

**AGENDA**  
**CALIFORNIA TRAFFIC CONTROL DEVICES COMMITTEE (CTCDC)**  
**May 24, 2012 Meeting (Start Time 9 am)**  
**1416 9<sup>th</sup> Street, Sacramento (Auditorium of Water Resources Building), CA 95814**

**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](mailto:Devinder.singh@dot.ca.gov). Electronic copies of this meeting Agenda is available at <http://www.dot.ca.gov/hq/traffops/signtech/newtech/index.htm>**

**Organization Items**

- 1 Introduction**
- 2 Membership**
- 3 Approval of Minutes of the February 16, 2012 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.

**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
12-1	The Proposal to amend Section 2I.03 of CA MUTCD 2012 to clarify local responsibility to establish STAA Route -Submitted by Caltrans	(Continued) (Fogle) 5-9
12-2	Minor Editorial and policy changes requested to the Temporary Traffic Control Part 6 of the CA MUTCD 2012-Submitted by Caltrans	(Continued) (Fogle) 10-24
12-2a	Proposal to amend Section 6F.60 in regards to Delineate Portable Changeable Message sign in Work Zones Areas -Submitted by Caltrans	(Continued) (Fogle) 25-26
12-3	Proposed amendment to Sections 6H.01 and 6A.01 of CA MUTCD 2012, Typical Applications-Submitted by LA County	(Continued) (Robinson) 27-28
12-4a	Proposal to amend Section 6F.65 Tubular Markers of CA MUTCD 2012 - Submitted by LA City	(Introduction) (Fisher) 29-34

- |  |   |  |
|--|---|--|
| 12-5                                     | Policy changes, updates, and addition of Typical Applications (TAs) to Chapter 6H of CA MUTCD 2012 and “UNEVEN PAVEMENT”<br>-Submitted by Caltrans  | (Continued)<br>(Fogle) <a href="#">35-50</a>         |
| 12-8                                     | Adopt a new Section 2B.112 in to the CA MUTCD 2012 to add<br>“MOVE OVER OR SLOW FOR STOPPED EMERGENCY AND<br>MAINTENANCE VEHICLES” sign- Submitted by Caltrans  | (Continued)<br>(Fogle) <a href="#">51-51</a>         |
| 12-10                                    | Proposal to amend CA MUTCD Section 2D.37 Destination Signs<br>(D1 Series) to allow the use of Monument Supplemental<br>Destination Sign- Submitted by Caltrans  | (Introduction)<br>(Fogle) <a href="#">52-54</a>      |
| 12-11                                    | Adopt Interim Approval issued by the FHWA for Optional Use of<br>Traffic Signal Photo Enforced Signs (IA-12) - Submitted by Caltrans  | (Introduction)<br>(Fogle) <a href="#">55-60</a>      |
| 12-12                                    | Update flag transfer method of one-lane two-way traffic control<br>policy in Section 6C.12 of CA MUTCD 2012 – Submitted by Caltrans   | (Continued)<br>(Fogle) <a href="#">61-61</a>         |
| <br><b>6 Request for Experimentation</b> |   |  |
| 10-10                                    | Request for Permission to Experiment with modified<br>SPEED HUMP (W17-1) Signs<br>See Final Report on the following website:<br><a href="http://www.dot.ca.gov/hq/traffops/signtech/newtech/reports.htm">http://www.dot.ca.gov/hq/traffops/signtech/newtech/reports.htm</a> | (Final Report)<br>(Knowles)<br><a href="#">62-62</a> |
| 07-19                                    | Wildlife Corridor Signage (Staff recommends to remove this item from the agenda,<br>because the experiment devices have not been installed since 2007)  |  |
| <br><b>7 Information Items - None</b>    |   |  |
| <br><b>8 Next Meeting</b>                |   |  |
| <br><b>9 Adjourn</b>                     |   |  |

ITEM UNDER EXPERIMENTATION

- 06-2 Experiment with Colored Bike Lane (Ku/Wong)  
(Proposed by the City of San Francisco)  
**Status:** San Francisco has completed material testing and determined that thermoplastic is the best colored pavement treatment material for the experimental installations based on durability, visibility, slip-resistance and estimated lifecycle costs. Beginning in April 2011, dashed retroreflective green thermoplastic was added to the dashed portion of bicycle lanes at six intersection approaches on Market Street. Photos can be viewed here:  
<http://sf.streetsblog.org/2011/04/28/sfmta-crews-begin-filling-in-green-bikeway-gaps-on-market-street/>
- Data will be collected at the Market Street locations to determine if the treatment has any impact on merging behavior between motorists making right turns and bicyclists continuing straight through intersections. Market Street was selected as the first installation location to coordinate with ongoing improvements to bicycle facilities along Market Street, which is the highest-use bicycle facility in San Francisco.
- The revised schedule for the remainder of the experiment is as follows:  
June-July 2011 – Collect "before" data prior to installation of green retroreflective thermoplastic (except for Market Street locations described above)  
August -September 2011 - Install green retroreflective thermoplastic  
October-November 2011 – Collect "after" data following installation of green retroreflective thermoplastic  
January 2012 - Draft report  
February 2012 - Final report
- 07-19 Wildlife Corridor Signage (Robinson/Babico)  
(Proposed by the County of San Bernardino)  
**Status:** The applicant still searching for someone to do study for the Federal Highway folks. The type of study that they requested would cost many thousands of dollars. Applicant is looking for a college student that could make the study part of his curriculum.
- 08-7 Request for Experimentation with new Warning Sign for Bicyclists (Ku/Wong)  
(Proposed by the City/Co of San Francisco)  
**Status:** No change since their last report. The City and County of San Francisco would like to bring this experiment to a close and therefore will analyze collision data collected before and after the installation of this experimental warning sign and submit the results to the Committee within the next 12 months for its evaluation.
- 08-21 Proposal to Experiment with Regulatory Sign “BIKES IN LANE” with Bicycle Symbol (Originally submitted as “Bike May Use Full Lane”) (Fogle/Henley)  
**Status:** No New update. Caltrans District 5 still looking for funding for the human factors study. The signs have been well received and there are no negative issues to report at this time. State collision data is not yet available, however, collision data obtained from the City of Santa Cruz up to 09/01/09, shows that there have been 3 bike related collisions since the signs went up, 5 in the year previous, and 7 in the year prior to that.

- 09-9 Request to Experiment with Steady Red Stop Line Light (Fisher)  
**Status:** See report on the following website under “Status Report – Ongoing Experiments”  
<http://www.dot.ca.gov/hq/traffops/signtech/newtech/index.htm>
- 09-21 Request for Permission to Experiment with Separated/Protected Bikeway (Fisher)  
On the Left Side of Two One-Way Streets in the City of Long Beach (Rte 9-112E)  
**Status:** See report on the following website under “Status Report – Ongoing Experiments”  
<http://www.dot.ca.gov/hq/traffops/signtech/newtech/index.htm>
- 10-3 Experiment with Second Train Warning Sign “Additional Train May (Fisher)  
Approach” with a Symbol Sign (Submitted by City of Riverside)  
**Status:** See report on the following website under “Status Report – Ongoing Experiments”  
<http://www.dot.ca.gov/hq/traffops/signtech/newtech/index.htm>
- 11-3 Request to Experiment with Buffered Bicycle Lanes on 2<sup>nd</sup> St.between Bayshore (Fisher)  
& PCH in Naples
- 11-4 Request for Permission to Experiment with Round Rapid Flashing Beacon (Fisher)
- 11-12 Request for Permission to Experiment with Circular Rapid Flashing Beacon (Fisher)  
and Rectangular Rapid Flashing Beacon
- 11-13 Request to experiment with a Sign “RECKLESS DRIVING PROHIBITED” (Mansourian)
- 11-19 Request to experiment with 2<sup>nd</sup> advance California Welcome Center Destination Sign (Fogle)
- 12-9 Request to Experiment with Yellow LED Border on Pedestrian Signal (Fogle)

**12-1 Proposal to amend Section 2I.03 of CA MUTCD 2012 to clarify local responsibility to establish a STAA Route**

**Recommendations:** Caltrans request that the Committee make recommendations to revise Section 2I.03 as proposed under the proposal.

**Requesting & Sponsor Agency:** Caltrans

**Background:**

**CHANGES TO THE Section 2I.03 of the 2012 MUTCD  
Proposed by the Truck Size & Weight Unit Branch  
4/5/12**

The Caltrans Office of Truck Services, Truck Size & Weight work group, is submitting the changes to the California MUTCD 2012, Section 2I.03, on Page 568. The proposed changes are needed for the following reasons:

**1 – Local STAA Route Application:** The existing language in the California MUTCD requires that local agencies inform the Department in writing that the local roads and intersections meet the geometric criteria for a STAA route. The purpose of this language is to reduce the need for Department staff to analyze local roads for STAA access. However, some confusion still exists regarding the separate roles of local and State agencies when analyzing local STAA routes. Also, when the proposed changes were submitted to the CTCDC in January 2012, some of the comments from the meeting indicated that the entity responsible for each step was not clear; so those entities have been clarified.

The Department should not be analyzing local roads, as it increases Department work load and Department liability. The existing language in the California MUTCD should be strengthened to improve the Department’s assurance that local governments have done a thorough analysis, while still limiting the Department’s liability for local decisions.

**2 – Multiple Jurisdictions:** If the proposed STAA route goes through more than one local jurisdiction, the existing MUTCD requires that the local government applying for the STAA route obtain “concurrence” from those adjacent jurisdictions. To protect the Department’s liability, the adjacent local governments should, instead, inform the Department in writing that their roads and intersections meet the geometric criteria for a STAA route.

**3 – 24-Hour Turn Around:** It is already standard practice to require a 24-hour turn around for STAA trucks where the TA route ends, but this practice is not yet included in any document that would ensure that it be required. Staff has determined that the most appropriate location for this requirement is the California MUTCD.

**4 – Order of Sign Placement:** The State should post signs for STAA trucks to exit the State highway ONLY AFTER the locals have posted trailblazing signs along the new local TA route. If the State signs are placed first, then STAA trucks could exit the State highways route and have no idea where to travel next. This sign placement order (locals first, then State) is standard practice, but the language is not strong enough in the California MUTCD and should be made clearer.

**5 – Minor edits for clarity:** Several minor edits are proposed to improve clarity. For example, the existing term “STAA vehicle” is proposed to be changed to “STAA design vehicle,” as there are many sizes of STAA vehicles, but only one standard “STAA design vehicle” in the Highway Design Manual. The “STAA design vehicle” should always be used when analyzing STAA routes.



**PROPOSAL (red color text is added to the existing text):****Section 2I.03 General Service Signs for Freeway and Expressways****STAA Truck Service and Terminal Access Signs (G66-55(CA) and G66-56(CA))**

## Option:

<sup>54</sup> The STAA Truck Service (G66-55(CA)) and STAA Truck Terminal Access (G66-56(CA)) signs may be placed by the California Department of Transportation (Department) on the National Network of Highways to identify locations where STAA trucks may leave the National Network to access services and terminals per CVC 35401.5(c) and (d). The G66-55(CA) and G66-56(CA) signs may also be used on Terminal Access routes to indicate turns and access ending points.

## Support:

<sup>55</sup> More information on the National Network and State Terminal Access routes is available from the Office of Truck Services in Department of Transportation's Division of Traffic Operations. Some of this information can also be accessed on the Internet at the following web site:

<http://www.dot.ca.gov/hq/traffops/trucks/>

**STAA Definitions**

## Support:

- **STAA** - Surface Transportation Assistance Act of 1982, federal funding authorization that declared, among other things;
  1. Semitrailers up to and including 48 feet in length are exempt from state kingpin to rear axle (KPRA) and overall combination length limits,
  2. Semitrailers over 48 feet long and up to and including 53 feet in length are exempt from state overall length limits (These semitrailers are subject to state KPRA limits in California.),
  3. Double trailers in combination where each does not exceed 28.5 feet in length are exempt from any state overall length limits.
  4. Federal length rules apply to these combination vehicles only when operating on a federally declared system of highways called the National Network and the state and local determined terminal access and service access **highways routes**.

Note: Four buses up to 45 feet long (motorcoaches) were added to the federal regulations under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). Motorhomes (housecars) up to 45 feet in length were legalized in California in October 2001. Although highway restrictions apply to both these vehicle types, they may operate beyond the STAA Network. However, the Motorcoach and Motorhome Network map defines highway access restrictions imposed at the limits of turning performance (i.e., the 45 feet vehicles would need to cross centerlines).

- **National Network** – federally designated state highways for STAA vehicles as defined and listed in the Federal Code of Regulations, Title 23, Part 658 (23CFR658) and 658.23 Appendix A.
- **Terminal Access** – state and local agency **highways routes** designated for “reasonable access” to/from the National Network by STAA vehicles as provided for in the CVC 35401.5(c) and (d). All transitions (egress) from National Network to Terminal Access **highways routes**, critical decision points (all turns) and Terminal Access end points should be so designated with a G66-56(CA) sign.

- **STAA Network** – the California network of Terminal Access routes and National Network highways. [A map and Truck Route List](#) identifying the STAA Network (includes State highway system only, does not include local streets and roads) are available from Office of Truck Services in Department of Transportation's Division of Traffic Operations.
- **Service Access (SA)** – state and local agency highways routes identified for service use by STAA vehicles. [Service access](#) is limited to 1 mile off the STAA network and must be "identified." Identification may include a map indicating service access for STAA vehicles, an approved list, or by G66-55(CA) signs.
- **STAA trucks** – are truck tractor-semitrailer combinations, or doubles with a long length configuration such that the vehicles may operate legally only on the STAA Network and SA routes.

### STAA Truck Service (G66-55(CA)) Sign

#### Option:

<sup>56</sup> The STAA Truck Service (G66-55(CA)) Sign may be placed on the STAA Network to identify locations where STAA trucks may exit the network to obtain services as provided for by CVC 35401.5(c) and (d).

#### Standard:

<sup>57</sup> STAA trucks shall not exit the STAA Network to obtain services unless the G66-55(CA) sign indicates egress.

<sup>58</sup> STAA Truck Service (G66-55(CA)) signs shall be provided as follows:

##### 1. Access – All the following requirements shall be met:

- Fuel, food, lodging and/or repair facilities shall be located within 1 mile of the point of ingress and egress from the designated system.
- Ramps, intersections and streets shall have adequate turning radii and lane widths to safely accommodate STAA trucks.
- The service being made accessible shall have parking provisions for STAA trucks, or alternative parking within 1 mile shall be identified.

##### 2. Facilities – Two of the four services - fuel, food, lodging & repair - shall be provided:

- Fuel (Diesel) - Fuel is available at least 12 hours during the working day.
- Food - Conforms to requirements for Food (D9-8) signs in this section.
- Lodging - Conforms to requirements for Lodging (D9-9) signs in this section.
- Repair Services - Oil, tire repair, engine and brake services are available.

##### 3. Concurrence:

- The proposal for G66-55(CA) signing has written concurrence by the local **agency(ies) jurisdiction(s)** having responsibility for maintenance of the roadways within 1 mile of ingress/egress.

##### 4. Sign Placement:

- The G66-55(CA) sign on the STAA Network shall be displayed in advance of the ramp or intersection.
- Although no follow-up signing is required, trailblazer signs may be used where applicable.

### STAA Truck Terminal Access (G66-56(CA)) Sign

<sup>59</sup> Option: STAA Truck Terminal Access (G66-56(CA)) signs may be placed to identify Terminal Access routes leading from the National Network, as trailblazers and to indicate the end of a Terminal Access route. STAA trucks can exit the National Network onto Terminal Access routes only where indicated by a G66-56(CA) sign. (Note: In California, no signs indicate

the National Network highways routes.) Highways Routes may be designated Terminal Access only if the curves, ramps, and intersections meet the geometric criteria\* (see paragraph 6D-2(D)) for STAA trucks, including adequate turning radii and lane width.

**Standard:**

<sup>60</sup> STAA Truck Terminal Access (G66-56(CA)) signs shall be provided as follows:

**1. On State Highways Routes:**

- State route segments under consideration for Terminal Access shall meet all geometric criteria\* for STAA trucks.
- The end of any Terminal Access route segment shall be signed as such.
- Trail-blazing signs shall be placed at decision points indicating direction(s) a STAA truck may proceed.
- The G66-56(CA) sign shall be placed in advance of the ramp or intersection where a STAA truck may exit the National Network or the designated system Terminal Access routes.

**2. On Local Highways Routes:**

- Signing of egress from a State Terminal Access route to a local Terminal Access route shall be done by the Department, only if:

**a) requested by the local jurisdiction agency has requested that the Department place the sign, and:**

**ab) the local jurisdiction agency has informed the Department in writing that the local roads and intersections on the proposed local Terminal Access route meet all geometric criteria\* for STAA trucks, and;**

**c) if the proposed Terminal Access route passes through more than one local jurisdiction, the city or county where the terminal is located shall acquire concurrence from all each affected jurisdictions agency has informed the Department in writing that the local roads and intersections on the proposed local Terminal Access route meet all geometric criteria\* for STAA trucks before requesting access from the STAA Network, and**

**bd) the Department has verified that the State highway ramp or intersection meets all geometric criteria\* for STAA trucks.**

**\*The geometric criteria involves involve using a the STAA design vehicle to design or analyze the intersection, or ramp, or curve so that the STAA vehicle can stay in its lane without encroaching into the adjacent or opposing lane (for more guidance on geometric criteria, see Topic 404 in the Caltrans Highway Design Manual) and, if the Terminal Access route ends without connecting to another STAA route, ensuring that an adequate turn-around location is available for all STAA vehicles 24 hours per day, 7 days per week.**

- ~~If the route passes through more than one local jurisdiction, the city or county where the terminal is located shall acquire concurrence from all affected jurisdictions before requesting access from the STAA Network, and the city or county shall provide this concurrence in writing to the Department. Per CVC 35401.5(d)(1)(2) "The denial of a request for access to terminals and services shall be only on the basis of safety and an engineering analysis of the proposed access route. If a written request for access has been properly submitted and has not~~

~~been acted upon within 90 days of receipt by the Department or the appropriate local agency, the access shall be deemed automatically approved."~~

- **After steps a) through d) have been completed in item 2 "On Local Routes," the local agency or agencies shall place G66-56(CA) signs at every critical decision point on the Terminal Access route in their respective jurisdictions, including a G66-56(CA) sign with END Auxiliary (M4-6) sign at the 24-hour turn-around location where the Terminal Access route ends if it does not connect to another STAA route.**
- **After the local agency or agencies have placed all the required signs on the local Terminal Access routes, the State Department shall place a G66-56(CA) sign on the State route in advance of the ramp or intersection to the local Terminal Access highway route.**



## 12-2 Minor Editorial and policy changes requested to the Temporary Traffic Control Part 6 of CA MUTCD 2012

### Recommendation:

Caltrans request that the Committee make recommendations to adopt minor Editorial changes and policy changes throughout Part 6 of the CA MUTCD 2012 as shown in the proposal.

**Agency Making Request/Sponsor:** Caltrans

### Background:

As part of Part 6 clean up efforts the following minor changes were identified by Caltrans.

Caltrans is seeking CTCDC recommendations on those items.

CA MUTCD	Proposed Change	Background Information
Section 6C.10	Policy added for low-volume road	Low-volume road should be defined as in Part5.
Section 6F.22	New sign code added to text	W20-5a sign is shown on Figure 6F-4. It was left out from California text of Section 6F.22.
Section 6F.37	Edit terms for types of work	Terms like “maintenance, reconstruction” do not include works such as landscaping, garbage removing, etc. and should be replaced with “shoulder works”.
Section 6F.68	Update policy Crashworthy	According to FHWA memorandum WZ-54, all barricades need to be crash tested with TTC signs as one unit.
Section 6F.88	Delete color policy	Traffic screen mounted on top of barriers are mostly made of plywood and they are gray in color not orange. No color policy is needed and should be deleted.
Section 6F.101-103(CA)	Language cleanup	Those policies were written for specifications. They need to be more in line with CA MUTCD style.
Section 6F.106(CA)	Sign location change	Caltrans bought roll-up SC19(CA) signs to be used in lane closures. The sign location policy needs to be changed for those roll-up signs.
6H TA-5, 101(CA), 102(CA) notes	Delete policies	Delete duplicate policy notes.
6H, TA-6,11, 15,16,18,26,	Policy defines low-volume road	Low-volume road should be defined as in Part5.

105(CA) notes		
Figure 6H-28	Pedestrian path width	Pedestrian path width changed to be consistent with other parts of CA MUTCD
Figure 6H-102(CA)	Change figure	Graphical error where bike lane is located in relation to the vehicular lanes.

**Proposal (Changes are shown in red color):**

**Section 6C.10 One-Lane, Two-Way Traffic Control**

**Standard:**

**<sup>01</sup> Except as provided in Paragraph 5, when traffic in both directions must use a single lane for a limited distance, movements from each end shall be coordinated.**

*Guidance:*

*<sup>02</sup> Provisions should be made for alternate one-way movement through the constricted section via methods such as flagger control, a flag transfer, a pilot car, traffic control signals, or stop or yield control.*

*<sup>03</sup> Control points at each end should be chosen to permit easy passing of opposing lanes of vehicles.*

*<sup>04</sup> If traffic on the affected one-lane roadway is not visible from one end to the other, then flagging procedures, a pilot car with a flagger used as described in Section 6C.13, or a traffic control signal should be used to control opposing traffic flows.*

*Option:*

*<sup>05</sup> If the work space on a low-volume street or road is short and road users from both directions are able to see the traffic approaching from the opposite direction through and beyond the worksite, the movement of traffic through a one-lane, two-way constriction may be self-regulating.*

**Support:**

*See Section 5A.01 for definition of a low-volume road where paragraph 5 is applied.*

**Section 6F.22 Lane(s) Closed Signs (W20-5, W20-5a)**

**Standard:**

**<sup>01</sup> The Lane(s) Closed sign (see Figure 6F-4) shall be used in advance of that point where one or more through lanes of a multi-lane roadway are closed.**

**<sup>02</sup> For a single lane closure, the Lane Closed (W20-5) sign (see Figure 6F-4) shall have the legend RIGHT (LEFT) LANE CLOSED, XX FEET, XX MILES, or AHEAD. Where two adjacent lanes are closed, the W20-5a sign (see Figure 6F-4) shall have the legend XX RIGHT (LEFT) LANES CLOSED, XX FEET, XX MILES, or AHEAD.**

*Option:*

*<sup>03</sup> The ~~Lane-Closed~~ LANE(S) CLOSED (W20-5, W20-5a or C20(CA)) sign by itself, or in combination with LEFT (C20A(CA)) plaque and/or Numeral (C20B(CA)) plaque may be used.*

<sup>04</sup> The LANE CLOSED (C30(CA)) sign may be used within a closed lane of a multilane highway as follow-up information to the appropriate advance warning signs. The C30(CA) sign may be repeated at intervals, throughout long lane closures, as a reminder to motorists.

<sup>05</sup> The words RAMP CLOSED may be used as an alternate message on the C30(CA) signs on surface streets to warn that the upcoming freeway/expressway on ramp is closed.

### **Section 6F.37 Shoulder Work Signs (W21-5, W21-5a, W21-5b)**

Support:

<sup>01</sup> Shoulder Work signs (see Figure 6F-4) warn of maintenance, reconstruction, or utility operations on the highway shoulder where the roadway is unobstructed.

**Standard:**

<sup>02</sup> **The Shoulder Work sign shall have the legend SHOULDER WORK (W21-5), RIGHT (LEFT) SHOULDER CLOSED (W21-5a), or RIGHT (LEFT) SHOULDER CLOSED XX FT or AHEAD (W21-5b) or SHOULDER WORK AHEAD (C24(CA)).**

Option:

<sup>03</sup> The Shoulder Work sign may be used in advance of the point on a non-limited access highway where there is shoulder work. It may be used singly or in combination with a ROAD WORK NEXT XX MILES or ROAD WORK AHEAD sign.

*Guidance:*

<sup>04</sup> *On freeways and expressways, the RIGHT (LEFT) SHOULDER CLOSED XX FT or AHEAD (W21-5b) sign followed by RIGHT (LEFT) SHOULDER CLOSED (W21-5a) sign should be used in advance of the point where the shoulder work occurs and should be preceded by a ROAD WORK AHEAD sign.*

Option:

<sup>05</sup> The SHOULDER WORK AHEAD (C24(CA)) sign may be used in advance of the point where maintenance, reconstruction, shoulder work or utility operations involve the shoulder but the roadway is unobstructed.

### **Section 6F.68 Type 1, 2, or 3 Barricades**

Support:

<sup>01</sup> A barricade is a portable or fixed device having from one to three rails with appropriate markings and is used to control road users by closing, restricting, or delineating all or a portion of the right-of-way.

<sup>02</sup> As shown in Figure 6F-7, barricades are classified as Type 1, Type 2, or Type 3.

Option:

<sup>23</sup> Signs may be installed on barricades (see Section 6F.03).

<sup>24</sup> ~~Type III-b~~ Barricades may be used as sign supports if the barricades have been successfully crash tested as one unit with a construction area sign attached.

### **Section 6F.88 Screens**

Support:

<sup>01</sup> Screens are used to block the road users' view of activities that can be distracting. Screens might improve safety and motor vehicle traffic flow where volumes approach the roadway capacity because they discourage gawking and reduce headlight glare from oncoming motor vehicle traffic.

*Guidance:*

*02 Screens should not be mounted where they could adversely restrict road user visibility and sight distance and adversely affect the reasonably safe operation of vehicles.*

**Option:**

*03 Screens may be mounted on the top of temporary traffic barriers that separate two-way motor vehicle traffic.*

*03a Temporary traffic screen may be mounted on top of temporary traffic barriers, when barriers are used in transition and crossover areas for glare-control on high-volume roadways.*

**Guidance:**

*03b If used, temporary traffic screen panels should be contiguous without gaps, minimum 32 inch in height. ~~and orange or red-orange in color.~~*

*04 Design of screens should be in accordance with Chapter 9 of AASHTO's "Roadside Design Guide" (see Section 1A.11).*

### **Section 6F.101(CA) LOOSE GRAVEL Sign (W8-7)**

**Guidance:**

*01 The LOOSE GRAVEL (W8-7) sign should be used on chip seal jobs or other areas to warn motorists that there is loose gravel on the roadway.*

**Standard:**

*02 When used, the W8-7 sign shall be placed at the beginning of work and at maximum 2000 feet intervals.*

**Option:**

*03 When warning is intended to be directed primarily to motorcyclists, use of the W8-7 sign with motorcycle plaque (W8-15P) may be considered.*

*04 The Advisory Speed (W13-1) plaque may be used in combination with the W8-7 sign to indicate the need to decrease speed at a particular location. See Section 6C.01.*

**Guidance:**

*05 The advisory speed should be reasonable or prudent, considering weather, visibility, traffic, surface condition and width of the roadway.*

**Standard:**

*06 On State highways for chip seal ~~coat~~ projects, the W13-1 (35mph) plaque shall be used to supplement the W8-7 sign during placing and/or brooming of screenings.*

### **Section 6F.102(CA) NARROW LANE(S) Sign (C12(CA))**

**Option:**

*01 The NARROW LANE(S) (C12(CA)) sign may be used, when appropriate, to warn the approaching motorist of a narrow lane condition.*

**Guidance:**

*02 When used, the C12(CA) sign should be used in conjunction with an Advisory Speed (W13-1) plaque. See Section 6C.01. ~~2C.08.~~*

### **Section 6F.103(CA) OPEN TRENCH Sign (C27(CA))**

**Standard:**

**01 The OPEN TRENCH (C27(CA)) sign shall be used in advance of open trenches in/or adjacent to roadway.**

**02 The edge of the traveled way shall be defined by edge line delineation consisting of appropriate markers or striping. Edge line delineation shall be white when located on the right of traffic and yellow when located on the left of traffic.**

**Guidance:**

03 Trenches in excess of 0.15 feet in depth but not exceeding 0.25 feet in depth that are less than 8 feet from the edge of traveled way should be identified by LOW SHOULDER (W8-9) ~~portable signs on Type II barricades~~ set in the trench adjacent to the edge of pavement at intervals not to exceed 2,000 feet.

**Option:**

04 Portable delineators may be placed at intervals not to exceed 100 feet in lieu of edge line delineation.

**Standard:**

**05 Trenches in excess of 0.25 feet but less than 2.5 feet in depth that are less than 8 feet from the edge of traveled way shall be identified by alternating C27(CA) and NO SHOULDER (C31A(CA)) ~~portable signs on Type II or Type III barricades alternately~~ set in the trench at intervals not to exceed ~~every~~ 2,000 feet.**

**Guidance:**

06 Channelizers or ~~portable~~ delineators should be placed 2 feet to 6 feet outside of the edge line at 100 feet intervals ~~for above condition~~.

07 Trenches in excess of 0.25 feet in depth but not exceeding 2.5 feet in depth that are 8 feet to 15 feet from the edge of traveled way should be identified by C27(CA) ~~portable signs on Type II or Type III barricades~~ set in the trench at intervals not to exceed 2,000 feet. ~~Portable d~~Delineators should be placed at 200 feet intervals within 2 feet from the edge of the trench and at 100 feet intervals for edge conditions exceeding 0.5 feet in depth.

08 Trenches in excess of 0.5 feet in depth but not exceeding 2.5 feet in depth that are more than 15 feet from the edge of traveled way at locations where a recovery area was available prior to construction should be identified by placing ~~portable~~ delineators at 200 feet intervals within 2 feet from the edge of the trench and by placing C27(CA) signs in the trench at intervals not to exceed 2,000 feet.

**Standard:**

**09 Signing for trenches in excess of 2.5 feet in depth shall be based upon engineering judgment or studies (as noted in Section 1A.09) to ensure proper visibility of barricades and signing.**

**Section 6F.106(CA) Slow For The Cone Zone (SC19(CA) and SC20(CA)) Signs****Option:**

01 The Slow For The Cone Zone (SC19(CA)) and SLOW FOR THE CONE ZONE (SC20(CA)) signs (see Figures 6H-32(CA), 6H-33 & 6H-36(CA)) may be used to remind motorists to slow down when entering a temporary traffic control (TTC) zone to improve worker and road user safety.

**Guidance:**

02 If used, SC19(CA) and / or SC20(CA) signs may be used within the advance warning area, transition area, or activity area of a TTC zone. ~~the Slow For The Cone Zone (SC19(CA)) Sign should be located after the ROAD (STREET) WORK, XX FT, XX MILES, or AHEAD (W20-1) sign. If used, the SLOW FOR THE CONE ZONE (SC20(CA)) Sign should be located in the portion of the TTC zone where channelizing devices are being used.~~

### Notes for Figure 6H-5 6H-5(CA)—Typical Application 5 Shoulder Closure on a Freeway

#### Guidance:

1. *SHOULDER CLOSED* signs should be used on limited-access highways where there is no opportunity for disabled vehicles to pull off the roadway.
2. If drivers cannot see a pull-off area beyond the closed shoulder, information regarding the length of the shoulder closure should be provided in feet or miles, as appropriate.
3. The use of a temporary traffic barrier should be based on engineering judgment.

#### Standard:

4. Temporary traffic barriers, if used, shall comply with the provisions of Section 6F.85.

#### Option:

5. The barrier shown in this typical application is an example of one method that may be used to close a shoulder of a long-term project.
6. The warning lights shown on the barrier may be used.

#### Standard:

~~7. The minimum offset from the upstream end of the barrier to the edge of the traveled way shall be at least 15 feet unless shielded by a crash cushion.~~

7 & 8. 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. See Section 6F.85 for more details.

### Notes for Figure 6H-6—Typical Application 6 Shoulder Work with Minor Encroachment

#### Guidance:

1. All lanes should be a minimum of 10 feet in width as measured to the near face of the channelizing devices.
2. The treatment shown should be used on a minor road having low speeds. For higher speed traffic conditions, a lane closure should be used.

#### Option:

3. For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 9 feet may be used.

#### Support:

Note 3 is applied on a low-volume road as defined in Section 5A.01.

4. Where the opposite shoulder is suitable for carrying vehicular traffic and of adequate width, lanes may be shifted by use of closely-spaced channelizing devices, provided that the minimum lane width of 10 feet is maintained.
5. Additional advance warning may be appropriate, such as a ROAD NARROWS sign.
6. Temporary traffic barriers may be used along the work space.
7. The shadow vehicle may be omitted if taper and channelizing devices are used.
8. A truck-mounted attenuator may be used on the shadow vehicle.
9. For short-duration work, the taper and channelizing devices may be omitted if a shadow vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.

10. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

**Standard:**

**11. Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.**

**12. Shadow and work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights.**

**13. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

~~14. Note 3 shall not be applicable for State highways. Note #1 shall be used instead for State highways.~~

**Notes for Figure 6H-11—Typical Application 11  
Lane Closure on a Two-Lane Road with Low Traffic Volumes**

**Option:**

1. This TTC zone application may be used as an alternate to the TTC application shown in Figure 6H-10 [6H-10\(CA\)](#) (using flaggers) when the following conditions exist:

a. Vehicular traffic volume is such that sufficient gaps exist for vehicular traffic that must yield.

b. Road users from both directions are able to see approaching vehicular traffic through and beyond the worksite and have sufficient visibility of approaching vehicles.

2. The Type B flashing warning lights may be placed on the ROAD WORK AHEAD and the ONE LANE ROAD AHEAD signs whenever a night lane closure is necessary.

**Standard:**

**3. The approach to the side that is not closed shall be visible (for a distance equal to the safe passing sight distance for that approach) to the driver who must yield or stop.**

**Support:**

See Section 3B.02 and 6C.15.

~~4. This typical application is to be used on low volume roads as defined by section 5A.01.~~

**Notes for Figure 6H-15—Typical Application 15  
Work in the Center of a Road with Low Traffic Volumes**

**Guidance:**

*1. The lanes on either side of the center work space should have a minimum width of 10 feet as measured from the near edge of the channelizing devices to the edge of the pavement or the outside edge of the paved shoulder.*

**Option:**

2. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.

3. If the closure continues overnight, warning lights may be used on the channelizing devices.

4. A lane width of 9 feet may be used for short-term stationary work on low-volume, low-speed roadways when motor vehicle traffic does not include longer and wider heavy commercial vehicles.

5. A work vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights may be used instead of the channelizing devices forming the tapers or the high-level warning devices.

**Standard:**

~~Note 4 and 5 shall not be applicable for State highways. Note #1 shall be used instead for State highways.~~

**Option:**

6. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

**Standard:**

**7. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

**Guidance:**

8. All advance warning signs should be placed so that the path of travel for bicycles is not blocked while maintaining visibility for road users.

9. When existing accommodations for bicycle travel are disrupted or closed in a long-term duration project (see Section 6G.02) and the roadway width is inadequate for allowing bicyclists and motor vehicles to travel side by side, the Bicycle Crossing (W11-1) sign and the SHARE THE ROAD (W16-1P) plaque should be used to advise motorists of the presence of bicyclists in the travel way lanes.

10. When existing accommodations for bicycle travel are disrupted or closed in a long-term duration project (see Section 6G.02), the temporary white edge line should be used on the shoulder to indicate the use of a portion of the shoulder as a traveled way lane.

**Support:**

11. This typical application is to be used on low volume roads as defined by section 5A.01.

**Notes for Figure 6H-16—Typical Application 16  
Surveying Along the Center Line of a Road with Low Traffic Volumes**

**Guidance:**

1. The lanes on either side of the center work space should have a minimum width of 10 feet as measured from the near edge of the channelizing devices to the edge of the pavement or the outside edge of the paved shoulder.
2. Cones should be placed 6 to 12 inches on either side of the center line.
3. A flagger should be used to warn workers who cannot watch road users.

**Standard:**

**4. For surveying on the center line of a high-volume road, one lane shall be closed using the information illustrated in Figure 6H-10 6H-10(CA).**

**Option:**

5. A high-level warning device may be used to protect a surveying device, such as a target on a tripod.
6. Cones may be omitted for a cross-section survey.
7. ROAD WORK AHEAD signs may be used in place of the SURVEY CREW AHEAD signs.
8. Flags may be used to call attention to the advance warning signs.
9. If the work is along the shoulder, the flagger may be omitted.

10. For a survey along the edge of the road or along the shoulder, cones may be placed along the edge line.
11. A BE PREPARED TO STOP sign may be added to the sign series.

*Guidance:*

12. When used, the BE PREPARED TO STOP sign should be located before [after](#) the Flagger symbol sign.

**Support:**

13. This typical application is to be used on low volume roads as defined by section 5A.01.

### **Notes for Figure 6H-18—Typical Application 18 Lane Closure on a Minor Street**

**Standard:**

1. This TTC shall be used only for low-speed facilities having low traffic volumes.

*Option:*

2. Where the work space is short, where road users can see the roadway beyond, and where volume is low, vehicular traffic may be self-regulating.

**Standard:**

3. Where vehicular traffic cannot effectively self-regulate, one or two flaggers shall be used as illustrated in Figure 6H-10 [6H-10\(CA\)](#).

*Option:*

4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. A truck-mounted attenuator may be used on the work vehicle and the shadow vehicle.

**Support:**

6. This typical application is to be used on low volume roads as defined by section 5A.01.

### **Notes for Figure 6H-26—Typical Application 26 Closure in the Center of an Intersection**

*Guidance:*

1. All lanes should be a minimum of 10 feet in width as measured to the near face of the channelizing devices.

*Option:*

2. A high-level warning device may be placed in the work space, if there is sufficient room.
3. For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 9 feet may be used.

**Support:**

- Note 3 is applied on a low-volume road as defined in Section 5A.01.

**Standard:**

~~Note #3 is not applicable for State highways. Note #1 shall be used instead for State highways.~~

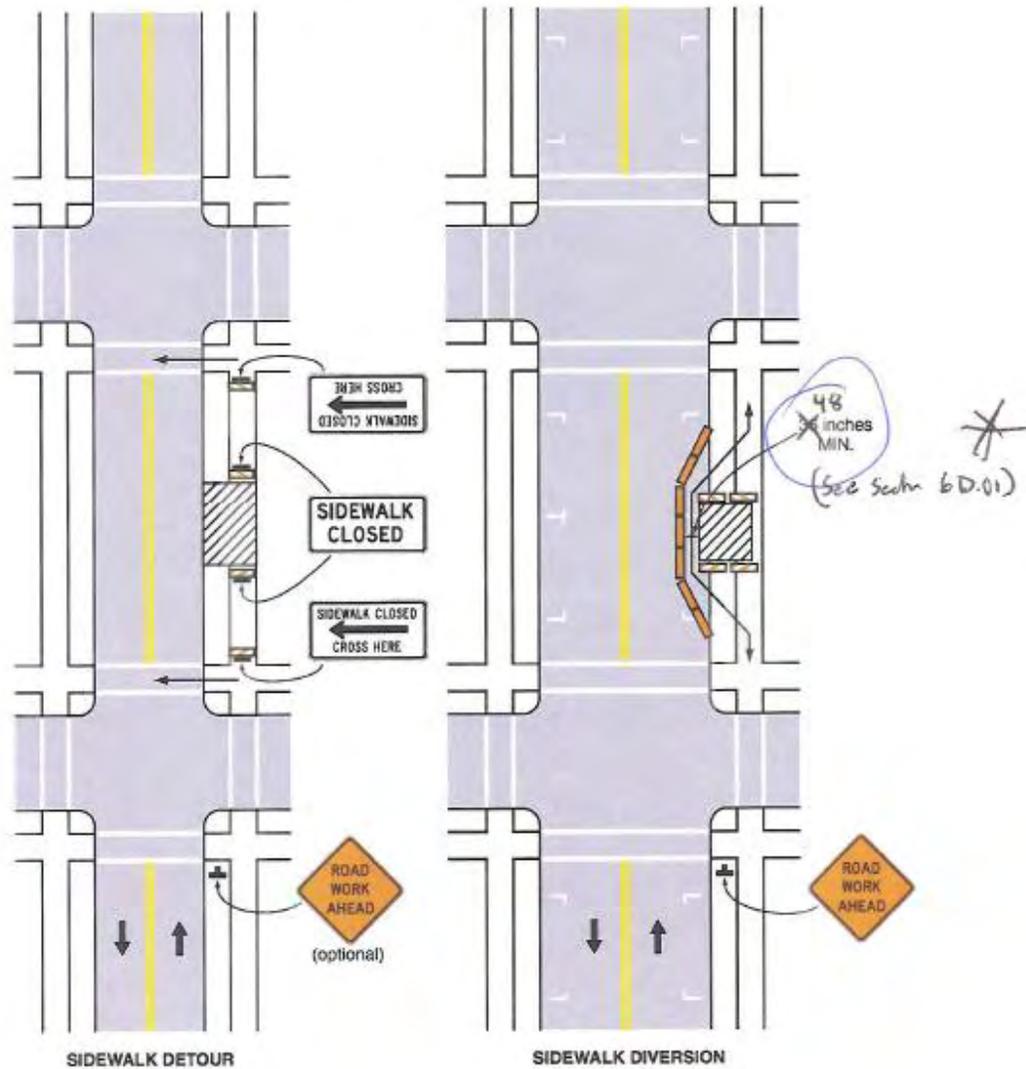
**Option:**

4. Flashing warning lights and/or flags may be used to call attention to advance warning signs.
5. Unless the streets are wide, it may be physically impossible to turn left, especially for large vehicles. Left turns may be prohibited as required by geometric conditions.
6. For short-duration work operations, the channelizing devices may be eliminated if a vehicle displaying high intensity rotating, flashing, oscillating, or strobe lights is positioned in the work space.
7. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

**Standard:**

**8. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

Figure 6H-28. Sidewalk Detour or Diversion (TA-28)



Typical Application 28

Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Notes for Figure 6H-101CA) – Typical Application 101(CA)  
Shoulder Closure on Urban (Low Speed) Locations to Accommodate Bicyclists

Guidance:

1. When existing accommodations for bicycle travel are disrupted or closed, information and devices contained in Figures 6H-101(CA) through 6H-104(CA), as appropriate per situation encountered, should be used to consider the needs and control of bicyclists through a TTC zone.
2. SHOULDER CLOSED signs should be used on limited-access roadways where there is no opportunity for disabled vehicles to pull off the roadway.
3. If drivers cannot see a pull-off area beyond the closed shoulder, information regarding the length of the shoulder closure should be provided in feet or miles, as appropriate.

4. The use of a temporary traffic barrier should be based on engineering judgment.

**Standard:**

**5. 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. See Section 6F.85 for more details.**

**Option:**

6. The barrier shown in this typical application is an example of one method that may be used to close a shoulder of a long-term project.
7. The warning lights shown on the barrier may be used.

**Standard:**

~~**8. The minimum offset from the upstream end of the barrier to the edge of the traveled way shall be at least 15 feet unless shielded by a crash cushion.**~~

**Guidance:**

9. This typical application should only be used in urban areas where posted speed is 25 mph or less. For applications on roadway with a posted speed of 30 mph or more use typical application TA-102(CA).
10. All advance warning signs should be placed so that the path of travel for bicycles is not blocked, while maintaining visibility for road users.
11. Where feasible, an adequate lane width should be provided to allow bicyclists and motor vehicles to travel side by side throughout the TTC zone. If lane width conditions are not met, use the SHARE THE ROAD or Bicycles May Use Full Lane sign.
12. The speeds used for the shoulder taper calculations should be of bicyclists in the project vicinity or if a special event such as a bike race, the expected speed of bicyclists approaching the TTC zone.

Notes for Figure 6H-102(CA) – Typical Application 102(CA)  
Lane Closure on Freeway, Expressway, Rural and Urban (High Speed) Locations to  
Accommodate Bicyclists

**Guidance:**

1. When existing accommodations for bicycle travel are disrupted or closed, information and devices contained in Figures 6H-101(CA) through 6H-104(CA), as appropriate per situation encountered, should be used to consider the needs and control of bicyclists through a TTC zone.
2. SHOULDER CLOSED signs should be used on limited-access highways where there is no opportunity for disabled vehicles to pull off the roadway.
3. If drivers cannot see a pull-off area beyond the closed shoulder, information regarding the length of the shoulder closure should be provided in feet or miles, as appropriate.
4. The use of a temporary traffic barrier should be based on engineering judgment.

**Standard:**

**5. 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. See Section 6F.85 for more details.**

## Option:

6. The barrier shown in this typical application is an example of one method that may be used to close a shoulder of a longterm project.
7. The warning lights shown on the barrier may be used.

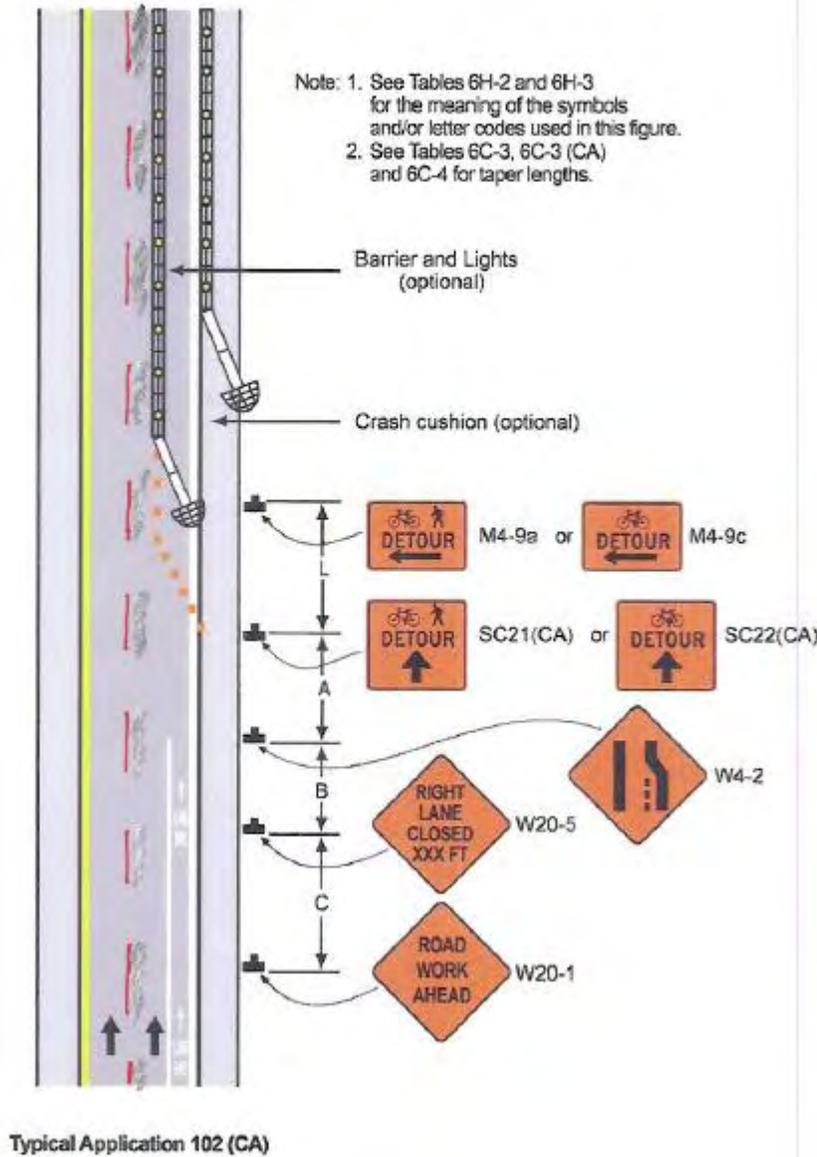
**Standard:**

~~8. The minimum offset from the upstream end of the barrier to the edge of the traveled way shall be at least 15 feet unless shielded by a crash cushion.~~

## Guidance:

- ~~89.~~ All advance warning signs should be placed so that the path of travel for bicycles is not blocked, while maintaining visibility for road users.
- ~~940.~~ The width of the existing pedestrian facility should be provided for the temporary facility, if practical. When it is not possible to maintain a minimum width of 60 inch throughout the entire length of the pedestrian pathway, a 60 x 60 inch passing space should be provided at least every 200 feet to allow individuals in wheelchairs to pass.

**Figure 6H-102 (CA). Lane Closure on Freeway, Expressway, Rural and Urban (High Speed) locations to accommodate bicyclists (TA-102 (CA))**



**Notes for Figure 6H-105(CA)—Typical Application 105(CA)  
 Lane Shift on Road with Low Traffic Volumes**

**Guidance:**

1. The lanes on either side of the center work space should have a minimum width of 10 feet as measured from the near edge of the channelizing devices to the edge of pavement or the outside edge of paved shoulder.
2. All advance warning signs should be placed so that the path of travel for bicycles is not blocked while maintaining visibility for road users.

**Standard:**

**3. Workers in the roadway shall wear high-visibility safety apparel as described in Section 6D.03.**

**Option:**

4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. If the closure continues overnight, warning lights may be used on the channelizing devices.
6. A lane width of 9 feet may be used for short-term stationary work on low-volume, low-speed roadways when motor vehicle traffic does not include longer and wider heavy commercial vehicles.
7. A work vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights may be used instead of the channelizing devices forming the tapers or the high-level warning devices.
8. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

**Standard:**

**9. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

~~**10. Notes 6 and 7 shall not be applicable for State highways. Note #1 shall be used instead for State highways**~~

**Support:**

- ~~10. This typical application is to be used on low volume roads as defined by section 5A.01.~~

**12-2a Proposal to amend Section 6F.60 in regards to the Delineation of Portable Changeable Message sign in Work Zones.****Recommendation:**

Caltrans request that the Committee make recommendation to adopt an amended policy on the use of channelizing devices to delineate a portable changeable message sign (PCMS) in work zones areas.

**Agency Making Request/Sponsor:** Caltrans

**Background:**

Current policy on using channelizing devices to delineate a PCMS is to delineate it with a taper consisting of 9 cones placed at a spacing of 25 feet apart. The taper is 200 feet long and it does not work well in an urban setting. Also CA MUTCD should not limit the channelizing device being used. In addition to cones other devices should be allowed.

The proposed policy uses a shoulder taper that is used else where in Part 6 of the CA MUTCD. The length of the taper is speed dependent. A figure is also proposed to be added to Part 6F to clarify the written policy.

**Proposal (additions are shown in red color):****Section 6F.60 Portable Changeable Message Signs**

*<sup>30</sup> Portable changeable message signs should be placed off the shoulder of the roadway and behind a traffic barrier, if practical. Where a traffic barrier is not available to shield the portable changeable message sign, it should be placed off the shoulder and outside of the clear zone. If a portable changeable message sign has to be placed on the shoulder of the roadway or within the clear zone, it should be delineated with retroreflective TTC devices. When used, advanced warning delineation is not needed if the portable changeable message sign is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway (see Section 6C.04). If the portable changeable message sign is placed on shoulder or partially blocking the shoulder (including overhangs), the shoulder should be closed off by a taper of channelizing devices with a length of  $1/3 L$  using the formulas in Tables 6C-3, 6C-3(CA) and 6C-4 (see Section 6C.08). See Figure 6F-104(CA) for typical layout using channelizing devices to delineate a portable changeable message sign on shoulder.*

**Option:**

*<sup>30a</sup> For incident management before additional resources are available or for short duration use (see Section 6G.02) or when portable changeable message sign is placed well beyond the shoulder but partially within 15 feet from the edge of any roadway it may be delineated with a minimum of a 30 feet taper formed by three traffic cones.*

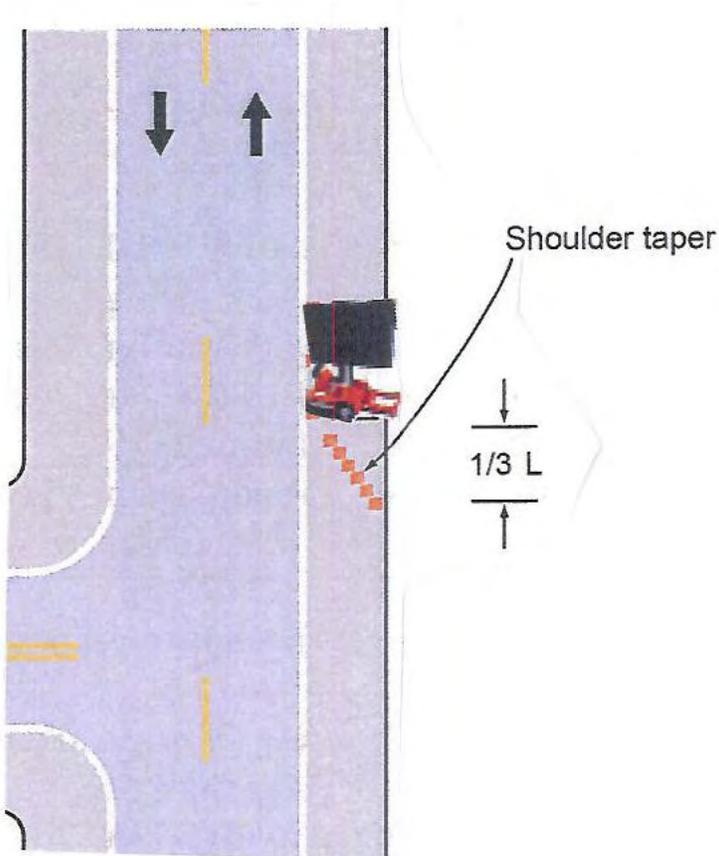
*<sup>31</sup> When portable changeable message signs are used in TTC zones, they should display only TTC messages.*

*<sup>32</sup> When portable changeable message signs are not being used to display TTC messages, they should be relocated such that they are outside of the clear zone or shielded behind a traffic barrier and turned away from traffic. If relocation or shielding is not practical, they should be delineated with retroreflective TTC devices. If the portable changeable message sign is stored within a shoulder or partially blocking a shoulder, the shoulder should be closed according to Section 6G.07. If the portable changeable message sign is stored well beyond the shoulder but within the clear zone, it should be delineated by a taper of channelizing devices with a length of  $1/3 L$  using the formulas in Tables 6C-3, 6C-3(CA) and 6C-4 (see Section 6C.08). Clear zone is defined by AASHTO's "Roadside Design Guide" (see Section 1A.11). See Figure 6F-104(CA) for typical layout using channelizing devices to delineate a portable changeable message sign on shoulder.*

*<sup>33</sup> Portable changeable message sign trailers should be delineated on a permanent basis by affixing retroreflective material, known as conspicuity material, in a continuous line on the face of the trailer as*

*seen by oncoming road users. If the sign trailer is located within 15 feet of the edge of the traveled way, it should be delineated with a taper consisting of 9 cones placed at a spacing of 25 feet apart.*

**Figure 6F-104(CA) Typical Layout Using Channelizing Devices to Delineate a Portable Changeable Message Sign on Shoulder.**



**12-3 Proposal to amend Sections 6H.01 and 6A.01 Typical Applications****Recommendation:**

That the CTCDC make recommendations to adopt revisions to text in Part 6 for incorporation into the California MUTCD 2012 as summarized and detailed below.

**Requesting Agency:**

Los Angeles County Department of Public Works (Bill Winter)

**Sponsor:**

Mike Robinson-CTCDC members, CSAC

**Summary:**

Los Angeles County Department of Public Works requests that the use of arrow boards for lane closures be made optional under discretion of local agency.

**Proposal:****Section 6H.01 Typical Applications**

Option:

<sup>04</sup> Other devices may be added to supplement the devices and device spacing may be adjusted to provide additional reaction time or delineation. Fewer devices may be used based on field conditions. **The Engineer or the Engineer's designee of the public agency or authority having jurisdiction over the highway may determine when arrow boards for temporary lane closures are required or optional based on duration and scope of work.**

**Background**

The proposed revision was submitted to Caltrans prior to the 2012 California MUTCD publication as a comment on the 2011 draft. The proposal was not addressed in the 2012 publication. The proposal was also not addressed by Caltrans' proposal to CTCDC on February 16, 2012 in follow up to other comments not addressed by the 2012 publication.

**Discussion**

Various Typical Applications (such as TA-21, TA-22, TA-23, TA-24, TA-25... TA-104(CA)) show the use of arrow boards for lane closures. Though the use of arrow boards is supported as a "should" condition in the Guidance statement in Section 6F-61, this agency is concerned about the cost associated with this requirement. The average cost of arrow boards is \$6,000. This agency performs maintenance work for numerous locations a day with many requiring the temporary closure of one lane. The requirement to use arrow boards for every instance of lane closure regardless of duration and scope of work is very costly and unnecessary. We propose that the use of arrow boards for lane closure be made optional under the discretion of the local agency.

Recommendation

That the CTCDC make recommendations to adopt revisions to Section 6A.01 text in Part 6 for incorporation into the California MUTCD as summarized and detailed below.

Summary

San Francisco MTA requests that Engineer or designee does not need to approve 6H typical applications as formally submitted plans; only that the use of 6H typical applications need to be approved by Engineer or designee.

Proposal

Section 6A.01 Typical Applications

Standard:

<sup>18</sup>Before work begins, traffic control plans, when developed for handling traffic through a construction or maintenance project, shall be approved by the Engineer or **the Engineer's designee** of the public agency or authority having jurisdiction over the highway.

**Option:**

**When typical applications from Chapter 6H are to be used the Engineer or the Engineer's designee of the public agency or authority having jurisdiction over the highway shall approve their use before the work begins to ensure the appropriate plans are used.**

Background

The proposed revision was raised by SFMTA prior to the California MUTCD 2012 publication as a comment on the 2011 draft. The proposal was not addressed in the 2012 publication. The proposal was addressed by Caltrans' proposal to CTCDC on February 16, 2012; however, Caltrans requested Los Angeles County Department of Public Works revise the wording of the proposal.

Discussion

SFMTA Comments on 2011 CA MUTCD draft:

There should be a statement exempting approval of standard traffic control plans provided in Section 6H. As written, this requires approval of all traffic control plans, even when using standard traffic control plans from Section 6H. This seems unnecessary. If Caltrans or a local agency grants permission to a private party (contractor) to close a lane and the contractor is directed to use a standard application from Section 6H, why would Caltrans or the local agency need to formally approve a standard traffic control plan?

Suggested policy – Local and State agencies are not required or directed to approve the MUTCD or CA-MUTCD standard traffic control plans. When the work is to use MUTCD and CA-MUTCD standard traffic control plans, local and State agencies shall approve their use for the work to ensure the appropriate plan is used.

Please insert this sentence:

Use of MUTCD or CA-MUTCD standard traffic control plans shall be approved by the Engineer of the public agency or authority having jurisdiction over the highway.

**12-4a Proposal to amend Section 6F.65 Tubular Markers of CA MUTCD 2012**

**CITY OF LOS ANGELES**  
CALIFORNIA

Jaime de la Vega  
GENERAL MANAGER



DEPARTMENT OF TRANSPORTATION  
100 South Main Street, 10th Floor  
Los Angeles, California 90012  
(213) 972-8470  
FAX (213) 972-8410

**ANTONIO R. VILLARAIGOSA**  
MAYOR

April 24, 2012

Mr. Devinder Singh  
Executive Secretary, CTCDC  
Caltrans  
P.O. Box 942874  
Sacramento, California 94274-0001

Dear Mr. Singh:

Enclosed is a proposal to revise text in Section 6F.65 regarding Tubular Markers. The text revisions would also require changes in Figures 6F-7 and 6F-102(CA).

Please note that the proposed revisions do not establish any new policy, but rather serve to clarify the types of tubular markers as either channelizers or portable delineators. This matter has been reviewed by Caltrans headquarter staff (Roberta McLaughlin) and was given tentative approval.

I request that this item be scheduled for the May 24, 2012 meeting of the CTCDC.

Sincerely,

A handwritten signature in blue ink that reads "John E. Fisher".

John E. Fisher, P.E. PTOE

JEF:jsl

Enclosure

Devinder Singh – Tubular Markers Revise Text (2012-4-24)

### Recommendation

That the CTCDC adopt revisions to the text in Section 6F, 65 and to Figures 6F-7 and 6F-102(CA).

### Requesting Agency

City of Los Angeles Department of Transportation (John E. Fisher).

### Sponsor

John E. Fisher, CTCDC Chairman, representing the League of California Cities, Southern Counties.

### Background

Section 6F.65, "Tubular Markers" lacks clarity. The proposed text and figure revisions are intended to clarify when a tubular marker serves as a channelizer versus a portable delineator.

### **Proposal:**

#### **Section 6F.65 Tubular Markers**

##### **Standard:**

**01 Tubular markers (~~see Figure 6F-7~~ 6F-102(CA)) shall be predominantly orange and shall be not less than 18 inches high and 2 inches wide facing road users. They shall be made of a material that can be struck without causing damage to the impacting vehicle.**

**02 Tubular markers shall be a minimum of 28 inches in height when they are used on freeways and other high-speed highways, on all highways during nighttime, or whenever more conspicuous guidance is needed.**

**02a Tubular markers shall be known as portable delineators for applications where the tubular marker is readily moveable and shall be known as channelizers for applications where the tubular marker is implanted into the ground or affixed to the pavement. See Figure 6F 102(CA).**

**02b Portable delineators shall be a minimum of 36 inches in height. The posts shall have a minimum of 3 inches in width or diameter. They shall have minimum of two white reflective bands, a minimum of 1.5 inches apart. The lower band shall be 30 to 36 inches above the roadway surface.**

**02c Channelizers shall be a minimum of 36 inches in height for speeds of 45 mph or greater and 28 inches in height for speeds of 40 mph or less. The width of lower portion of the post shall be 2.2 inches minimum with the flattened top portion of the post having a minimum width of 3.5 inches. They shall have white reflectorized sheeting, 3 inches by 12 inches minimum applied to flattened top portion of the post. The reflective sheeting shall face oncoming vehicular traffic.**

**03 For nighttime use, tubular markers shall be retroreflectorized. Retroreflectorization of tubular markers portable delineators that have a height of less than 42 inches shall be provided by two 3-inch wide white bands placed a maximum of 2 inches from the top with a maximum of 6 inches between the bands. Retroreflectorization of tubular markers that have a height of 42 inches or more shall be provided by four 4- to 6-inch wide alternating orange and white stripes with the top stripe being orange.**

##### **Support:**

**03a The 42 inch high tubular markers provide additional conspicuity in visually complex environments and for older road users.**

**03b Cylindrical tubular markers that are fixed (cemented) to the pavement are commonly referred to as tubular markers. Non-cylindrical tubular markers are commonly referred to as**

channelizers (CA). Tubular markers that are not fixed to the pavement but stabilized by using weighted bases are commonly referred to as portable delineators.

**Standard:**

~~03c The design of a portable delineator shall be as shown in Figure 6F-102(CA).  
03d Portable delineators shall be a minimum of 36 inches in height. The vertical portion of portable delineators shall be fluorescent orange or predominantly orange. The posts shall be not less than 3 inches in width or diameter. A minimum of 2 white retroreflective bands, each not less than 3 inches wide, shall be mounted at a minimum of 1-1/2 inches apart. The lower retroreflective band shall be from 2.5 to 3 feet above the roadway surface.~~

**Guidance:**

04 Tubular markers have less visible area than other devices and should be used only where space restrictions do not allow for the use of other more visible devices, such as cones or drums.

~~05 Tubular markers should be stabilized by affixing them to the pavement, by using weighted bases, or weights such as sandbag rings that can be dropped over the tubular markers and onto the base to provide added stability. Ballast should be kept to the minimum amount needed.~~

**Option:**

06 Tubular markers may be used effectively to divide opposing lanes of road users, divide vehicular traffic lanes when two or more lanes of moving vehicular traffic are kept open in the same direction, and to delineate the edge of a pavement drop off where space limitations do not allow the use of larger devices.

**Standard:**

~~07 A tubular marker shall be attached to the pavement to display the minimum 2-inch width to the approaching road users.~~

08 When a non-cylindrical tubular marker or a channelizer (CA) is used, it shall be attached to the pavement in a manner such that the retroreflectorized bands facing road users meet the minimum visibility requirements.

~~09 The design of a channelizer (CA) shall be as shown in Figure 6F-102(CA). The height shall be 36 inch minimum where speeds are above 40 mph. The height shall be 28 inch minimum where speeds are 40 mph or less. The width of the post shall be 2 ¼ inch minimum and the color predominantly orange. channelizers (CA) shall be affixed with retroreflective white sheeting, 3 by 12 inches in size.~~

**Support:**

~~10 One kind of non-cylindrical tubular marker is called a "channelizer (CA)", see Figure 6F-102(CA). This channelizer (CA) is not to be confused with the term "channelizing device(s)" in Section 6F.63.~~

11 Channelizers (CA) are implanted in the ground or affixed to the pavement, and are not susceptible to displacement, and are capable of normally withstanding numerous vehicular impacts.

12 Channelizers (CA) are generally used in series to create a visual fence/barrier, to provide additional guidance and/or restriction to traffic.

**Option:**

13 Channelizers (CA) may be used in lieu of cones, portable delineators, or drums, to channelize traffic or divide opposing lanes of traffic.

**Standard:**

<sup>14</sup> On State highways, the retroreflectorized bands for ~~tubular markers~~, portable delineators, and channelizers (CA) shall be visible at 1000 feet during night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20.

Guidance:

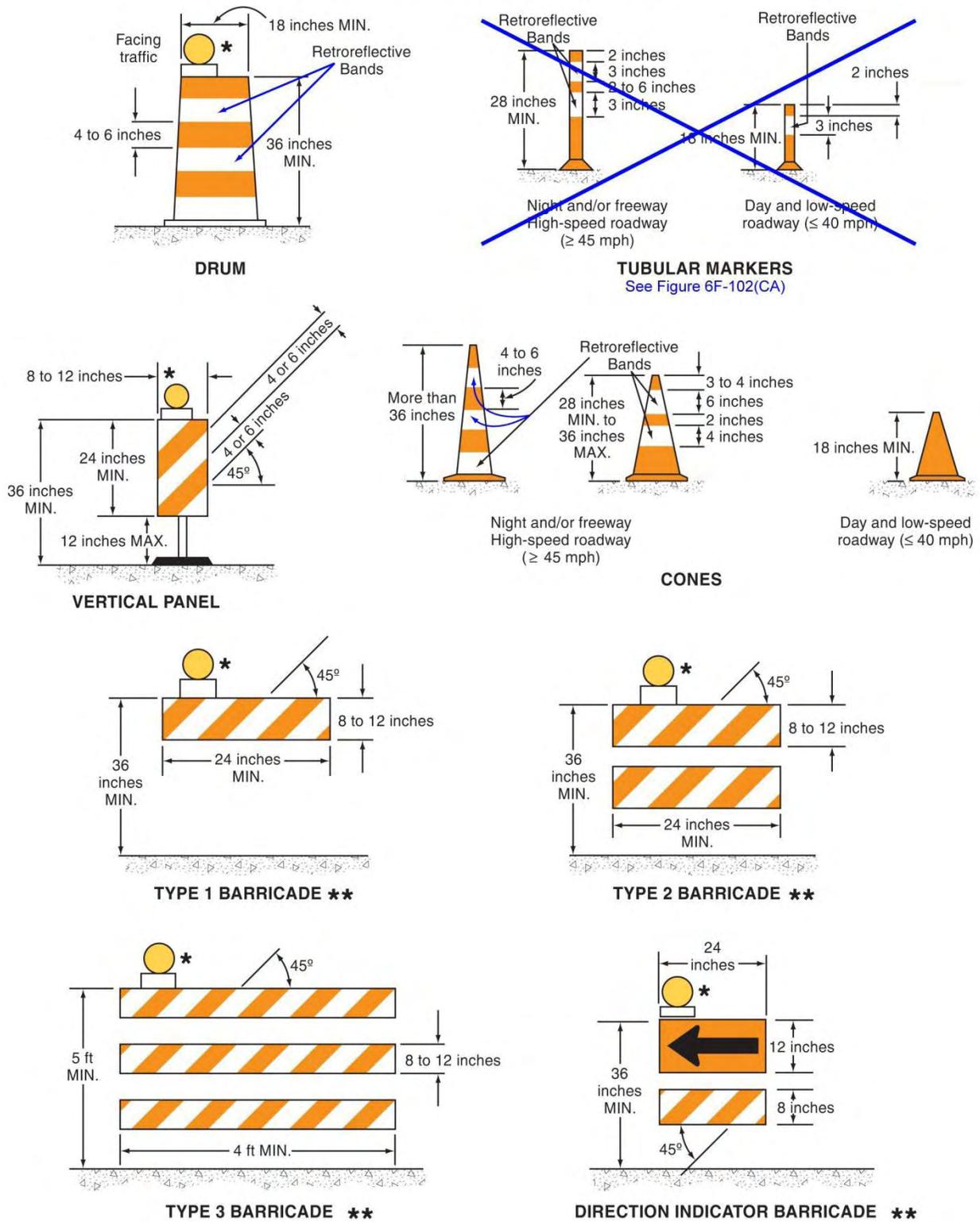
<sup>15</sup> On local roads, the retroreflectorized bands for tubular markers, portable delineators, and channelizers (CA) should be visible at 1000 feet at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20.

Support:

<sup>16</sup> Refer to Department of Transportation's Standard Specifications Section 12-3.01A(4) for visibility criteria cited. See Section 1A.11 for information regarding this publication.

<sup>17</sup> Refer Chapter 3H for other details and requirements of channelizers (CA).

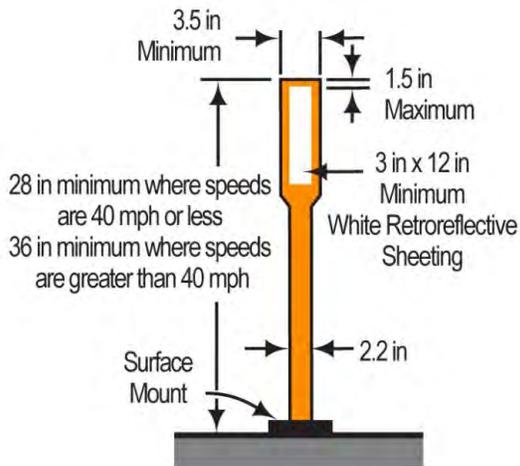
**Figure 6F-7. Channelizing Devices**



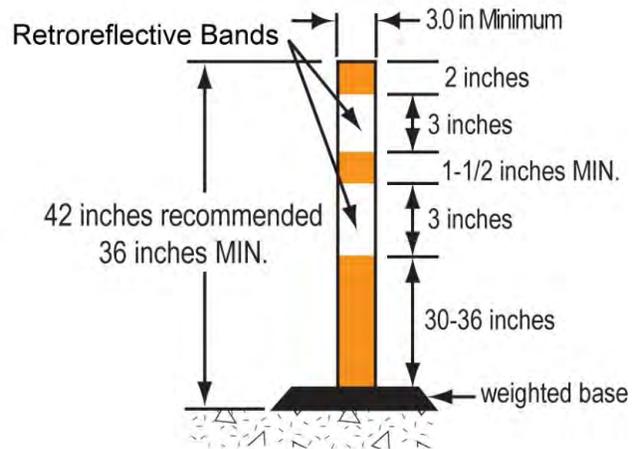
\* Warning lights (optional)

\*\* Rail stripe widths shall be 6 inches, except that 4-inch wide stripes may be used if rail lengths are less than 36 inches. The sides of barricades facing traffic shall have retroreflective rail faces.

**Figure 6F-102 (CA). Channelizer (CA) and Portable Delineator**



**Channelizer (CA)**  
(Tubular marker with flattened top and affixed to pavement)



**Portable Delineator**  
(Tubular marker with weighted base)

## 12-5 Policy changes, updates, and addition of Typical Applications (TAs) to Chapter 6H of CA MUTCD 2012 and UNEVEV PAVEMENT Sign

**Recommendation:** Caltrans recommends that the Committee adopt changes to Chapter 6H of the CA MUTCD 2012 as shown under the proposal.

**Agency Making Request/Sponsor:** Caltrans

### Background:

Both Figure 6H-4 and 6H-5 are for shoulder closures. By allowing both Federal and California signs to be used on those TAs, agencies and contractors can reduce the number of different kinds of signs they keep in stock. Also the California figures can be eliminated to keep the manual cleaner, lesser pages, and more agreeable to MUTCD policies.

Figure 6H-6 only shows work area on a two lane slow speed road. Figure 6H-6A(CA) needs to be added to show layout for high speed high volume highways.

In Figure 6H-26 the work area creates a traffic island like a mini round about. Making left turn movements from any approach difficult and confusing. "No left turn" signs should be added as optional to all directions of traffic.

Figure 6H-27 does not show where Flaggers should be stationed at. Flaggers should be added to this figure as they appear on Figure 6H-13

TA-37 and Figure 6H-37 is new to 2012 CA MUTCD. The past version of CA MUTCD has simply deleted the Federal figure and directed practitioner to sheet T10 of the Caltrans Standard Plans. When Caltrans included Figure 6H-37 in the new manual not every standards was included in the figure and notes. Updating it is needed so the TA is agreeable with Caltrans standards.

### Proposal (amendments are shown in red color):

#### Notes for Figure ~~6H-4~~ ~~6H-4(CA)~~ —Typical Application 4 Short Duration or Mobile Operation on a Shoulder

##### Guidance:

1. In those situations where multiple work locations within a limited distance make it practical to place stationary signs, the distance between the advance warning sign and the work should not exceed 5 miles.
2. In those situations where the distance between the advance signs and the work is 2 miles to 5 miles, a Supplemental Distance plaque should be used with the **ROAD WORK AHEAD** sign or **SHOULDER WORK AHEAD (C24(CA))** sign. ~~SHOULDER WORK (W21-5) sign.~~

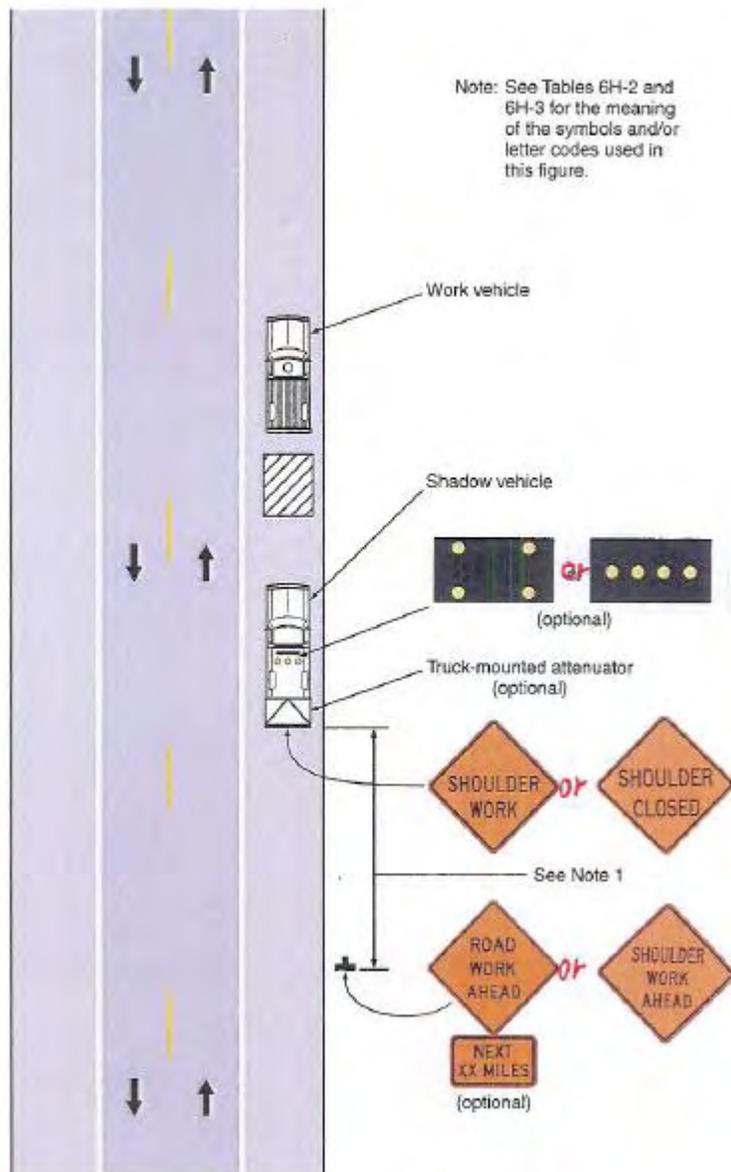
##### Option:

3. The **ROAD WORK NEXT XX MILES** sign may be used instead of the **ROAD WORK AHEAD** sign or **SHOULDER WORK AHEAD** sign ~~Next Distance (W7-3a) plaque may be used with the SHOULDER WORK (W21-5) sign~~ if the work locations occur over a distance of more than 2 miles.
4. Stationary warning signs may be omitted for short duration or mobile operations if the work vehicle displays high-intensity rotating, flashing, oscillating, or strobe lights.
5. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

##### Standard:

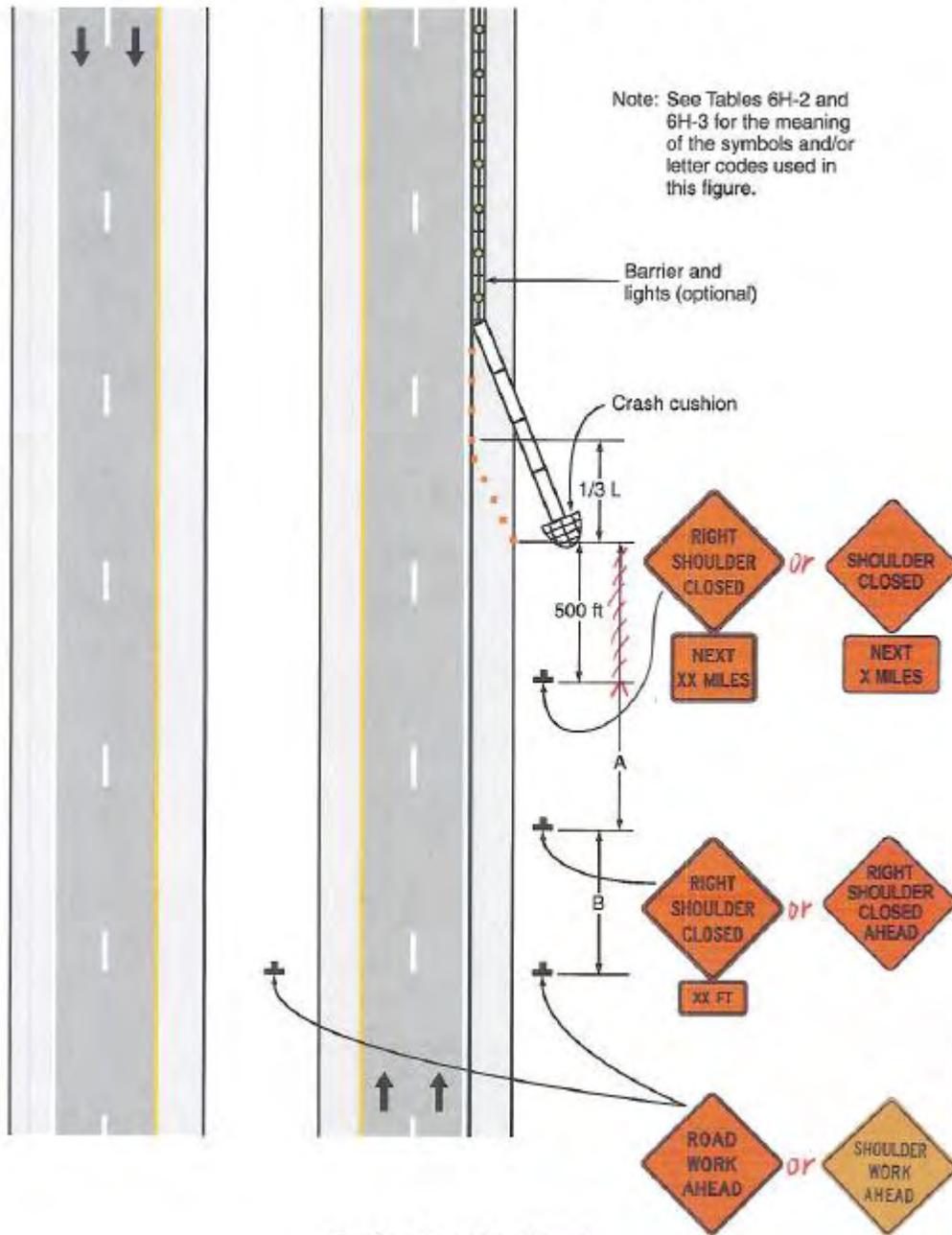
- 6. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.
- 7. If an arrow board is used for an operation on the shoulder, the caution mode shall be used.
- 8. Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.

Figure 6H-4. Short-Duration or Mobile Operation on a Shoulder (TA-4)



Typical Application 4

Figure 6H-5. Shoulder Closure on a Freeway (TA-5)



Typical Application 5

### Notes for Figure 6H-6—Typical Application 6 Shoulder Work with Minor Encroachment

**Guidance:**

1. All lanes should be a minimum of 10 feet in width as measured to the near face of the channelizing devices.
2. The treatment shown should be used on a minor road having low speeds. For higher-speed traffic conditions, a lane closure should be used.

**Option:**

3. For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 9 feet may be used.

**Support:**

**Note 3 is applied on a low-volume road as defined in Section 5A.01.**

4. Where the opposite shoulder is suitable for carrying vehicular traffic and of adequate width, lanes may be shifted by use of closely-spaced channelizing devices, provided that the minimum lane width of 10 feet is maintained.
5. Additional advance warning may be appropriate, such as a ROAD NARROWS sign.
6. Temporary traffic barriers may be used along the work space.
7. The shadow vehicle may be omitted if a taper and channelizing devices are used.
8. A truck-mounted attenuator may be used on the shadow vehicle.
9. For short-duration work, the taper and channelizing devices may be omitted if a shadow vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.
10. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

**Standard:**

11. **Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.**
12. **Shadow and work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights.**
13. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

~~14. Note 3 shall not be applicable for State highways. Note #1 shall be used instead for State highways.~~

**Guidance:**

- ~~14. All advance warning signs should be placed so that the path of travel for bicycles is not blocked, while maintaining visibility for road users.~~
- ~~15. When existing accommodations for bicycle travel are disrupted or closed in a long-term duration project (see Section 6G.02) and the roadway width is inadequate for allowing bicyclists and motor vehicles to travel side by side, the Bicycle Crossing (W11-1) sign and the SHARE THE ROAD (W16-1P) plaque should be used to advise motorists of the presence of bicyclists in the travel way lanes.~~
- ~~16. Except for short durations and mobile operations, when a highway shoulder is occupied and bicyclists would be sharing a lane with vehicular traffic, as a result of the TTC zone, speed reduction countermeasures should be used to reduce traffic speeds in the TTC zone. Refer to Sections 6C.01 and 6D.03.~~

*17. Except for short durations and mobile operations, when a highway shoulder is occupied and bicyclists would be sharing a lane with vehicular traffic, as a result of the TTC zone, before narrowing the outside lane other measures such as widening the outside shoulder to allow bicyclists and motor vehicles to travel side by side through the TTC zone should be considered.*

*18. If traffic volumes make it feasible, the two left lanes should be merged into one lane to avoid using the shoulder as a traveled way lane and allowing continued use for emergency purposes and bicycle travel.*

*19. When existing accommodations for bicycle travel are disrupted or closed in a long-term duration project (see Section 6G.02) and the roadway width is inadequate for allowing bicyclists and motor vehicles to travel side by side, a separate path should be considered for bicyclists.*

Figure 6H-6. Shoulder Work with Minor Encroachment (TA-6)

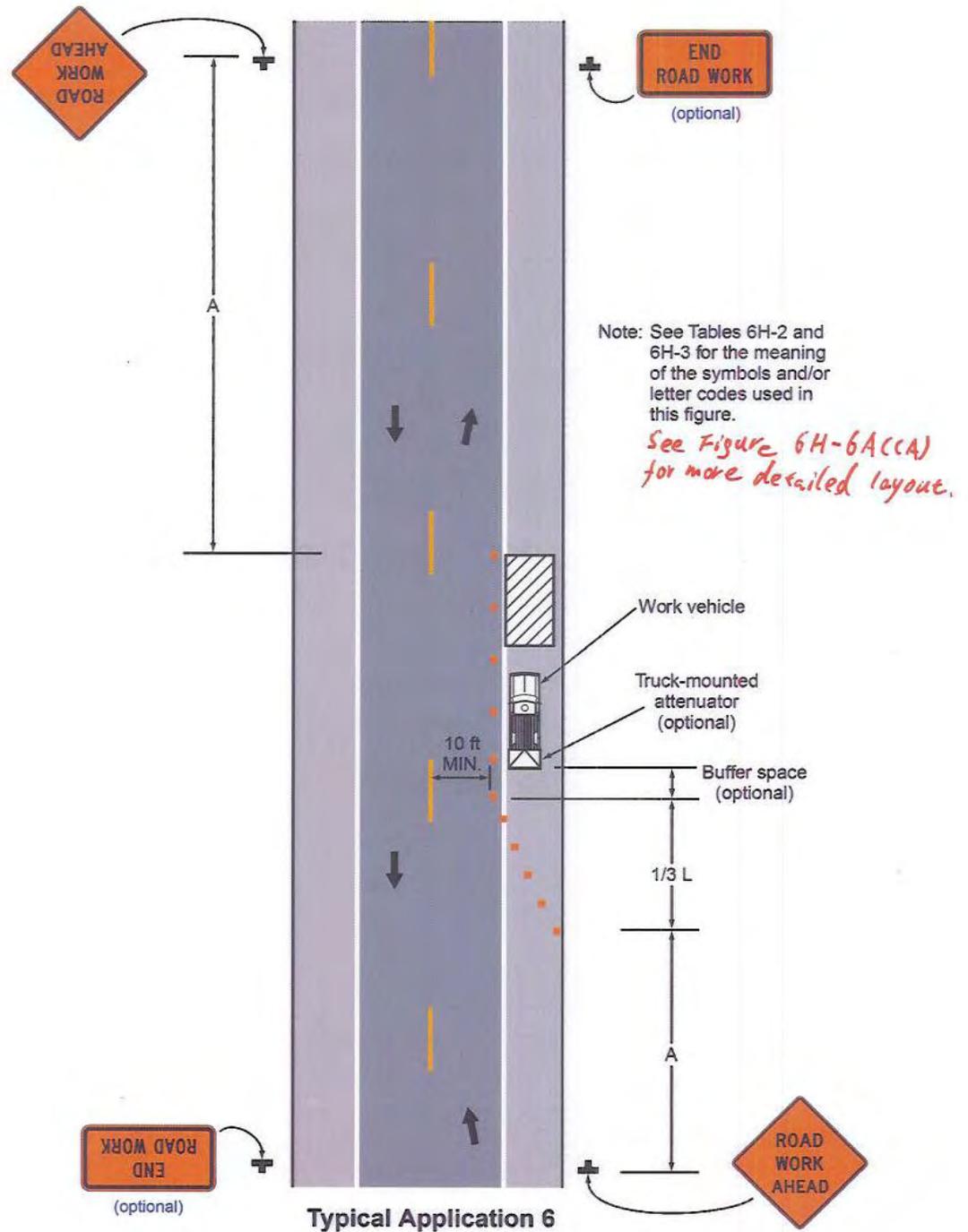
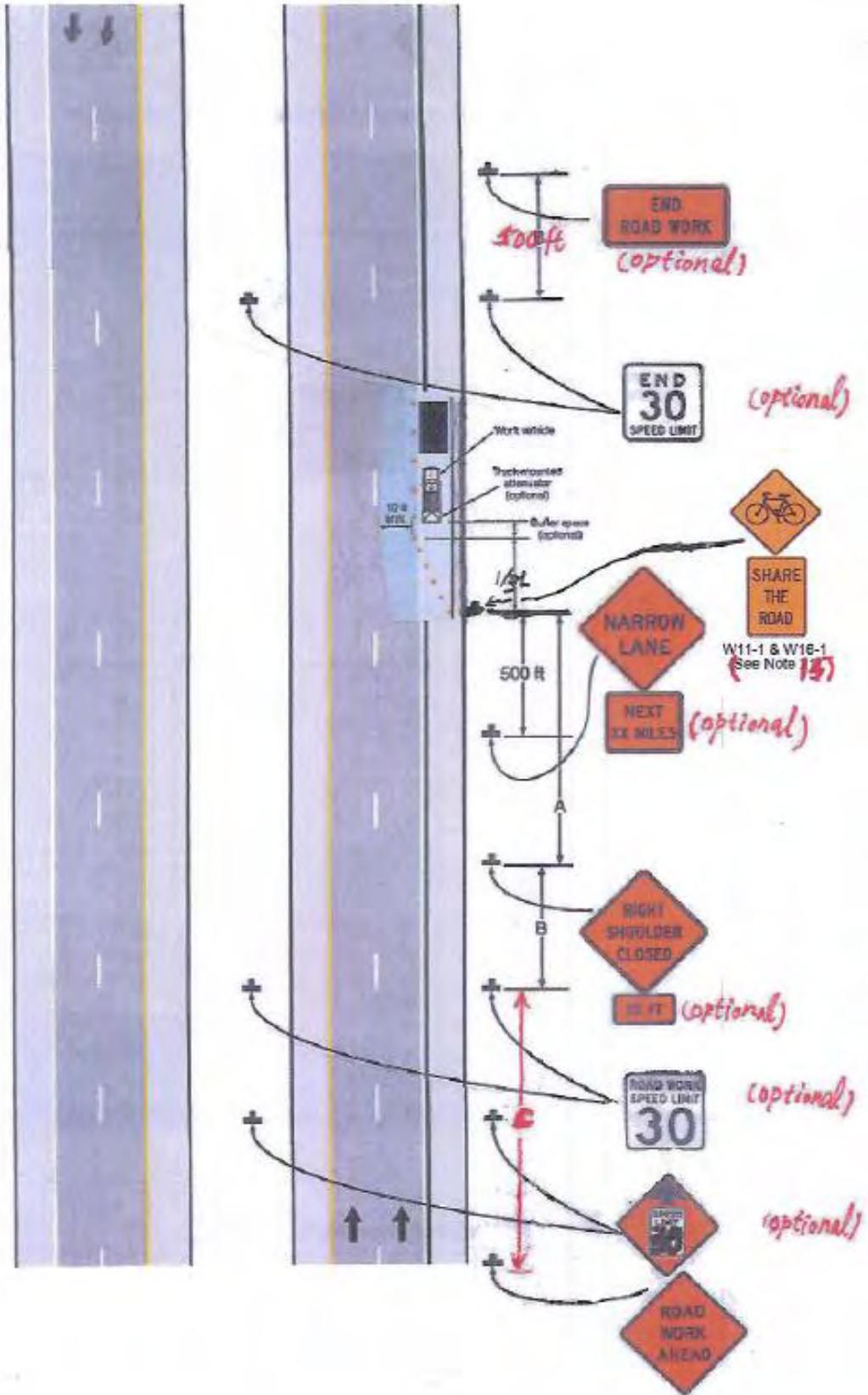


Figure 6H-6A(CA). Shoulder Work with Minor Encroachment (TA-6A(CA))



### Notes for Figure 6H-26—Typical Application 26 Closure in the Center of an Intersection

**Guidance:**

1. All lanes should be a minimum of 10 feet in width as measured to the near face of the channelizing devices.

**Option:**

2. A high-level warning device may be placed in the work space, if there is sufficient room.
3. For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 9 feet may be used.

**Support:**

- Note 3 is applied on a low-volume road as defined in Section 5A.01.

**Standard:**

~~Note #3 is not applicable for State highways. Note #1 shall be used instead for State highways.~~

**Option:**

4. Flashing warning lights and/or flags may be used to call attention to advance warning signs.
5. Unless the streets are wide, it may be physically impossible to turn left, especially for large vehicles. Left turns may be prohibited as required by geometric conditions. **If used optional No Left Turn signs may be placed on left side of approaching traffic. If space is limited they may be placed on right side of approaching traffic.**
6. For short-duration work operations, the channelizing devices may be eliminated if a vehicle displaying highintensity rotating, flashing, oscillating, or strobe lights is positioned in the work space.
7. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

**Standard:**

8. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**

Figure 6H-26. Closure in the Center of an Intersection (TA-26)

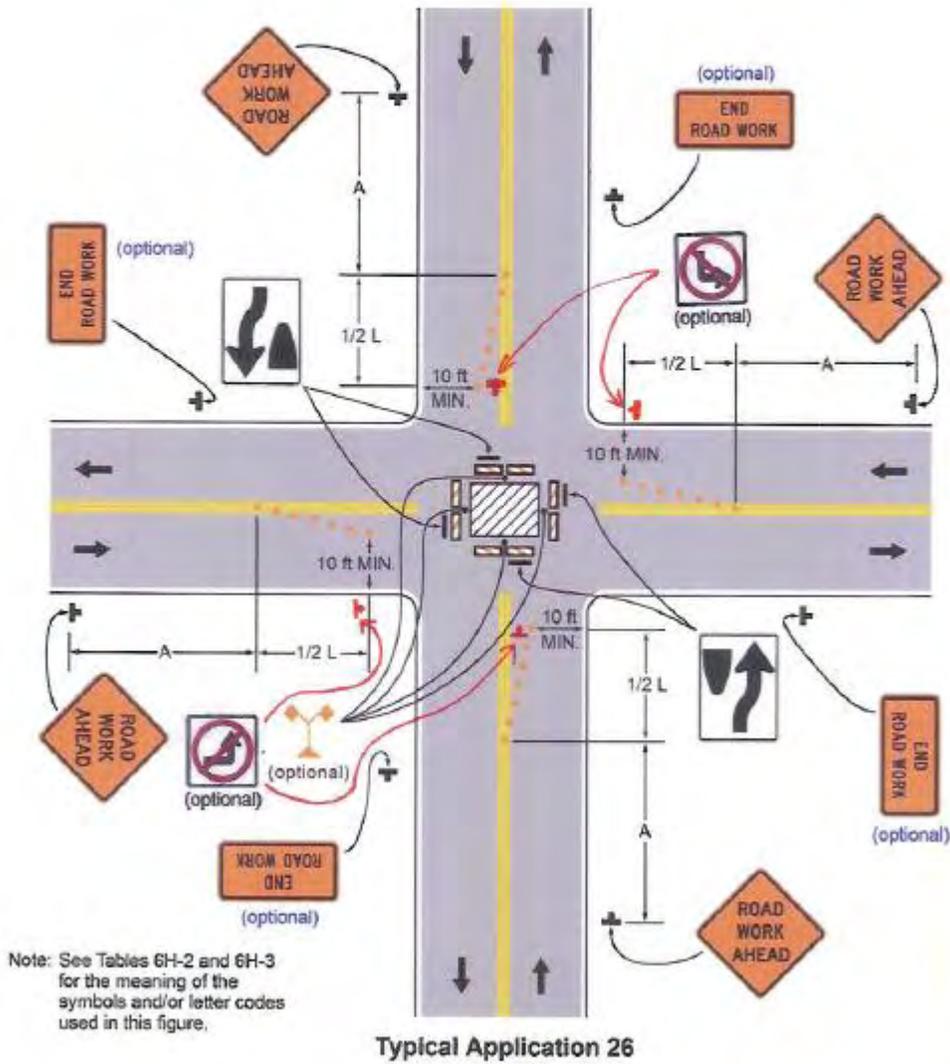
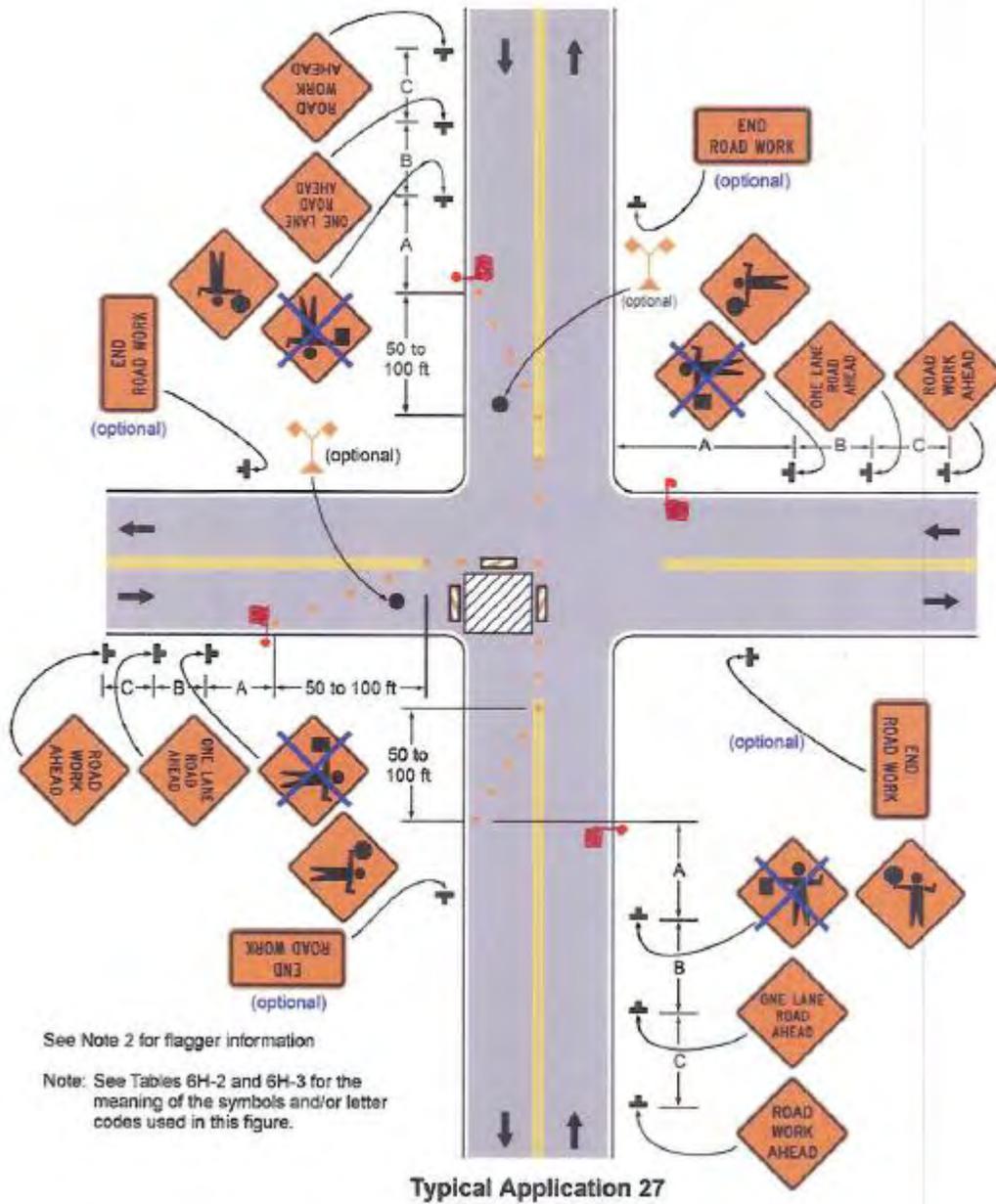


Figure 6H-27. Closure at the Side of an Intersection (TA-27)



### Notes for Figure 6H-37—Typical Application 37 Double Lane Closure on a Freeway

**Standard:**

1. An arrow board shall be used when a freeway lane is closed. When more than one freeway lane is closed, a separate arrow board shall be used for each closed lane.

*Guidance:*

2. Ordinarily, the preferred position for the second arrow board is in the closed exterior lane at the upstream end of the second merging taper. However, the second arrow board should be placed in the closed interior lane at the downstream end of the second merging taper in the following situations:

- a. When a shadow vehicle is used in the interior closed lane, and the second arrow board is mounted on the shadow vehicle;
- b. If alignment or other conditions create any confusion as to which lane is closed by the second arrow board; and
- c. When the first arrow board is placed in the closed exterior lane at the downstream end of the first merging taper (the alternative position when the shoulder is narrow).

**Standard:**

3. All advanced warning signs mounted on portable support shall be equipped with at least two flags or a flashing warning beacon. Each flag shall be at least 16"X16" in size and shall be orange or red in color. Flashing warning beacons (Section 6F.83) shall be used to call attention to the initial warning signs during hours of darkness. Flashing warning beacons is optional during daytime operations.

**Option:**

~~3. Flashing warning lights and/or flags may be used to call attention to the initial warning signs.~~

4. A truck-mounted attenuator may be used on the shadow vehicle.
5. If a paved shoulder having a minimum width of 10 feet and sufficient strength is available, the left and adjacent interior lanes may be closed and vehicular traffic carried around the work space on the right-hand lane and a right-hand shoulder.

*Guidance:*

6. When a shoulder lane is used that cannot adequately accommodate trucks, trucks should be directed to use the normal travel lanes.

**Standard:**

7. 3 cones or 2 Type II barricades shall be placed transversely across each closed lane at end of each merging taper and every 2000 feet throughout the lane closure.

8. On freeways, maximum spacing of channelizing devices shall be 50 feet in advance warning and transition areas, 100 feet in activity and termination areas (see figure 6C-1).

*Guidance:*

9. LANE CLOSED C30(CA) sign ~~should~~ shall be placed every 2000 feet throughout the lane closure adjacent to the open lane within the closed lane.

**Support:**

10. For State highways, see Department of Transportation's Standard Plan T10. See Section 1A.11 for information regarding this publication.

**Recommendation:**

Adopt a word message warning sign and a plaque for “UNEVEN PAVEMENT”.

**Agency Making Request/Sponsor:** Caltrans

**Background:**

Currently there are 5 warning signs for pavement irregularities: “ROUGH ROAD”, “UNEVEN LANES”, “GROOVED PAVEMENT”, “BUMP”, and “DIP”. When uneven pavement occurs not along the lane line no warning sign can be used in this application. Many self made signs are used for this purpose and they are confusing. Until an official sign is adopted this condition will persist.





It's worth noting that BUMP and DIP refer to transverse hazards, whereas UNEVEN LANES and GROOVED PAVEMENT refer to longitudinal hazards. UNEVEN PAVEMENT could refer to either, as does ROUGH ROAD.

In Chapter 1000 of the Highway Design Manual published by Caltrans shows the pavement tolerance affecting bicyclists. This policy needs to be reflected in the CA MUTCD when there is an uneven pavement condition exists within a work zone.

HIGHWAY DESIGN MANUAL

**Table 1003.6  
Bikeway Surface  
Tolerances**

Direction of Travel	Grooves <sup>(1)</sup>	Steps <sup>(2)</sup>
Parallel to travel	No more than ½" wide	No more than ⅜" high
Perpendicular to travel	---	No more than ¼" high

Notes:

- (1) Groove--A narrow slot in the surface that could catch a bicycle wheel, such as a gap between two concrete slabs.
- (2) Step--A ridge in the pavement, such as that which might exist between the pavement and a concrete gutter or manhole cover; or that might exist between two pavement blankets when the top level does not extend to the edge of the roadway.

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**Proposal:**

**Section 6F.45 UNEVEN LANES Sign (W8-11)**

*Guidance:*

*<sup>01</sup> The UNEVEN LANES (W8-11) sign (see Figure 6F-4) should be used during operations that create a difference of 2-inch or more in elevation between adjacent lanes that are open to travel.*

*<sup>02</sup> The UNEVEN PAVEMENT (C41(CA)) sign (see Figure 6F-101(CA)) should be used during operations that create a difference in elevation in the pavement that are not along a lane line.*

**Support:**

*<sup>03</sup> Uneven pavement conditions include elevation difference adjacent to lanes but not at the lane line; between a vehicle lane and a bicycle lane or an unmarked shoulder; and a step in any direction in the pavement. A step is defined as a ridge in the pavement, such as that which might exist between the pavement and a concrete gutter or manhole cover; or that*

might exist between two pavement blankets when the top level does not extend to the edge of the roadway.

Option:

<sup>04</sup> In situations where there is a need to warn bicyclists or other road users of the uneven pavement condition the UNEVEN PAVEMENT (C41P (CA)) plaque (see Figure 6F-101(CA)) may be used.

Standard:

<sup>05</sup> **A C41P (CA) plaque shall not be used alone. If a C41P (CA) plaque is used, it shall be mounted below either a Vehicular Traffic Warning sign (see Section 2C.49) or a Non-Vehicular Warning sign (see Section 2C.50). The background color of the C41P (CA) plaque shall match the background color of the warning sign with which it is displayed.**

Option:

<sup>06</sup> When warning is intended to be directed primarily to motorcyclists, ~~or when elevation difference is less than 2 inch but will affect motorcycle operation,~~ use of the UNEVEN LANES (W8-11) sign or UNEVEN PAVEMENT (C41(CA)) sign with motorcycle plaque (W8-15P) may be considered.

Support:

<sup>07</sup> See table 6F-102 (CA) for pavement surface tolerances for each road user group.

**Section 6F.54 Motorcycle Plaque (W8-15P)**

Option:

<sup>01</sup> A Motorcycle (W8-15P) plaque (see Figure 6F-4) may be mounted below a LOOSE GRAVEL (W8-7) sign, an UNEVEN LANES (W8-11) sign, an UNEVEN PAVEMENT (C41(CA)) sign, a GROOVED PAVEMENT (W8-15) sign, a METAL BRIDGE DECK (W8-16) sign, or a STEEL PLATE AHEAD (W8-24) sign if the warning is intended to be directed primarily to motorcyclists.

Table 6F-102 (CA) Pavement Surface Tolerances\*

Direction of Travel	Steps **	
	Bicycles / Motorcycles	4 wheeled motor vehicles
Parallel to travel	No more than 3/8" high	No more than 2" high
Perpendicular to travel	No more than 3/4" high	No more than 2" high

Notes:

\* Criteria for displaying warning signs. If a step of more than 3" high exists in the pavement do not open that portion of roadway to traffic.

\*\* Step -- A ridge in the pavement, such as that which might exist between the pavement and a concrete gutter or manhole cover; or that might exist between two pavement blankets when the top level does not extend to the edge of the roadway.

**12-8 Adopt a new Section 2B.112 in to the CA MUTCD to add “MOVE OVER OR SLOW FOR STOPPED EMERGENCY AND MAINTENANCE VEHICLES” sign**

**Recommendation:** Caltrans request that the Committee make recommendation to establish a "MOVE OVER" Law roadside sign for use on California freeways (CVC 21809).

**Requesting Agency/Sponsor:** Caltrans

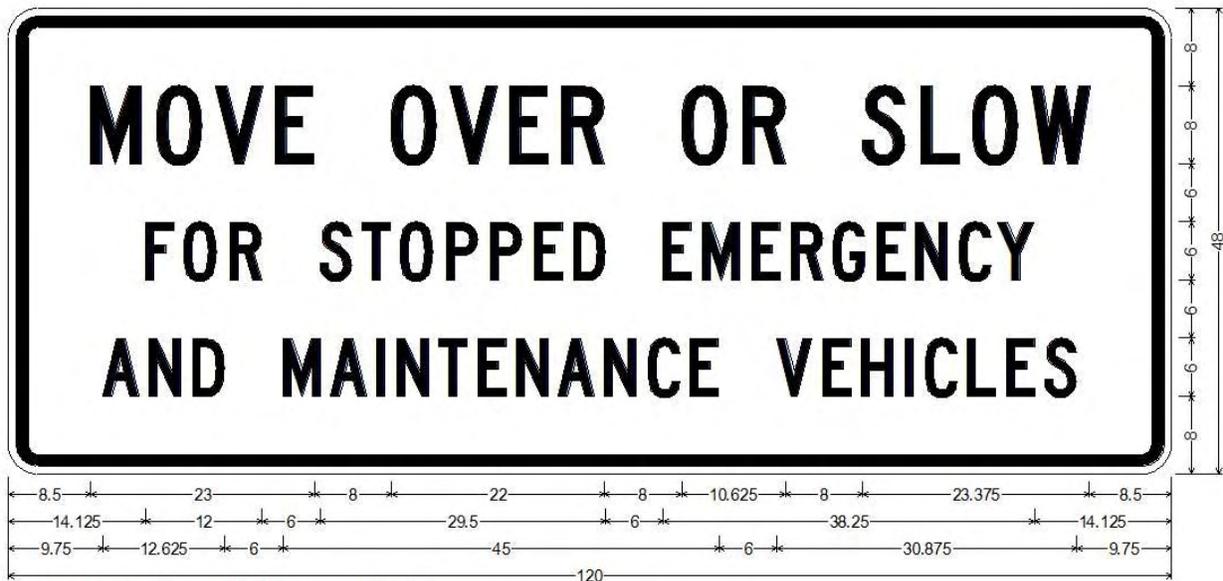
**Background:** Caltrans recently experienced three highway worker fatalities within a 48-day period between May and June 2011. In response to these fatalities, Caltrans launched a statewide media campaign on Monday, July 11, 2011 to generate awareness and to educate the traveling public of their responsibility to comply with the terms of the law. Changeable message signs were used to display instructions to “SLOW OR MOVE OVER FOR WORKERS IT’S THE LAW.” The implementation of a roadside highway sign describing the law to move over or slow for stationary emergency vehicles displaying emergency flashing lights, or tow trucks and California Department of Transportation vehicles displaying amber flashing warning lights should be implemented immediately. This fixed sign will educate the traveling public, encourage compliance with the law, and to promote highway safety. Implementing a regulatory sign that displays a “MOVE OVER OR SLOW” message promotes awareness and reinforces the responsibility of the traveling public to comply with Section 21809 of the California Vehicle Code.

**Proposal:** Recommend adopting a new Section in the CA MUTCD, Section 2B.112

Section 2B.112 MOVE OVER OR SLOW FOR STOPPED EMERGENCY AND MAINTENANCE VEHICLES (RYYY(CA)) Sign

Option:

01 The MOVE OVER OR SLOW FOR STOPPED EMERGENCY AND MAINTENANCE VEHICLES (RYYY(CA)) sign may be used to inform road users of the State's MOVE OVER Law, CVC 21809. This sign may be used only within freeway facilities.



3.000" Radius, 1.250" Border, 0.750" Indent, Black on White; "MOVE OVER OR SLOW" C; "FOR STOPPED EMERGENCY" C; "AND MAINTENANCE VEHICLES" C;

**12-10 Proposal to amend CA MUTCD Section 2D.37 Destination Signs (D1 Series) to allow the use of monument supplemental destination signs**

**Reommendations:** Caltrans request that the Section 2D.37 be amended as shown in red under the proposal to allow the use of monument supplemental destination signs from the State Highways/Freeways.

**Requesting Agency & Sponsor:** Caltrans

**Background:** The City of Murrieta, California requested an encroachment permit during the summer of 2011 (see response letter dated August 25, 2011, from Richard Goh, District 8 Encroachment Permit Engineer, Riverside County). The request to install signs by encroachment permits was denied, with the response that Caltrans “. . . will be proposing a change to the California MUTCD to address Veterans’ memorials and hope to have the change approved by January 2013.” This information item initiates the process to begin the dialogue to discuss pros and cons of updating Caltrans’ policy to include Veterans Memorials (or Monuments) by State of California sign policy.

**Action item:** If Caltrans were to add a new line to Table 2D-102(CA) Supplemental Destination Guide Signs, for “Monuments” and include the AASHTO, Table II criteria, it includes:

Type of Destination	Specific Criteria	Major Metropolitan Areas	Urbanized Areas	Rural Areas
Monuments*	Maximum Miles from State Highway (or Freeway Interchange)	5	5	5

\*criteria for maximum miles from State Highway for National Cemeteries in Table 2D-102(CA) is: 1, 3, and 5 miles for Major Metropolitan, Urbanized, and Rural areas (respectively)

Pros:	Cons:
<ul style="list-style-type: none"> <li>Veterans Groups, and other sponsors of monuments, in general, may request supplemental destination signs, and have a sign policy to pursue optional, supplemental signs to monuments of deep local, regional, statewide, or national significance.</li> </ul>	<ul style="list-style-type: none"> <li>Current sign policy limits a supplemental destination guide sign to traffic generators, and “Monuments” is too limited a scope of whether it is or is not a significant traffic generator.</li> </ul>
	<ul style="list-style-type: none"> <li>Caltrans will place supplemental destination guide signs for memorial bridges or segments of State highways, only when placed at the request of the Legislature.</li> </ul>

Proposal to include limiting criterion to “Monuments” to require that a city or county by resolution of city council or county commission request for a community that supplemental destination signs be requested for placement on State highways, freeways or expressways, and that funds be made available for these signs, for the limits of the existence of these signs, from nonstate sources:

**Proposal: ( Amendment shown in red color)**

Caltrans recognizes that Table 2D-102 (CA), in the CA MUTCD 2012, has no current line item for Supplemental Destination Guide signs for “Veterans Memorial” destinations. Caltrans sponsors this information item to the CA Traffic Control Devices Committee, to consult with cities and counties, as an action item, to establish a rational criterion upon which to include “Veterans Memorials” or for specific war(s) “Veterans of \_\_\_\_\_ War(s) Memorial” in the CA MUTCD Table 2D-102(CA) Supplemental Destination Guide Signs.

Current Policy (general, for all Streets and Highways):

**Section 2D.37 Destination Signs (D1 Series)****Standard:**

<sup>19</sup> Criteria for supplemental destination signs shall be as shown in Table 2D-102(CA).

<sup>20</sup> Signs shall not be provided for privately owned, profit making enterprises regardless of their size.

(For freeways and expressways):

**Section 2E.35 Other Supplemental Guide Signs****Support:**

<sup>01</sup> Supplemental Guide signs can be used to provide information regarding destinations accessible from an interchange, other than places displayed on the standard interchange signing. However, such Supplemental Guide signing can reduce the effectiveness of other more important guide signing because of the possibility of overloading the road user’s capacity to receive visual messages and make appropriate decisions. “The AASHTO Guidelines for the Selection of Supplemental Guide Signs for Traffic Generators Adjacent to Freeways” is incorporated by reference in this Section (see Page i for AASHTO’s address).

**Guidance:**

<sup>02</sup> *No more than one Supplemental Guide sign should be used on each interchange approach.*

<sup>03</sup> *A Supplemental Guide sign (see Figure 2E-24) should not list more than two destinations. Destination names should be followed by the interchange number (and suffix), or if interchanges are not numbered, by the legend NEXT RIGHT or SECOND RIGHT or both, as appropriate. The Supplemental Guide sign should be installed as an independent guide sign assembly.*

<sup>04</sup> *Where two or more Advance Guide signs are used, the Supplemental Guide sign should be installed approximately midway between two of the Advance Guide signs. If only one Advance Guide sign is used, the Supplemental Guide sign should follow it by at least 800 feet. If the interchanges are numbered, the interchange number should be used for the action message.*

<sup>05</sup> *States and other agencies should adopt an appropriate policy for installing supplemental signs using “The AASHTO Guidelines for the Selection of Supplemental Guide Signs for Traffic Generators Adjacent to Freeways.” In developing policies for such signing, such items as population, amount of traffic generated, distance from the route, and the significance of the destination should be taken into account.*

**Support:**

<sup>12</sup> Section 2D.37 also applies to freeways and expressways.

At 6,000-plus California freeway interchange off ramps on the California Freeway system, if the guideline of no more than one Supplemental Guide sign should be used on each interchange approach, is strictly followed, eligibility to place “plus-one” signs in addition to existing guide signs, statewide, would be very limited. Section 2D.37 Destination Signs, and Table 2D-102(CA) are where Caltrans has established its policy for installing supplemental guide signs using “The AASHTO Guideline for the Selection of Supplemental Guide Signs for Traffic Generators Adjacent to Freeways.” Table 2D-102(CA) (formerly referred to as Table 2D-104(CA) in prior editions of the CA MUTCD) reflects the data in the AASHTO Guideline, amended for use in California. AASHTO does not specifically mention “Veterans Memorials”

in its guidelines, but does refer to “Monuments.” There is no specific visitor criteria in AASHTO guidelines for “Monuments.”

**Standard:**

**<sup>19</sup> Criteria for supplemental destination signs shall be as shown in Table 2D-102(CA).**

**<sup>19A</sup> For a monument to be signed from a State highway, its location shall be within 5 miles of the highway. Only one sign, for each direction shall be allowed and it will be from the nearest State highway. The type of sign, whether it is a supplemental plaque under an existing Supplemental Destination (G86(CA) Series) sign or a standalone sign shall be determined by the Department of Transportation. Any follow-up directional signs on local roadways, if needed, shall be in place before the highway signs are installed.**

**<sup>19B</sup> A requesting local agency shall be responsible for adopting a resolution requesting Department of Transportation approval to install monument supplemental destination signs, or to install signs by encroachment permit. The costs for signs, their installation, and ongoing maintenance and replacement shall be the responsibility of the requesting local agency for the installation and maintenance of these signs by nonstate sources. If after 7 to 10 years supplemental destination signs to monuments are not maintained or replaced by the requesting local agency, worn-out or faded signs not meeting criteria in Table 2A-3, will be removed from the State highway and will require renewal of the local resolution by the requesting local agency for reinstallation of supplemental signs to monuments.**

**<sup>20</sup> Signs shall not be provided for privately owned, profit making enterprises regardless of their size.**

**12-11 Interim Approval issued by FHWA for Optional Use of Traffic Signal Photo Enforced Signs (IA-12)**

**Recommendations:** Caltrans recommends that the Committee make recommendations to keep using existing CA Sign specs and not to adopt IA and reevaluate when this sign would make to the National MUTCD.

**Requesting Agency/Sponsor:** Caltrans



# Memorandum

**Subject:** **INFORMATION:** MUTCD – Interim Approval for Optional Use of a Traffic Signal Photo Enforced Sign (IA-12)

**Date:** NOV 12 2010

**From:** Jeffrey A. Lindley  
Associate Administrator for Operations

**In Reply Refer To:**  
HOTO-1

**To:** Directors of Field Services  
Federal Lands Highway Division Engineers  
Director of Technical Services  
Division Administrators

**Purpose:** The purpose of this memorandum is to issue an Interim Approval for the optional use of a sign that informs road users on an approach to a signalized location that compliance with the red signal indication is being enforced through the use of a red-light-running camera system. Interim Approval allows interim use, pending official rulemaking, of a new traffic control device, a revision to the application or manner of use of an existing traffic control device, or a provision not specifically described in the Manual on Uniform Traffic Control Devices (MUTCD).

**Background:** The Missouri Department of Transportation has requested that the Federal Highway Administration (FHWA) issue an Interim Approval to allow the use of a Traffic Signal Photo Enforced sign that includes a traffic signal symbol (the same symbol that is used on the W3-3 warning sign) below which is the word message PHOTO ENFORCED in black letters. The border of the sign is black and the background color of the sign is white. This sign does not appear in the 2009 MUTCD, and Paragraph 8 of Section 2A.12 prohibits the use of a symbol used on a warning sign from being used on a regulatory sign unless it is specifically authorized in the MUTCD. According to the 2009 MUTCD, the manner in which road users may be warned of traffic signal photo enforcement is through the use of a Photo Enforced (W16-10P or W16-10aP) plaque (see Figure 2C-12) mounted below a Signal Ahead (W3-3) warning sign (see Figure 2C-6). However, there are many signalized locations where photo enforcement is present where the engineer has determined that a Signal Ahead warning sign is not needed. Using a Signal Ahead (W3-3) sign to notify road users about the photo enforcement on an approach where the advance warning of the traffic control signal itself is not needed diminishes the effect of the Signal Ahead (W3-3) sign at locations where the advance warning of the traffic control signal is needed.



**Research on the Traffic Signal Photo Enforced Sign:** The effectiveness of a Traffic Signal Photo Enforced sign design consisting of a traffic signal symbol (the same symbol that is used on the W3-3 Signal Ahead warning sign) in combination with the word legend of PHOTO ENFORCED in black letters, with a black border on a white background, was successfully evaluated by researchers at the University of Missouri-Kansas City and the University of Iceland on behalf of the Missouri Department of Transportation in approved Official Experiment 2-595. The results included in the Final Report for this experiment showed that the correct meaning of the experimental sign was identified by a sufficient percentage of the survey participants for this application.

The issue of the appropriate color (white or yellow) for the background of the Traffic Signal Photo Enforced sign was considered by the Regulatory and Warning Signs Technical Committee (RWSTC) of the National Committee on Uniform Traffic Control Devices at its 2010 summer meeting. The RWSTC voted in favor of a white background, which conforms to the color of the TRAFFIC LAWS PHOTO ENFORCED (R10-18) sign (see Figure 2B-3) that also gives notice to road users of the photo enforcement of traffic laws.

**FHWA Evaluation of Results:** The Office of Transportation Operations has reviewed the available data and considers the experimental Traffic Signal Photo Enforced sign to be satisfactorily successful for the application tested (an approach to a signalized location where red-light cameras are present). The experimental Traffic Signal Photo Enforced sign provides agencies with a means of notifying road users of the presence of red-light cameras without the use of an unnecessary Signal Ahead warning sign, thus avoiding the overuse of this important warning sign. The safety effects of making road users aware that the jurisdiction is using photo enforcement of red-light compliance will likely be realized at other intersections in the geographic area in addition to the location where the red-light-running cameras are installed.

The design of the experimental Traffic Signal Photo Enforced sign is not proprietary and can be used by any jurisdiction that requests and obtains interim approval from the FHWA to use the sign. The FHWA believes that the experimental Traffic Signal Photo Enforced sign has a low risk of safety or operational concerns.

The experimental Traffic Signal Photo Enforced sign is a non-controversial sign whose design and use has been endorsed by the National Committee on Uniform Traffic Control Devices. The granting of an Interim Approval for this sign will provide practitioners with a uniform sign that can be used nationally to notify road users about this specific type of photo enforcement.

This Interim Approval does not create a new mandate compelling the use of this new sign, but will allow agencies to install this sign, pending official MUTCD rulemaking, to provide notice to road users that photo enforcement of red-light running is present on a particular approach to a signalized location. Agencies may also continue to use a Photo Enforced (W16-10P or W16-10aP) plaque mounted below a Signal Ahead (W3-3) sign for this application.

**Conditions of Interim Approval:** The FHWA will grant Interim Approval for the optional use of a Traffic Signal Photo Enforced sign, designated as R10-18a, to any jurisdiction that submits a written request to the Office of Transportation Operations. A State may request Interim Approval for all jurisdictions in that State. Jurisdictions using the Traffic Signal Photo Enforced sign under this Interim Approval must agree to comply with the technical conditions detailed below, to maintain an inventory list of all locations where the signs are installed, and to comply with Item D in Paragraph 18 of Section 1A.10 of the 2009 MUTCD, which requires:

“An agreement to restore the site(s) of the Interim Approval to a condition that complies with the provisions in this Manual within 3 months following the issuance of a Final Rule on this traffic control device; and terminate use of the device or application installed under the interim approval at any time that it determines significant safety concerns are directly or indirectly attributable to the device or application. The FHWA’s Office of Transportation Operations has the right to terminate the interim approval at any time if there is an indication of safety concerns.”

1. General Conditions:

The use of the Traffic Signal Photo Enforced (R10-18a) sign is optional. However, if an agency opts to use a Traffic Signal Photo Enforced sign under this Interim Approval, the following design and installation requirements shall apply, and shall take precedence over any conflicting provisions of the MUTCD for the approach on which the Traffic Signal Photo Enforced sign is used.

2. Allowable Uses:

- a. A Traffic Signal Photo Enforced (R10-18a) sign may be installed on an approach to a signalized location where red-light cameras are present on any approach to the signalized location. The Traffic Signal Photo Enforced sign shall not be installed on approaches to signalized locations where red-light cameras are not present on any of the approaches to the signalized location.
- b. If used, the Traffic Signal Photo Enforced (R10-18a) sign shall be individually installed on a separate post or mounting. A Traffic Signal Photo Enforced sign shall not be installed on the same support in combination with a Signal Ahead (W3-3) sign. A Signal Ahead sign and a Traffic Signal Photo Enforced sign may be used on the same approach provided that they are on separate supports.
- c. If used, the Traffic Signal Photo Enforced (R10-18a) sign should be located on the right-hand side of the roadway far enough in advance of the stop line to provide adequate notice to approaching road users. On one-way streets or where a median of sufficient width is present, an additional Traffic Signal Photo Enforced sign may be placed on the left-hand side of the roadway in accordance with Paragraph 11 of Section 2A.16.
- d. If used, the Traffic Signal Photo Enforced (R10-18a) sign should be located such that it does not block or obscure the road user’s view of other signs or traffic control devices.

3. Sign Design and Size:

- a. The design of the Traffic Signal Photo Enforced (R10-18a) sign shall be as shown in the attached sign detail.
- b. The minimum size of the Traffic Signal Photo Enforced (R10-18a) sign shall be 30 inches in width by 42 inches in height.

4. Other:

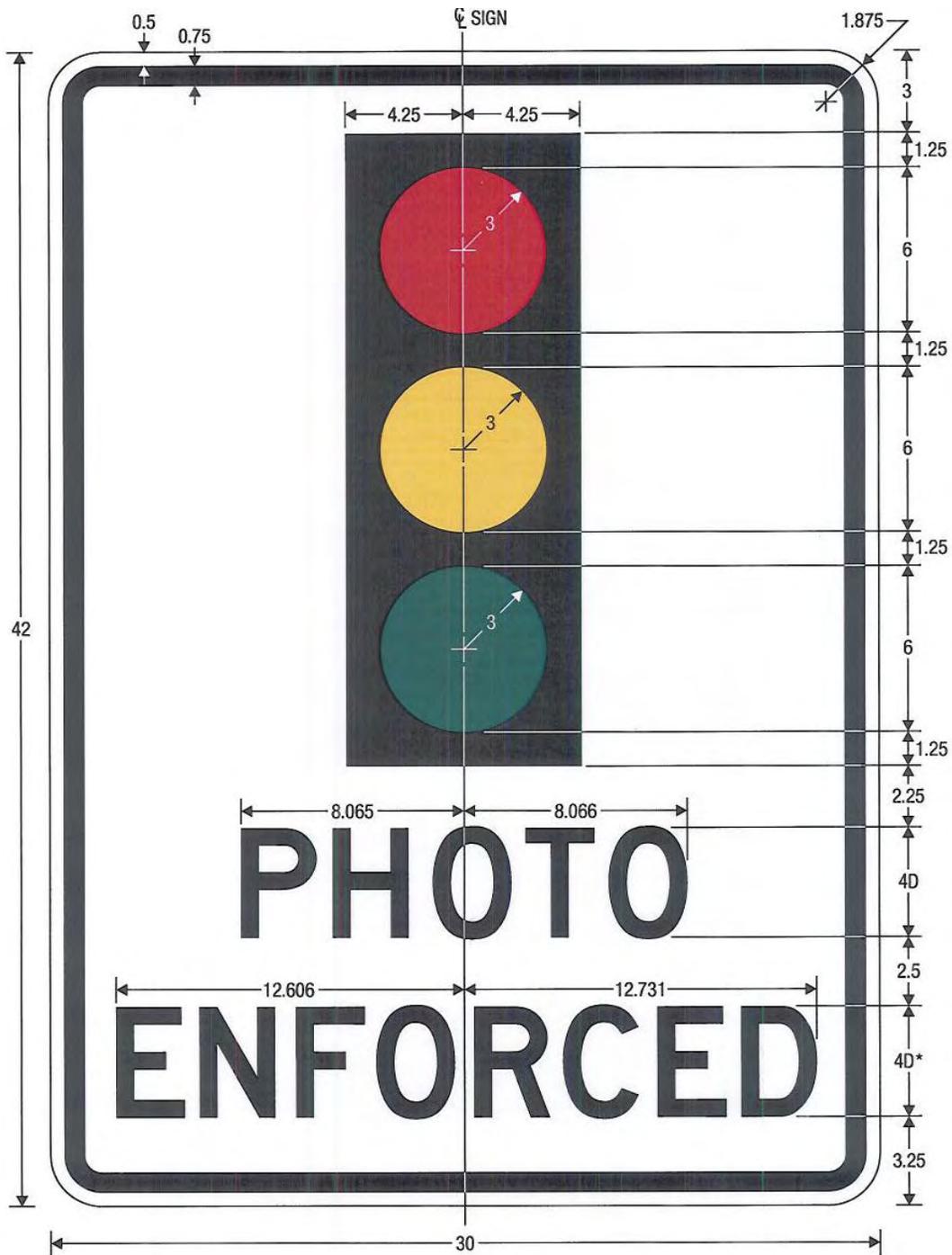
Except as otherwise provided above, all other provisions of the MUTCD applicable to signs shall apply to Traffic Signal Photo Enforced (R10-18a) signs.

Any questions concerning this Interim Approval should be directed to Mr. Bruce Friedman at [bruce.friedman@dot.gov](mailto:bruce.friedman@dot.gov).

Attachment

cc:

Associate Administrators  
Chief Counsel  
Chief Financial Officer



R10-18a

\* Reduce character spacing 20%

[Traffic Signal] PHOTO ENFORCED

- |                         |                            |
|-------------------------|----------------------------|
| COLORS: LEGEND & BORDER | — BLACK                    |
| BACKGROUND              | — WHITE (RETROREFLECTIVE)  |
| SYMBOL BACKGROUND       | — BLACK                    |
| TOP CIRCLE              | — RED (RETROREFLECTIVE)    |
| CENTER CIRCLE           | — YELLOW (RETROREFLECTIVE) |
| BOTTOM CIRCLE           | — GREEN (RETROREFLECTIVE)  |

X-XX

**Current Sign Used in CA:**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

MUTCD NUMBER None CODE SR56

SIGN SIZE	DIMENSIONS (Inches)												
	A	B	C	D	E	F	G	H	J	K	L	M	N
30 x 42	30	42	1/2	3/4	1-7/8	4	1-1/4	6	23	8-1/2	3	3D	2
36 x 54	36	54	5/8	7/8	2-1/4	5-1/4	1-1/2	8	30	11	3	4D	2-1/2
48 x 72	48	72	3/4	1-1/4	3	7	2	10	38	14	4	6D	4

**COLOR**  
 BORDER, LEGEND & SYMBOL - BLACK (Non-Reflective)  
 SYMBOL CIRCLES - RED, YELLOW & GREEN (Reflective)  
 BACKGROUND - WHITE (Reflective)

- THE POLICY FOR INTENDED USAGE OF THIS SIGN IS SHOWN ON REVERSE SIDE -

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*W.A. Alexander*  
CHIEF, OFFICE OF SIGNS AND DELINEATION
11/1/96  
DATE
REVISION
REVISION

**12-12 Update flag transfer method of one-lane two-way traffic control policy in 6C.12.****Recommendation:**

Delete existing policy. This traffic control method shall not be allowed in the state.

**Agency Making Request/Sponsor:** Caltrans

**Background:**

The flag transfer method requires flagger to stop the last car in the series of cars waiting to be let go by the flagger. Then a flag is given to the driver of this last car. It is the responsibility of the driver of that last car to stop again at the other end of flagging operation to give the flag to the flagger at the other flagger station.

There are a few problems with this method.

1. A member of the public (the driver of last car) becomes part of the traffic control.
2. When cars are letting go, it is hard to stop the last car that was waiting at the flagger station. In order to stop the last car it may put flagger within moving traffic.
3. When flagger is giving the flag to last car and giving direction to the driver no one is paying attention to the upcoming traffic. A car may come up from behind and try to go around the flagger while flagger is talking to the driver.
4. Communication between the flagger and the driver could be problematic. Driver license exam are given in many languages in California and drivers are only required to understand basic instructions in English during driving test.
5. If the driver does not stop at the other end of the flagging operation or driver turns into a driveway while going through the work zone the flag will never get to the other flagger.

Caltrans does not allow such method to be used for maintenance operation, construction, and permitted work within Caltrans R/W. In order to be consistent through entire state of California this method should be deleted from CA MUTCD.

**Proposal (Changes are shown in red color):****Section 6C.12 Flag Transfer Method of One-Lane, Two-Way Traffic Control****Standard:**

**This section is deleted for application and shall not be used in California. See section 6C.10, 6C.11, 6C.13, 6C.14, and 6C.15 for other methods of one-lane, two-way traffic control that are to be used in California.**

**Support:**

~~*01-The driver of the last vehicle proceeding into the one-lane section is given a red flag (or other token) and instructed to deliver it to the flagger at the other end. The opposite flagger, upon receipt of the flag, then knows that traffic can be permitted to move in the other direction. A variation of this method is to replace the use of a flag with an official pilot car that follows the last road user vehicle proceeding through the section.*~~

**Guidance:**

~~*02-The flag transfer method should be employed only where the one-way traffic is confined to a relatively short length of a road, usually no more than 1 mile in length.*~~

**10-10 Request for Permission to Experiment with modified SPEED HUMP (W17-1) Signs**

**Recommendation:** The City of Stockton would recommend continued use of the “BUMP” pavement legend to draw attention to vertical traffic calming measures and requested that CTCDC adopt the revised Section 2C.29 of the CA MUTCD 2012 as shown under the proposal.

Requesting Agency: City of Stockton

**Sponsor:** Jeff Knowles – CTCDC member, LOCC

**Background:**

The City of Stockton's Experimented with Traffic Calming Signs, Final Report (April 2012) has been posted on the following website:

<http://www.dot.ca.gov/hq/traffops/signtech/newtech/reports.htm>

**Proposal (revision shown in red color):****Section 2C.29 SPEED HUMP Sign (W17-1)***Guidance:*

*<sup>01</sup> The SPEED HUMP (W17-1) sign (see Figure 2C-6) should be used to give warning of a vertical deflection in the roadway that is designed to limit the speed of traffic.*

*<sup>02</sup> If used, the SPEED HUMP sign should be supplemented by an Advisory Speed plaque (see Section 2C.08).*

*Option:*

*<sup>03</sup> If a series of speed humps exists in close proximity, an Advisory Speed plaque may be eliminated on all but the first SPEED HUMP sign in the series.*

*<sup>04</sup> The legend SPEED BUMP may be used instead of the legend SPEED HUMP on the W17-1 sign.*

*<sup>05</sup> If a series of speed humps exists in close proximity, the optional “SPEED HUMPS AHEAD” sign may replace the first SPEED HUMP sign in the series provided additional warning of speed humps is provided through signs or pavement markings at the speed humps.*

*<sup>06</sup> If speed humps exist on a network of streets within an area accessible by a limited number of access points to the area, the optional SPEED HUMP AREA sign may be placed at each access point to the area provided additional warning of speed humps is provided through signs or markings at the speed humps.*

*Support:*

*<sup>05 07</sup> Speed humps generally provide more gradual vertical deflection than speed bumps. Speed bumps limit the speed of traffic more severely than speed humps. Other forms of speed humps include speed tables and raised intersections. However, these differences in engineering terminology are not well known by the public, so for signing purposes these terms are interchangeable.*