

Amended Agenda Item 13-10 Reduced Speed Limits in TTC Zones

Recommendation:

Caltrans request that the Committee recommend adoption of the proposed changes needed to address reduced speed limits in temporary traffic control zones per the proposal below.

Agency Making Request/Sponsor: Caltrans

Background:

Caltrans Construction Partnering Steering Committee's Work Zone Safety Task Group and the California Strategic Highway Safety Plan's Challenge Area 14 (Enhance Work Zone Safety) initiated the proposed change. Safety in highway work zones is an area of emphasis for Caltrans (California Department of Transportation). Therefore many improvements in work zone safety are being implemented. One of these improvements is the increased use of speed limits to control vehicle speeds through highway work zones. Proper and uniform application of these speed limits should improve the safety of the highway workers and the traveling public.

The current policy in California MUTCD Part 6 contains errors and the location and order of the topics in different sections leads to confusion for the manual users. The distinction between the short-term and long-term closure when reducing speed limits and the resulting difference in signs that are needed is not explained nor clarified. Why does the current policy use two different sign packages when the intended response from the motorist is the same? The current policy lacks flexibility for reducing speed limits by only 10 mph for short duration traffic control in work zones (such as Maintenance activities lasting only few hours) without formal justification and documentation.

FHWA California Division office has voiced concern with the letter height of the "ROAD WORK" and "SPEED LIMIT" portion of the C17(CA) sign being too small for the conditions and type of roadway classification. The letter height is 3 inches on a 24 x24 inch sign size, 4.5 inches on 36 x 36 inch sign size and 6 inches on 48 x 48 inch sign size. Prior to the adoption of the National MUTCD in California on May 20, 2004, the C17(CA) signs were included in the Traffic Manual for use by local agencies on their roadways. The C17(CA) signs were included in the California MUTCD under the "grandfather" clause. One of the main reason local agencies prefer the C17(CA) sign is that its size, 24 x 24 inch lends it to be placed on Type 1 Barricade which is 36 inches high while still maintaining the 1-foot vertical clearance requirement. Caltrans initial proposal attempted to address this concern by using only the R2-1 sign with an orange border or top half colored orange background. However, FHWA California Division office in review of the CTCDC agenda item, informed Caltrans that doing so would violate the National MUTCD and if included in California MUTCD, the entire manual could be determined to be not in compliance with the national MUTCD. This proposal has been modified to include FHWA's concerns.

This proposal attempts to address these issues while avoiding the inclusion of more detailed documentation procedures that Caltrans plans to include in soon to be released publication titled "California Manual for Setting Speed Limits". The purpose of "California Manual for Setting Speed Limits" manual is to set forth a uniform procedure for setting speed limits, provide information on how to apply various sections of the California Vehicle Code (CVC), on how to determine the need for an Engineering and Traffic Survey (E&TS), describe the elements and data needed for the E&TS, how to determine the appropriate speed limit for any California street or highway, and includes procedures for documenting the final outcome with the court system and law enforcement agencies. This manual is in "Draft" form while undergoing internal review. Caltrans plans to share it with the CTCDC and solicit review and comment before finalizing it and making it an official publication.

The current policy in California MUTCD Part 6 addresses two scenarios of speed reductions in TTC zones, one for long term speed reductions when there is lane shift, narrow lanes, or other geometric constraints and the second scenario is for short term speed reduction when geometrics are not an issue but concerns for workers safety due to no physical barrier separation. Current policy addresses these two scenarios with separate sign packages primarily due to past practice and sign size issues. This has led to confusion with practitioners not aware of the distinction between the two packages and their intended use. This proposal simplifies the sign package to only one type of device for both scenarios as the intended response from road users is essentially the same regardless of the scenario for which the device is used. The proposal also provides additional guidelines for short duration traffic control in work zones at the request of Caltrans Maintenance.

This proposal also deletes the current reference to Engineering and Traffic Survey (E&TS) requirement as an E&TS is not required for reducing speeds in TTC zones. TTC speed limits do not fall under the definition of the Speed Trap and can be enforced with radar or lidar without a formal E&TS

California MUTCD 2012 Proposed Policy (Reduced Speed Limits in TTC zones)

Please note:

- **Black text is existing National MUTCD policy from FHWA that has been adopted for use in California and is the current policy.**
- **Black crossed out text is existing National MUTCD policy from FHWA that has NOT been adopted for use in California.**
- **Blue text is current and existing California created policy.**
- **Red text is the proposed changes to current policy as per this proposal.**
- **Green text is comments explaining the proposed changes included in this proposal.**

Section 6C.01 Temporary Traffic Control Plans

Support:

⁰¹ A TTC plan describes TTC measures to be used for facilitating road users through a work zone or an incident area. TTC plans play a vital role in providing continuity of effective road user flow when a work zone, incident, or other event temporarily disrupts normal road user flow. Important auxiliary provisions that cannot conveniently be specified on project plans can easily be incorporated into Special Provisions within the TTC plan.

⁰² TTC plans range in scope from being very detailed to simply referencing typical drawings contained in this Manual, standard approved highway agency drawings and manuals, or specific drawings contained in the contract documents. The degree of detail in the TTC plan depends entirely on the nature and complexity of the situation.

Guidance:

⁰³ *TTC plans should be prepared by persons knowledgeable (for example, trained and/or certified) about the fundamental principles of TTC and work activities to be performed. The design, selection, and placement of TTC devices for a TTC plan should be based on engineering judgment.*

⁰⁴ *Coordination should be made between adjacent or overlapping projects to check that duplicate signing is not used and to check compatibility of traffic control between adjacent or overlapping projects.*

⁰⁵ *Traffic control planning should be completed for all highway construction, utility work, maintenance operations, and incident management including minor maintenance and utility projects prior to occupying the TTC zone. Planning for all road users should be included in the process.*

⁰⁶ *Provisions for effective continuity of accessible circulation paths for pedestrians should be incorporated into the TTC process. Where existing pedestrian routes are blocked or detoured,*

information should be provided about alternative routes that are usable by pedestrians with disabilities, particularly those who have visual disabilities. Access to temporary bus stops, travel across intersections with accessible pedestrian signals (see Section 4E.09), and other routing issues should be considered where temporary pedestrian routes are channelized. Barriers and channelizing devices that are detectable by people with visual disabilities should be provided.

Option:

⁰⁷ Provisions may be incorporated into the project bid documents that enable contractors to develop an alternate TTC plan.

⁰⁸ Modifications of TTC plans may be necessary because of changed conditions or a determination of better methods of safely and efficiently handling road users.

Guidance:

Standard:

⁰⁹ This alternate or modified plan ~~should~~ shall have the approval of the Engineer of the public agency or authority having jurisdiction over the highway ~~responsible highway agency~~ prior to implementation.

Guidance:

¹⁰ Provisions for effective continuity of transit service should be incorporated into the TTC planning process because often public transit buses cannot efficiently be detoured in the same manner as other vehicles (particularly for short-term maintenance projects). Where applicable, the TTC plan should provide for features such as accessible temporary bus stops, pull-outs, and satisfactory waiting areas for transit patrons, including persons with disabilities, if applicable (see Section 8A.08 for additional light rail transit issues to consider for TTC).

Reduced Speed Limits in TTC Zones

¹¹ Provisions for effective continuity of railroad service and acceptable access to abutting property owners and businesses should also be incorporated into the TTC planning process.

¹² Reduced speed limits should be used only in the specific portion of the TTC zone where conditions or restrictive features are present. However, frequent changes in the speed limit should be avoided. A TTC plan should be designed so that vehicles can travel through the TTC zone with a speed limit reduction of no more than 10 mph.

¹³ A reduction of more than 10 mph in the speed limit should be used only when required by restrictive features in the TTC zone. Where restrictive features justify a speed reduction of more than 10 mph, additional driver notification should be provided. The speed limit should be stepped down in advance of the location requiring the lowest speed, and additional TTC warning devices should be used.

¹⁴ Reduced speed zoning (lowering the regulatory speed limit) should be avoided as much as practical because drivers will reduce their speeds only if they clearly perceive a need to do so.

Standard:

^{14a} **The justification for the reduced speed limit shall be documented in writing, in satisfaction of the Engineering and Traffic Survey (E&TS) requirement. Refer to CVC 627 for E&TS. Refer to CVC 21367 & 22362. (reason for deletion is that it is not in compliance with Section 2B.13 & CVC 21367 & 22362 as speeds can be reduced without E&TS)**

Option:

²⁵ Reduced speed limits in construction zones may be established by an engineering analysis, which may include a traffic and engineering survey. (*relocated text*)

Support:

¹⁵ Research has demonstrated that large reductions in the speed limit, such as a 30 mph reduction, increase speed variance and the potential for crashes. Smaller reductions in the speed limit of up to 10 mph cause smaller changes in speed variance and lessen the potential for increased crashes. A reduction in the regulatory speed limit of only up to 10 mph from the normal speed limit has been shown to be more effective.

Support:

¹⁶ See Section 2B.13 for ~~permanent~~ Regulatory Speed Limit signs and Speed Zones signs.

¹⁷ See Section 6F.12 for ~~Road Work/Speed Zone (G17(GA)) sign~~, WORK ZONE (G20-5aP) plaque and END WORK ZONE SPEED LIMIT (R2-12) sign.

Construction Speed Zones:

~~18 Construction speed zones are established on roads under construction where reduced speed is necessary to limit the risk of an accident to workers and the traveling public during all hours of the day and night. Refer to CVC Section 21367. Protection of workers during working hours is provided for under CVC Section 22362.~~

CVC section 22362 gives the agency having jurisdiction over a highway the authority to regulate the speed of traffic to provide protection for workers when at work on the roadway or within the right-of-way so close thereto as to be endangered by passing traffic.

CVC Section 21367 gives the agency having jurisdiction over a highway the authority to regulate the speed of traffic whenever the traffic would endanger the safety of workers or the work would interfere with or endanger the movement of traffic through the area.

Guidance:

The need for a long-term reduced speed limit within a TTC zone should be a decision made during the project development process. The need for a short-term reduced speed limit within a TTC zone, such as a maintenance activity, should be determined in advance of planned maintenance activities.

Option:

If lowering speed limits for a short-term, such as a maintenance activity, signs lowering the speed limit by 10 mph may be placed in work zones that are not protected by a positive barrier and involve workers on foot or on equipment.

Guidance:

~~19 Construction Reducing speed zones limits in TTC zones should be avoided if traffic speeds can be controlled reduced by other means. Speed restrictions should be imposed on the public only when necessary for worker or public safety.~~

Standard:

20 Where traffic obstructions exist only during the hours of construction, the speed zone signs shall be covered during non-working hours.

Support:

21 CVC 22362 applies to "When Workers are Present" condition and signs need to be covered or removed when no work is in progress. As per CVC 21367, agency can "...regulate the movement of traffic...whenever the traffic would endanger the safety of workers or the work would interfere with or endanger the movement of traffic through the area." If obstructions would be present throughout the project duration the signs would not need to be covered or removed. This would also apply to situations where the construction work changes the highway configuration, curvature or elevation, making it necessary to post reduced speed limits.

~~*Guidance:*~~

~~22 The traveled way should be signed and delineated to communicate physical conditions to the motorists such as curvature, narrow roadways, detours, rough roads, dips or humps, etc.~~

Option:

23 The Advisory Speed (W13-1) plaque may be used in combination with various warning type signs to decrease speed at a particular location.

Guidance:

24 *To preserve the effectiveness of the W13-1 plaque, it should not be used unless the condition to which it applies is immediate and will be experienced by all motorists.*

~~*Option:*~~

~~25 Reduced speed limits in construction zones may be established by an engineering analysis, which may include a traffic and engineering survey. (relocated text)~~

Guidance:

26 *Construction zone speed limits should be reduced in sequential stages and where overall reduction of 15 mph or more is required. The first stage of the sequence should be a reduction of 10 mph and the final stage reduction should be 10 mph or 5 mph, as necessary.*

Standard:

27 The reduced speed limit shall not be less than 25 mph. Refer to CVC 22362.

Option:

²⁸ As an example, if the project falls within an established 55 mph zone, and a 40 mph speed limit is considered necessary, it may be posted only if the approaching speed limits are lowered in two stages (i.e., first to a 45 mph speed limit followed by a reduction to the desired 40 mph).

Guidance:

²⁹ ~~Speed Limit and End Zone signs should be installed at locations jointly agreed upon by the Traffic Engineer and the Construction Engineer.~~

Support:

³⁰ ~~Orders for construction speed zones~~ Documentation for reducing speed limits in TTC zones are ordinarily issued for the entire length of the ~~construction~~ TTC zones in a project. This avoids the necessity and resulting delay of obtaining a new ~~order~~ documentation each time the speed restriction signs require relocation to fit the conditions. It is not the intention, however, that the entire length be posted for the duration of the ~~contract~~ project.

Standard:

³¹ **Speed restriction limit signs for reduced speed limits shall be posted only in areas where the traveling public is affected by construction TTC operations.**

Guidance:

³² As the ~~construction~~ TTC zone activities change ~~progresses~~, signs should be moved as appropriate.

Standard: (move to Section 6F.12)

³³ **Signs shall be used only during working hours and removed, or covered during non-working hours unless the movement of traffic through the TTC zone is affected during non-working hours as well. Refer to CVC 21367.**

³⁴ **Signs shall be removed immediately following completion of the construction or change in the conditions for which they were installed. When the construction is completed or the speed restriction is no longer necessary, the formal speed zone orders shall be revoked.**

Section 6F.12 Work Zone and Higher Fines Signs and Plaques

Option:

⁰¹ A WORK ZONE (G20-5aP) plaque (see Figure 6F-3) may be mounted above a Speed Limit (R2-1X(CA)) sign to emphasize that a reduced speed limit is in effect within a TTC zone. An END WORK ZONE SPEED LIMIT (R2-12) sign (see Figure 6F-3) may be installed at the downstream end of the reduced speed limit zone.

Guidance:

⁰² A ~~BEGIN HIGHER~~ DOUBLE FINES ZONE (R2-10) sign (see Figure 6F-3) should be installed at the upstream end of a work zone where increased fines are imposed for traffic violations, and an ~~END HIGHER~~ DOUBLE FINES ZONE (R2-11) sign (see Figure 6F-3) should be installed at the downstream end of the work zone.

Option:

⁰³ Alternate legends such as BEGIN (or END) DOUBLE FINES ZONE may also be used for the R2-10 and R2-11 signs.

⁰⁴ A ~~FINES HIGHER~~, FINES DOUBLE, or ~~\$XX FINE~~ plaque (see Section 2B.17 and Figure 6F-3) may be mounted below the Speed Limit sign if increased fines are imposed for traffic violations within the TTC zone.

⁰⁵ Individual signs and plaques for work zone speed limits and higher fines may be combined into a single sign or may be displayed as an assembly of signs and plaques.

⁰⁶ The TRAFFIC FINES DOUBLED IN CONSTRUCTION ZONES (C40(CA)) and TRAFFIC FINES DOUBLED IN WORK ZONES (C40A(CA)) signs may be placed approximately 500 feet in advance of the first required TTC sign(s). The placement of the C40(CA) and C40A(CA) signs is at the discretion of the responsible person(s) in charge of the work zone.

Support:

⁰⁷ Refer to CVC 42009 for fines for offenses committed in highway construction or maintenance area. In California, as per CVC only doubling of the fines is allowed, not higher fines of other denominations.

Guidance:

⁰⁸ *The C40A(CA) sign is intended to be manufactured as a fabric sign and should be used on a short term (daily) basis only. Longer term situations should use the C40(CA) sign.*

Support:

⁰⁹ CVC 22362 applies to "When Workers are Present" condition and signs need to be covered or removed when no work is in progress. However, per CVC 21367, agency can "...regulate the movement of traffic...whenever the traffic would endanger the safety of workers or the work would interfere with or endanger the movement of traffic through the area." If obstructions would be present throughout the project duration the signs would not need to be covered or removed. This would also apply to situations where the construction work changes the highway configuration, curvature or elevation, making it necessary to post reduced speed limits.

Option:

¹⁰ ~~A WORK ZONE (G20-5aP) plaque may be mounted above a Speed Limit sign to emphasize that a permanent (24 hours a day, 7 days a week) reduced speed limit is in effect within a TTC zone. An END WORK ZONE SPEED LIMIT (R2-12) sign (see Figure 6F-3) may be installed at the downstream end of the reduced speed limit zone.~~

¹¹ ~~The Road Work/Speed Limit (C17(CA)) sign Speed Limit (R2-1X(CA)) sign with a WORK ZONE (G20-5aP) plaque mounted above it may be used for the protection of workers during working hours to reduce speed limit within a TTC zone.~~

Standard:

¹² **The C17(CA) sign Speed Limit (R2-1X(CA)) sign with a WORK ZONE (G20-5aP) plaque mounted above it shall only be used in conjunction with appropriate advance warning signs.**

¹³ **The C17(CA) signs Speed Limit (R2-1X(CA)) sign with a WORK ZONE (G20-5aP) plaque mounted above it shall be removed or covered promptly when no longer applicable.**

Support:

¹⁴ ~~The C17(CA) sign Speed Limit (R2-1X(CA)) sign with a WORK ZONE (G20-5aP) plaque mounted above it is authorized for use by CVC Section 22362. This section provides authority to post a speed limit of not less than 25 mph at locations where employees of any contractor, or of the agency in charge of the job, are engaged in work upon the roadway.~~

¹⁵ Posting unrealistically low speed limits will result in loss of sign credibility and a high violation rate.

Guidance:

¹⁶ ~~Before using a C17(CA) sign Speed Limit (R2-1X(CA)) sign with a WORK ZONE (G20-5aP) plaque mounted above it, work zone conditions should be analyzed to determine what maximum speed limit would be appropriate for that particular location.~~

¹⁷ ~~The C17(CA) sign Speed Limit (R2-1X(CA)) sign with a WORK ZONE (G20-5aP) plaque mounted above it should be placed within 400 feet of the zone where workers are on the roadway or so nearly adjacent as to be endangered by traffic.~~

Option:

¹⁸ ~~The C17(CA) sign Speed Limit (R2-1X(CA)) sign with a WORK ZONE (G20-5aP) plaque mounted above it may be provided by the agency having jurisdiction over the street or road.~~

Guidance:

¹⁹ ~~The C17(CA) Speed Limit (R2-1X(CA)) sign with a WORK ZONE (G20-5aP) plaque mounted above it should be posted a maximum distance of 400 feet in advance of where, and when workers are present; and the Speed Reduction (W3-5) sign or Speed Zone Ahead (R2-4(CA)) sign informs road users of the reduced speed limit TTC zone.~~

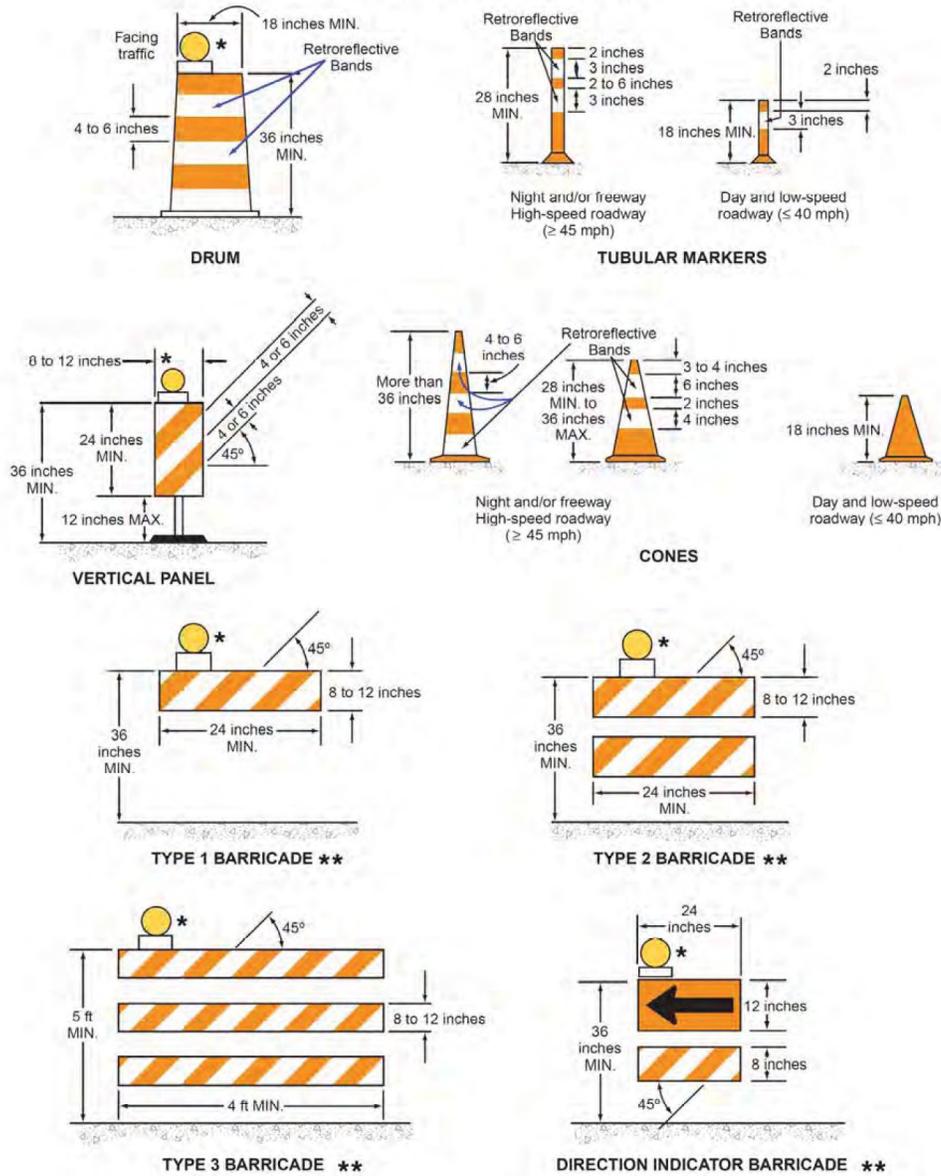
Reduced Speed Limits in TTC Zones Sign Size Comparisons

	Current Policy	Current Policy	Proposed Policy
Closure duration	Long-term duration closure	Short-term duration closure	All duration closures
Physical barrier	Physical barrier separating motorists/workers	No physical barrier separating motorists/workers	With or without physical barrier separating motorists/workers
CVC Section	CVC 21367	CVC 22362	CVC 21367 or 22362
	<small>G20-5aP</small>  <small>R2-1</small>	 <small>C17 (CA) (Front)</small> <small>C17 (CA) (Back)</small>	<small>G20-5aP</small>  <small>R2-1</small>
Conventional Road	24 x 48 (18+30)	24 x 24	24 x 48 (18+30)
Expressway	36 x 72 (24+48)	36 x 36	36 x 72 (24+48)
Freeway	36 x 72 (24+48)	48 x 48	36 x 72 (24+48)

Figure 6F-3. Regulatory Signs and Plaques in Temporary Traffic Control Zones
 (Sheet 1 of 2)

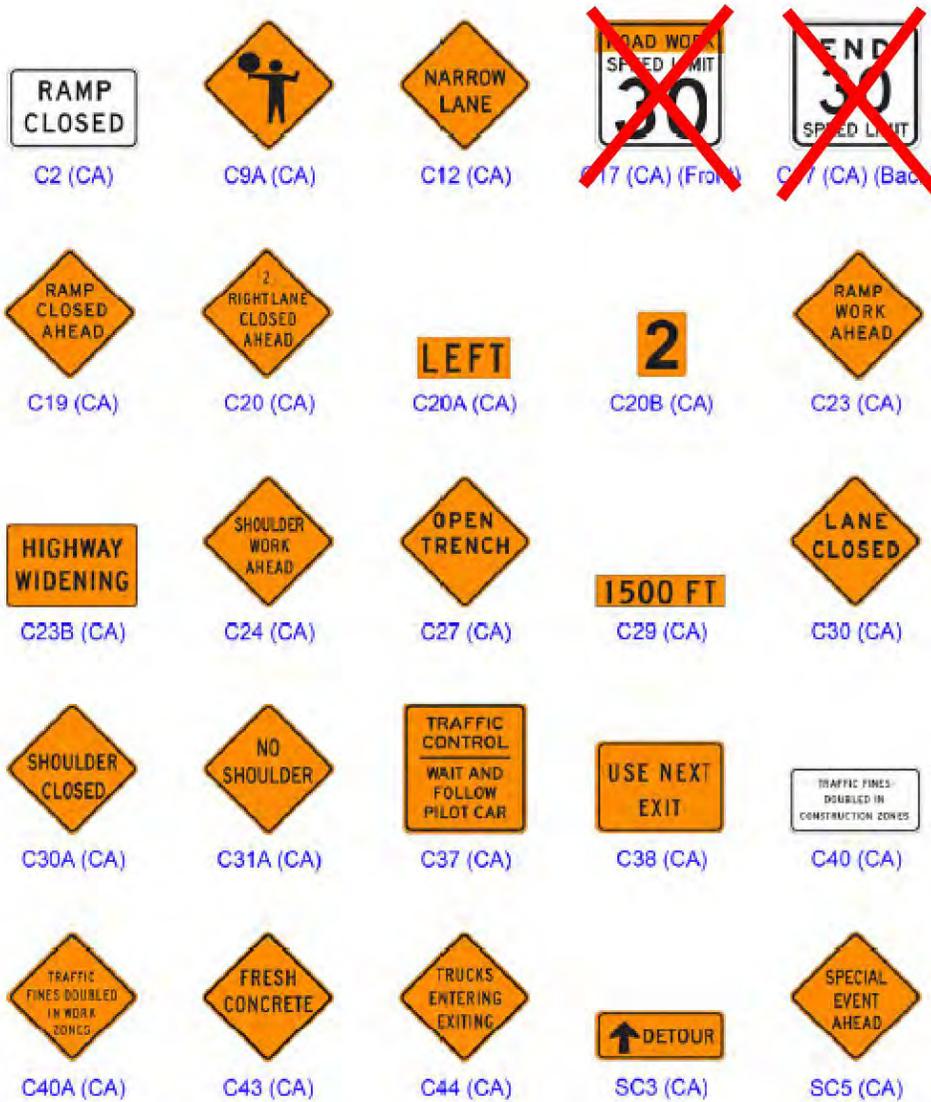


Figure 6F-7. Channelizing Devices



* 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-101 (CA). California Temporary Traffic Control Signs
 (Sheet 1 of 2)**



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

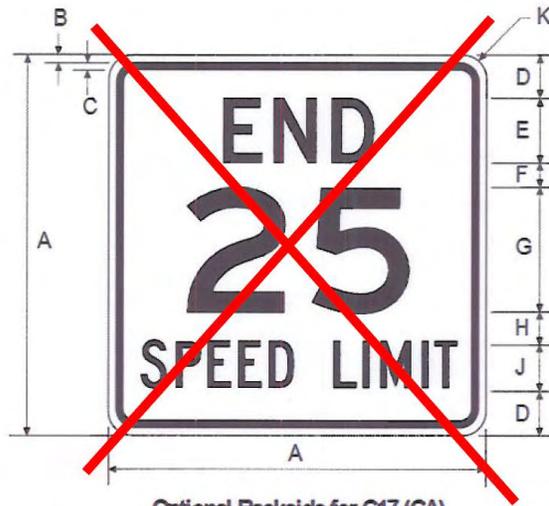


C17 (CA)

ENGLISH UNITS

A	B	C	D	E	F	G	H	J	K
24	.375	.625	2.5	3C	.75	1.5	10D	2.5	1.5
36	.625	.875	3.75	4.5C	1.5	2.75	13.3D	4.25	2.25
48	.75	1.25	5	6C	2.5	4	16D	6	3

COLORS: BORDER & LEGEND - BLACK
BACKGROUND - ORANGE (RETROREFLECTIVE) & WHITE (RETROREFLECTIVE)



Optional Backside for C17 (CA)

ENGLISH UNITS

A	B	C	D	E	F	G	H	J	K
24	.375	.625	2.75	4D	1.5	8D	2	3C	1.5
36	.625	.875	4	6D	2.75	12D	2.75	4.5C	2.25
48	.75	1.25	5.5	8D	3.5	16D	3.5	6C	3

COLORS: BORDER & LEGEND - BLACK
BACKGROUND - WHITE (RETROREFLECTIVE)

NOTE: When using back-to-back and one side is not applicable, that side shall be covered.

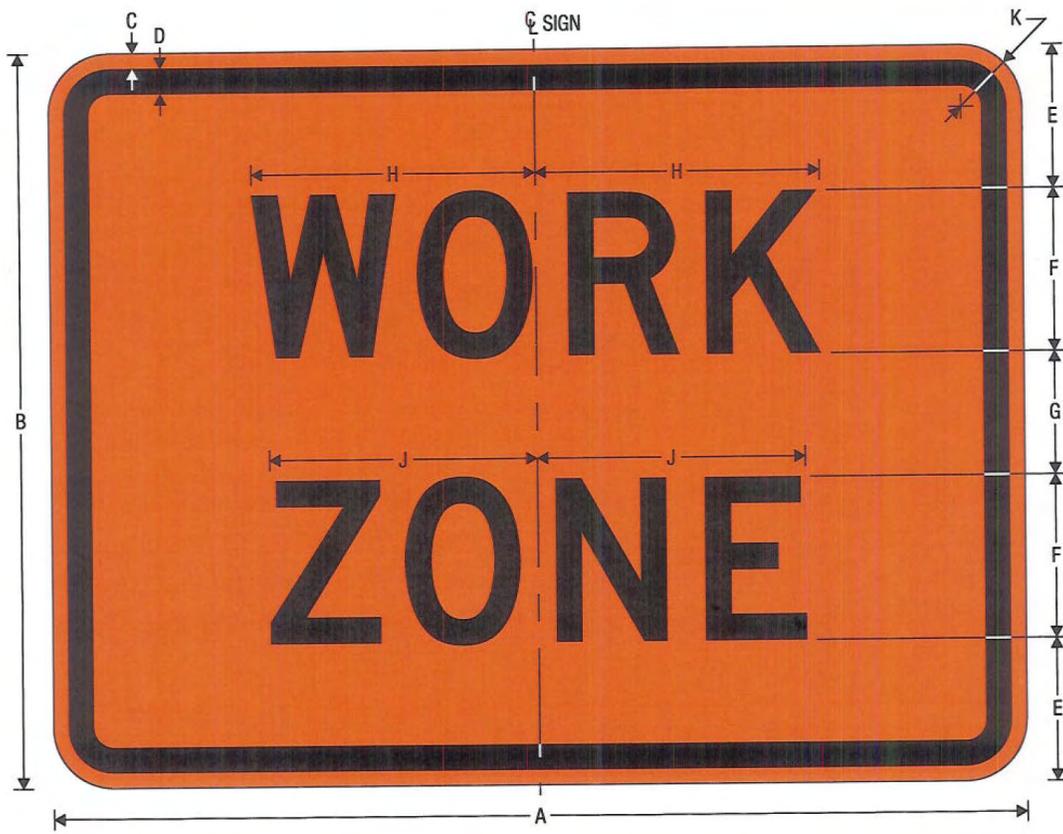


R2-1
SPEED LIMIT (ENGLISH)

*Optically space numerals about centerline

	A	B	C	D	E	F	G	H	J	K	L
	18	24	.375	.625	3	3 E	2	8 E	7.188	5.5	1.5
C	24	30	.375	.625	4	4 E	2	10 E	9.563	7.313	1.5
	36	48	.625	.875	6	6 E	5	14 E	14.375	11	2.25
	48	60	.75	1.25	8	8 E	6	16 E	19.125	14.625	3

COLORS: LEGEND — BLACK
BACKGROUND — WHITE (RETROREFLECTIVE)



G20-5aP
WORK ZONE (PLAQUE)

A	B	C	D	E	F	G	H	J	K
24	18	0.375	0.625	3.5	4 D	3	7.005	6.605	1.5
36	24	0.375	0.625	4.125	6 D	3.75	10.507	9.907	1.5
48	36	0.625	0.875	7	8 D	6	14.009	13.209	2.25

COLORS: LEGEND, BORDER — BLACK
BACKGROUND — ORANGE (RETROREFLECTIVE)