CHAPTER *7*
Traffic Management

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7.01 Introduction

7.01.01 Chapter Contents and Resources

This chapter contains information relevant to providing an overview of policies, expectations, and strategies regarding traffic and safety management.

Personnel responsible for maintenance operations on highways where non-motorized (bicycle/pedestrian) travel is permitted should ensure that bicyclists and pedestrians have a safe and reasonably direct route through or around the work area.

Additional information about non-motorized considerations can be found in:

- Flexible Pavement – Chapter A
- Vegetation Control – Chapter C2
- Drainage Facilities – Chapter C5
- Litter & Debris – Chapter D1

Refer to Protection of Workers – Chapter 8 for the following:

- Protective Vehicles – Chapter 8.11
- MAZEEP (Maintenance Zone Enhanced Enforcement Program) – Chapter 8.12
- Amber Lights – Chapter 8.15

For additional information see the following references:

- Joint Operations Policy Statement https://traffic.onramp.dot.ca.gov/downloads/traffic/files/otm/2005-12-29_CHP-CT_Joint_Operational_Policy_Statements.pdf
- Maintenance Policy Directive MPD-18-01 "Division of Maintenance – Use of Road Flares" https://maintenance.onramp.dot.ca.gov/downloads/maintenance/files/maint_admin/directives_memos/MPD-18-01-Use-of-Road-Flares.pdf
- Caltrans Memorandum, "Perchlorate Best Management Practices" (May 2006) https://env.onramp.dot.ca.gov/downloads/env/managedfiles/h003.pdf
- California Manual on Uniform Traffic Control Devices https://dot.ca.gov/programs/safety-programs/camutcd
- Flagging Traffic https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/ca-mutcd/rev6/camutcd2014-part6-rev6.pdf

7.01.02 Definitions

CA Signs referenced with (CA) in this chapter indicate a California sign code. Otherwise, the sign code referenced is a federal sign code.

CA MUTCD California Manual on Uniform Traffic Control Devices
CHP California Highway Patrol
CMS Changeable Message Sign
CPR Cardiopulmonary Resuscitation
CSOP Code of Safe Operating Practices
CVC California Vehicle Code
FAS Flashing Arrow Sign

FHWA	Federal Highway Administration
LED	Light Emitting Diode
MAZEEP	Maintenance Zone Enhanced Enforcement Program
MUTCD	Manual on Uniform Traffic Control Devices
PCMS	Portable Changeable Message Sign
SHC	Streets and Highway Code
TMC	Traffic Management Center
TTC	Temporary Traffic Control
TTY	Text Telephone
VC	Vehicle Code

Freeway - a divided highway with full control of access. As per California Vehicle Code (CVC) 332, "Freeway" is a highway in respect to which the owners of abutting lands have no right or easement of access to or from their abutting lands or in respect to which such owners have only limited or restricted right or easement of access.

Expressway - a divided highway with partial control of access. As per CVC 314, an "expressway" is a portion of highway that is part of either of the following:

(a) An expressway system established by a county under Section 941.4 of the Streets and Highways Code

(b) An expressway system established by a county before January 1, 1989, as described in subdivision (g) of Section 941.4 of the Streets and Highways Code

Multi-Lane - more than one lane moving in the same direction.
A multi-lane street, highway, or roadway has a basic cross-section comprised of two or more through lanes in one or both directions.

A multi-lane approach has two or more lanes moving toward the intersection, including turning lanes.

Conventional Road - a street or highway other than a low-volume road (as defined in the Manual on Uniform Traffic Control Devices "MUTCD", Section 5A.01), expressway, or freeway.

7.01.03 References and Hyperlinks

Some of the references found in this chapter have hyperlinks that connect to Caltrans intranet pages which are not displayable to the general public. Until such time that the specific reference becomes available on the internet, the user will have to contact their district maintenance engineer or the appropriate Headquarters division to inquire about the availability of the reference.

7.01.04 Chapter Contact

This chapter of the Maintenance Manual is maintained by the Maintenance Safety Liaison, Office of Maintenance Safety, Equipment and Training.

7.02 Overview

Caltrans has the authority to close any State highway to protect the public or to protect the highway from damage. The highway may also be closed during construction, maintenance operations and potential emergencies.

The California Highway Patrol (CHP) is authorized to direct traffic, which includes stopping or expediting traffic for any purpose that will ensure safety. Stopping traffic could be the result of road failures,

severe traffic conditions resulting from accidents, severe weather conditions resulting from heavy snow or rainfall, or any other phenomenon that would endanger the public or to protect the highway from damage.

7.03 Relation of Chapter 7 to California Manual on Uniform Traffic Control Devices (CA MUTCD)

Since 2004, Caltrans has adopted the California Manual on Uniform Traffic Control Devices (CA MUTCD). Part 6 "Temporary Traffic Control" of the CA MUTCD establishes guidelines for traffic controls in highway construction and maintenance work zones. The MUTCD is published by the FHWA (Federal Highway Administration), while the CA MUTCD is published by the Division of Traffic Operations. In case of any inconsistency between the CA MUTCD and Chapter 7 of Maintenance Manual, Volume One, Maintenance forces are to follow Chapter 7.

Refer to the Division of Traffic Operation homepage for the Office of Signs, Markings and Permits for the most current version of the CA MUTCD.

7.04 Cooperation with the California Highway Patrol

CHP and Caltrans have a Joint Operations Policy Statement that functions as a guide for joint activities on State highways.

7.05 Highway Closure Notification

7.05.01 Streets and Highway Code (SHC)

SHC §124. The department may restrict the use of, or close, any State highway whenever the department considers such closing or restriction of use necessary:

(a) For the protection of the public
(b) For the protection of such highway from damage during storms or during construction, improvement or maintenance operations thereon

SHC §125. To notify the public that a state highway is closed or its use restricted, the department may:

(a) Erect suitable barriers or obstructions upon such highway.
(b) Post warnings and notices of the condition of any such highway.
(c) Post signs for the direction of traffic upon it, or to or upon any other highway or detour open to public travel.
(d) Place warning devices on such highway.
(e) Assign a flagger to warn, detour, or direct traffic on such highway.

SHC §127. The CHP shall cooperate with the department in the enforcement of the closing, or restriction of use, of any State highway.

7.05.02 Vehicle Code (VC)

"The Department of Transportation, or its duly authorized representatives with the approval of the department, while engaged in

the construction of a state highway upon new alignment, may restrict the use of and regulate the movement of traffic upon any highway intersecting the project at or near the place of intersection whenever such work interferes with or endangers the safe movement of traffic through the work." (VC 21370)

7.06 Notification of Highway Closure, Lane Closure, Controlled Traffic, Traction Control Devices (formerly known as Chain Control) or Incident of Significant Media Attention

The District Office Dispatch Center or Traffic Management Center (TMC) should be advised immediately by telephone or radio, whenever there is a highway closure, emergency lane closures, controlled traffic, traction control devices, or any incident of significant media attention. A highway is considered closed when all lanes of a divided highway, in any direction, are not passable, or when both lanes of an undivided two-lane highway are not passable. Highways are considered closed, even if traffic is moving on the shoulder or via a detour. The closure may be due to snow, slides, slip outs, floods, accidents or other causes. This information should be routed through channels, e.g., Maintenance Supervisor to Superintendent, to Region Manager, to Deputy District Director, Maintenance, and designated District Duty Officer. Levels of authority can be by-passed when not immediately available. The District Dispatch Office or TMC in turn, shall immediately advise the Headquarters Highway Communications Center by telephone, TTY (text telephone), radio, e-mail or fax. The same procedure shall be followed in reporting the opening of the highway that has previously been reported closed. The District Office Dispatch Center or TMC should also notify the appropriate CHP office of the closure and opening of highways.

Each month, all highway closures and re-openings shall be recorded and archived in the district office for a period of at least seven years.

7.06.01 Executive Reporting Procedures

It shall be the responsibility of the designated District Duty Officer to be familiar with the latest Executive Reporting Guidelines. The Duty Officer or alternates are to report events, as noted in the guidelines, and other significant events they feel could have a major impact on Caltrans. Reports shall be directed to the Director, or to alternates listed on the weekly Duty Officer roster.

7.07 Bomb Threat

When a report is received that explosives or bombs have been placed on the highway system, and the situation indicates that either the traveling public or our employees are in jeopardy, immediate action is to be taken to reduce such exposure to a minimum.

The Joint Operational Policy Statement between Caltrans and the CHP specifies that "The decision to close a highway rests with the first member of either department to arrive on the scene."

Reopening of the highway will be with the concurrence of both departments. "Differences of opinion concerning closure or reopening will be resolved in favor of the greater protection for the public."

In order to ensure the most rapid response to such threats, authority to take immediate action in closing a portion of the highway system is to be delegated to the lowest practical level. In Caltrans, this level will usually be defined as the field supervisor level. After taking action, the field supervisor will provide highway closure notification. In addition,

each district will develop procedures insuring prompt notification to the CHP of any actual or suspected incident involving an explosive device on a State highway or highway related structure. These procedures include the notification of any change in status of the affected highway or highway structure.

Bomb searches on State highways are the responsibility of the CHP under the Joint Operational Policy Statement. Districts, at their own discretion, may enter into a training program with CHP for selected employees in critical areas to aid in such searches. Selected employees should be volunteers and should be chosen because of specialized knowledge specifically needed to protect a vital segment of the highway system. Only those employees who need to participate will be allowed near a reported bomb area.

7.08 Emergency Detouring of Traffic

Attention is directed to the CA MUTCD Chapter 6C.09 "Detours and Diversions." When a road has been closed and will remain closed for several hours or longer, and a detour route is available, such detours should be signed as soon as possible.

If the closure involves a road where non-motorized (bicycle/pedestrian) travel is permitted or a separate bicycle/pedestrian path, personnel responsible for designating the detour route should provide a detour which enables continuity for non-motorized modes.

When a road is closed and no detour is available, warning signs should be placed at the nearest towns or other convenient points to reduce unnecessary motorist travel and confusion. If conditions are recurring, the necessary signs, made up by Maintenance forces, shall be kept on hand.

Where the closure affects a route or routes in other districts, the TMC of the affected district(s) must be advised at once so that the necessary detour signs may be placed. Headquarters Office of Structures Maintenance and Investigations should also be informed if the closure is caused by failure of a bridge.

The district office will notify the CHP and the local radio and television stations when local traffic is affected; and also notify the major networks when a main route is closed.

7.09 Flooded Traveled Way

When the traveled way is flooded but passable, Maintenance forces should place W55 (CA) “FLOODED” signs and delineators to mark the edge of the traveled way. Warning lights should be used whenever traffic would encounter some unusual or unexpected condition. Traffic controls may be placed to slow down traffic if flooded condition presents a surprise element. Close the road as soon as it is evident the water will become too deep for safe travel.

7.10 Supply of Signs, Etc.

Each supervisor shall be equipped with sufficient signs, barricades and portable flashers to enable him/her to protect the public against emergencies which may arise in their particular territory. A routine check shall be made to assure the availability of signs, barricades and condition of possible detour routes.

7.11 Disabled, Abandoned and Wrecked Vehicles

The legal authority for Maintenance forces to move unattended vehicles along or from a highway is quite limited. Sections 22654 (c) and (d) of the CVC permit removal by State forces of any disabled or unattended vehicle to the nearest safe and legal parking location under the following conditions:

(a) The vehicle is obstructing traffic
(b) The vehicle is obstructing work being performed on the highway. This reason is applicable to legally parked vehicles only if signs announcing the parking prohibition have been posted for at least 24 hours.

For further information regarding disabled and abandoned vehicles refer to CVC Sections 22654 (c) and (d).

Where the vehicle is clearly junk, is of no value, and has been in its abandoned location for a week or more (and the CHP refuses to see to its removal), it will then be in order for Caltrans Maintenance forces to haul it to the nearest available location for junking.

When it is necessary to clear a highway following a wreck, any debris or wreckage which constitutes a hazard to traffic should be immediately removed from the traveled way by Maintenance forces. In cases where death or serious injury results to any person, the damaged vehicle or debris should be left untouched and traffic protected by flaggers or barriers, lights, etc., until CHP has had an opportunity to examine the wreck.

In the event a Maintenance employee is required to aid a motorist whose vehicle has become disabled, under no circumstances shall the employee

accept payment for such assistance. Gratuities shall not be accepted from tow truck operators or anyone else who may be called to assist at the scene of an accident. Such assistance should be made only when commercial operators or CHP officers are not available.

When the decision to assist a stranded motorist is made, the employee shall inform Dispatch/TMC and request CHP response prior to leaving their vehicle, and shall follow up with Dispatch/TMC upon returning to their vehicle. If the Dispatch Center/TMC is not staffed then the employee shall make contact with their supervisor or the CHP directly.

7.11.01 When Permit is Needed to Remove Property

It is permissible to issue emergency permits to move on weekends or holidays, or after the usual hauling hours:

- for wrecked or broken down commercial vehicles carrying livestock or perishable cargo
- for loaded butane tankers and other highly flammable or explosive cargo

7.12 Moving Injured Persons

Maintenance personnel should use careful judgment in deciding whether to remove an injured person from the traveled way. It is preferable that this be done by or under the direction of a CHP officer, or paramedics. Factors to be considered include:

(a) If immediate First Aid and/or CPR (Cardiopulmonary Resuscitation), safety is required (life threatening)
(b) Danger from traffic to the injured person or others
(c) Danger to traffic by obstructing the traveled way
(d) Estimated time of arrival of the CHP or an ambulance. If a CHP officer is not available, and it is not convenient to notify the sheriff's office, Maintenance personnel are authorized by Section 20016 of the VC to arrange for an ambulance or some other conveyance to move the injured person to a hospital, if the injured person does not object to such transportation.

7.13 Deceased Persons/Body Parts

CHP shall immediately be notified of deceased persons and/or body parts on Caltrans facilities. Caltrans employees should not disturb, move, or otherwise handle deceased bodies and/or body parts unless it presents a significant danger to traffic or personnel. If the CHP cannot be located, local law enforcement and/or the coroner should be contacted to arrange for removal of the bodies/body parts.

For the cleanup of possible human biohazards, hazardous spills, or unknown substances, contact the District HazMat Coordinator (DHC) to arrange for specialized cleanup.

7.14 Warning Traffic

When a slide, slip-out or other incident occurs which partially or wholly blocks the traveled way, appropriate signs should be placed at each side of the location, and on the right of approaching traffic 400 to 800 feet in advance of the obstruction. That portion of the road which is obstructed shall be blocked off with barricades. At night, warning lights should be placed on both signs and barricades, and a sufficient number set out along the road to outline the obstruction. This same procedure should be followed for road repair work which is not completed in one day.

(a) On roads carrying heavy traffic, one or more flaggers should be assigned, depending on length of control and sight distance.
(b) The W3-4 "BE PREPARED TO STOP" sign should be placed in advance of all flagger stations. Refer to Standard Plans T9 and T13 for guidance.
(c) Where the numbers of vehicles to be controlled are such that one flagger cannot handle the control and contact the last vehicle in line, a second sign shall be placed, and a second flagger assigned.
(d) Signs should be well lighted or retro reflectorized for night work.
(e) When flaggers are required, they should be logically placed in relation to the equipment or operation so as to give adequate warning.
(f) At the flagging station **cones** should be placed in position on the shoulder or otherwise to indicate the control point.
(g) All signs, barricades, and other equipment should be maintained in good condition.

Both the district office and headquarters should be notified in advance when a traffic control is to be established for an extended period of time. When the control is discontinued, signs and barricades should be removed immediately, and the district office, as well as headquarters, notified of the discontinuance.

Note: Barricades should not be used to channelize traffic.

7.15 Flagging Traffic

Attention is directed to Standard Plan T-13 and Chapter 6E Flagger Control of the CA MUTCD. Flagging of traffic should be handled in a uniform manner,

Flaggers are responsible for public safety and for temporary traffic control (TTC). Because flaggers have frequent contact with traffic, they should demonstrate the following abilities:

- Receive and communicate specific instructions clearly, firmly, and courteously.
- Move and maneuver quickly to avoid danger from errant vehicles.
- Control signaling devices (such as paddles and flags) to provide clear and positive guidance to drivers approaching a TTC zone in frequently changing situations.
- Demonstrate proper flagging methodology and operations.
- Demonstrate the proper use of the STOP/SLOW paddle and hand signals before being assigned as a flagger.
- Understand the layout of the work zone and flagging station.
- Understand and apply safe traffic control practices, sometimes in stressful or emergency situations.
- Hear, see, and recognize dangerous traffic situations and warn workers in sufficient time to avoid injury.

Flaggers must wear ANSI/ISEA 107-2010 or equivalent revision Class 3 apparel with a background (outer) material color that is fluorescent orange-red. The retroreflective material must be orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors and must be visible at a minimum distance of 1000 feet.

The retroreflective clothing, or the retroreflective material added to the clothing, must be designed to clearly identify the wearer as a person and must have a minimum of one horizontal stripe around the torso. High-visibility clothing must be kept clean and in good repair or replaced. If a vest is worn, it must be fastened closed. Flaggers must wear safety glasses and a white hardhat.

A flagger shall not engage in argument with a driver or a passenger. If a driver refuses to obey a flagger's instructions, a record is to be taken of the license number of the car and the time of day, and a report made to the CHP officer on duty (Maintenance Zone Enhanced Enforcement Program (MAZEEP)) or the flagger's supervisor.

Refer to Chapter 6E of the CA MUTCD in section entitled “Flagger Procedures” for proper signaling devices and procedures.

7.16 Flagging Operations

Any time two-way traffic must share the same lane because of work in the other lane; a flagging operation shall be set up. See Standard Plan T13. A flagging operation can also be used for temporary road closure not exceeding 20 minutes. See Chapter 6H “Typical Applications”, Typical Application 13 of the CA MUTCD.

Flaggers shall receive on-the-job training before going on duty and shall follow the flagging procedures described in Chapter 6C "Temporary Traffic Control Elements" and Chapter 6E "Flagger Control" of the CA MUTCD. Flaggers should receive training and instructions based on the CA MUTCD and work site conditions that also includes the following:

(1) Flagger equipment which must be used
(2) Layout of the work zone and flagging station
(3) Methods to signal traffic to stop, proceed, or slow down
(4) Methods of one-way traffic control
(5) Trainee demonstration of proper flagging technique and operations
(6) Emergency vehicles traveling through the work zone
(7) Handling emergency situations
(8) Methods of dealing with hostile drivers
(9) Flagging procedures when a single flagger is used (when applicable)*

* Do not use a single flagger unless approved by the supervisor.

The training needs to be documented. Documentation of the training shall be maintained as required by Injury Illness and Prevention Program of the General Industry Safety Order in the California Code of Regulations (Title 8, Division 1, Chapter 4, Subchapter 7, Section 3203).

Traffic should be controlled by a flagger at each end of a constricted or closed section of roadway. One of the flaggers should be designated as the coordinator. To provide coordination of the control of the traffic, the flaggers should be able to communicate with each other orally or electronically**.** Where the end of a one-lane section is not visible from the other end, the flaggers shall use 2-way radios or other positive means to maintain control of traffic.

Flaggers should be rotated and relieved periodically to maintain alertness.

Flaggers shall wear American National Standards Institute Class 3 high visibility apparel. Additionally, flaggers shall stand where they are most visible to approaching traffic and avoid areas of shade, shadows, etc., whenever possible. Flagger stations shall be located such that approaching road users will have sufficient distance to stop at an intended stopping point.

The flagger shall identify an escape route that can be used to avoid being struck by an errant vehicle. Flagger stations should be located such that an errant vehicle has additional space to stop without entering the work space. The minimum distance required between the flagger and the work area is shown on the Standard Plan T13 and Table 2 on Standard Plan T9.

When a one-lane, two-way TTC zone is short enough to allow a flagger to see from one end of the zone to the other, traffic may be controlled by a single flagger. This method must be approved by the supervisor. When a single flagger is used, the flagger should be stationed on the shoulder opposite the constriction or work space, or in a position where good visibility and traffic control can be maintained at all times. When good visibility and traffic control cannot be maintained by one flagger station, traffic should be controlled by a flagger at each end of the section.

The cones on the centerline shown in Standard Plan T13 may be eliminated at the supervisor's discretion if a pilot car is used or an approved deviation is in place (see Chapter 8.07, Changing Chapter Standards),

The pilot car shall have radio contact with personnel in the work area and the maximum speed of the pilot car through the traffic control zone shall be 25 miles per hour.

- The G20-4 "PILOT CAR FOLLOW ME" or R115 (CA) "PILOT CAR DO NOT PASS" sign must be prominently mounted on the rear of the vehicle.

Flaggers shall be used when the drivers vision is impaired because of smoke or dust in work zones. They shall also be used to protect trucks that must turn on the traveled way to load or dump. The flagging procedures in Chapter 6C "Temporary Traffic Control Elements" and Chapter 6E "Flagger Control" of the CA MUTCD shall be followed.

Except for unusual circumstances or emergencies, flaggers should not be used on freeways.

Automated flagger assisted devices may be used to control traffic on two lane roads. The operation must conform to section 6E.04, 05, 06 of the CA MUTCD.

Traffic signals may be used to control traffic on two lane roads. The operation must conform to Chapter 4D Traffic Control Signal Features of the CA MUTCD and Typical Applications 12 and 14 of the CA MUTCD Chapter 6H.

7.16.01 Handling Emergencies Within the Work Zone

Warning signal for Maintenance forces at the work area

Prior to going out on the job, Maintenance forces shall establish a warning signal for the work area Maintenance forces in case of an emergency.

Emergency vehicles

Supervisors shall ensure that all Maintenance forces are aware of the procedures to be used whenever emergency vehicles approach the flagger's station. Supervisors should also discuss emergency procedures with local law enforcement agencies, ambulance services, and fire departments. When certain types of work, such as blasting or extensive excavation makes the roadway impassable, advance arrangements should be made with the local police agency or CHP who has jurisdiction over the roadway.

When informed in advance of an approaching emergency vehicle, the flagger should clear an unimpeded path for the emergency vehicle by stopping traffic from all directions.

When no advance notice is given, first stop the emergency vehicle, and then stop all traffic including construction equipment to provide a clear path for the emergency vehicle to pass.

Violations of traffic control and hostile drivers

Flagger should warn the Maintenance forces that a driver has run the flagger station. Stop all vehicles entering the work area, but do not put

yourself in an unsafe situation. Plan your escape route before an emergency occurs.

When dealing with hostile drivers, be courteous and professional. Do not get involved in an argument with motorists, bicyclists or pedestrians.

If a motorist fails to follow your instruction and threatens the safety of the work area, or is hostile, note the vehicle license number and description of the vehicle and driver. Report the information to the CHP officer on duty (MAZEEP) or your supervisor for the purpose of filing a police report.

Collisions in traffic control zone

Flaggers must know how to handle collisions in traffic control zone and be prepared for emergency flagging operations.

In the event of a traffic collision, notify your supervisor and call for help.

If a collision happens in the line of waiting traffic, stay at your station and continue to control traffic until you receive instructions from your supervisor or CHP.

If a collision happens within the controlled area, hold approaching traffic and follow instructions from the supervisor, the leadworker, or from the CHP.

7.17 Time Control

When a control is necessary over a narrow section of highway for an extended period, the District Director may recommend a time control.

Interested agencies, radio, television and social media may be notified of the time the road is to be closed and opened to traffic. The control is handled by flaggers supplemented by signs and publicity as to conditions.

7.18 Barricades

Attention is directed to Chapter 6F of the CA MUTCD in section entitled “Type 1, 2, or 3 Barricades”

7.19 Signs

Advance warning signs shall be placed when a stationary operation is on the traveled way, or is on the shoulder on a multilane highway with a paved shoulder of 8 feet or more in width. Also, warning signs shall be placed well in advance of the work, when traffic slows, changes lanes, or moves from its normal course of travel because of the work. The standard signs shown in the CA MUTCD Part 6, “Temporary Traffic Control” and in Standard Plans T9 through T17 shall be used.

Portable signs should be placed on sign standards with two (2) or more orange flags. The sign standard shall be in an upright position with the bottom of the sign panel a minimum of 1 foot above the level of the travel way. A cone shall be placed next to each warning sign. If portable signs are displaced or overturned during the work, they shall be immediately uprighted or replaced. Portable signs shall be held in position with approved ballasting devices only.

Use your vehicle to protect yourself from traffic while setting and retrieving warning signs. A shadow vehicle shall be used as a protective vehicle during the installation and retrieval of traffic cones and signs in the taper and tangent sections of a lane closure.

All planned lane closures on freeways with a usable shoulder 8’ or less in width should utilize a CHP traffic break for the installation and removal of the advanced warning signs and merging taper. Usable shoulder area is defined as any longitudinal paved or unpaved surface adjacent to the traveled way with:

1. Enough weight-bearing capacity to support temporary traffic control devices, such as flashing arrow sign, PCMS, and Shadow vehicle.
2. Slope not greater than 6:1 (horizontal : vertical).

When work is temporarily stopped or finished and traffic is not affected, all signs shall be promptly removed, dropped down, or turned away from traffic. Using signs when they are not needed reduces their effectiveness. In addition, installing them when they are not needed increases worker exposure to traffic.

Extra warning signs may be used when appropriate. For example, if queues are expected to develop in lane closures with reversible control, extra W3-4 “BE PREPARED TO STOP” signs can be used.

Placing an advance warning sign, such as a W20-1 “ROAD WORK AHEAD” sign, on the rear of a vehicle in the actual work area does not provide adequate warning to traffic, and is not permitted. However, an advance warning sign may be used on an advance warning vehicle.

Signs, such as W8-7 “LOOSE GRAVEL”, W21-2 “FRESH OIL”, etc., may be placed on barricades. The barricades shall be ballasted either internally or by means of sandbags placed on the lower parts of the barricade frame or stays. The sandbags shall not be placed on top of the barricade or, over any retro reflectorized barricade rail facing traffic.

For individual sign policy and specifications see CA MUTCD Chapter 6F "Temporary Traffic Control Zone Devices". For sign locations and placements see Standard Plans T-9 to T-17, CA MUTCD Chapter 6C "Temporary Traffic Control Elements" and Chapter 6H "Typical Applications". For signs used during flagging operation see CA MUTCD Chapter 6E "Flagger Control".

7.19.01 Supplemental Signing

The following signs may be used within an area closed to traffic after traffic has been directed around the work:

The W8-4 "SOFT SHOULDER" signs may be used on sections where the constructed or natural stability of the shoulder has been destroyed or impaired by maintenance or construction operations, such as in grading or spreading new material over the old. Retro reflectorized signs should be used on main traveled routes with unstable shoulders. Where the length of the soft shoulders is extensive; retro reflectorized signs should be placed at about one (1) mile intervals.

The R11-2 "ROAD CLOSED" is to be placed on a barricade at the point of road closure.

7.19.02 Rough Road

W8-8 "ROUGH ROAD" sign should be placed in advance of rough pavements as required. The road condition should be corrected as soon as possible.

W8-8

7.19.03 Emergency Signage Used When Restricting Loads on Bridges

Temporary Signs. When an emergency develops due to an accident or failure of a structure member, or when, after an investigation, it appears a structure is not capable of carrying full legal loads, temporary signs shall be placed immediately. The temporary signs are to notify traffic of the load limit, pending repair of the bridge or holding of a hearing and obtaining permanent signs. Districts should obtain a small supply of temporary signs, with blank space for filling in the weight or speed restrictions, so that they will be immediately available when required. Temporary signs may be secured from the warehouse, contract, or local vendor. A Portable Changeable Message Sign (PCMS) may also be used.

Permanent Signs. The R12-5 Weight Limit and R21 (CA) Bridge Speed signs, with limits as recommended by the Bridge Engineer, shall be erected to replace such temporary signs if the bridge cannot be repaired or strengthened within a reasonable time. Ordering of such signs need not wait upon the formal posting order. These signs shall be placed not more than 500 feet from each end of the bridge or structure.

R12-5

R21 (CA)

Where a detour is not available at the site of a posted bridge and trucks would have no opportunity to turn around and retrace their path, advance signs shall be erected to notify truck drivers of the restriction, thus affording them the opportunity of selecting another route. The following is a suggested wording for such advance signs:

LOAD LIMIT
10 TONS
ON BRIDGE
5 MILES
AHEAD

7.20 Traffic Controls in Snow Areas

Maintenance forces shall be prepared to handle traffic during snow and ice conditions.

7.20.01 Speed Regulations

Attention is directed to Chapter 2B of the CA MUTCD in section entitled "Speed Limit Sign (R2-1)." Section 22363 of the CVC authorizes Caltrans to erect appropriate speed limit signs for prima facie speeds of 40 miles, 35 miles, 30 miles or 25 miles per hour when, by reason of snow or ice conditions, such speeds are most reasonable or safe. The R2-1 speed limit sign should be used when required. Such speed limit signs may be placed and removed as snow and ice conditions vary. The only sign to be used to regulate speed in the snow areas is the R2-1 speed limit sign. It has been the practice to install R2-1 speed limit signs in the vicinity of resorts, ski tows, and at other critical locations where skiers and children frequently cross the highway. These speed limits should be established by District Traffic Operations.

7.20.02 Parking Regulations

Attention is directed to Chapter 2B of the CA MUTCD in section entitled "Parking, Standing, and Stopping Signs (R7 and R8 Series)." Section 22510 of the CVC authorizes Caltrans to prohibit parking on either or both sides of a highway which has been cleared of snow, but where the width of the highway is still restricted. The R26 (CA) and R28 (CA) "NO PARKING ANY TIME" signs are used to indicate the areas where parking is prohibited. Within those areas where parking is permitted, it is customary to install R25 (CA) "PARK OFF PAVEMENT" signs at frequent intervals.

7.20.03 Traction Control Devices

Attention is directed to Chapter 2B of the CA MUTCD. Most districts have certain areas that are subject to annual snowfall. It is good practice to install the SW58 (CA) "WATCH FOR SNOW REMOVAL

EQUIPMENT" signs in black letters on yellow, on all highways leading to snow areas. These signs are generally placed at the lower elevations where the first snow is usually encountered. They should either be hooded or removed during the summer season.

Traction control device areas are marked with R75 (CA) "CHAINS REQUIRED 1 MILE AHEAD" signs, R76 (CA) "CHAINS REQUIRED", and R78 (CA) "END CHAIN CONTROL". Within the traction control device area, Caltrans may permit, as an alternate, the use of snow tread tires on authorized vehicles. Standard chain signs should be in place on each side of built up areas that develop an appreciable volume of traffic. Permanent installations should be made to facilitate putting the chain signs into service by Maintenance personnel.

Permits to individuals, who must apply in person, for installing tire chains on highway right of way may be issued. Contact District Encroachment Permit Engineer for assistance.

Certain highways are allowed to close each winter due to heavy snow. At the beginning of these areas, signs reading "SNOW NOT REMOVED BEYOND THIS POINT--PROCEED AT YOUR OWN RISK" should be installed. Arrangements shall also be made to place signs prominently at important intersections and other advance points to inform traffic when a through route is closed by snow. Such a sign should read "_____CLOSED BY SNOW BEYOND_____."

7.21 Shoulder Closures

Working on the shoulder of a highway requires caution and awareness. Employees have been killed or seriously injured being struck by errant vehicles leaving the traveled way. It is every employee's responsibility

to be aware and watchful while performing work on the shoulder of any highway.

While working on the shoulder, keep a vehicle or other means of physical protection between yourself and approaching motorists. Keep to an absolute minimum the time you stand or work at the rear of your vehicle.

Shoulder closures are used to guide motorists around stationary operations on shoulders. A shoulder closure is optional on unpaved shoulders and two-lane roads. It must be kept in mind that shoulder closures provide no physical protection.

A shoulder closure is required for a stationary operation on a multilane highway with a paved shoulder of 8 feet or more in width whenever vehicles or equipment are parked on the shoulder for more than 20 minutes. Shoulder closures are to be set up as described on Standard Plans T10 and Part 6 “Temporary Traffic Control” of the CA MUTCD

For short duration shoulder operations of 20 minutes or less, signs/channeling devices may be eliminated if a vehicle with activated flashing amber light is used.

Shoulders used as part time lanes should be closed in the same way as lanes are closed.

A properly placed barrier vehicle shall be used with shoulder closures to protect Maintenance forces.

For traffic control procedures and layouts see Standard Plans T-10 for "Traffic Control System for Lane Closure on Freeways and Expressways and CA MUTCD Chapter 6H "Typical Applications" for conventional highways. For shoulder closure policies see CA MUTCD Chapter 6C "Temporary Traffic Control Elements" and Chapter 6G "Type of Temporary Traffic Control Zone Activities". For signs used during shoulder closures see CA MUTCD Chapter 6F "Temporary Traffic Control Zone Devices".

7.22 Moving Lane Operations/Closures

Before employees work in a moving lane closure, a pre-job meeting shall be held and documented on a "Safety Meeting Report" (Form PM-S-0110) and/or "BMP Tailgate Meeting Report" (Form NPDES-001) so that all involved employees will know what their role in the operation is and how to proceed safely.

In any slow moving operation, the first vehicle in the lane approached by motorists shall be a shadow vehicle.

For information on vehicle spacing, vehicle positioning, and signing, refer to Standard Plans T15 and T16, "Traffic Control System for Moving Lane Closure on Multilane Highways" and Standard Plan T17 "Traffic Control System for Moving Lane Closure on Two Lane Highways".

All vehicles used as shadow trucks shall be equipped as defined in Section 8.11, Protective Vehicles. Radio communication in all vehicles is required.

Other requirements for moving lane closures and shadowing moving operations, found in the Maintenance Code of Safe Operating Practices (CSOP), shall be followed.

Exceptions to this rule are tow trucks and snow removal/de-icing equipment.

During moving lane operations/closures on-foot exposure within travel lanes are prohibited except activities described in Section 7.25 Standard Exceptions to Lane Closure Procedures.

Standard Plans T15-T17 shall be followed when conducting moving lane operations/closures. Additional policies can be found in CA MUTCD Chapter 6G "Type of Temporary Traffic Control Zone Activities".

7.23 Lane Closures

A lane closure shall be set if a stationary operation takes more than 2 feet or reduces the width to less than 10 feet of an existing lane on a multilane highway. To take up to 2 feet of a lane on a multilane highway without a lane closure, a cone taper shall be installed that begins at least 300 feet upstream from the work area. Refer to Table 1 on Standard Plan T9 for taper length and cone spacing.

The lane of a two-lane highway shall be closed if work reduces the width of a lane to less than 10 feet. Traffic shall not be moved across the center stripe without a lane closure or other means of traffic control. In general, a flagging operation is used for such conditions.

A space of 6 feet should be maintained, whenever possible, between moving traffic and the work area. When closing a lane, a barrier vehicle or a shadow vehicle shall be used for the installation of the signs and the

flashing arrow sign (FAS) if they can be placed while off the traveled way on the shoulder or median. A shadow vehicle shall be used as the protective vehicle during the installation and retrieval of traffic cones and signs in the taper and tangent sections of the lane closure. All devices placed in areas with no shoulders from an open lane require the use of a shadow vehicle for protection.

Lane closures should be placed according to the Standard Plan T10, Traffic Control System for Lane Closure on Freeways and Expressways or the Standard Plan T11, Traffic Control System for Lane Closure on Multilane Conventional Highways. In case of any inconsistency between the Standard Plans and Chapter 8 of Maintenance Manual, Volume One, Maintenance forces are to follow Chapter 8.

7.23.01 Placement of Traffic Control Systems at the Start of Work

Ensure there is a traffic control system in place before commencing work. The following are some installation instructions depending on the situation in which the system will be used:

(1) Systems affecting traffic only in one direction—Start with the first device that the drivers will see as they enter the work zone (usually a W20-1 “Road Work Ahead” sign). Additional devices are placed in sequence, moving in the direction of the traffic flow. Move the Maintenance forces and equipment onto the closed lanes only after all system components are in place.

(2) Systems affecting traffic in both directions—Install the first sign drivers will see traveling in the opposing direction. Then install in sequence all remaining signs and devices in the opposing direction of travel. Next install the

first sign drivers will see in approaching the work area from the affected direction. Place all remaining signs and devices in sequence through the work area. If flaggers are to be used, have flaggers take their stations; then move Maintenance forces and equipment onto the road.

7.23.02 Removal of Traffic Control System at the End of Work

Ensure the traffic control system is removed following the reverse order of the placement sequence:

(1) Remove all Maintenance forces and equipment from the roadway.

(2) Then remove the devices and signs in the reverse order of placement. You may allow the forward mode of cone and sign retrieval for the merging taper and for ramps and connector closures when the shoulder area is not wide enough and restricts backing up the impact attenuator vehicle and cone truck. When the forward mode of retrieval is used, follow the Traffic Control Plans for a moving operation.

(3) Restore all signs and signals to normal operation.

If a lane closure begins to cause traffic to back up (commonly called queuing), the advance warning signs shall be moved back in advance of queuing, or additional advance warning signs shall be placed ahead of queuing, or PCMS shall be placed and maintained in advance of the upstream end of queuing. If the signs cannot be moved back, or additional signs cannot be placed, or the use of a PCMS cannot be

employed, the lane closure should be removed. If the lane closure results in a significant traffic delay, the closure may need to be removed.

A PCMS may also be used to redirect traffic and relieve queuing. The additional PCMS may be used at key interchanges and exit ramps and other locations where traffic queues may be expected due to maintenance activities.

A fixed Changeable Message Sign (CMS) may also be used to redirect traffic and relieve queuing.

If for some reason, a lane cannot be closed utilizing the requirements of this section, a deviation may be warranted. See Section 8.07, Changing Chapter Standards.

All lane closures shall follow the layout in Standard Plan T9-T17. Elements of a lane closure are described in CA MUTCD Chapter 6C "Temporary Traffic Control Elements". Signs and channelizing devices (i.e. traffic cones) used for lane closures are described in CA MUTCD Chapter 6F "Temporary Traffic Control Zone Devices". Additional lane closure layout can be found in CA MUTCD Chapter 6H "Typical Applications".

7.24 Closing Auxiliary Lanes

Work occurring at the beginning of an auxiliary lane such as a truck lane or lane added to increase capacity, will require as a minimum, the shoulder closure plan shown on Standard Plan T10 plus these additional requirements:

- A W20-1 “ROAD WORK AHEAD” sign instead of the W21-5 “SHOULDER WORK” sign on the shoulder upstream from the beginning of the auxiliary lane.

- A C20(CA) “R/L LANE CLOSED AHEAD” sign instead of the W21-5 “R/L SHOULDER CLOSED AHEAD”.

- A C20(CA) “R/L LANE CLOSED AHEAD” instead of the C30A(CA) “SHOULDER CLOSED”.

- Extend the cones from the shoulder to the beginning of the stripe for the added auxiliary lane. Continue the cones through the work zone.

- A C30 (CA) “LANE CLOSED” sign in the closed lane about 100 feet from its beginning and every 1,000 feet after that.

- Field staff should consult with the District Traffic Manager for additional recommendations associated with unique sight conditions that may require additional signs or delineation.

If the work site is a considerable distance from the beginning of the auxiliary lane and the above method is not practical, the lane shall be closed according to the Standard Plan T10A. If the auxiliary lane is located at an exit ramp or connector, the closure plan in Standard Plan T14 shall be used.

More layouts for auxiliary lane closure can be found in CA MUTCD Chapter 6H “Typical Applications”.

7.25 Standard Exceptions to Lane Closure Procedures

Short-duration operations may be conducted on the traveled way without using a lane closure or signs. Pothole patching and debris retrieval, are examples of brief operations. Prior to using this method a CHP traffic break should be considered. In order to conduct short term operations on the traveled way without using a lane closure or signs, all of the following conditions must exist:

1. The traffic volume must be light. This means the worker can walk from the shoulder to the site on the traveled way, do the job, and walk back to the shoulder without interfering with traffic.

2. Sight distance shall be at least 500 feet in each direction. Where 500 feet of sight distance is not available at the work site, one or more lookouts should be posted to extend visual coverage if necessary.

3. Vehicles must be parked completely off the traveled way.

If all three (3) of these conditions exist, the supervisor may instruct Maintenance forces to perform the work on a specified section of highway without a lane closure. All of the following work methods shall be used:

- When the Maintenance forces consists of at least two workers, one of the workers shall act as a lookout. The lookouts exclusive duty will be to continually watch for approaching traffic and to warn the worker whenever a possible work zone intrusion is suspected.

- The lookout shall not carry a flag or paddle and shall do nothing to control or influence traffic. All Maintenance forces shall be off the traveled way when traffic passes.

- Only one production worker shall be on the traveled way, unless more are needed to reduce the exposure time.

- Maintenance forces shall face approaching traffic whenever possible.

- Maintenance forces shall have a planned escape route.

- A FAS in the caution mode or a flashing amber light shall be operating.

- W20-1 "ROAD WORK AHEAD" signs are not required, since passing traffic is not to be affected.

A supervisor may allow pavement marking and relamping operations on the traveled way without a lane closure. The conditions above shall be met, and the work methods listed above shall be followed. The posted speed limit must be less than 55 miles per hour and the work must take less than 20 minutes to complete. It is recommended that the supervisor also use devices such as signs, FAS, barrier/shadow vehicles, MAZEEP and lookouts to increase worker protection. If vehicles cannot be parked completely off of the traveled way, then a shadow vehicle shall be required.

Lane closures are not required in traction control device operations. However, on multilane highways, they may be used to create a cushion between Maintenance forces and fast vehicles leaving the snow area. In

addition, a supervisor may use lookouts and barrier vehicles to increase worker protection.

The supervisor may allow moving shoulder operations next to the traveled way without a lane or shoulder closure. Shoulder grading, mowing, sweeping and spraying operations are examples of moving shoulder operations. The work must leave at least 10 feet of the lane next to the shoulder open to traffic. A shadow vehicle and/or vehicle equipped with a FAS is recommended but not required. See CA MUTCD Chapter 6H, "Typical Application", "Short Duration or Mobile Operation on a Shoulder". On two-lane conventional highways, traffic shall not be moved across the center stripe without a lane closure or other means of traffic control. For more information, refer to the CA MUTCD, Section 6G.02 "Work Duration".

7.26 Flashing Amber Lights and Rotating Amber Lights

Amber lights shall be used to alert motorists to work activity near, but not on, the traveled way. Amber lights are not to be used while driving at prevailing speeds, when parked in an established lane closure, or when no danger to the employee or motorist exists. Amber lights, to be effective, must only be used when they are needed. Flashing Amber Light includes such devices as flashing lights, rotating beacons, or light/stick bars.

Flashing and/or rotating amber lights are to be used on motor graders, snow removal equipment, and other specialized equipment that are operated on the traveled way at lower than prevailing traffic speeds.

Flashing amber/rotating lights are to be used on pilot cars while leading traffic. A flashing amber light should not be used at the same time as a

FAS because the arrow becomes more difficult to read. If the vehicles are equipped with both, do not use at the same time.

During the hours of darkness, or during periods of inclement weather, amber lights should be used with discretion.

The use of flashing amber lights and rotating amber lights shall follow California Code of Regulations: Title 13 Motor Vehicles. Additional information can also be found in CA MUTCD Chapter 6F “Temporary Traffic Control Zone Devices”, Section titled “Lighting Devices”.

7.27 The Use of the Flashing Arrow Sign

A FAS shall be a sign with a matrix of elements capable of either flashing or sequential displays. This sign shall provide additional warning and directional information to assist in merging and controlling road users through or around a TTC zone. A portable CMS may be used to simulate a FAS display.

Two types of FAS are Type I and Type II. The Type I has a minimum size of 8 feet x 4 feet and is typically a trailer mounted FAS. The Type II has a minimum size of 6 feet x 3 feet and is typically a vehicle mounted FAS.

The terms "arrow board" and "flashing arrow sign" are synonymous. A FAS has the following three mode selections:

(1) A Flashing Arrow, Sequential Arrow, or Sequential Chevron mode;
(2) A flashing Double Arrow mode; and
(3) A flashing Caution or Alternating Diamond mode

FAS in the arrow or chevron mode shall be used only for stationary or moving lane closures on multi-lane roadways. FAS shall be used to indicate a lane closure where traffic is required to merge into the next lane. FAS shall not be used to indicate a shift in traffic such as shifting traffic from the most outside lane on to the shoulder.

For shoulder work, blocking the shoulder, for roadside work near the shoulder, or for temporarily closing one lane on a two-lane, two-way roadway, a FAS shall be used only in the caution mode to alert the motorist that work activity is near.

During hours of darkness, the FAS shall be dimmed to prevent blurring of the arrow image.

Additional information on FAS can be found in CA MUTCD Chapter 6F "Temporary Traffic Control Zone Devices", Section "Arrow Boards". A list of allowed operating modes for FAS can be found in CA MUTCD Chapter 6F, Figure 6F-6 "Advance Warning Arrow Board Display Specifications".

7.28 Placing the Flashing Arrow Sign

When FASs are used to close multiple lanes, a separate FAS shall be used for each closed lane. In multilane closures on freeways and expressways (Standard Plan T10), one Type I FAS must be used for each lane closed. If a Type I FAS is not available, a Type II FAS may be used in place of a Type I FAS in the second and succeeding closed lanes. Under this condition, the Type II FAS shall be in place as soon as the traffic lane is closed and shall not be removed until the closed lane is opened to traffic. The Type II FAS shall not be moved to perform lane closure installation or retrieval. Please refer to Figure 6F-6 in the CA MUTCD.

The FAS shall be located behind channelizing devices used to transition traffic from the closed lane. The FAS should be placed on the shoulder at the beginning of the taper as shown in Standard Plan T10. If there is no shoulder, the FAS should be placed as close to the beginning of the taper as possible. A minimum 1500 feet of sight distance shall be provided, where possible, for vehicles approaching the first FAS.

If the FAS cannot be located properly, consider placing the taper in a different location.

Any shadow vehicle working on the traveled way of a multilane highway outside of a lane closure must be run with a FAS in an arrow mode.

Work vehicles that are being shadowed shall not display a FAS in arrow mode. The FAS, if available, should usually display caution mode. Two partially superimposed FASs may not give a clear message.

7.29 The Use of Road Flares

No activities that have the potential of starting a fire should begin before Maintenance staff consult daily distribution of Caltrans Daily Fire Danger Ratings and localized weather reports to ensure that all parameters of this policy are followed.

7.29.01 Before Road Flare Use

For static operations, consider alternative products such as electronic flares.

For moving operations/closures, consider Maintenance Zone Enhanced Enforcement Program (MAZEEP), additional shadow vehicles or Portable Changeable Message Signs (PCMS) instead of flares.

Managers and Supervisors shall ensure employees are familiar with their Districts' Fire Risk Management Plan.

The Maintenance Superintendent and Supervisor shall ensure that each member of the Maintenance crew has received instruction on the proper inspection, deployment, and disposal of road flares before use on the job. Please refer to the latest Code of Safe Operation Practices (CSOP) "Use of Road Flares".

If using a Truck Mounted Fusee Igniter, ensure the Maintenance crew is familiar with the "Truck Mounted Fusee Igniter" CSOP.

Road flares should be inspected prior to their use.

Loose caps should be tightened.

Road flares that are wet, leaking, expired, missing any portion of the paperboard covering, cap or cap wings, or otherwise damaged should not be used.

Separate damaged road flares for immediate disposal.

Dispose of damaged road flares in hazardous waste storage for proper disposal of perchlorate-containing substances, in accordance with the Caltrans Memorandum, "Perchlorate Best Management Practices," (May 2006).

7.29.02 During Road Flare Use

Use the least amount of road flares as possible without compromising safety.

Consider the use of alternative, non-flammable signal aids in lieu of road flares where practicable and safety is not compromised. Crews are authorized and encouraged to request CHP assistance.

When road flares are used, Maintenance Supervisor shall ensure that the job site is patrolled and monitored to ensure that road flares remain on the pavement and are extinguished.

Partially-burned flares that are extinguished before they burn out completely as manufactured may contain perchlorate and should be safely removed from the job site where possible and disposed of in hazardous waste storage.

Where possible, Maintenance Supervisors, Superintendents, and/or Managers should monitor weather conditions by accessing local National Oceanic and Atmospheric Administration (NOAA) weather data.

7.29.03 In areas with combustible materials* adjacent to the roadway, except in emergencies:

- During extreme (red flag) Fire Weather Conditions, the use of road flares is prohibited. Planned activities that need road flares shall be canceled.

- During high (yellow flag) and very high (orange flag) Fire Weather Conditions, operations shall include a skid-mounted or similar self-

contained pump and tank unit. This unit shall be mounted on a vehicle and capable of carrying and pumping 200 gallons of water, per the "Fire Prevention Guidelines".

If road flare use is necessary for emergencies during these weather events, a vehicle equipped with fire-extinguishing equipment shall be used in order to monitor and address flares until they have been entirely extinguished.

Call 9-1-1 and radio the local Traffic Management Center (TMC) to inform dispatch and request emergency fire response when a fire incident occurs that cannot be immediately resolved with fire suppression equipment readily available to the crew.

*Combustible material includes trees, brush, grasses, and other vegetation in sufficient quantity to start and maintain a fire.

APPENDIX A

Standard Plans T9 Through T17

For your convenience, attached to this document are the most commonly used Standard Plans. For a complete list, please visit: https://dot.ca.gov/-/media/dot-media/programs/design/documents/locked-2023-std-plans-dor-a11y.pdf

T 9 - Traffic Control System Tables for Lane and Ramp Closures

T10 - Traffic Control System For Lane Closure on Freeways and Expressways

T10A - Traffic Control System For Lane Closures on Freeways and Expressways

T11 - Traffic Control System For Lane Closure on Multilane Conventional Highways

T12 - Traffic Control System For Half Road Closure on Multilane Conventional Highways

T13 - Traffic Control System For Lane Closure on Two Lane Conventional Highways

T14 - Traffic Control System For Ramp Closures

T15 - Traffic Control System For Moving Lane Closure on Multilane Highways

T16 - Traffic Control System For Moving Lane Closure on Multilane Highways

T17 - Traffic Control System For Moving Lane Closure on Two Lane Highways