speed of 3.5 feet per second for the timing of pedestrian crossings on State facilities. In 2011, the Caltrans representative on CTCDC (Wayne Henley) abstained from voting for the change to the federal language to allow a higher walking speed of 4 feet per second. This was out of concern that this higher walking speed would not allow enough time for all pedestrians to cross.
- **Discussion** – The timing of a pedestrian crossing should not be set such that 15% of people cannot cross safely. While the application of a bell curve, with a 15% cut-off, may be appropriate for operational decisions having to do with traveler convenience, it should not be applied to matters of safety. Moreover, the safety of one group (pedestrians trying to cross) should not be traded for the convenience of another group (motorists waiting at the intersection).

Proposal:

Section 4E.06 Pedestrian Intervals and Signal Phases

~~07 The pedestrian clearance time should be sufficient to accommodate the walking speed of the 15th percentile pedestrian, meaning that 85% walk faster. However, where no specific engineering study has been conducted and Except except as provided in Paragraph 8, the pedestrian clearance time should be sufficient to allow a pedestrian crossing in the crosswalk who left the curb or shoulder at the end of the WALKING PERSON (symbolizing WALK) signal indication to travel at a walking speed of 3.5 feet per second to at least the far side of the traveled way or to a median of sufficient width for pedestrians to wait.~~

Option:

~~07a A walking speed between 3.5 and 4 feet per second may be used for the pedestrian clearance time if an engineering study at a representative location documents that it is sufficient to accommodate the walking speed of the 15th percentile pedestrian.~~

08 A walking speed of up to 4 feet per second may be used to evaluate the sufficiency of the pedestrian clearance time at locations where an extended pushbutton press function has been installed to provide slower pedestrians an opportunity to request and receive a longer pedestrian clearance time. Passive pedestrian detection may also be used to automatically adjust the pedestrian clearance time based on the pedestrian's actual walking speed or actual clearance of the crosswalk.

09 The additional time provided by an extended pushbutton press to satisfy pedestrian clearance time needs may be added to either the walk interval or the pedestrian change interval.

Guidance:

10 Where pedestrians who walk slower than 3.5 feet per second, or pedestrians who use wheelchairs, routinely use the crosswalk, a walking speed of less than 3.5 feet per second should be considered in determining the pedestrian clearance time.

Option:

~~10a Where older or disabled pedestrians routinely use the crosswalk, a walking speed of 2.8 feet per second may be used in determining the pedestrian clearance time.~~

10a Where older or disabled pedestrians routinely use the crosswalk, a walking speed of 2.8 feet per second should be used in determining the pedestrian clearance time.

For Additional Supporting Document:

Please see the title page (page 3 of 111 in the PDF page numbering) and Summary (pages 12-13 of 111 in the PDF numbering, but with pages 1 and 2 printed at the top of the two pages) at

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_562.pdf

4. Section 7A.01 Need for Standards

- **Summary (Executive Summary)** – In contrast to the federal MUTCD, the 2012 CA MUTCD provides no encouragement for middle and high schools to prepare school area traffic control plans. This contradicts the goals of the Safe Routes to School (SRTS) component of the Active Transportation Program and strategies and goals in the California Strategic Highway Safety Plan.
- **Background** – See summary above.
- **Discussion** – Striking out the federal MUTCD language, which encourages middle and high schools to develop school route plans, contradicts State policy and guidelines meant to meet California’s goals for improving pedestrian safety. The California Strategic Highway Safety Plan (SHSP) Challenge Area 8 *Make Walking and Street Crossing Safer*, includes Strategy 6. “Improve the safety of pedestrians traveling to and from schools”. In addition, the SHSP Implementation Plan includes as Action #1 for Challenge Area 8, “Expand the SRTS to implement a comprehensive, age-appropriate approach to school traffic safety, including school facilities planning, collaboration, and coordination among those responsible for education, transportation, and land use planning to maximize safety for children walking to and from school.”
- Attachment – SHSP Implementation Plan Action 8.01, page 25
(<http://www.dot.ca.gov/hq/traffops/shsp/docs/Implementation-SHSP.pdf>)

Proposal:

Section 7A.01 Need for Standards

Guidance:

06 A school route plan for each school serving elementary ~~to high school~~ **to high school** students should be prepared in order to develop uniformity in the use of school area traffic controls and to serve as the basis for a school traffic control plan for each school.

Option:

~~06a A school route plan for each school serving middle school or high school students may be prepared.~~

Guidance:

07 The school route plan, developed in a systematic manner by the school, law enforcement, and traffic officials responsible for school pedestrian safety, should consist of a map (see Figure 7A-1) showing streets, the school, existing traffic controls, established school walk routes, and established school crossings.

08 The type(s) of school area traffic control devices used, either warning or regulatory, should be related to the volume and speed of vehicular traffic, street width, and the number and age of the students using the crossing.

09 School area traffic control devices should be included in a school traffic control plan.

Additional Supporting Document:

Please see page 25 at <http://www.dot.ca.gov/hq/traffops/shsp/docs/Implementation-SHSP.pdf>

5. Section 7B.01 Size of School Signs

- **Summary (Executive Summary)** – This small change to the California MUTCD will make school signs more visible, with resulting safety benefit, at very little additional cost to local agencies.
- **Background** – Allowing signs in the minimum size category at speeds above 25 mph appears to be based on an outdated understanding of the impact of speed on pedestrian safety, wherein speeds below 30 are considered low. Although a speed of 30 mph is low from the perspective of vehicular occupants, 30 mph can be a fatal impact speed for pedestrians who are much more exposed to the force of impact with a motor vehicle.
- **Discussion** – 30 mph is a lethal impact speed for about 40% of pedestrians, whereas only about 5% of pedestrians are killed when struck at 20 mph (Killing speed and Saving Lives, UK Department of Transportation, 1997). The percentage killed when impacted at 30 mph would be even greater for child pedestrians, whose smaller bodies have less area to distribute the impact and whose vital organs are lower and therefore in the initial impact zone of even low passenger cars. The 30 mph speed limit therefore justifies the provision of larger, more conspicuous signage for extra protection of child pedestrians.
- **Attachment** – See Kill Speed, Not Kids from Peds.org (http://peds.org/wp-content/uploads/2012/08/4489-PEDS-flier_F.pdf).

Proposal:

Section 7B.01 Size of School Signs

03 The sizes in the Minimum column shall be used only where traffic volumes are low and speeds are ~~30~~**25** mph or lower, as determined by engineering judgment.

Additional Supporting Document:

Please see SRTS Guide at http://guide.saferoutesinfo.org/engineering/slowing_down_traffic.cfm

Please see title page and abstract (first and fourth pages) at

<https://www.aaafoundation.org/sites/default/files/2011PedestrianRiskVsSpeed.pdf>

6. Section 7B.12 School Crossing Assembly

- **Summary (Executive Summary)** – This small addition to the California MUTCD will raise awareness of the option of providing advanced yield lines with “Yield Here to Pedestrians” signs at multi-lane uncontrolled crossings in school zones and will direct readers to appropriate guidance in Part 3.
- **Background** – School officials who are unfamiliar with other parts of the CA MUTCD will benefit from this cross-reference.
- **Discussion** – The use of advance yield lines with “Yield Here to Pedestrians” signs is a recommended treatment for improving sight lines to pedestrians in crosswalks and avoiding the multiple threat crash type wherein the vehicle yielding to the pedestrian blocks the view from the adjacent lane (FHWA PedSafe Guide, *Advance Yield/Stop Lines*).
- **Attachment** – See FHWA PedSafe Guide on uses and benefits of advance yield lines (http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=13).

Proposal:

Section 7B.12 School Crossing Assembly

Option:

05b For uncontrolled locations with more than one lane in each direction of travel, see Section 3B.16 for guidance on the use of advance yield lines with the ‘Yield Here to Pedestrians’ sign.

Additional Supporting Document:

Please see the PedSafe flier on advance yield lines at

http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=13

7. Section 7C.02 Crosswalk Markings

- **Summary (Executive Summary)** – The proposed change to subsection 05 would provide more positive guidance and encouragement for use of higher visibility crosswalks at uncontrolled locations where they are most needed, particularly in school zones where vulnerable children are present.
- **Background** – School officials who are unfamiliar with other parts of the CA MUTCD will particularly benefit from this information.
- **Discussion** – Recent FHWA-sponsored research showed a great difference in visibility between crosswalks with only transverse markings and crosswalks with longitudinal markings (*Crosswalk Marking Field Visibility Study* by Fitzpatrick et al, Pub. # FHWA-HRT-10-068, Nov 2010). This study found that longitudinal (continental) markings were detectable at about twice the distance upstream as transverse markings during daytime conditions. The study therefore recommended making longitudinal markings (bar pairs and continental) the default for all crosswalks across uncontrolled locations. The proposed added guidance to Subsection 05 will help to encourage the appropriate use of longitudinal markings at uncontrolled crossing locations in school zones.
- **Attachment** – See FHWA Tech Brief for *Crosswalk Marking Field Visibility Study* by Fitzpatrick et al, Nov 2010 (<https://www.fhwa.dot.gov/publications/research/safety/pedbike/10067/10067.pdf>).

Proposal:

Section 7C.02 Crosswalk Markings

Option:

05 For added visibility, the area of the crosswalk may be marked with white or yellow diagonal lines at a 45-degree angle to the line of the crosswalk or with white or yellow longitudinal lines parallel to traffic flow. Refer to CVC 21368. When diagonal or longitudinal lines are used to mark a crosswalk, the transverse crosswalk lines may be omitted.

Guidance:

These diagonal or longitudinal markings should be used when the crosswalk is marked at an uncontrolled crossing location.

14-16 Proposal to Amend Section 4C.01, Studies and Factors for Justifying Traffic Control Signals

Recommendations: Caltrans requests that the Committee recommend adoption of the modified Section 4C.01 of the CA MUTCD as amended under the proposal.

Requesting & Sponsoring Agency: Caltrans, Duper Tong, Caltrans Voting Member

Background:



SHSP Action Approval Form

Date Submitted:	Submitted By: Jerry Champa, Caltrans Division of Traffic Operations
Challenge Area 7: Improve Intersection and Interchange Safety for Roadway Users	
Action Description: Revise Part 4 of the CA MUTCD in order to integrate the consideration of (yield-controlled) roundabouts into the “Standard” and the engineering study that is required under Section 4C.01 to determine whether a traffic control signal is justified.	

The current engineering process allows or encourages the “pre-selection” of signalization as the de facto solution for new or existing intersections with performance deficiencies (whether the need is related to safety, delay or insufficient capacity). This is a deterrent to the consideration of alternative intersection traffic control strategies that are often more effective and cost-efficient in terms of value-added versus cost (capital, Operating & Maintenance, environmental impacts, etc.).

The conditions which produce severe intersection collisions include: *speed, speed differential, and the type of conflicting movements (i.e. crossing and left-turns)*. The potential for severe collisions increases as the volume of conflicting traffic volumes (exposure) increases. Conflicting movements control the capacity of intersections. When capacity is exceeded during peak periods, some drivers experience excessive delays. The conventional response (treatment or improvement strategy) to existing or expected problems (as defined by the measurement of collisions, delay or conflicting volumes) is signalization. Other engineering solutions (potentially safer and more efficient) are often available, but are not always evaluated or even considered. For example, single lane roundabouts (circular intersections which rely upon the “yield upon entry” rule) are usually a better “solution” for a broad range of traffic volumes and operating conditions. Roundabouts usually produce less “control” delay, fewer collisions, and significantly fewer severe collisions. Because roundabouts produce a lower speed environment, shorter crossing distances for pedestrians and bicyclists, and less speed differential among all highway travelers, roundabouts are generally as safe or safer than intersection traffic control and geometric alternatives. Side benefits include: more space (i.e. smaller construction “footprints”) to allocate for parking, refuge islands, bike lanes, etc.; improved air quality, and aesthetics.

Benefit/Justification: The safety performance benefits of roundabouts in the U.S. are well-documented. In their July 10, 2008 guidance memorandum (from Lindley), the FHWA emphasizes that roundabouts are one of nine “proven crash countermeasures” that should be strongly considered and widely implemented. The FHWA recently published the 2nd edition of its Roundabout Information Guide, which contains safety-related data and analytical tools that prove and/or demonstrate the ability of single-lane roundabouts to reduce fatal and injury collisions by 76% and total crashes by 35%. **The FHWA “Guide” also reports**

that pedestrians are “as safe or safer” at single-lane roundabouts (based on a review of international research studies and project evaluations in the U.S. and abroad). Well-designed roundabouts separate the pedestrian crossing from all other conflicting movements; and, they produce a low speed environment that reduces speed differential among all users, makes it easier for drivers to yield to pedestrians, and reduces the severity of collisions that do occur.

The following proposal is based on the successful implementation of *Intersection Control Evaluation* policies by Caltrans and other state DOT’s to establish a more holistic decision-making framework for access-related investment proposals. See Attachments below for a link to the Caltrans ICE policy directive (TOPD 13-02) and web page.

Proposal:

Section 4C.01 Studies and Factors for Justifying Traffic Control Signals

Standard:

01 An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location.

01a The engineering study shall include consideration of a roundabout (yield control). If the roundabout is determined to provide a viable and practical solution, it shall be studied in lieu of, or in addition to a traffic control signal.

02 The investigation of the need for a traffic control signal shall include an analysis of factors related to the existing operation and safety at the study location and the potential to improve these conditions, and the applicable factors contained in the following traffic signal warrants:

Warrant 1, Eight-Hour Vehicular Volume

Warrant 2, Four-Hour Vehicular Volume

Warrant 3, Peak Hour

Warrant 4, Pedestrian Volume

Warrant 5, School Crossing

Warrant 6, Coordinated Signal System

Warrant 7, Crash Experience

Warrant 8, Roadway Network

Warrant 9, Intersection Near a Grade Crossing

03 The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Support:

04 Sections 8C.09 and 8C.10 contain information regarding the use of traffic control signals instead of gates and/ or flashing-light signals at highway-rail grade crossings and highway-light rail transit grade crossings, respectively.

Guidance:

05 A traffic control signal should not be installed unless one or more of the factors described in this Chapter are met.

06 A traffic control signal should not be installed unless an engineering study indicates that installing a traffic control signal will improve the overall safety and/or operation of the intersection.

07 A traffic control signal should not be installed if it will seriously disrupt progressive traffic flow.

08 The study should consider the effects of the right-turn vehicles from the minor-street approaches. Engineering judgment should be used to determine what, if any, portion of the right-turn traffic is subtracted from the minor-street traffic count when evaluating the count against the signal warrants listed in Paragraph 2.

09 Engineering judgment should also be used in applying various traffic signal warrants to cases where approaches consist of one lane plus one left-turn or right-turn lane. The site-specific traffic characteristics should dictate whether an approach is considered as one lane or two lanes. For example, for an approach with one lane for through and right-turning traffic plus a left-turn lane, if engineering judgment indicates that it

should be considered a one-lane approach because the traffic using the left-turn lane is minor, the total traffic volume approaching the intersection should be applied against the signal warrants as a one-lane approach. The approach should be considered two lanes if approximately half of the traffic on the approach turns left and the left-turn lane is of sufficient length to accommodate all left-turn vehicles.

10 Similar engineering judgment and rationale should be applied to a street approach with one through/left-turn lane plus a right-turn lane. In this case, the degree of conflict of minor-street right-turn traffic with traffic on the major street should be considered. Thus, right-turn traffic should not be included in the minor-street volume if the movement enters the major street with minimal conflict. The approach should be evaluated as a one-lane approach with only the traffic volume in the through/left-turn lane considered.

11 At a location that is under development or construction and where it is not possible to obtain a traffic count that would represent future traffic conditions, hourly volumes should be estimated as part of an engineering study for comparison with traffic signal warrants. Except for locations where the engineering study uses the satisfaction of Warrant 8 to justify a signal, a traffic control signal installed under projected conditions should have an engineering study done within 1 year of putting the signal into stop-and-go operation to determine if the signal is justified. If not justified, the signal should be taken out of stop-and-go operation or removed.

12 For signal warrant analysis, a location with a wide median, even if the median width is greater than 30 feet, should be considered as one intersection.

Option:

13 At an intersection with a high volume of left-turn traffic from the major street, the signal warrant analysis may be performed in a manner that considers the higher of the major-street left-turn volumes as the “minor-street” volume and the corresponding single direction of opposing traffic on the major street as the “major street” volume. ~~volume of the major-street left-turn volumes plus the higher volume minor-street approach as the “minor street” volume and both approaches of the major street minus the higher of the major-street left-turn volume as “major street” volume.~~

14 For signal warrants requiring conditions to be present for a certain number of hours in order to be satisfied, any four sequential 15-minute periods may be considered as 1 hour if the separate 1-hour periods used in the warrant analysis do not overlap each other and both the major-street volume and the minor-street volume are for the same specific one-hour periods.

15 For signal warrant analysis, bicyclists may be counted as either vehicles or pedestrians.

Support:

16 When performing a signal warrant analysis, bicyclists riding in the street with other vehicular traffic are usually counted as vehicles and bicyclists who are clearly using pedestrian facilities are usually counted as pedestrians.

Option:

17 Engineering study data may include the following:

- A. The number of vehicles entering the intersection in each hour from each approach during 12 hours of an average day. It is desirable that the hours selected contain the greatest percentage of the 24-hour traffic volume.
- B. Vehicular volumes for each traffic movement from each approach, classified by vehicle type (heavy trucks, passenger cars and light trucks, public-transit vehicles, and, in some locations, bicycles), during each 15-minute period of the 2 hours in the morning and 2 hours in the afternoon during which total traffic entering the intersection is greatest.
- C. Pedestrian volume counts on each crosswalk during the same periods as the vehicular counts in Item B and during hours of highest pedestrian volume. Where young, elderly, and/or persons with physical or visual disabilities need special consideration, the pedestrians and their crossing times may be classified by general observation.
- D. Information about nearby facilities and activity centers that serve the young, elderly, and/or persons with disabilities, including requests from persons with disabilities for accessible crossing improvements at the location under study. These persons might not be adequately reflected in the pedestrian volume count if the absence of a signal restrains their mobility.

- E. The posted or statutory speed limit or the 85th-percentile speed on the uncontrolled approaches to the location.
- F. A condition diagram showing details of the physical layout, including such features as intersection geometrics, channelization, grades, sight-distance restrictions, transit stops and routes, parking conditions, pavement markings, roadway lighting, driveways, nearby railroad crossings, distance to nearest traffic control signals, utility poles and fixtures, and adjacent land use.
- G. A collision diagram showing crash experience by type, location, direction of movement, severity, weather, time of day, date, and day of week for at least 1 year.

¹⁸ The following data, which are desirable for a more precise understanding of the operation of the intersection, may be obtained during the periods described in Item B of Paragraph 17:

- A. Vehicle-hours of stopped time delay determined separately for each approach.

- B. The number and distribution of acceptable gaps in vehicular traffic on the major street for entrance from the minor street.
- C. The posted or statutory speed limit or the 85th-percentile speed on controlled approaches at a point near to the intersection but unaffected by the control.
- D. Pedestrian delay time for at least two 30-minute peak pedestrian delay periods of an average weekday or like periods of a Saturday or Sunday.
- E. Queue length on stop-controlled approaches.

Standard:

¹⁹ Delay, congestion, approach conditions, driver confusion, future land use or other evidence of the need for right of way assignment beyond that which could be provided by stop sign or roundabout shall be demonstrated.

Support:

²⁰ Figure 4C-101(CA) and 4C-103(CA) are examples of warrant sheets.

Guidance:

²¹ Figure 4C-103(CA) should be used only for new intersections or other locations where it is not reasonable to count actual traffic volumes.

14-17 Proposed to create an “ALT FUEL VEHICLE PARKING ONLY” sign by amending Section 2I.05

RECOMMENDATION: The California Department of Transportation (Caltrans) requests the Committee to recommend adopting the proposed “ALT FUEL VEHICLE PARKING ONLY” (RXXX(CA)) sign to Chapter 2I of the *California Manual on Uniform Traffic Control Devices, 2014* edition (CA MUTCD) and amend Section 2I.05 to define usage for the proposed sign.

AGENCY MAKING REQUEST/SPONSOR: Caltrans, Duper Tong, Voting Member

BACKGROUND: Over the past two years, the Governor had issued Executive Order B-16-2012 and signed into law Assembly Bill 2583 (2012) directing State agencies to support and facilitate the rapid commercialization of zero-emission and alternatively fueled vehicles. This includes developing and implementing vehicle parking programs in public parking facilities of 50 spaces or more to incentivize the purchase and use of zero-emission and alternatively fueled vehicles. These incentives may include preferential spaces, reduced fees, and fueling infrastructure for alternatively fueled vehicles. The proposed “ALT FUEL VEHICLE PARKING ONLY” sign is needed to designate preferential parking spaces for eligible alternatively fueled vehicles.

PROPOSAL:

Permissive “ALT FUEL VEHICLE PARKING ONLY” (RXXX(CA)) sign.
(Green on white permissive regulatory sign, 12” x 18”)

Section 2I.05 Rest Area and Other Roadside Area Signs (new paragraph 29 and 30)

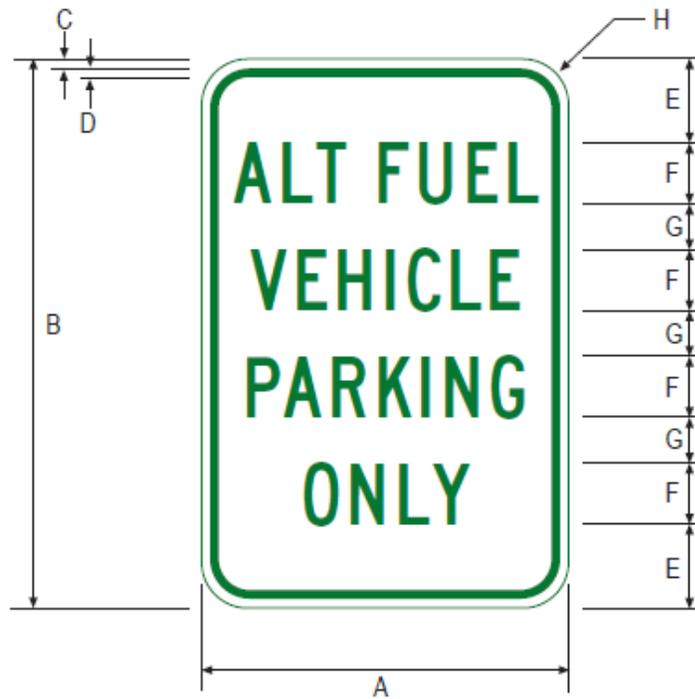
Option:

29 The ALT FUEL VEHICLE PARKING ONLY (RXXX(CA)) sign may be used in a public parking facility or a park-and-ride lot to designate a parking stall(s) dedicated for alternatively fueled vehicles only.

Support:

30 Public Resource Code 25722.9 (a) defines “alternatively fueled vehicles” as light-, medium-, and heavy-duty vehicles that reduce petroleum usage and related emissions by using advanced technologies and fuels, including, but not limited to, hybrid, plug-in hybrid, battery electric, natural gas, or fuel cell vehicles and including those vehicles described in Section 5205.5 of the Vehicle Code.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



RXXX (CA)

ENGLISH UNITS

A	B	C	D	E	F	G	H
12	18	.275	.275	2.75	2C	1.5	1.5

COLORS: BORDER & LEGEND - WHITE
 BACKGROUND - GREEN

8/1/2014

14-18 Proposal to create a New Regulatory & Warning Sign-Motorist Give 3 FT to Bike (Rxx(CA) & W11-XXP(CA))

MEMO



Subject	Request for CTCDC Agenda Item: "Motorists Give 3 Feet To Bicyclists" sign and plaque	Date	8/3/2014
To	Devinder Singh, Executive Secretary California Traffic Control Devices Committee (CTCDC)	Pages	9+addenda
From	John Ciccarelli, Bicycle Solutions Member, CTCDC		
Addenda	Utah DOT Std. Highway Signs Supplement 11-19-13, WS16-1aP (standard size only; oversized page omitted)		

Assembly Bill 1371 (Bradford), the Three Feet for Safety Act, becomes effective on September 16, 2014. Its full text appears on the last page of this memo. AB 1371 has been promoted by the California Bicycle Coalition (CalBike, <http://www.calbike.org>), California's state-level bicycle advocacy membership organization, whose mission is to "[enable] more people to bicycle for the health, safety, and prosperity of all Californians". This agenda item is in response to a request from CalBike for a sign to support informing roadway users of the new law in appropriate contexts.

This memo:

- Describes California legislation – "Three Feet For Safety Act" / AB 1371 (Bradford) -- that modifies the California Vehicle Code (CVC) to require that motorists pass bicyclists with a lateral clearance of three (3) feet whenever conditions permit;
- Provides background on other states that have enacted such legislation;
- Describes applicable signs and plaques created by other states;
- Proposes a new regulatory sign to support the new law's intent, with appropriate CA MUTCD content including a proposed policy change regarding the MUTCD "sideways bicycle" symbol;
- Proposes a new warning plaque to support the new law's intent and to offer an alternative to the MUTCD W16-11p "Share The Road" plaque, with appropriate CA MUTCD content.

Legislation – AB 1371 (Bradford), "Three Feet for Safety Act"

AB 1371 modifies the California Vehicle Code (CVC), updating Section 21750 "Overtake and Pass to Left" and adding a new Section 21760 that includes key language, highlighted here in **bold blue**:

21760.

- (a) This section shall be known and may be cited as the Three Feet for Safety Act.
- (b) The driver of a motor vehicle overtaking and passing a bicycle that is proceeding in the same direction on a highway shall pass in compliance with the requirements of this article applicable to overtaking and passing a vehicle, and shall do so at a **safe distance that does not interfere with the safe operation of the overtaken bicycle**, having due regard for the size and speed of the motor vehicle and the bicycle, traffic conditions, weather, visibility, and the surface and width of the highway.
- (c) A driver of a motor vehicle shall not overtake or pass a bicycle proceeding in the same direction on a highway at a distance of less than **three feet between any part of the motor vehicle and any part of the bicycle or its operator**.
- (d) If the driver of a motor vehicle is unable to comply with subdivision (c), due to traffic or roadway conditions, the driver **shall slow to a speed that is reasonable and prudent, and may pass only when doing so would not endanger**

the safety of the operator of the bicycle, taking into account the size and speed of the motor vehicle and bicycle, traffic conditions, weather, visibility, and surface and width of the highway.

(e) (1) A violation of subdivision (b), (c), or (d) is an **infraction** punishable by a **fine of thirty-five dollars (\$35)**.

(2) If a **collision** occurs between a motor vehicle and a bicycle **causing bodily injury to the operator of the bicycle**, and the driver of the motor vehicle is found to be in violation of subdivision (b), (c), or (d), a **two-hundred-twenty-dollar (\$220) fine** shall be imposed on that driver.

The overall intent is that whenever traffic or roadway conditions permit, overtaking motorists shall either “give 3 feet”, slow sufficiently to pass safely, or delay passing until they can comply.

Similar laws in other states

Laws that require motorists to pass bicyclists with at a minimum or greater lateral clearance are known as “safe passing laws”. Most states with such laws have chosen three (3) feet as the default distance, and their laws are known as “3-foot laws” or “3 feet laws”. Several websites track state adoption status.

The League of American Bicyclists (LAB), a national organization based in Washington D.C. that advocates for bicyclists rights and which created and manages the national Smart Cycling program, surveys such laws and publishes this online summary:

Bike Law University: Summary of State Safe Passing Laws

<http://bikeleague.org/content/bike-law-university-summary-state-safe-passing-laws>

LAB’s summary (downloaded 8/3/2014) says the following 22 states plus D.C. have 3-foot laws:

AZ, AK, CO, CT, DE, DC, FL, GA, IL, LA, ME, MD, MN, MI, NE, NV, NH, OK, TN, UT, VA, WV, WI

Other states with specified-distance laws include NC (2’) and PA (4’).

Charles Brown, MPA, Senior Research Specialist, project manager of the New Jersey Bicycle and Pedestrian Resource Center at Rutgers University / Alan M. Voorhees Transportation Center, charles.brown@ejb.rutgers.edu, surveyed such laws and published the following report in May 2012:

The 3’ Law: Lessons Learned from a National Analysis of State Policies and Interviews

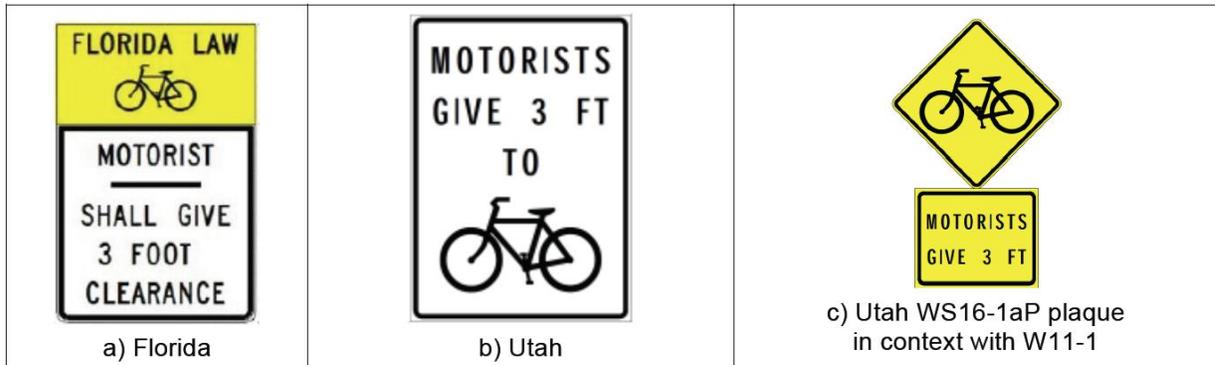
http://njbikeped.org/wp-content/uploads/2013/04/3-Foot-Final-Report-Draft_V7.pdf

Applicable signs and plaques

There is currently no national (FHWA) sign or plaque addressing motorist-passing-bicyclist clearance, though given the number of states with such laws there is interest among members of the national (NCUTCD) Bicycle Technical Committee. A graphic-oriented sign such as those researched by Florida State University (“Examples” figure below, section (d), upper left) would be subject to the NCUTCD process and federal MUTCD rulemaking.

My online research and email inquiry to colleagues found two adopted regulatory traffic control device (TCD) signs and one warning TCD plaque – all of which are “word message” except for the MUTCD bicycle symbol, two proposed graphic-oriented TCD regulatory signs, and one complex graphic “reminder” sign.

Examples of “specified passing clearance” signs



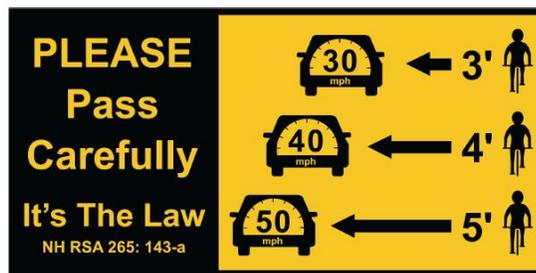
Bicycle Warning Signs



d) Proposed Florida signs, user-tested by Florida State University

(from Final Report: Aging Road User, Bicyclist, and Pedestrian Safety: Effective Bicycling Signs and Preventing Left-Turn Crashes, BDK83 977-15, September 2013, Department of Psychology, Florida State University, Tallahassee)

http://www.dot.state.fl.us/research-center/Completed_Proj/Summary_TE/FDOT-BDK83-977-15-rpt.pdf



e) New Hampshire “reminder sign”

Florida’s adopted regulatory sign (a) is a pure word-message sign (except for the bar), supplemented by a plaque above. (Arguably the plaque should be black on white as it is a regulatory message.)

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The Utah* regulatory sign (b) is a pure word-message sign except for the [BICYCLE] symbol. (*Pending confirmation from Utah DOT that this sign is theirs. It does not appear in their November 2013 Sign Manual. However, the chair of the NCUTCD Bicycle Technical Committee, Arizona DOT's Richard Moeur, indicated that it is a Utah sign and referred us to John Leonard at Utah DOT.)

Utah's warning plaque WS16-1aP (c) is, according to Utah DOT Sign Manual (11/1/2013), intended to replace the less specific US MUTCD W16-1P "SHARE THE ROAD" plaque for the specific context of supplementing the W11-1 BICYCLE warning sign:

...in situations where there is a need to warn drivers to watch for bicycles traveling along the highway and a Share the Road plaque is used with a Bicycle (W11-1) sign, the MOTORISTS GIVE 3 FEET (WS16-1aP) plaque... shall be used.

The New Hampshire graphic sign (e) does not meet at least two of the five criteria in MUTCD Section 1A.02 Principles of Traffic Control Devices:

- C. Convey a clear, simple meaning
- E. Give adequate time for proper response

Its considerable complexity requires substantial time to comprehend, and the speedometer-in-car and rear-view-bicyclist symbols are not in the MUTCD (note that the Florida research tested a TCD sign option using the rear-view-bicyclist symbol). As such, this graphic is a "reminder" rather than a MUTCD-suitable (TCD) sign; this is acknowledged by its developers, who obtained permission from NH DOT to install it as a pilot at a single location on a state highway. The graphic has also been used on billboards in the state. It might be suitable for educational graphics on or within buses.

Analysis

The proposal for CTCDC's consideration is to add a regulatory sign and warning plaque to the CA MUTCD along with new text content governing their use. These proposed designs are identical or substantially identical to the corresponding Utah designs (b) and (c) in the Examples above.

Regulatory sign

Graphic-oriented signs such as the two evaluated by Florida State University ("d" in the Examples above) require FHWA approval and should be user-tested for glance recognition and correct interpretation. I do not propose such a sign, instead deferring to NCUTCD and/or FHWA for potential federal action.

Although the Utah regulatory sign design (b) contains one symbol (the MUTCD "sideways bicycle"), I consider it to be essentially a "word message" sign because the symbol simply replaces the word "BICYCLES" or "BICYCLISTS". I consider the symbol-enhanced "wording" superior to Florida's text-only sign body because the symbol facilitates glance recognition and comprehension without necessitating a plaque like Florida's design. The Utah text also eliminates an unnecessary "SHALL".

CA MUTCD Section 2A.12 Symbols states:

02a Use of symbols [in contrast] to word messages is preferred. However, care needs to be taken so as not to mix the individual symbols.

MUTCD Section 2A.06 Design of Signs states, "...new word message signs may be used without the need for experimentation":

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....

Option:

¹³ ~~State and local highway agencies~~ Department of Transportation may develop special word message signs in situations where roadway conditions make it necessary to provide road users with additional regulatory, warning, or guidance information, such as when road users need to be notified of special regulations or warned about a situation that might not be readily apparent. Unlike colors that have not been assigned or symbols that have not been approved for signs, new word message signs may be used without the need for experimentation.

I asked the Caltrans Traffic Control Devices Branch as to whether they might be open to specifically treating the MUTCD "sideways bicycle" symbol as a "word" for purpose of designing a word message sign. Don Howe expressed interest and said that he would consult with Duper Tong, Branch Chief.

Warning plaque

The MUTCD W16-1P SHARE THE ROAD plaque, when used to supplement the W11-1 BICYCLE warning sign, is considered to be an ineffective traffic control device by many practitioners because it fails two of the five criteria of MUTCD 1A.02 Principles of Traffic Control Devices:

- C. Convey a clear, simple meaning*
- D. Command respect from road users*

The issue is that "share" is interpreted differently by motorists unfamiliar with safe and legal bicycle positioning in narrow lanes, by experienced bicyclists who are comfortable with controlling a narrow lane to deter passing, and by novice bicyclists who are not. A plaque that states the 3-foot law could be expected to convey a clear, simple meaning to each of these user groups, to more effectively command respect from motorists who have the responsibility to comply, and perhaps to encourage more bicyclists to use their lane position to deter passing in narrow lanes.

I consider the Utah warning plaque's design (c) to be a suitable supplemental (plaque) formulation of the Utah regulatory sign's message. I propose its use only to supplement the W11-1, as is the practice of Utah DOT.

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A related policy question is whether the proposed MOTORIST GIVE 3 FT plaque should supplant (replace) the SHARE THE ROAD plaque in some or all situations. At least four cases apply:

Case	Is another lane available for the motorist to pass the bicyclist (including an oncoming lane if applicable)?	Is the shared lane used by the bicyclist sufficiently wide for a "Three Foot Law" - compliant pass?	Desired motorist action	Does  convey a clear, simple meaning?	Is R4-11  applicable?
1	YES	YES	Pass safely within lane OR change lanes to pass	YES	NO
2	YES	NO	Change lanes to pass	YES	YES
3	NO	YES	Pass safely within lane	YES	NO
4	NO	NO	Defer passing	YES	YES

For the above reasons, I believe that the proposed MOTORISTS GIVE 3 FT plaque should replace the W16-1P SHARE THE ROAD plaque in California for supplementing the W11-1 BICYCLE warning sign. The proposed CA MUTCD content makes this optional.

Proposal

1. Modify CA MUTCD Section 2A.06 to consider the MUTCD “sideways bicycle” symbol to be a “word” for purposes of designing a Word Message Sign, when used to substitute for any one of the single words BICYCLE, BICYCLES, BIKE, BIKES, BICYCLIST or BICYCLISTS, where there is no other symbol within the sign, and (if the Committee prefers) only when the symbol appears on its own line with no other text or graphics. In the following proposed content, the phrase “on its own line with no other text” could be omitted if the Committee desires.

Section 2A.06 Design of Signs

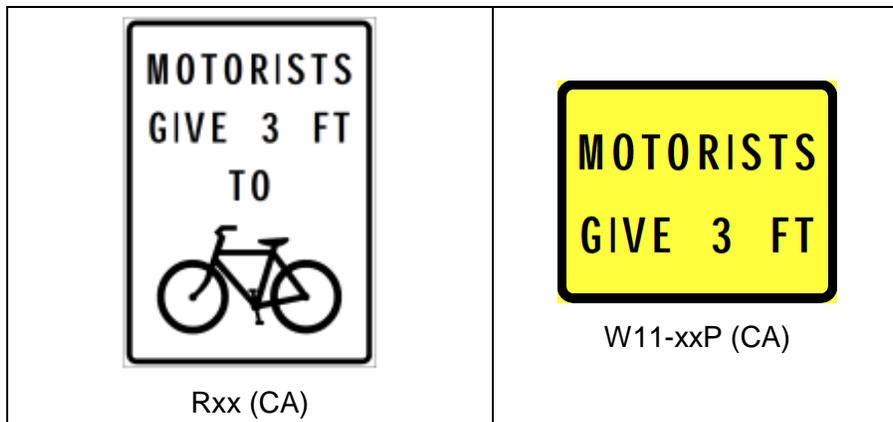
....

Option:

For purposes of construction a word message sign, the sideways-facing bicycle symbol, as used on the R4-11 sign, is considered to be a word when all of the following conditions apply:

- The symbol appears within what is otherwise a word message sign
- The symbol appears on its own line with no other text
- The symbol is used to replace the single word “BICYCLE”, “BICYCLES”, “BIKE”, “BIKES”, “BICYCLIST” or “BICYCLISTS”.

2. Add the following sign and plaque to the California MUTCD:



3. Add the Rxx (CA) to *Figure 9B-2 (CA) California Regulatory Signs for Bicycle Facilities*, Table 2B-1 (CA) California Regulatory Sign and Plaque Sizes, Table 9B-1 (CA) California Bicycle Facility Sign and Plaque Minimum Sizes, and any other applicable Figures and Tables.

4. Add text governing the Rxx (CA) to new Section 9B.xx:

Section 9B.xx MOTORISTS GIVE 3 FT TO BIKES sign

Option:

01 In situations where there is a need to remind motorists to pass bicyclists with sufficient lateral clearance in compliance with California Vehicle Code Section 21760 (“Three Feet for Safety Act”), the MOTORISTS GIVE 3 FT TO BIKES (Rxx (CA)) sign may be used.

Support:

02 The Uniform Vehicle Code (UVC) (Also refer to CVC 21202(a)(3)) defines a “substandard width lane” as a “lane that is too narrow for a bicycle and a vehicle to travel safely side by side within the same lane.”

03 Refer to Section 9B.06 for Bicycles May Use Full Lane (R4-11) sign.

5. Add the following to Section 2C.60 SHARE THE ROAD plaque (W16-1P):

Support:

04 For supplementing the Bicycle Warning sign (W11-1) sign, the MOTORISTS GIVE 3 FT plaque (W11-xxP (CA)) may provide a clearer message to motorists.

6. Add the W11-xxP (CA) to *Figure 9B-3 Warning Signs and Plaques and Object Markers for Bicycle Facilities*

7. Add text governing the W11-xxP (CA) to Section 9B.19 Other Bicycle Warning Signs:

Option:

xx In situations where there is a need to remind motorists to pass bicyclists with sufficient lateral clearance in compliance with California Vehicle Code Section 21760 ("Three Feet for Safety Act"), the MOTORISTS GIVE 3 FT (W11-xxP (CA)) plaque (see Figure 9B-3) may be used in conjunction with the W11-1 sign.

Support:

xx Where a W16-1P SHARE THE ROAD plaque is currently used in conjunction with a W11-1 sign, the MOTORISTS GIVE 3 FT W11-xxP (CA) plaque may provide a clearer message to motorists.

CTCDC Actions Requested

1. Request that Caltrans adopt the recommended policy change to CA MUTCD 2A.06 to allow the use of the BICYCLE symbol, as used on the R4-11 Bicycle May Use Full Lane sign, as a "word" in word message signs.
2. Request that Caltrans add or modify the above-mentioned MUTCD sections, figures and tables to add the new regulatory sign and warning plaque.

Assembly Bill 1371, full text

(from http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB1371)

SECTION 1.

Section 21750 of the Vehicle Code is amended to read:

21750.

(a) The driver of a vehicle overtaking another vehicle or a bicycle proceeding in the same direction shall pass to the left at a safe distance without interfering with the safe operation of the overtaken vehicle or bicycle, subject to the limitations and exceptions set forth in this article.

(b) This section shall become inoperative on September 16, 2014, and, as of January 1, 2015, is repealed, unless a later enacted statute, that becomes operative on or before January 1, 2015, deletes or extends the dates on which it becomes inoperative and is repealed.

SEC. 2.

Section 21750 is added to the Vehicle Code, to read:

21750.

(a) The driver of a vehicle overtaking another vehicle proceeding in the same direction shall pass to the left at a safe distance without interfering with the safe operation of the overtaken vehicle, subject to the limitations and exceptions set forth in this article.

(b) This section shall become operative on September 16, 2014.

SEC. 3.

Section 21760 is added to the Vehicle Code, to read:

21760.

(a) This section shall be known and may be cited as the Three Feet for Safety Act.

(b) The driver of a motor vehicle overtaking and passing a bicycle that is proceeding in the same direction on a highway shall pass in compliance with the requirements of this article applicable to overtaking and passing a vehicle, and shall do so at a safe distance that does not interfere with the safe operation of the overtaken bicycle, having due regard for the size and speed of the motor vehicle and the bicycle, traffic conditions, weather, visibility, and the surface and width of the highway.

(c) A driver of a motor vehicle shall not overtake or pass a bicycle proceeding in the same direction on a highway at a distance of less than three feet between any part of the motor vehicle and any part of the bicycle or its operator.

(d) If the driver of a motor vehicle is unable to comply with subdivision (c), due to traffic or roadway conditions, the driver shall slow to a speed that is reasonable and prudent, and may pass only when doing so would not endanger the safety of the operator of the bicycle, taking into account the size and speed of the motor vehicle and bicycle, traffic conditions, weather, visibility, and surface and width of the highway.

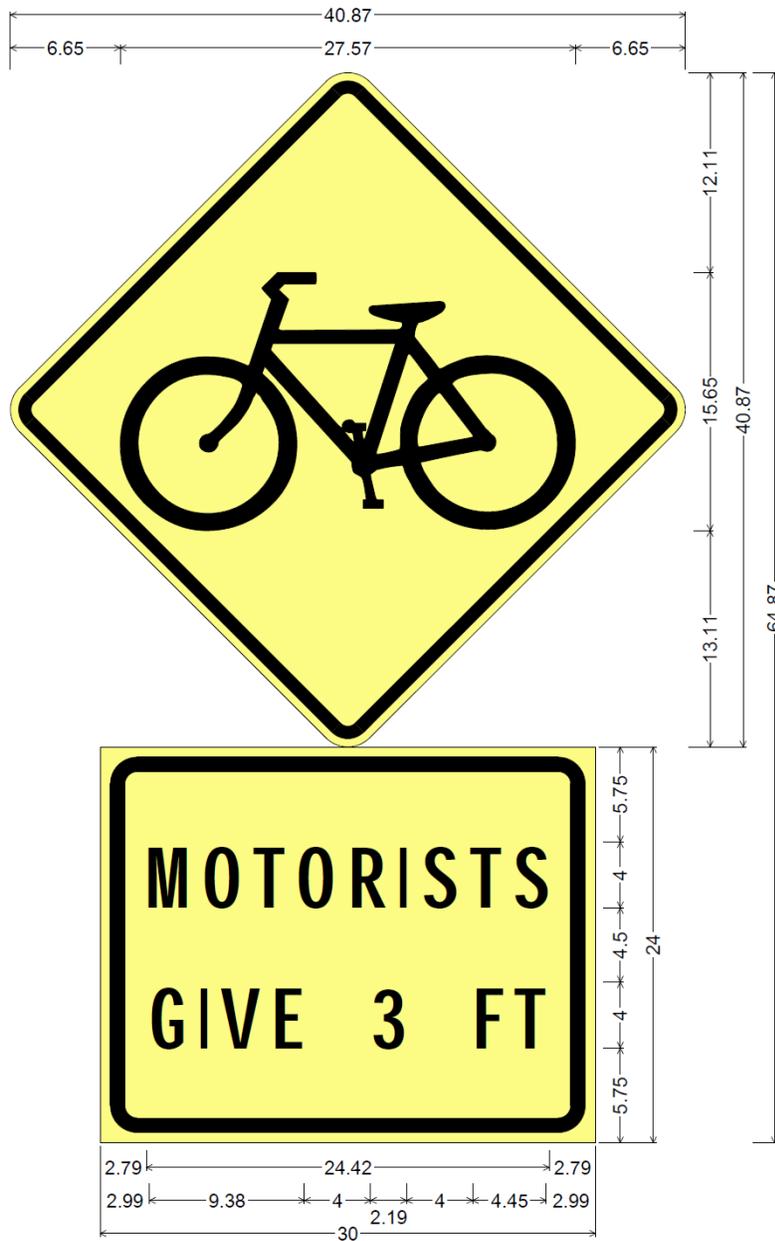
(e) (1) A violation of subdivision (b), (c), or (d) is an infraction punishable by a fine of thirty-five dollars (\$35).

(2) If a collision occurs between a motor vehicle and a bicycle causing bodily injury to the operator of the bicycle, and the driver of the motor vehicle is found to be in violation of subdivision (b), (c), or (d), a two-hundred-twenty-dollar (\$220) fine shall be imposed on that driver.

(f) This section shall become operative on September 16, 2014.

SEC. 4.

No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because the only costs that may be incurred by a local agency or school district will be incurred because this act creates a new crime or infraction, eliminates a crime or infraction, or changes the penalty for a crime or infraction, within the meaning of Section 17556 of the Government Code, or changes the definition of a crime within the meaning of Section 6 of Article XIII B of the California Constitution.



WS16-1x Motorists Give 3 Ft Bicycle Warning Assembly Single Lane Conventional;
 W11-1 Bicycle Warning Sign 30"x30";
 30.00" across sides 1.88" Radius, 0.75" Border, 0.50" Indent, Black on Fluorescent yellow;
 WS16-1aP MOTORISTS GIVE 3 FT Plaque Conventional and Expressway;
 2.25" Radius, 0.88" Border, 0.63" Indent, Black on Fluorescent yellow;
 "MOTORISTS" C; "GIVE 3 FT" C;

14-18 Proposal to Amend CA Blue text in Section 6F.85 of CA MUTCD Temporary Traffic Barriers

RECOMMENDATION: The California Department of Transportation (Caltrans) requests the Committee to recommend adopting the proposed amendment to Section 6F.85 sign.

AGENCY MAKING REQUEST/SPONSOR: Caltrans, Duper Tong, Voting Member

BACKGROUND: It was brought to our attention that [cube-corner lenses reflectors](#) are used on the permanent barriers not on the temporary barriers. Since section 6F.85 deals with temporary Traffic Barriers, we proposed to amend this section by removing the reference in regards to the [cube-corner lenses reflectors](#).

Proposal:**Section 6F.85 Temporary Traffic Barriers**

Support:

01 Temporary traffic barriers, including shifting portable or movable barriers, are devices designed to help prevent penetration by vehicles while minimizing injuries to vehicle occupants, and to protect workers, bicyclists, and pedestrians.

02 The four primary functions of temporary traffic barriers are:

- A. To keep vehicular traffic from entering work areas, such as excavations or material storage sites;
- B. To separate workers, bicyclists, and pedestrians from motor vehicle traffic;
- C. To separate opposing directions of vehicular traffic; and
- D. To separate vehicular traffic, bicyclists, and pedestrians from the work area such as false work for bridges and other exposed objects.

Option:

03 Temporary traffic barriers may be used to separate two-way vehicular traffic.

Guidance:

04 *Because the protective requirements of a TTC situation have priority in determining the need for temporary traffic barriers, their use should be based on an engineering study.*

Standard:

05 **Temporary traffic barriers shall be supplemented with standard delineation, pavement markings, or channelizing devices for improved daytime and nighttime visibility if they are used to channelize vehicular traffic. The delineation color shall match the applicable pavement marking color.**

06 **Temporary traffic barriers, including their end treatments, shall be crashworthy. In order to mitigate the effect of striking the upstream end of a temporary traffic barrier, the end shall be installed in accordance with AASHTO's "Roadside Design Guide" (see Section 1A.11) by flaring until the end is outside the acceptable clear zone or by providing crashworthy end treatments.**

Option:

07 Warning lights or steady-burn lamps may be mounted on temporary traffic barrier installations.

07a [Side reflectors with cube-corner lenses](#) or [top mounted reflectors \(facing the driver\)](#) may be used on temporary traffic barriers.

Guidance:

07b *If used, the spacing of these reflectors should not exceed a distance in feet equal to 1.0 times the speed limit in mph through the TTC zone.*

Support:

08 Movable barriers are capable of being repositioned laterally using a transfer vehicle that travels along the barrier. Movable barriers enable short-term closures to be installed and removed on long-term projects. Providing a barrier-protected work space for short-term closures and providing unbalanced

flow to accommodate changes in the direction of peak-period traffic flows are two of the advantages of using movable barriers.

⁰⁹ Figure 6H-45 shows a temporary reversible lane using movable barriers. The notable feature of the movable barrier is that in both Phase A and Phase B, the lanes used by opposing traffic are separated by a barrier.

¹⁰ Figure 6H-34 shows an exterior lane closure using a temporary traffic barrier. Notes 7 through 9 address the option of using a movable barrier. By using a movable barrier, the barrier can be positioned to close the lane during the off-peak periods and can be relocated to open the lane during peak periods to accommodate peak traffic flows. With one pass of the transfer vehicle, the barrier can be moved out of the lane and onto the shoulder. Furthermore, if so desired, with a second pass of the transfer vehicle, the barrier could be moved to the roadside beyond the shoulder.

¹¹ More specific information on the use of temporary traffic barriers is contained in Chapters 8 and 9 of AASHTO's "Roadside Design Guide" (see Section 1A.11).

Support:

¹² More specific information on the use of portable barriers and crash cushions can be obtained from the Department of Transportation's Standard Plans and Standard Specifications. See Section 1A.11 for information regarding this publication.

14-20 Proposal to adopt Buffered Bicycle Lane, Contra Flow Bicycle Lane, Intersection Bicycle Lane Marking by amending Section 9C.04 of CA MUTCD.

Recommendations: Caltrans requests that the Committee makes recommendations to adopt the inclusion of Buffered Bicycle Lane, Contra Flow Bicycle Lane, and Intersection Bicycle Lane Marking into the CA MUTCD by amending Section 9C.04 of the CA MUTCD as shown under the proposal.

Requesting Agency: Caltrans

Sponsor: John Ciccarelli, Caltrans Non-motorized Voting Member

Background: The National Association of City Transportation Officials issued an Urban Bikeway Design Guide which has been endorsed by FHWA.

On April 10, 2014, Caltrans Director endorsed two sets of guidelines meant to improve Caltrans design of bike and pedestrian facilities, specifically the AASHTO Bike Guide, which is the American Association of State Highway Transportation Officials, and the NACTO Urban Bikeway Design Guide, which is the National Association of City Transportation Officials. He stated that we are only the third state to take this proactive step to improve street safety and designs for all users.

Caltrans has a newly adopted mission statement that states: “Caltrans provides a safe, sustainable, integrated, and efficient transportation system to enhance California’s economy and livability”. This transportation system must accommodate all modes of travel: highway users, transit users, pedestrians, and cyclists.

Draft policy and Figures were sent to California Bicycle Advisory Committee (CBAC) and Caltrans District 4 Bicycle Advisory Committee for review and comments. The comments which we believe were appropriate have been incorporated in this proposal.

This is a first step to achieving the Caltrans mission, by incorporating Buffered Bicycle Lane, Contra Flow Bicycle Lane, and Intersection Bicycle Lane Marking into the CA MUTCD.

Proposal: (proposed to add definitions about Buffered Bicycle Lanes and Contraflow Bicycle Lanes under Section 1A.13)

Section 1A.13 Definitions of Headings, Words, and Phrases in this Manual**Standard:**

⁰³ The following words and phrases, when used in this Manual, shall have the following meanings:

^{24b.} **Buffered Bicycle Lane – A buffered bicycle lane is a bicycle lane that is separated from the adjacent general-purpose lane or parking lane by a pattern of standard longitudinal markings. The buffer area might include chevron or diagonal markings.**

^{36a.} **Contraflow Bicycle Lane – A contraflow bicycle lane is an area of the roadway designated to allow for the lawful use by bicyclists to travel in the opposite direction from traffic on a roadway that allows traffic to travel in only one direction.**

Section 9C.04 Markings For Bicycle Lanes (Proposed to add policies under this Section)**Buffered Bicycle Lanes****Support:**

⁴³ A buffered bicycle lane is a bicycle lane that is separated from the adjacent general-purpose lane or parking lane by a pattern of standard longitudinal markings. The buffer area might include chevron or diagonal markings.

⁴⁴ Markings for buffered bicycle lanes are shown in Figure 9C-104 (CA).

⁴⁵ Pavement markings can designate a buffer area between a bicycle lane and adjacent general purpose lane and/or parking lane. A buffer area provides a greater separation between the bicycle lane and adjacent lanes than is provided by a single normal or wide lane line.

Option:

⁴⁶ A bicycle lane buffer area may be used to separate a bicycle lane from an adjacent general-purpose lane and/or parking lane.

Standard:

⁴⁷ If used, a buffer between a bicycle lane and general-purpose lane or parking lane shall be delineated by standard normal width longitudinal pavement markings.

Guidance:

⁴⁸ Consideration should be given to installing chevron or diagonal markings as appropriate in a bicycle lane buffer area. The use of chevron or diagonal markings in a bicycle lane buffer area should be based on engineering judgment and the Standards and Guidance in Section 3B. 24.

⁴⁹ If used, interior chevron or diagonal markings should consist of 4" lines angled at 45 degrees and striped at intervals of 10 to 40 feet.

⁵⁰ If used, the buffer should be marked with longitudinal lines. Where there is parking on the right side of the buffered bicycle lane, the rightmost line should be broken. Where vehicles are expected to cross the buffer at driveways, both lines should be broken. Where neither condition exists, both lines should be solid.

⁵¹ End the buffer on the approach to the intersection of side streets or major commercial driveways as shown in Figure 9C-104 (1 of 2) (CA).

Support:

⁵² Increased interior chevron or diagonal marking frequency may increase motorist compliance.

Option:

⁵³ The chevron or diagonal markings may be omitted from bicycle lane buffer areas less than 3 feet wide.

Contraflow Bicycle Lanes

Support:

⁵⁴ A contraflow bicycle lane is an area of the roadway designated to allow for the lawful use by bicyclists to travel in the opposite direction from traffic on a roadway that allows traffic to travel in only one direction.

⁵⁵ Markings for contraflow bicycle lanes are shown in Figure 9C-105 (CA).

Standard:

⁵⁶ Where used, a contraflow bicycle lane shall be marked on the left side of travel lanes so that contraflow bicycle travel is on the left of opposing traffic.

⁵⁷ Where used, a contraflow bicycle lane shall be separated from opposite-direction travel by use of a solid double yellow center line marking, or a painted or raised median island.

⁵⁸ Where intersection traffic controls along the street exist, (e.g., stop signs, flashing light signals, or traffic signals), appropriate devices shall be oriented toward bicyclists in the contraflow lane.

⁵⁹ A contraflow bicycle lane shall not be installed on a two-way roadway.

Guidance:

⁶⁰ A buffer per Section 3B.24 or an island should be used to separate the contraflow lane from adjacent travel lanes at posted speeds of 40 mph and above.

Option:

⁶¹ A bicycle lane for travel in the same direction as the general purpose lanes may be placed on the left hand side of the general purpose lanes.

Guidance:

⁶² Where signs are provided to regulate turns from streets or driveways that intersect with a roadway that has a contraflow bicycle lane, One Way (R6-1 or R6-2) signs should not be used. Turn Prohibition signs (R3-1 or R3-2) with supplemental

Except Bicycles plaques (R ## (CA) should be used. If DO NOT ENTER signs (R5-1) are used, an Except Bicycle plaque should be placed under the DO NOT ENTER sign. See Figure 9C-105 (CA).

Support:

⁶³ Contraflow bicycle travel can be unexpected by motorists crossing the contraflow bicycle lane when entering, exiting, or crossing the roadway. Consideration of additional signalization, signing and/or marking treatments is appropriate for intersections, alleys, grade crossings, and driveways.

Option:

⁶⁴ At locations where a contraflow bicycle lane is provided across an intersection or a driveway entrance, pavement markings that inform intersection or driveway traffic of the presence of the bicycle facility and the direction of permitted bicycle traffic may be placed within the contraflow bicycle lane across the intersection or driveway opening.

Bicycle Lane Line Extensions through Intersections**Support:**

⁶⁵ The extension of bicycle lanes through intersections advises motorists that bicyclists are likely to use the intended path.

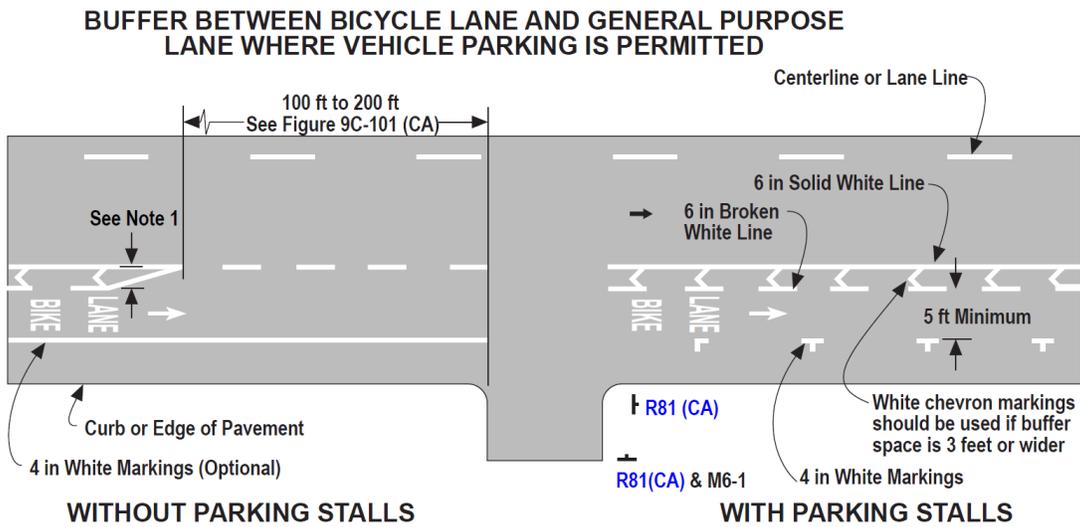
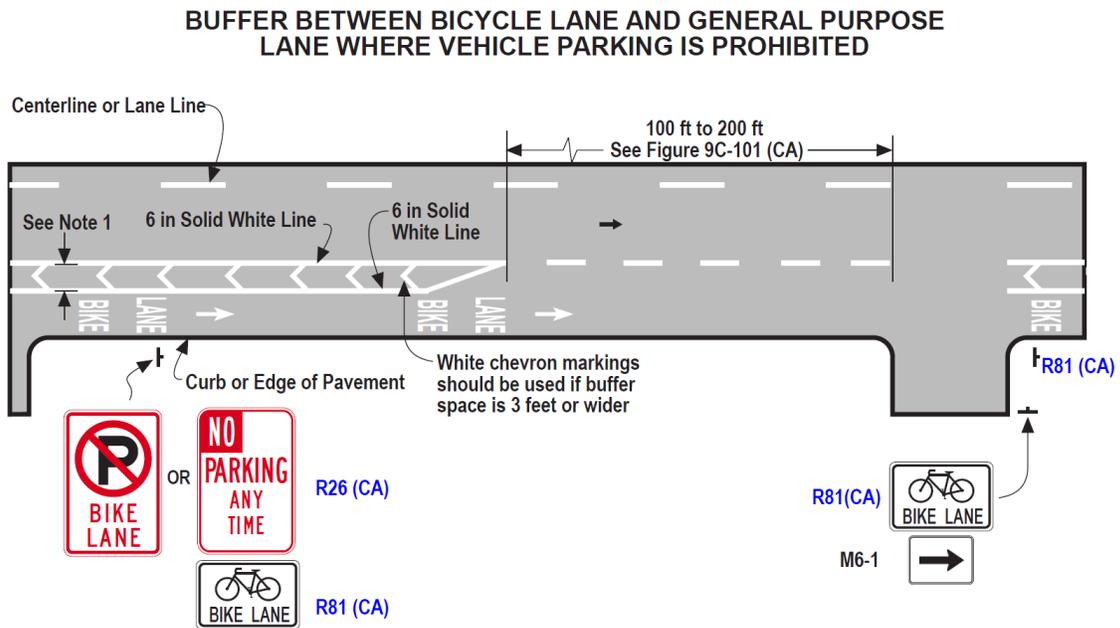
Option:

⁶⁶ Bicycle lane markings may be extended through intersections consistent with the provisions of Section 3B.08.

⁶⁷ Green colored pavements may be used in conjunction with the extension of bicycle lanes through intersections.

⁶⁸ Bicycle lane markings as shown in Figure 9C-106 (CA) may be used within the boundaries of bicycle lane extensions.

Figure 9C-104 (1 of 2) (CA). Examples of Markings for Buffered Bicycle Lanes



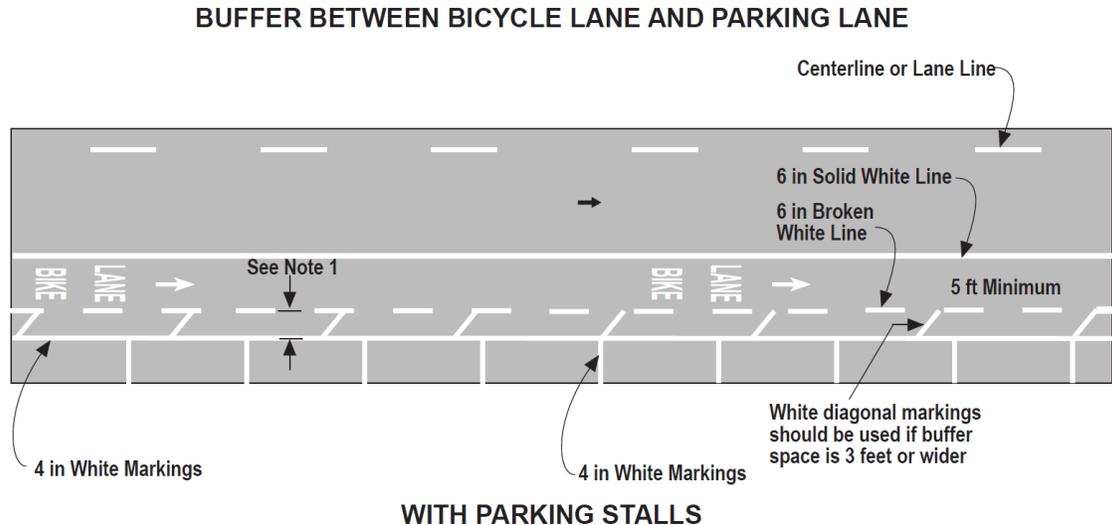
WITHOUT PARKING STALLS

WITH PARKING STALLS

NOT TO SCALE

NOTE 1: 18 in Minimum for Buffered Lane Width

Figure 9C-104 (2 of 2) (CA). Examples of Markings for Buffered Bicycle Lanes



NOT TO SCALE

NOTE 2: 18 in Minimum for Buffered Lane Width

Figure 9C-105 (CA). Example of Contraflow Bicycle Lanes

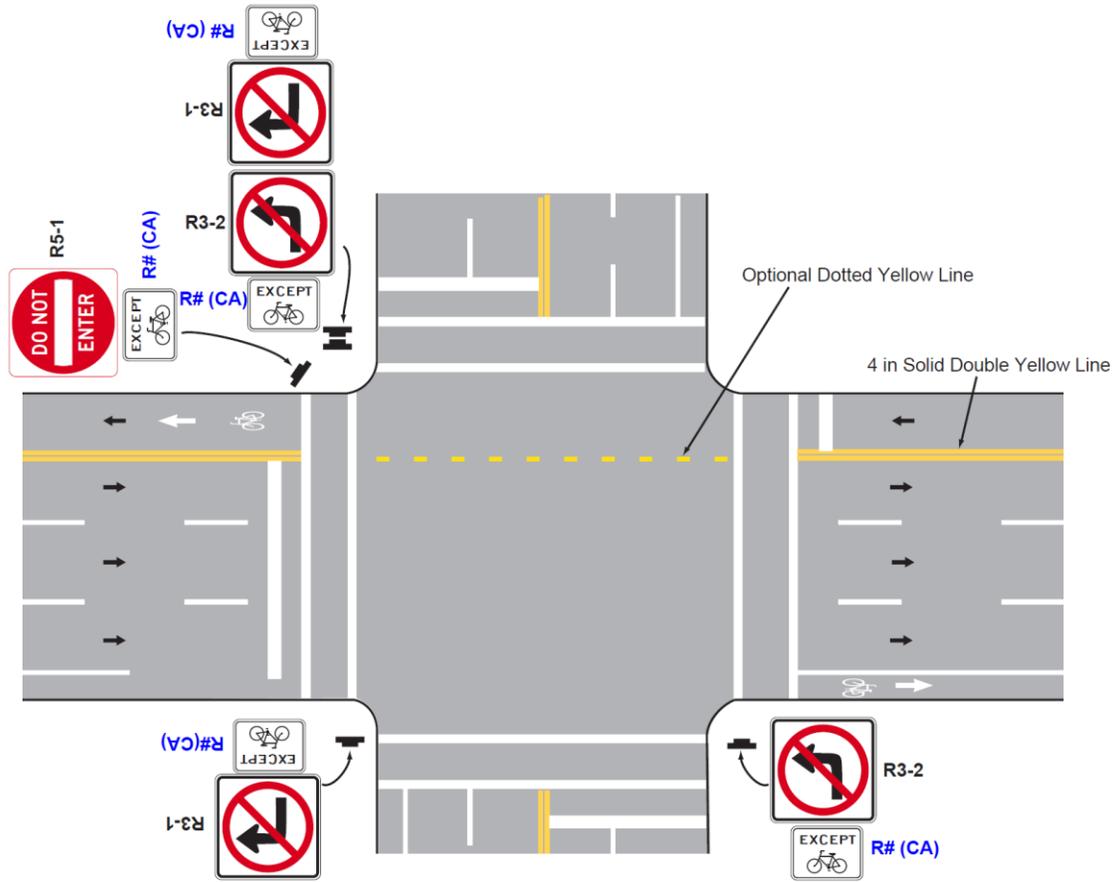


Figure 9C-106 (1 of 2) (CA). Examples of Bicycle Lane Extensions Through Intersection

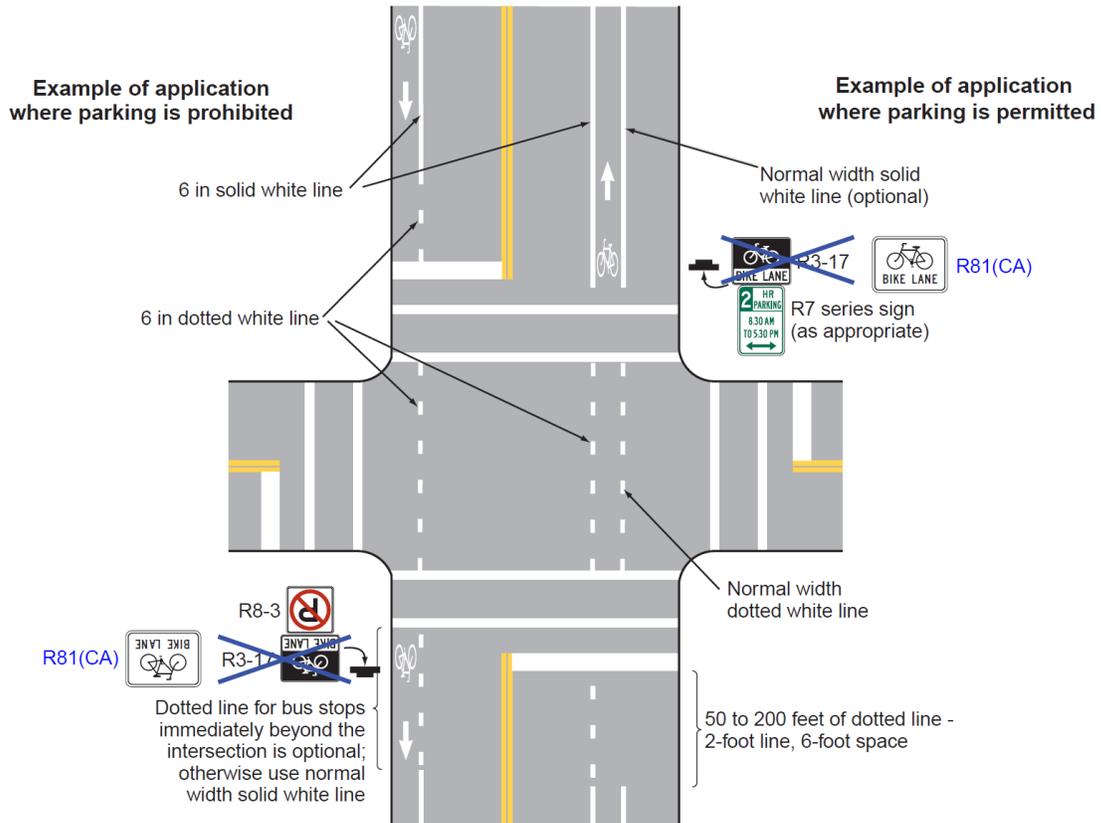
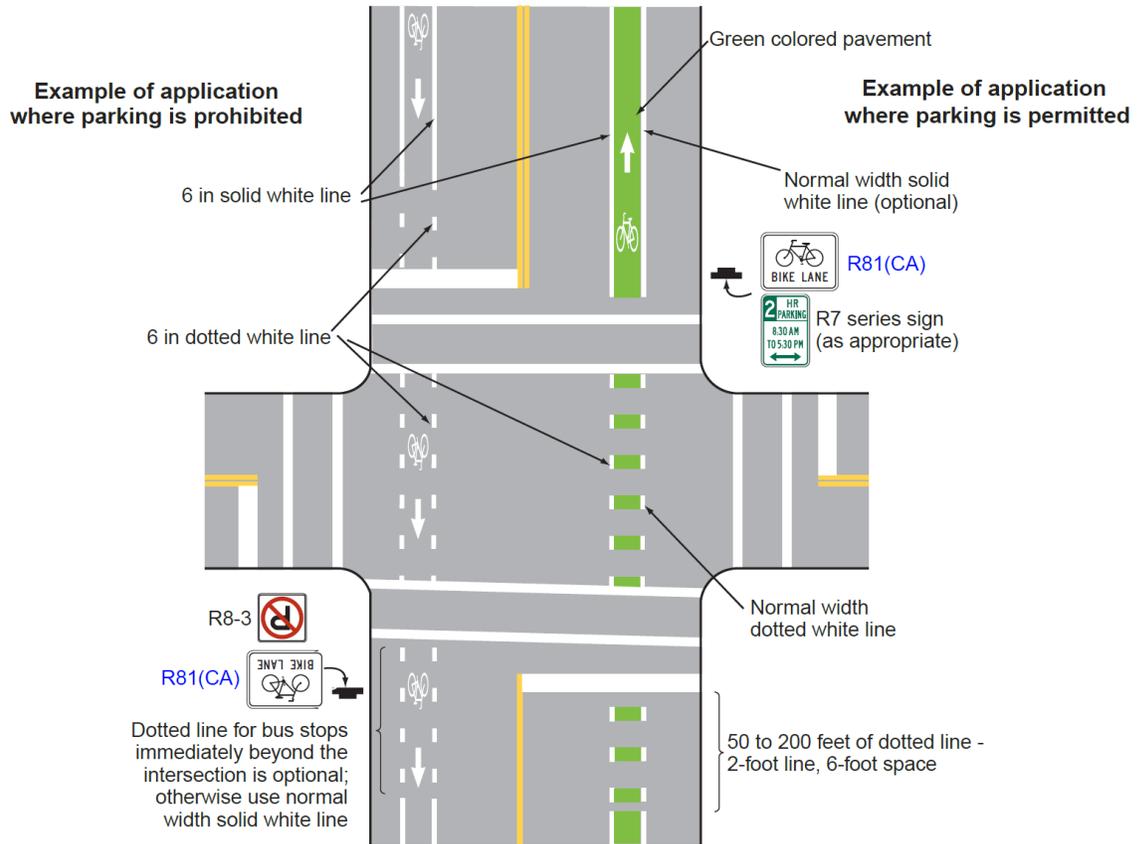


Figure 9C-106 (2 of 2) (CA). Examples of Bicycle Lane Extensions Through Intersection



8 Information items:**14.02 Proposal to adopt “PRESERVE AMERICA” sign by adding a new Section 2D-104(CA) to the CA MUTCD-**

A Tradition of Stewardship
A Commitment to Service

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Steven Lederer
Director

August 4, 2014

Devinder Singh, Executive Secretary
California Traffic Control Devices Committee
P.O. Box 942874
Sacramento, CA 94274-0001

Subject: Request for Agenda Item – Preserve America Community Sign

Dear Devinder,

This proposal was considered at the February 19, 2014 meeting of the Committee, at the request of Tuolumne County and sponsored by me. At that time, there was discussion about the request in the context of a larger issue of non-traffic control devices in public road rights-of-way. It was suggested that some work had been done recently at the Federal level which would inform the Committee's consideration of this topic. The matter was referred to a subcommittee to evaluate alternative approaches to the proposal and return to the Committee with a recommendation.

In February, John Ciccarelli and Larry Patterson agreed to serve on the subcommittee with me. With Larry's work transition, he was not able to participate in this discussion prior to his departure from the Committee. Since that time, I have invited Mark Greenwood to join the subcommittee, so that there would be a representative from the cities, as well as from both northern and southern California.

I contacted Johnny Bhullar, Caltrans staff, and asked him for information about recent activity at the Federal level on this same subject, which had been alluded to in the February meeting. He provided the following perspective on the question: "... (this) issue was reflected in the CA MUTCD per Section 1A.08. I believe the work I was referring to (in February) at the NCUTCD is now already included in the CA MUTCD 2012 edition. Please verify if it satisfies your concern. If not, let's discuss and figure out the next steps."

For reference, here is an excerpt from Section 1A.08:

Support:

06 Certain types of signs and other devices that do not have any traffic control purpose are sometimes placed within the highway right-of-way by or with the permission of the public agency or the

official having jurisdiction over the street or highway. Most of these signs and other devices are not intended for use by road users in general, and their message is only important to individuals who have been instructed in their meanings. These signs and other devices are not considered to be traffic control devices and provisions regarding their design and use are not included in this Manual. Among these signs and other devices are the following:

- A. Devices whose purpose is to assist highway maintenance personnel. Examples include markers to guide snowplow operators, devices that identify culvert and drop inlet locations, and devices that precisely identify highway locations for maintenance or mowing purposes.
- B. Devices whose purpose is to assist fire or law enforcement personnel. Examples include markers that identify fire hydrant locations, signs that identify fire or water district boundaries, speed measurement pavement markings, small indicator lights to assist in enforcement of red light violations, and photo enforcement systems.
- C. Devices whose purpose is to assist utility company personnel and highway contractors, such as markers that identify underground utility locations.
- D. Signs posting local non-traffic ordinances.
- E. Signs giving civic organization meeting information.

Standard:

07 Signs and other devices that do not have any traffic control purpose that are placed within the highway right-of-way shall not be located where they will interfere with, or detract from, traffic control devices.

Paragraph 06 refers to signs or devices placed within the right-of-way with the permission of the jurisdiction, which are not considered to be traffic control devices. A list follows which is introduced with “among these,” seeming to indicate the list is not the sum total of all such signs which could be placed. Paragraph 07 goes on to refer to such signs and devices, and indicates that they shall not conflict with traffic control devices. The combination of these two paragraphs would seem to address the concerns which were raised at the February meeting: that there be an approach which is more general than just the “Preserve America” request which had been presented, and that there be criteria on the placement of such signs.

The subcommittee concluded that the existing language in the Manual is sufficient to cover Tuolumne County’s request, and considered three possible options for how to wrap this up:

- 1. No action needed from the CTCDC.
- 2. CTCDC Action Item to confirm this understanding.
- 3. CTCDC Action Item to propose modified language to clarify that honorary designation signs, such as Preserve America or the other examples which were cited in the February meeting, are to be considered as allowable non-traffic-control devices in the right-of-way (essentially, adding an item “F” to the list of “A” through “E” in paragraph 06 of Section 1A.08 above).

The subcommittee recommends in favor of Option #1, that no further action is needed from the CTCDC. If there is consensus from the committee, I will convey that message to Tuolumne County and Caltrans District 10. The subcommittee also indicated that if there was a preference on the part of CTCDC, they could support Option #3, which would modify Paragraph 06 as follows:

Support:

06 Certain types of signs and other devices that do not have any traffic control purpose are sometimes placed within the highway right-of-way by or with the permission of the public agency or the official having jurisdiction over the street or highway. Most of these signs and other devices are not intended for use by road users in general, and their message is only important to individuals who have

been instructed in their meanings. These signs and other devices are not considered to be traffic control devices and provisions regarding their design and use are not included in this Manual. Among these signs and other devices are the following:

- A. Devices whose purpose is to assist highway maintenance personnel. Examples include markers to guide snowplow operators, devices that identify culvert and drop inlet locations, and devices that precisely identify highway locations for maintenance or mowing purposes.
- B. Devices whose purpose is to assist fire or law enforcement personnel. Examples include markers that identify fire hydrant locations, signs that identify fire or water district boundaries, speed measurement pavement markings, small indicator lights to assist in enforcement of red light violations, and photo enforcement systems.
- C. Devices whose purpose is to assist utility company personnel and highway contractors, such as markers that identify underground utility locations.
- D. Signs posting local non-traffic ordinances.
- E. Signs giving civic organization meeting information.
- F. **Honorary community designation signs for public agencies such as towns, cities, counties or the state, such as Preserve America Community, Bicycle Friendly Community, Tree City USA and others.**

Background – Original Request

Certain communities have been designated by the Federal government as Preserve America communities, including 38 within California. This designation recognizes communities that protect and celebrate their heritage, use their historic assets for economic development and community revitalization, and encourage people to experience and appreciate local historic resources through education and heritage tourism programs. The designation is provided by a coalition of federal agencies, including the Department of Transportation, but the Federal Highway Administration (FHWA) has not yet incorporated the sign indicating this designation into the Manual on Uniform Traffic Control Devices (MUTCD).

The Federal government makes this sign available for designated communities to post at their entrances. I was recently contacted by staff from Tuolumne County, who were interested in doing so at several locations on State routes, and whose application for encroachment permit to do so was denied by Caltrans District 10. The primary cause for denial of their application was that the sign is not incorporated into the CA MUTCD. In her denial letter, the Caltrans District Director referred Tuolumne County to the CTCDC, and they have contacted me as the representative for northern counties.

As the sign proposed consists of a word message and pictograph only, it is my understanding that the CTCDC can approve it for use by communities in California which are interested, which includes the County of Tuolumne. The proposed sign would be new to the CA MUTCD, so I have proposed language to be included, and recommended a designation code for the sign.

Regards,

Rick Marshall (e-signature)

Rick Marshall
Deputy Director of Public Works
Road Commissioner & County Surveyor
Member, CTCDC – Northern Counties' Representative

13-08 Minimum Yellow Change Interval Timing Compliance dates

Table I-2(CA). Target Compliance Dates Established by the CTCDC/Caltrans

2014 CA MUTCD Section Number(s)	2014 CA MUTCD Section Title	Specific Provision	Compliance Date
4D.26	Yellow Change & Red Clearance Intervals	Signalized intersections equipped with Red Light Cameras shall comply with 2014 CA MUTCD, Section 4D.26	April 1, 2015
4D.26	Yellow Change & Red Clearance Intervals	All signalized intersections shall comply with 2014 CA MUTCD, Section 4D.26	April 1, 2017

10. Next Meeting:

11. Adjourn: