TRAFFIC OPERATIONS MANUAL

Chapter 125
Transportation Management Plans
Part 1 Transportation Management Plans

March 2026

California Department of Transportation
Division of Traffic Operations

Table of Contents

List of Tables

List of Figures

Section 1 Introduction

The safety of workers, pedestrians, bicyclists, and motorists is the most important part of any construction project. Implementing a transportation management plan (TMP) is an essential step to prioritize safety, enhance mobility, and support active transportation in and around a construction work zone. TMPs outline the temporary traffic control practices and strategies needed for construction, maintenance, and encroachment permit activities on the State Highway System (SHS).

With the construction of California's SHS virtually complete, the California Department of Transportation (Caltrans) has shifted focus from new construction to reconstruction, rehabilitation, operation, and maintenance of existing facilities. Each of these activities can result in additional congestion and traffic incidents, particularly in urban areas, thereby requiring robust traffic management strategies.

Early planning and coordination among Caltrans divisions and districts ensures that planned highway work will not result in extensive traffic delays to the public.

Caltrans districts have used traffic management strategies for decades to move travelers through work zones efficiently and safely. Caltrans Deputy Directive-60 (DD-60) established the TMP program in the year 2000 and outlined strategies needed to minimize traffic congestion during all road work, including construction, maintenance, and encroachment permit activities.

This chapter identifies the processes, roles, and responsibilities for preparing and implementing TMPs, as well as useful strategies for reducing congestion and managing work zone traffic impacts.

Topic 1 Federal and Caltrans Policies

According to Title 23 Code of Federal Regulations 630, Subpart J, federal work zone safety and mobility regulations require Caltrans to adopt a policy for "the systematic consideration and management of work zone impacts" on all federally funded highway projects.

Caltrans DD-60-R2 Transportation Management Plans establishes department policy, including roles and responsibilities in TMP development and implementation.

Caltrans Design Information Bulletin (DIB) 91-02, "Guidelines on the Use of Positive Work Zone Protection (PWP) & Mitigation Measures" provides guidance to apply PWP and mitigation measures in projects on the SHS based on requirements of the Streets and Highways Code, Section 92.1 and Title 23 Code of Federal Regulations 630, Subpart K. DIB 91-02 defines PWP as "devices that contain and/or redirect vehicles and meet applicable industry crashworthiness evaluation criteria. Minimum crashworthiness evaluation criteria must comply with the *Caltrans Traffic Safety Systems Manual*."

Section 2 What Is in a Transportation Management Plan?

Topic 1 General

A TMP includes activities that are implemented to minimize traffic delays that may result from lane restrictions or closures in a work zone. TMP strategies are designed to improve mobility and safety for the traveling public and highway workers.

Topic 2 Transportation Management Plan Strategies

TMP strategies are categorized as follows:

A. Public Information
B. Motorist Information
C. Incident Management
D. Construction Strategies
E. Demand Management
F. Alternate Routes (or Detours)

The TMP strategies selected are dependent on the type of work that is planned, the geographic and demographic area in which the work is located, and the anticipated traffic impacts. This section describes strategies that may be considered where appropriate.

Category A: Public Information

Caltrans maximizes the widespread distribution of travel information to improve mobility and help travelers make informed transportation choices. Due to the broad use of mobile devices, public notification of planned and ongoing highway work is one of the most effective tools for reducing congestion in work zones. When the public is equipped with work zone information before they begin traveling, they have the opportunity to adjust their travel plans.

Advance roadway delay information can decrease the number of vehicles traveling through the work area and can help minimize the inconvenience of delays. Public outreach should include information on alternative transportation modes, such as transit services and bicycle routes, which can be accessed during project construction to reduce congestion. In addition, public awareness campaigns inform the public of the overall purpose of the project and can help generate and maintain public support. Many of these strategies are used for major construction projects but can also be

effectively applied to highway maintenance work or encroachment permit activities that may significantly affect traffic conditions.

Advertisements

Paid or public service announcements of a planned major project may be transmitted through the Internet, newspapers, radio and television ads, and billboards. Paid advertisements may also deliver progress updates or provide information regarding major changes to the work zone configuration and traffic management strategies. A cost analysis should be conducted to determine the expense of developing a public service announcement against the value of the number of targeted road users the information will reach.

Brochures and Mailers

Brochures and mailers are printed materials that contain project-related information such as a notice of the project's start date, schedules, pictures or graphics, a description of the need for the project, transit services, and alternative routes and modes of transportation that are available. These printed materials may be distributed to motorists at key locations, including businesses, rest stops, travel information centers, and automobile associations. They may also be mailed directly to affected businesses and residents in the project area.

Communication With Selected Stakeholders

The most directly affected stakeholders can be identified and sent targeted information during construction regularly through periodic meetings, emails, and social media.

Community Task Force

Developing a community task force that includes stakeholders (such as businesses, neighborhood groups, employee transportation coordinators, interested individuals, public officials, or other representatives) who may be impacted by the work zone may help distribute information related to a transportation project. A task force may also help generate interest and support for a project.

Freight Travel Information

This strategy may be appropriate when there is a moderate-to-high percentage of freight movement through the work zone. It involves coordination with the freight community (including trucking companies and truck drivers) to disseminate useful work zone information (e.g., truck restrictions, locations of traffic incidents, planned closures, and detours). This strategy also requires providing that information to freight stakeholders at central locations or to truckers as they approach the work zone.

Information Kiosk

An information kiosk is a small information center that can provide handouts and other information to individuals passing by. The kiosk should be located in an area with high foot traffic in the general vicinity of the work location, such as shopping malls, rest stops, and gas stations.

Lane Closure System

The Lane Closure System (LCS) is a statewide web-based application that allows Caltrans users to request, review, approve or deny, and monitor planned lane closures on the SHS. The purpose of the LCS is to provide California highway workers and motorists with a dedicated source of information on lane closures on highways. The LCS operates continuously, providing real-time information on lane closures located in both urban and rural areas. Lane closure information is also posted on the Caltrans Planned Lane Closures website and QuickMap, listing the routes involved, the type of work being performed, and the closure end dates and times.

In addition, LCS Mobile is the mobile-friendly interface for the LCS that allows authorized field staff and contractors to update lane closure status in real time directly from a mobile device, improving accuracy, timeliness, and coordination of lane closure information. The following traffic break activities are exempted from the LCS requirements:

- Emergency brief breaks (defined as one minute or less) conducted by a CHP officer or other law enforcement officer to remove items from the traveled way.
- Closures that are already in place, and the engineer authorized an on-duty officer to conduct a traffic break.

Press Releases and Media Alerts

This strategy provides timely project-related information to the news media, affected businesses, and other interested parties using mass media. Project information can be distributed to the following:

- Local and cable television newsrooms.
- Traffic navigation systems groups.
- Schools.
- Major local employers and businesses.
- Emergency services such as fire, law enforcement, and ambulance.
- Social media platforms (to display media alerts).

Leveraging news media such as newspapers, television, and radio is a cost-effective and efficient method of notifying travelers of planned roadway work. Various mechanisms, including e-mail, telephone messages, and mailings can also be used to

communicate information relating to start dates, work schedules, significant traffic pattern changes, transit routes, traffic collisions, and other incidents within the work zone.

Project Website

A project website provides information for a specific work zone, including long-term static information on project plans and progress, as well as real-time interactive information.

Figure 125-1 Example Project Website

Public Information Center

This is a small-scale facility typically located on or near the project site that contains such materials as scale-model displays, maps, brochures, and videos. Public information centers also inform the public of potential traffic impacts, as well as travel alternatives to minimize traffic impacts, such as available transit routes and transit agency contact information.

Public Meetings or Hearings

This strategy involves the project team and public relations staff presenting project information to the community and businesses and soliciting input, such as potential concerns, impacts, and management strategies. Public meetings often use videos, slides, and other presentations to supplement public announcements and public information center displays.

Telephone Hotline

This traveler information strategy provides traffic or travel information for the work zone using a toll-free telephone number. It can include prerecorded messages or real-time interactive information and a link to 511, the travel information telephone direct line for roadside assistance.

Category B: Motorist Information

Motorist information is vital to help travelers who are approaching a work zone and still have time to make a decision that could divert them away from possible congestion. Motorists can play an active role in helping to reduce overall congestion when given information on travel delays or alternative routes before a decision point.

Figure 125-2 Changeable Message Sign Displaying Travel Times

Automated Work Zone Information System

To mitigate recurring congestion and queuing due to construction work, the Automated Work Zone Information System (AWIS) may be considered to inform motorists about upcoming slow traffic. The AWIS is a collection of intelligent transportation system (ITS) elements that are used to give real-time information to travelers in a work zone using a portable changeable message sign (PCMS). The AWIS is also useful if detour routes are rapidly changing due to planned construction activities. For more information, refer to the *Automated Work Zone Information System Guidelines* available on the Caltrans Onramp Intranet.

Changeable Message Signs

Changeable message signs (CMSs) are permanent overhead message signs placed along roadways to notify road users of lane and road closures, work activities, traffic incidents, potential work zone hazards, traffic queues (backups), travel times, delay information, as well as alternate routes in or around the work zone. As noted in the Caltrans *Changeable Message Sign Guidelines*, a CMS that is five miles or less in advance of an active work zone should be considered to advise the traveling public. An example of a work zone CMS message is "WORK ZONE AHEAD - WATCH FOR WORKERS." Communication and coordination with the district transportation management center (TMC) for activation and use of the CMS during construction should be included in the TMP. These overhead CMSs supplement PCMSs. Work zone messages may be preempted by other essential messages as needed.

Highway Advisory Radio

Fixed or portable highway advisory radio (HAR) systems provide detailed messages beyond the limitations of roadside signage. HAR involves disseminating information to motorists over wide-area wireless communications directly to in-vehicle radios. Extinguishable message signs are typically associated with HAR systems where the sign indicates how to obtain information on roadway conditions by tuning into a specific radio station (for example, "Tune into 1610 AM"). These signs turn on and off depending on whether the HAR has a message available. Extinguishable message signs, signs with flashing beacons, CMSs, and PCMSs can be used to inform motorists of the radio frequency for the available information.

Portable Changeable Message Signs

A PCMS can be placed at key locations to notify motorists of lane closures, alternate routes, expected delays, end-of-queue protections, speed reductions, the AWIS, and upcoming road closures. These signs can also be used to inform drivers of speed limit reductions and enforcement activities in a work zone, as well as projected delays or road opening times. The approximate sign placement is included in the project plans. A PCMS is typically deployed as a part of project signing. As a TMP measure, additional PCMSs may be specified when warranted, based on factors such as roadway geometrics or proximity to interchanges.

Radar Speed Message Signs

Portable radar speed systems can be mounted as a fixed sign or located on a portable trailer. Radar measures the speed of approaching vehicles and displays the speed on a sign along with the work zone speed limit. The objective of this system is to enhance safety by encouraging speed limit compliance and limiting the range of speeds among vehicles.

Temporary Motorist Information Signs

Temporary conventional signs mounted in the ground or overhead provide traveler information to guide motorists through the work zone.

Traffic Radio Announcements

Traffic-related information is typically distributed through regularly scheduled traffic reports on commercial radio stations. These reports are usually scheduled during morning and evening peak-hour commute periods.

Traveler Information

Traveler information provides the public with real-time traffic and travel conditions on the SHS. Accurate and available real-time traveler information regarding congestion, chain controls, road closures, incidents, and construction allows travelers to make informed transportation choices. Caltrans makes traveler information available through tools such as QuickMap, Caltrans Highway Information Network (CHIN), and the Commercial Wholesale Web Portal 2. California's regional Metropolitan Planning Organizations also own and manage eight operational 511 Real-Time Traveler Information services.

Figure 125-3 Examples of Traveler Information Services

Wizard Citizens Band Alert System

The Wizard Citizens Band Alert System is a device that continuously broadcasts a message over citizens band (CB) radio that warns approaching drivers of the work zone ahead. The messages can be pre-recorded or recorded on-site and can be transmitted every 30, 60, or 90 seconds. The information specifically targeting truck drivers can be broadcast over any selected CB channel, but channel 19 is the most widely used and typically reaches the largest audience.

Category C: Incident Management

According to the Federal Highway Administration (FHWA), traffic incidents are "unplanned roadway events that affect or impede the normal flow of traffic." When traffic incidents occur in or near a work zone on the SHS, the most effective way to reduce potential congestion is to quickly clear the incident from the roadway. Traffic incidents can range in severity from a flat tire to a multi-vehicle collision involving hazardous waste that may close a section of the highway for several hours. A standard protocol should be established for all traffic incident management (TIM) as part of statewide incident management practices. District traffic managers and TMP managers should then review this protocol and determine whether it needs to be supplemented or if additional strategies are required in certain areas. For example, when a work zone includes areas without shoulders or off-ramps, district traffic managers and TMP managers should consider coordinating with CHP and local responder agencies to share information. For more details on TIM, refer to the *Traffic Operations Manual* Chapter 130, "Traffic Incident Management."

Aerial Surveillance

Helicopters are especially useful in urban areas to identify and verify traffic problems and incidents. Helicopters are normally used when several routes may be severely impacted by traffic congestion on any one route. However, helicopter surveillance is not part of the approved Construction Zone Enhanced Enforcement Program (COZEEP) service. When these services are needed, the district must enter into an agreement with the area CHP office. In addition to helicopters, drones may also be used for aerial surveillance, particularly in urban areas, as they can efficiently identify and verify traffic issues and incidents. However, like helicopter surveillance, drone usage is not part of the approved COZEEP or Maintenance Zone Enhanced Enforcement Program (MAZEEP) program service.

Construction Tow Truck Service (Construction Freeway Service Patrol)

An on-site construction tow truck service, also known as the construction Freeway Service Patrol (FSP), can reduce the time required to detect, attend to, and clear incidents from the roadway by providing tire repairs, gasoline, and towing services to assist motorists during construction periods. Reducing the amount of time that motorists

and disabled vehicles spend near a work zone reduces opportunities for secondary incidents. Construction tow truck services can be provided for a short period (two weeks) at a location where there is no shoulder, or where there is a minimum shoulder width available for a distance of 0.25 miles or more.

Private tow vendors operating under construction tow truck services or traditional FSP perform similar functions in the field. The primary differences between the two programs are in how they are funded, when they operate, and where they are deployed.

Dedicated (Paid) Law Enforcement

Caltrans contracts with CHP to provide enhanced enforcement services through the COZEEP and MAZEEP programs.

For more information, refer to the CHP interagency agreements for COZEEP and MAZEEP on the Caltrans Onramp Intranet.

CHP presence helps manage traffic and provide law enforcement oversight within work zones to enhance safety for workers and the traveling public. The on-site field supervisor (construction or maintenance supervisor) directs CHP officers to perform stationary or roving patrols. These officers may also assist with traffic control measures or emergencies. Priority should be given to these services during nighttime operations and sites where workers are on foot in the work zone. Workers on foot have increased exposure to serious injury or death from errant motorists. Refer to the *Construction Manual* or *Maintenance Manual* for implementation criteria to determine when these services are warranted or recommended. Resident engineers should refer to the Work Zone Enforcement (COZEEP/MAZEEP) Pocket Guide for suggested enforcement strategies as well as essential contact information. The Work Zone Enforcement (COZEEP/MAZEEP) Pocket Guide should be completed and distributed to CHP and other field staff in work zones.

Intelligent Transportation Systems

Note that Transportation Management System (TMS) and ITS elements are often used interchangeably, as both terms refer to the integrated use of technology to monitor and manage transportation infrastructure and flow. ITS elements already installed in the field should be used as part of a TMP when practical. Contractors should maintain ITS elements installed as part of a project in operational condition throughout the duration of the work. This can be accomplished by reviewing contract plans, identifying and evaluating potential impacts on ITS elements, and including the appropriate standard special provisions (SSPs) in contract documents.

Surveillance Equipment

Surveillance equipment such as closed-circuit television (CCTV), loop detectors, lasers, and probe vehicle ITS elements can be used in work zones to identify areas where traffic flow is impeded so that traveler information can be provided and adjustments to

the work zone can be made. Work zone ITS deployment uses sensors to detect traffic conditions and can automatically feed the information to traveler information outlets such as CMSs, websites, or TMCs. Cameras are also used to help identify traffic problems and detect, verify, and respond to expected traffic impacts and incidents in the work zone.

Transportation Management Center

This strategy involves the use of a TMC for coordinating and managing traffic and disseminating incident information. The TMC controls all fixed ITS elements and, in some cases, portable HARs and PCMSs. If the project is large and long in duration, a mobile project-specific TMC vehicle may be used to help manage traffic incidents and maintain efficient traffic flow through and around the work zone. Figure 125-5 depicts the many components used at the TMC.

Figure 125-4 Transportation Management Center Components

Traffic Management Teams

Traffic management teams (TMTs) assist in managing traffic during incidents and planned lane closure activities that are expected to result in significant vehicle queuing. The primary purpose of the TMT is to minimize secondary incidents and end-of-queue collisions. The following services can also be provided by a contractor within the appropriate contract provisions:

- Temporary Automated End-of-Queue Warning System.
- End-of-queue monitoring and warning using pick-up-truck-mounted changeable message signs.

Category D: Construction Strategies

Construction strategies can be effective in reducing congestion in a work zone. These strategies include:

- Innovative construction staging plans.
- Use of contractor incentive and disincentive clauses within the contract.
- Lane requirement charts that require crews to work at night instead of during daily peak commute periods.
- Full closures of a roadway segment for a short period instead of nightly closures for several months or years.
- Use of reversible lanes that can be modified to accommodate peak-hour traffic in either direction.

Similarly, reduced speed limits in work zones may not reduce congestion but may make travel through the work zone safer for workers and the traveling public.

Note: Extended work windows must be considered during project development. In addition, buffer lanes are a work zone safety enhancement strategy and shall be implemented in Caltrans projects, in accordance with the Buffer Lane requirements in Section 12 of the Caltrans Standard Specifications. For additional information on extended work windows, refer to Appendix 125 C, "Extended Work Windows for Highway Work Activities."

Figure 125-5 Example of Highway Construction in District 3

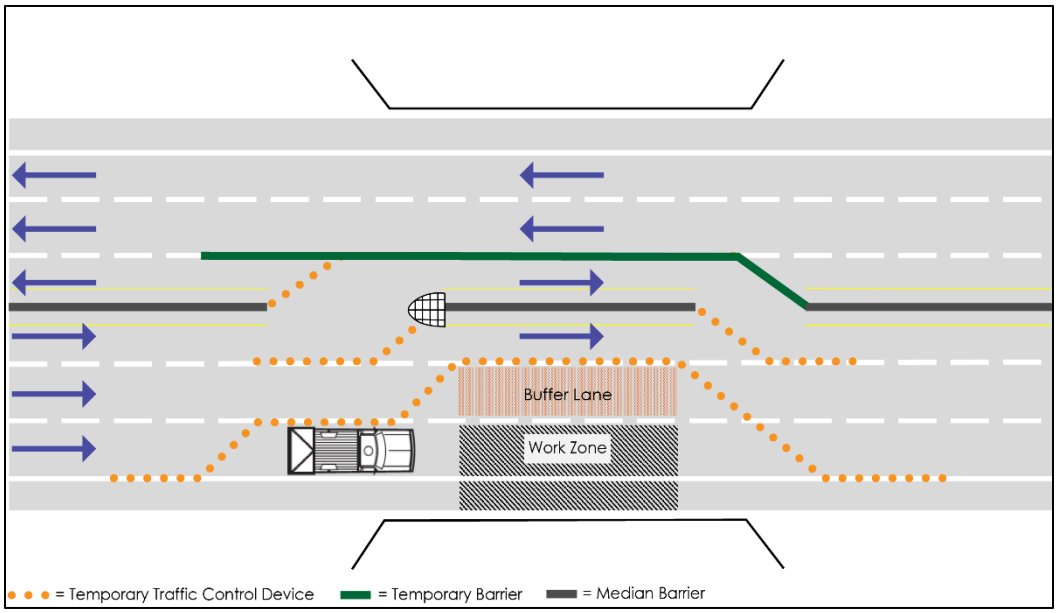
Bus Priority Access

Providing bus-only lanes or other features to ensure buses can travel through a construction zone with minimal delay encourages the use of transit and may decrease the number of vehicles that travel through the corridor.

Bypass Lanes

This strategy involves shifting one or more lanes to the opposite side of the highway while keeping the remaining lanes in operation on the same side of the highway. For example, replacing a concrete barrier of a bridge in the northbound direction on a 6-lane highway with 3 lanes in each direction. Eastbound traffic of lane number 1 is crossed over to westbound lane number 1 and separated from westbound traffic by placing temporary railing (barrier systems). Figure 125-6 shows an illustrative example of bypass lanes.

Figure 125-6 Example Bypass Lanes



Connector Closure

A connector closure involves closing one or more connectors in or near the work zone for specific periods or construction phases to restrict the traffic flow onto the mainline where construction activities are in progress.

Construction Staging

The project Stage Construction Plan shows the sequence of construction activities. The contract plans may identify portions of the project to be completed in a specific sequence to minimize impacts on the traveling public.

Coordination With Adjacent Construction Projects

This strategy involves combining, coordinating, or staging projects within a specific corridor to minimize the combined impacts on the traveling public and community. The objective is to ensure that adequate capacity remains available to accommodate the anticipated travel demand within the corridor by not implementing work zones on adjacent or parallel highways at the same time. This may involve communicating information about the timing of lane closures and coordinating diversion routes. It may also involve completing the necessary capacity and safety improvements on a highway before using it to carry diverted or detoured traffic from another project. Construction staging can be used to remove work at the same location or to address traffic control conflicts between adjacent projects.

Cost-Plus-Time Bidding

Cost-plus-time bidding is a method of determining the lowest responsible bidder and number of contract working days for a project by requiring contractors to bid competitively on both construction cost and project duration. Construction cost is the contractor's price bid for the advertised work and time is the product of the cost of time, which is the sum of liquidated damages, road user costs, and road impact costs. Cost-plus-time bidding is recommended on projects estimated at $1 million or more in construction cost and 100 or more working days.

Extended Weekend Work

A construction work window may allow work to be performed during weekend periods from the end of the Friday afternoon peak period to the beginning of the Monday morning peak period (for example, a 55-hour closure). This strategy may be difficult to implement in an area where there is a high volume of weekend tourist traffic. Consideration should be given to avoiding weekends in areas that may have a high volume of special events or tourist traffic.

Full-Facility Closures

This strategy involves the complete closure of a roadway, either in one or both directions, or a highway-to-highway connector. Full-facility closures should be considered as one of the design alternatives in the project initiation phase. Full closures can minimize the duration of the project and improve worker safety. Full closures may be brief (intermittent, off-peak), short-term (night, weekend), or long-term (continuous for the duration of the project). Caltrans encourages the use of full closures where feasible if adequate advance planning is conducted and appropriate TMP measures are implemented.

An example of using a full closure could be implementing an 80-hour highway full closure to eliminate several consecutive 55-hour closures from a project schedule to minimize future closure impacts on a surrounding community and the traveling public.

Full-facility closures should be considered on projects with the following criteria:

- Nighttime or weekend closures would lead to significant delays.
- Materials or methods require daytime working conditions.
- Longer work windows are required to complete certain activities (e.g., bridge removal, bridge girder installation, paving and chip seal operations, and others).
- Overall delay over an extended construction period could have significant impacts on the traveling public, as well as on commercial interests in the project area.
- Significant reduction in working days is possible (e.g., a 50-75% reduction).

- A viable alternate route must be available that has adequate capacity to accommodate the diverted traffic flow.
- Adequate lead time must be available to provide information to the public and gain support for the work.
- External partners must support the full-closure concept.

For more information on full closures, refer to Appendix 125 A, "Full Closure of Highway Guidelines." For additional information on considerations for full closures, refer to Appendix 125 A, Topic 10, "Project Initiation Phase Full-Closure Conditions to Consider."

Incentive or Disincentive Clauses

This strategy involves using an incentive and disincentive clause in the construction contract to minimize construction duration. Caltrans pays the contractor the incentive for each day the corresponding work part is completed in fewer days than the days shown in the contract documents. Caltrans also deducts the disincentive for each day the corresponding work part is completed in more days than the days shown in the contract documents. After consulting with the district traffic manager and TMP managers, the project engineer provides calculations to support incentive and disincentive clauses.

Innovative Construction Techniques

The use of special materials, such as rapid-curing concrete or precast items (e.g., culverts, bridge deck slabs, and pavement slabs) can be used to minimize the duration of construction or maintenance activities. These techniques should be used when traffic restrictions need to be minimized (e.g., roadways with high volumes), and when work activities need to be completed during night or weekend periods to allow for the reopening of traveled lanes for normal weekday travel.

Other innovative construction techniques that can expedite construction completion time and minimize the impact on the traveling public by reopening travel lanes include intelligent compaction and slide-in bridge construction. In real time, intelligent compaction rollers use vibration and a computer system to collect, process, and analyze measurements. Intelligent compaction rollers can compact greater amounts of pavement and at the same time analyze the collected data to complete the work in a shorter period, thus opening the traffic lanes sooner. As noted in the FHWA *Slide-In Bridge Construction Implementation Guide*, slide-in bridge construction is a cost-effective technique for quickly replacing an existing bridge. A new bridge is built on temporary supports parallel to an existing bridge. When construction is complete, the road is closed and the existing bridge structure is demolished (or slid out of the way) and the new bridge is slid into place, tied into the approaches, and paved within 48 to 72 hours. These techniques may require short-term full closures, such as a 55-hour weekend closure.

Interior Lane Closure

This strategy is useful when planning stage construction for work being performed on an interior lane on a conventional highway. Refer to *California Manual on Uniform Traffic Control Devices* (*CA MUTCD*) Figure 6P-21, "Typical Application 21 Lane Closure on the Near Side of an Intersection" for a strategy illustration. Stationary interior lane closures are not allowed on highways per the *CA MUTCD* Chapter 6P, "Typical Applications."

Lane Modifications

It is essential to maintain the existing number of highway lanes to the extent possible. This can be done through lane modifications, which are typically in place for extended periods. Special consideration should be given to accommodate extra-high and extra-wide trucks where possible. During construction, reducing lane width to less than 11 feet requires concurrence from the district Safety Review Committee and the district Constructability Review Committee. Lane modifications must also consider bicyclists, pedestrians (if allowed), and emergency parking. Efforts should be made to limit the time a lane or shoulder is closed or reduced in width. Modifications may include the following:

- **Reducing Lane Widths to Maintain the Number of Lanes (Constriction).** This involves reducing the width of one or more lanes to maintain the existing number of lanes on the facility while permitting work access to part of the facility.
- **Buffer Lane to Provide Worker Safety**. This strategy involves closing a lane to separate the lane carrying traffic from the work area to enhance the safety of workers and allow errant vehicles to recover safely. Buffer lanes will be implemented in Caltrans projects, in accordance with the buffer lane requirements found in Section 12 of the Caltrans Standard Specifications. The closure period for the buffer lane shall be in accordance with the lane requirement charts. For time periods at the beginning or end of work, when the lane requirement charts do not allow the closure of the adjacent traffic lane, certain construction activities are allowed. Refer to the latest specifications for allowed work activities that can be performed during this period without a buffer lane. Exceptions to using buffer lanes on a qualified project shall be approved by the District Director and documented in the project files. Buffer lanes may be considered in maintenance activities and encroachment permit projects.
- **Reducing Shoulder Width to Maintain the Number of Lanes.** This involves reducing the width of the shoulder for use as part of the traffic lane by shifting traffic onto the shoulder, allowing access for the work activities to take place. The shoulder pavement section should be verified for adequacy to handle mainline traffic before using this strategy.
- **Closing Shoulders to Provide Worker Safety.** This strategy involves closing the shoulder to the public and making it available to accommodate work activities.

Where bicyclists or pedestrians are allowed, shoulder closures must provide for alternate accommodations.

- **Shifting Lanes to the Shoulder or Median to Maintain the Number of Lanes**. This strategy involves diverting traffic onto the shoulder or median, or a portion of the shoulder or median, for use as a traffic lane. In addition, shoulder or median pavement may need to be rehabilitated after the traffic shift is completed. This additional work should be shown in the contract plans.

Lane Requirement Charts

The lane requirement charts are project-specific and identify the number of lanes that must be open for traffic each hour of the day to minimize delays when work activities are being conducted. These charts restrict work hours so that traffic is not affected during periods of peak travel demand and congestion (e.g., peak hours, holidays, or special events). Work is typically performed during off-peak periods, such as at night, to minimize work zone impacts on motorists and adjacent businesses. This allows the TMP to extend the work windows for half an hour at each end of the work window. The lane requirement charts can be found in the Standard Special Provisions 12-4.02C(3).

Maintain Business Access

When a project has a direct impact on businesses, accessibility issues may warrant signage or specific information to direct motorists to the businesses and relocation of access locations.

Night Work

Work is performed at night (end of the evening peak period to the beginning of the morning peak period) to minimize work zone impacts on motorists and adjacent businesses. Consideration should be given to worker safety, potential noise impacts on residents, and temperature requirements for paving operations.

One-Way Reversing Operation

On two-lane highways, one-way reversing traffic control involves alternately stopping traffic in one direction, allowing work activities to occur in the lane that is closed. The TMP manager determines the maximum allowable delay that each direction should be stopped for so that motorists do not experience undue delays.

Pedestrian and Bicycle Access Improvements

This requirement involves providing alternate facilities for bicyclists and pedestrians following Deputy Directive 64-R2 (DD-64-R2) in places where the work zone may impact their accessibility and movement during highway work activities. Provisions for a shuttle

service may be necessary (for more information, see "Shuttle Services" later in this section).

Railroad Crossing Controls

When a rail crossing is located within a work zone, detour, or diversion route, traffic control enhancements at the crossing may become necessary for safety purposes, especially if work zone delays and congestion have the potential to force vehicles to stop on the tracks or between the crossing gates. Enhancements may include advance warning signs, railroad crossing signs, pavement markings, flashing lights, gate arms, flaggers, or law enforcement officers, and possibly the closure of the railroad crossing to traffic during work periods.

Ramp Closure and Relocation

A ramp closure involves closing one or more ramps in or near the work zone for specific periods or construction phases to allow work access. In some cases, a temporary ramp may be constructed to maintain access. SSPs typically do not allow for the closure of consecutive ramps.

Reversible Lanes

This strategy, also known as variable lanes, involves sharing lanes of travel to accommodate peak-period traffic flow. The direction of travel in the shared lane switches by the time of day or day of the week.

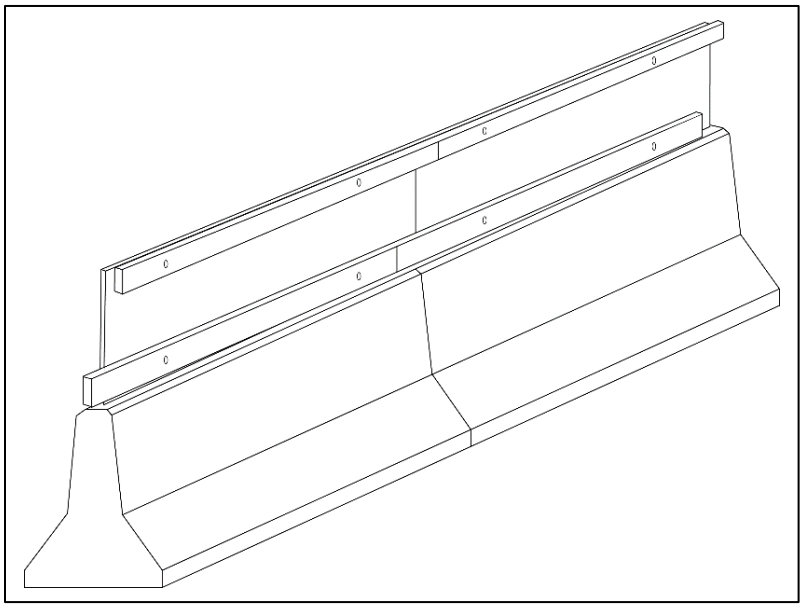
Traffic Handling Plans

Traffic handling plans contain sufficient alignment detail, profiles, and typical cross-sections to guide traffic through the work zone in the sequence shown in the Stage Construction Plan.

Traffic or "Gawk" Screens

Traffic screens, sometimes referred to as "gawk" screens, help prevent driver distractions in work zones by blocking motorists' view of construction or maintenance activities. This strategy helps to keep traffic moving and enhance safety. Screens may be mounted on top of temporary traffic barriers to discourage distracted driving. Figure 125-7 shows an illustrative example of a traffic screen.

Figure 125-7 Example Traffic Screen



Two-Way Traffic on One Side of a Divided Facility

This strategy involves closing one side of a divided facility to permit work to proceed without traffic interference while both directions of traffic are accommodated on the opposing side of the roadway. Refer to *CA MUTCD* Figure 6P-39, "Median Crossover on a Freeway (TA-39)" for a strategy illustration.

Category E: Demand Management

Demand management strategies can be used to encourage motorists to travel using carpools or mass transit, or to alter their work hours to reduce the typical peak-hour traffic volumes. Rideshare incentives include free transit tickets or tickets at a reduced price. Park-and-ride lots can be built as a part of the project to encourage commuters to travel together both during and after construction.

When pursuing this strategy, TMP teams should contact local transit providers to establish a plan, using the elements described in this topic, to use existing transit services and resources to lessen the impact of the construction project on person throughput in the corridor. Public information methods should educate the public on the plan and transit elements that are available. This could lead to a short-term reduction of traffic during construction and might lead to long-term benefits of increased ridership after the project is finished. Transit incentives should be considered for all projects and implemented when deemed effective.

Park-and-Ride Promotion

This strategy involves the development, expansion, and promotion of park-and-ride lots to encourage ridesharing or transit use, thus reducing the number of vehicles traveling through the work zone.

Parking Supply Management

This strategy involves reducing traffic demand in the work zone area by limiting parking supply, typically through price increases.

Ramp Closures

Temporary closure of one or more on-ramps in or around the work zone may be used to improve traffic flow on the mainline. Consideration must be given to notify emergency services and to provide adequate alternatives for emergency vehicles.

Ramp Metering

Ramp meters are traffic signals located on on-ramps or highway connectors designed to decrease demand on a highway facility by controlling the entrance of vehicles and matching entering vehicles to gaps in the traffic stream. Strategies for ramp metering include preset timing, traffic-actuated metering changes (based on mainline traffic volumes), or centrally controlled metering. Ramp metering may be used during peak periods or all day to modify on-ramp traffic directly upstream of the work zone. Portable or temporary ramp meters are also options.

Ridesharing and Carpool Incentives

This strategy involves the use of ridesharing or carpool incentives to reduce the number of vehicles traveling through a work zone. Incentives may include preferential parking for carpools, the addition of mainline high-occupancy vehicle (HOV) lanes or bypass lanes on on-ramps, and provisions for vanpool vehicles.

Shuttle Services

Shuttles and charter buses can reduce traffic volumes through a work zone if enough users along the corridor are anticipated to use the service. Shuttle services must be used where pedestrians or bicyclists are allowed and do not have alternate access through a work zone.

Telecommuting

Telecommuting is working outside of the traditional office or workplace, usually at home. Motorists, particularly in urban areas, who normally travel through the work zone,

can be encouraged to telecommute for the duration of a project to reduce travel demand.

Transit Incentives

Transit incentives include employer or traveler transit subsidies and guaranteed ride-home programs.

Transit Service Improvements

Where appropriate, transit service improvements may include modifying transit schedules or routes, increasing frequency, or establishing transit service in or near the project corridor.

Truck and Heavy Vehicle Restrictions

This strategy encourages truck drivers to use detours or alternate routes during specific periods, or at all times, increasing passenger vehicle capacity of the roadway on a facility that normally has a high truck volume.

Variable Work Hours

This strategy involves encouraging motorists who typically travel through the work zone during peak periods to work variable hours (off-peak) to reduce travel demand.

Category F: Alternate Routes or Detours

Alternate route (or detour) strategies can be used to allow travelers to avoid the work zone completely by diverting to other highways or adjacent surface streets. This strategy includes identifying adequate detours or alternate routes and coordinating with the agencies responsible for those routes and the transit services on the routes. Use of a detour may require improving the effectiveness of the detour route by restricting parking or placing traffic control officers at critical intersections to help move traffic along during peak periods. Bicyclist and pedestrian accommodations (e.g., access and length) must be considered when using alternate routes during construction. An example of a detour route is shown in Figure 125-8.

Figure 125-8 Example Detour Route in District 4

Bus Turnouts

This strategy involves constructing bus stop areas that are separate from the travel lanes. This strategy may be helpful in work zones or on detour routes with a high frequency of bus traffic.

Off-Site Detours and Use of Alternate Routes

This strategy involves rerouting some or all traffic from the roadway under construction or repair to other roadways. Detours need to be evaluated to accommodate extra-high and extra-wide truck loads. Any restrictions must be reported to the HQ Division of Traffic Operations, Office of Commercial Vehicle Operations. Before the work begins, it is recommended to record the condition of the detour route to allow assessment of the roadway condition after the work is completed. During the work, traffic conditions on detours should be monitored to make sure that motorist delays remain within acceptable levels.

Parking Restrictions

This strategy involves restricting parking in all or part of the work zone or alternate routes during work hours or peak traffic periods along alternate routes. Parking restrictions can be used to:

- Increase capacity by converting the parking lane to an additional travel lane.

- Reduce traffic conflicts.
- Provide improved access to the work area.

Signal Timing and Coordination Improvements

This strategy involves retiming traffic signals to increase vehicle throughput on the roadway, improve traffic flow, and optimize intersection capacity in and around the work zone. Signal timing and coordination could include transit vehicle priority.

Street and Intersection Improvements

Improvements to streets and intersections on the roadway or alternate routes may be necessary to provide increased capacity to handle the traffic through the work zone or within the adjacent corridor. This may include improvements to the mainline and intersections, such as widening the roadway or shoulder and constructing new through lanes and turn lanes. Pedestrian, bicycle, emergency vehicle, and transit needs should be considered to maximize the positive impact of alternative modes.

Temporary Traffic Signals

Installing temporary traffic signals can improve traffic flow through and near the work zone. At a corridor or network level, using temporary traffic signals is more effective at providing mobility through the work zone area than stop signs or flaggers. These temporary traffic signals may also be coordinated with existing signals.

Turn Restrictions

This involves restricting turning movements for driveways and intersections to increase roadway capacity, reduce potential congestion and delays, and improve safety. Restrictions may be applied during peak periods or all day.

Topic 3 Preliminary Information Needed for Developing a Transportation Management Plan

When developing a preliminary TMP, use the most current layout of the roadway (geometrics) information and plans available. This may require a field review of the project site before developing a TMP. The most current traffic volumes, either at the specific location or as close as possible to the work zone site, should be used to determine possible traffic impacts. Traffic information can be accessed through sources such as the Traffic Census Program website, Caltrans Performance Measurement System (PeMS), special manual vehicle and occupancy counts, and tachometer surveys, which provide time and speed information. If current traffic counts are not readily available, a request for a new count should be submitted to the district traffic census staff.

Traffic data is typically used to determine the expected traffic delay at the work site and the work windows that will be made available. Sometimes projects that have been programmed and funded are "shelved" or delayed for a year or more due to funding, right-of-way, or environmental issues. When these projects are put back on the schedule, the traffic volumes and associated work windows need to be reviewed and updated to reflect the latest traffic conditions.

Consider the following information when developing a TMP:

- Latest traffic volumes (including motorized, non-motorized, and truck traffic).
- Concurrent corridor (including conflicting) construction projects.
- Lane closure policies and procedures.
- Length of project (in miles).
- Political or environmental issues.
- Urban versus rural conditions.
- Multijurisdictional communication and buy-in.
- Time constraints (including duration).
- CHP and local law enforcement involvement.
- Transit and railroad services.
- Percentage of truck volume.
- Viability of alternate routes.
- Business and affected activity center impacts.
- Impacts on bicyclists, pedestrians, senior citizen facilities, or schools.
- Clearance of alternate routes in compliance with the Surface Transportation Assistance Act, Title 23 United States Code, Section 101, that are suitable for oversized trucks.
- Current project layout, staging, and traffic handling. Construction staging involves organizing construction activities into manageable phases to optimize efficiency and safety. Traffic handling manages vehicular, bicyclist, and pedestrian traffic around the construction site to ensure safety and minimize disruptions. While construction staging may focus on the construction process, traffic handling specifically deals with managing traffic flow during construction.
- Direct project impacts on census, ITS, TMS, and other state facilities.

Topic 4 Transportation Management Plan Classifications

TMPs can be classified by the anticipated impact of the highway work on the traveling public. The district TMP manager determines the type of TMP required for the proposed work. The three TMP classifications are described as follows.

Blanket Transportation Management Plans

Certain low-impact maintenance and encroachment permit activities do not require the development of detailed work-specific TMPs. A blanket TMP may be appropriate for activities performed during off-peak hours on roadways with low volumes. Blanket TMPs may range in detail from district traffic manager approval for a lane closure to a few selected strategies (e.g., PCMS activation) taken to keep delay below the delay threshold. District maintenance and encroachment permit offices must have a list of activities for which blanket TMPs can be used. Depending on the type and duration of the proposed work, a blanket TMP may also include a one-page description of the activities to be performed and contact information for personnel involved in the activities.

Certain low-impact maintenance and encroachment permit activities do not require the development of detailed work-specific TMPs. The following is a list of activities that typically occur off the traveled way and require a blanket TMP:

- Litter removal.
- Highway patrol for debris and litter.
- Tree work (such as trimming and pruning).
- Landscaping (such as irrigation and repair, weed control, trimming, pruning, thinning, and replacing).
- Delineator and post mile marker repairs and replacements.
- Culvert and drainage facility work (such as cleaning and inspection).
- Sign repairs and replacements.
- Median barrier, guard rail, and attenuator repairs.
- Right-of-way fence repairs.
- Sump pump repairs and cleaning.
- Ditch and channel cleaning.
- Maintenance at public facilities, such as safety roadside rest areas, vista points, map view areas, weigh stations, and park-and-ride lots.
- Graffiti abatement and cleanup on walls, signs, and equipment cabinets.

- Tree, brush, and vegetation work in non-landscaped areas.
- Electrical work on a non-traveled way.
- Roadside mowing.
- Shoulder area grading for lateral support.
- Electrical work, such as traffic census counters, loops, and cabinet maintenance.

The following is a list of activities that can be suspended (and the shoulder or lane closure opened) if unacceptable delay occurs:

- Pavement marking operations.
- Sign lighting repair.
- Traffic signal knockdown repairs.
- Litter and debris sweeping operations.
- Moving shoulder or lane closure operations.
- Asphalt Concrete (AC).
- Portland Cement Concrete (PCC) pavement crack sealing.
- Pothole repairs.
- Drain inlet cleaning.
- Pavement striping operations.
- Raised pavement marker replacement.
- Sign and highway lighting re-lamping operations.
- Roadside vegetation control operations, such as spraying or mowing.

The following is a list of work that must be completed before reopening to traffic (shoulder or lane closure open).

- Moving shoulder and lane closure operations.
- PCC pavement slab replacement.
- Pavement chip seals.
- Culvert replacement operations.
- Guardrail and gore attenuator repairs.
- AC pavement blankets.
- Pavement mud jacking operations.
- Most bridge repairs on the traveled way.
- Pavement grinding (AC dig out) operations.
- Traffic counting element work (such as loop detectors).

Minor Transportation Management Plans

Certain activities may result in traffic impacts on the SHS that are not significant, as defined in this document, and may require a minor TMP. A minor TMP will likely include lane requirement charts specifying when the work can be conducted. Depending on the type and duration of the proposed work, a minor TMP may also include a schedule and detailed description of the activities to be performed, as well as the TMP strategies to be used, such as enhanced enforcement services, motorist information (e.g., PCMS), and advance public information provided to the media.

Major Transportation Management Plans

Major TMPs are prepared for capital, encroachment permit, and maintenance projects that could significantly impact traffic. Some major TMPs may involve full closures, weekend closures, and continuous closures. Generally, major TMPs are identified as follows:

- Multijurisdictional in scope: encompasses the interests of CHP, local law enforcement; city, county, and regional governments; bordering state transportation departments; employers, merchants, developers, transit operators, ridesharing agencies; neighborhood and special interest groups; emergency services, and transportation management associations.
- Multifaceted: comprised of traffic operations, facility enhancement, demand management, and public relations strategies, as well as more traditional work zone actions, construction methods, and contract incentives that are customized to meet the unique needs of the impacted corridor.
- In place over an extended period, sometimes implemented a year or more before the start of actual construction, with specific elements often implemented incrementally to coincide with construction phasing.

Major TMPs may include the full spectrum of strategies, including lane requirement charts, special provisions for unique project characteristics, a large-scale public awareness campaign (with brochures, public meetings, a project website, and a telephone hotline), COZEEP services, construction tow truck services, detours to alternate highways or surface streets, and special arrangements with local transit services to accommodate a significant increase in ridership.

Topic 5 Transportation Management Plan Resources

The development of TMP strategies is a continuous effort to efficiently and effectively manage traffic in work zones on the SHS.

Statewide Transportation Management Plan Resources

For further guidance or questions on the TMP process, contact the district TMP manager. For questions regarding TMP policy, contact the Headquarters Division of Traffic Operations Office of Traffic Management. Organizational charts and contact information are available on the Caltrans Onramp intranet and the Transportation Management Plan public website. External entities may contact their local Caltrans office.

Sources of Transportation Management Plan Information

Refer to the Federal Highway Administration's *Developing and Implementing Transportation Management Plans for Work Zones* publication for a comprehensive work zone strategies matrix that provides information on triggers for considering various strategies, potential benefits and challenges, and other considerations that can help to determine the best project strategies.

For additional guidance on selecting the most effective TMP elements while considering cost, refer to Wilbur Smith Associates' *Traffic Management Plan Effectiveness Study* and Frank Wilson & Associates' *A Traffic Management Plan Study for State Route 91 During Construction of HOV Lanes.*

The district Public Information Office (PIO) is also an experienced source for public awareness campaign strategies that can help the TMP manager estimate the cost and effectiveness of the proposed TMP strategies in reducing traffic demand throughout the project area.

Section 3 Transportation Management Plan Process

Topic 1 Process Overview

TMP development begins at the initiation of the planning process. Capital projects begin with the preparation of a TMP datasheet or checklist for each phase of the project as part of the project initiation document (PID) process. The TMP is a "living" document and continues to be modified as work information warrants it. Frequently, after construction or maintenance activities begin, if traffic conditions differ from what was anticipated, changes in TMP strategies may be necessary to keep motorist delays below acceptable levels. Any modifications to the TMP should be approved by the TMP manager.

Corridor, Regional, and Multifunctional Area Transportation Management Plans

When multiple or consecutive projects are within the same general corridor, the cumulative impact can result in excessive traffic delays, detour conflicts, and work conflicts. These may be multiple capital projects, the involvement of more than one district or local jurisdiction, or a combination of capital projects and encroachment permit and maintenance activities. Corridor, regional, and local coordination will mitigate these impacts and thereby minimize inconvenience to the traveling public.

When multiple projects are in the same corridor or on corridors within the same traffic area, it may be possible to develop a single corridor or regional TMP. In other cases, individual TMPs are developed and funded from individual project sources and a "bare bones" corridor or regional TMP addresses the cumulative impact. Each project covered by the corridor and regional TMP contributes resources in proportion to its traffic impact.

The TMP manager coordinates the development and implementation of corridor and regional TMPs. The TMP manager forms a TMP team including, at a minimum, representatives from Caltrans Divisions of Construction, Maintenance, Project Management, and Traffic Operations for each of the affected districts. The district PIO and CHP participate as needed. The initial meeting is held several months in advance of construction to set milestones and allow time to prepare and distribute project information.

During TMP implementation, the TMC serves as a central hub for information and coordinates operations. The TMC helps identify conflicts and recommends appropriate action. When provided with accurate and up-to-date lane closure information, the TMC provides real-time traffic information through electronic media, CMS, PCMS, QuickMap, and HAR.

The corridor or regional TMP may call for strategies in addition to the strategies provided by the individual TMP for each project. Additional strategies may include using existing CMS, placing PCMS at key locations outside individual project limits, establishing an information hotline, publishing websites for all projects involved, using the statewide 511, and utilizing the TMCs as central reporting hubs.

If the corridor or regional TMP calls for strategies beyond the individual project TMP, it is recommended that:

- The requirement should be included in one of the corridor projects as part of the project plans and SSP.
- The service should be provided through a construction change order on one of the corridor projects.

Transportation Management Plan Team

For major TMPs, the TMP manager solicits team members based on the project's proposed TMP elements and anticipated traffic impacts. The TMP team may include representatives from the following:

- Divisions of Design, Project Management, Construction, and Traffic Operations.
- PIO or Public Affairs.
- Local law enforcement, transit, and emergency services agencies.
- FHWA.
- CHP.
- District staff, such as the district transit representative, district bicycle and pedestrian coordinator, and field staff from the Division of Maintenance.
- Other entities as appropriate.

Topic 2 Transportation Management Plans in the Project Initiation Document Phase

The extent of a TMP is determined by the district TMP manager during the preliminary studies of a capital project. At the request of the project initiating unit (typically design or planning), the TMP manager coordinates the preparation of TMP information that will be included in the PID phase. Projects are generally programmed, budgeted, and scheduled upon project approval at the end of the PID phase. It is extremely important to identify the proper scope and cost of the TMP activities in the PID, as significant post-PID approval changes will be difficult to obtain.

As soon as possible and before PID approval, the initiating unit sends conceptual geometrics to the district TMP manager and district traffic manager for evaluation. The TMP manager and the district traffic manager estimate the extent of the TMP required

and determine whether potential traffic delays are anticipated that cannot be mitigated by traditional traffic handling practices or well-planned construction staging.

Transportation Management Plan Datasheet Preparation

During the PID process, the TMP manager coordinates the development of the TMP datasheet. The datasheet identifies the proposed TMP strategies that may be included to minimize the traffic impacts of the planned work. For a sample TMP datasheet, refer to Appendix 125 B. Contact your district TMP manager to identify the information that will be needed.

For all TMPs, an itemized estimate of the proposed strategies and their respective costs may be included in the TMP for proper funding consideration. If an itemized estimate is not included, the TMP manager should review the project cost estimate prepared for the PID.

Transportation Management Plan Cost Estimate

A TMP cost estimate should be developed for each alternative being considered and should not be based solely on the project cost. The cost of a TMP could range from a small percentage of the project cost to 10% or more, and often is not dependent on the size of the project. The cost of the TMP strategies should be weighed against the potential delay savings that the motorists might experience, as well as mobility and safety effects on all modes of travel.

Topic 3 Transportation Management Plan During the Project Approval and Environmental Document Phase

During this phase, studies of the identified alternatives are performed to determine the preferred TMP alternative. During the development of the project concept and staging, the design office can incorporate traffic considerations that could potentially eliminate the need for extensive and expensive TMP strategies. During this phase, the highest-level deliverables completed are the project report and the environmental documents.

Transportation Management Plan Refinement During the Project Approval and Environmental Document Process

The planning or design team should work with traffic engineering or operations personnel and other relevant technical specialists (e.g., right-of-way experts, pavement engineers, and environmental specialists) to obtain the necessary project information and help identify potential issues or concerns. This collaboration can help to develop the best combination of design, construction phasing and staging, and work zone management strategies. With proper planning, potential traffic problems can be eliminated by modifying the design or construction phasing.

If traffic studies are needed to develop TMP strategies, they should be initiated as soon as possible to make sure that the necessary data is available. As information becomes available during the project approval and environmental document (PA&ED) phase, the preliminary scope and cost of the overall TMP and the individual elements should continue to be refined. The TMP manager (or TMP team for a major project) will coordinate the TMP strategies with the project engineer and appropriate functional units, with each team member handling their area of expertise. For major projects, subcommittees or task forces may be formed to handle the planning, implementation, monitoring, and evaluation details of specific elements.

For major TMPs, a schedule should be developed at this point in the process. Many TMP elements may be bid and then constructed or initiated separately from the project, or may be included in the project plans and then installed or implemented as the first order of work. On major capital projects, public awareness campaigns may need to be initiated well before the actual work begins, often a year or more in advance. For example, if new park-and-ride lots are necessary for the ridesharing element, the planning phase would have to be extended for several months and a design phase added.

An additional activity involves analyzing the existing traffic volume and user mix, such as pedestrians, bicyclists, trucks, and buses in the corridor both on the highway and surface streets. This will provide the basis for establishing the goal of the TMP and determining the capability of the surrounding surface streets to handle the additional vehicular demand and impact on bicyclist and pedestrian traffic. Considering transit alternatives and service enhancements may decrease the need for other investments.

Topic 4 Transportation Management Plans During the Plans, Specifications, and Estimates Phase

The project engineer should coordinate with the TMP manager to ensure that all TMP requirements are addressed in the SSPs, engineer's estimate, and project plans.

Preparation of Transportation Management Plans During Design

During the project design phase, the TMP manager may further develop or modify the TMP strategies as details of the work become more specific. Design engineers should consider work zone impacts in the evaluation and selection of the project alternatives. For some projects, it may be possible to choose a design alternative that alleviates many work zone impacts. These broader strategies cross various disciplines and highlight the need for a multidisciplinary approach. As the design progresses, a selected alternative is typically chosen and the TMP is reviewed and updated to reflect the most current project information. During this time, the highway's historical conditions and current traffic volumes are evaluated to determine the anticipated traffic impacts during construction and to verify that the appropriate TMP strategies are being proposed.

The TMP manager receives input from the other divisions that may be involved with the project development team (PDT) or the TMP team if one is established. The team would typically include staff members from the Divisions of Design, Project Management, Construction, Traffic Operations, Maintenance, and the PIO. The team should also include CHP and any local agencies that might be affected by the project.

Caltrans maintains standard plans and standard specifications that include typical traffic control plans. Any deviations from the standard plans and standard specifications, such as detours or special work windows, require specific SSPs or special details that should be included in the project plans for TMP-related work that needs to be implemented by the contractor. All TMP-related special details and SSPs, or changes to SSPs, must be approved by the TMP manager. Any non-standard special provisions (NSSPs) must be approved by the specification owner or designee and the district construction office.

Acceptable Delay Thresholds

Lane requirement charts are prepared based on historical traffic volumes at the specific location. The best available traffic data should always be used to develop the charts.

If current traffic counts are not readily available, a request for new counts should be submitted to the local district traffic census staff.

Lane requirement charts are ideally prepared in such a way that no congestion will result from the work. In other words, "zero delay" will be expected.

Certain activities, such as approach slab replacement, falsework, chip seal operations, and others, may require more time than the "zero delay" charts allow. The design engineer, TMP manager, and district traffic manager should work together to identify activities that require a longer work window. At a minimum, the charts should be adjusted to provide a half-hour increment at each end of the work window. The TMP would then need to be modified to mitigate the traffic impacts created by the longer work window.

If the project has been taken off the shelf and is being resurrected, the lane requirement charts should be reviewed and, if necessary, updated using the latest traffic volumes available.

Construction Work Windows

Through TMPs, Caltrans strives to strike a balance between reducing the overall construction duration, minimizing disruption to the traveling public, and maximizing safety in the work zone. DD-60-R2 states that the maximum allowable delay at any location at any time should be limited to less than 30 minutes. Applying this criterion has resulted in a general shift from day work activities to night work, particularly for capital projects.

In general, this strategy has been successfully implemented. However, its effectiveness has been questioned in circumstances where materials or methods require day work conditions or where longer work windows are required to complete certain activities. Overall delay over an extended construction period could have significant impacts on the traveling public as well as commercial interests in the project area.

Congestion in work zones with high traffic volumes is typically minimized by only allowing work to be conducted during off-peak traffic periods. For example, in urban areas, peak hours might occur between 6 a.m. to 10 a.m. and 3 p.m. to 7 p.m. during weekdays. Peak-hour traffic volumes during weekdays do not allow for adequate daytime work windows and certain highway work activities often can only be conducted at night. Night work that involves noisy equipment, lighting operations, or both could create a nuisance for residential housing nearby, while pile driving during working hours could also be a nuisance for businesses in the area.

Alternative construction strategies and work windows should be considered early in the design phase, for example, during the PDT process. These alternative strategies might include the following:

- Extended closure options, such as:
    - 55-hour weekend closures (typically from 10 p.m. on Friday until 5 a.m. on Monday).
    - 72-hour weekday closures.
    - Continuous closures (10 days, including weekends).
- Full closures in one direction or both directions.
- Closed facility for all vehicles except for buses.

Extended work windows and full closures often enhance safety and provide a shorter project duration, which may result in cost savings and overall delay savings to the traveling public. These alternatives reduce the time needed to set up and break down traffic control and construction equipment, resulting in more effective work time. For example, a project team may opt for a continuous nine-day closure of the full facility (alternately in each direction), rather than six months of night work. For more information on extended work windows, refer to Appendix 125 C, "Extended Work Windows for Highway Work Activities."

The use of alternative work windows must consider the need for revised or additional public awareness strategies. The district PIO should be included when determining which strategies are needed and the appropriate timing for implementation.

Traffic queueing can introduce safety concerns. These queues can often result in secondary traffic incidents (usually rear-end collisions) when motorists fail to slow down for the end of the queue. When using alternative work windows or extended work windows beyond the lane requirement chart hours, it is crucial to warn motorists approaching the anticipated end-of-queue. End-of-queue warnings can be implemented by the contractor or the district TMT.

If the work methods cannot be modified or avoided, select the least detrimental period and be sure to notify the public of why the work is necessary and when it will occur.

Pedestrian and Bicycle Traffic

Work zone activities can disrupt the public's mobility and access. Temporary lane restrictions, use of shoulders as travel lanes, detours, and other transportation management strategies should be designed to accommodate vulnerable road users wherever they are legally permitted. Safe and convenient access should be maintained for pedestrians and bicyclists, who are susceptible to disruptions because of their slower speeds and sensitivity to noise, airborne dust, road debris, and fumes. Special care should be taken to consider areas where the elderly, individuals with disabilities, or children are concentrated, such as schools or senior citizen centers. A travel path that replicates, if possible, the most desirable characteristics of their usual travel route should be provided.

Temporary Traffic Control

An essential part of highway construction, utility work, maintenance operations, and traffic incident management is accommodating the needs of all road users through a temporary traffic control zone, including motorists, bicyclists, pedestrians, and persons with disabilities following the Americans with Disabilities Act of 1990 (ADA). The *CA MUTCD*, Part 6 "Temporary Traffic Control" contains guidance on pedestrian and bicyclist accommodation, as well as figures that can be adapted for traffic handling plans. Figure 6P-29 "Crosswalk Closures and Pedestrian Detours (TA-29)" shows typical temporary traffic control device usage and techniques for pedestrian movement through work zones. Public participation should be used to determine the extent of public impacts of proposed construction activities and to discuss the appropriate temporary accommodations that can be reasonably achieved.

- DD-64-R2 on Complete Streets - Integrating the Transportation System requires full consideration of non-motorized travelers, including pedestrians, bicyclists, and persons with disabilities in all programming, planning, maintenance, construction, operations, and project development activities and products.
- Design Information Bulletin 82-06 on Pedestrian Accessibility Guidelines for Highway Projects provides highway design guidance to accommodate persons with disabilities within a public right-of-way. This document satisfies the requirements of the ADA.

Transit Services

When preparing a TMP, the team should meet with local transit agencies to understand existing transit services, ensure the transit level of service remains at an acceptable rate, and find ways to promote the use of this transportation mode. An increase in transit

ridership leads to a decrease in the number of vehicles that must be accommodated during project construction.

Transportation Management Plan Certification

The district TMP manager must provide a certification that the project contains all the latest TMP strategies, estimates, and specifications. Certification should be completed before the project is ready to list (RTL). If the project has been taken off the shelf, the TMP strategies and specifications need to be reviewed, updated, and recertified before it is RTL. For encroachment permit projects, this certification occurs before encroachment permits are issued.

Transportation Management Plan Modification of Programmed Projects

Generally, the TMP type is determined before programming (PID approval); however, it may be necessary to modify a TMP for a project that is already programmed due to project changes, policy changes, emergencies, or unforeseen conditions. These projects must be handled on a case-by-case basis since the course of action depends on where the project is in the development process and the extent of the TMP modifications. For example, a project that was initially designed to be constructed as a nighttime operation over several months may be converted just before construction to a full closure or a continuous closure to reduce the overall project duration.

Topic 5 Transportation Management Plan Modifications During Construction

Contractors implement contract-related TMP strategies with Caltrans oversight. Caltrans personnel may also implement strategies related to public awareness. If project conditions change, traffic volumes increase, or project staging changes, the district traffic manager or the TMP manager must be notified and consulted to determine if the TMP needs to be revised.

At times, certain activities may require more time than the lane requirement charts allow. In those instances, the resident engineer should contact the district traffic manager or TMP manager to request a longer work window. If the district traffic manager or TMP manager determines that minimal delays would be acceptable based on current traffic conditions, the lane requirement charts may be modified to provide a longer work window. When work is allowed outside of the original work window, the district TMT should be contacted to monitor potential traffic backups.

Traffic Monitoring During Construction

The resident engineer should ensure that inspectors monitor traffic conditions while work is being performed to avoid impacts in excess of what was identified in the TMP. When excessive queues occur, the TMC should be notified to initiate mitigation.

When congestion due to highway work zone activities is anticipated, traffic monitoring can be made a part of the construction contract or conducted by district TMT personnel. The traffic monitor typically uses a vehicle with a truck-mounted CMS and stations the vehicle where approaching motorists can easily read the CMS. This strategy provides periodic assessments of the effectiveness of project safety features and is often done at the beginning of a project to make sure that the TMP strategies are effective. Electronic monitoring and warning systems can also be used for this purpose.

Transportation Management Plan Coordination During Construction

The construction office should monitor and evaluate TMP activities. Any elements that are found to be ineffective should be appropriately modified after consulting with the district traffic manager and TMP managers.

During construction, any TMP elements that are part of the main contract or encroachment permit are implemented under the general direction of district construction or encroachment permitting staff. Any separate contracts or agreements, such as ridesharing, transit activities, and public awareness campaigns, will be under the direction of their respective contract managers.

Special effort should be given to ensure that CMS, HAR, QuickMap, and other media tools provide accurate and timely information to motorists, bicyclists, and pedestrians regarding lane closure times and locations.

Late Lane Closure Opening

The resident engineer or the encroachment permit inspector needs to ensure that lane closures are opened within the lane closure window. Exceptions can occur when the activity needs to be completed for the safety of the public and workers. The resident engineer or the encroachment permit inspector should coordinate with the district traffic manager if the contractor needs to work outside the lane requirement chart hours. The TMC should also be notified, and the TMT may need to be called to monitor possible queuing.

To avoid significant traffic impacts, it is essential to monitor and respond immediately to delays, open lanes on time, and have solid traffic handling and contractor construction contingency plans.

Contractor compliance with lane closure opening deadlines can be enforced in two ways. Specifications are often included in the contract, allowing the contractor to be assessed for damages based on the value of traffic delay when the contractor

exceeds the lane closure window. The minimum damages are typically $1,000 per 10 minutes, but the damages can exceed the minimum, depending on traffic volumes and the highway facility. The TMP or district traffic manager's office normally calculates the delay damages during the plans, specifications, and estimates phase (PS&E) in consultation with the construction team. The second method to ensure that the lane closures are opened on time is for the resident engineer or the encroachment permit inspector to suspend the contract work.

Contractors or Caltrans staff can be ordered to open a lane closure early if traffic impacts become significant, either due to a project incident or activities outside the project area. During construction, remedial actions may be based on contingency plans submitted by the contractor. When the traffic impact becomes significant, early lane opening should be ordered without compromising the safety of the public or workers. The contractor will also be compensated for liquidated damages. Encroachment permit provisions require the permittee to open a closure early without compensation.

A Caltrans staff member who can make informed decisions about implementing contingency plans and modifying, terminating, or extending approved lane closures should be available to respond to significant delays and other unexpected events whenever lane closures are in place. The designated employee or employees may be from the Divisions of Traffic Operations or Construction, or a member of TMC staff, depending on the district.

Lessons Learned Report

At the end of a major project where the actual delay exceeded the threshold set by the district traffic manager, the DLCRC or HLCRC may request a brief, post-TMP Lessons Learned Report from the TMP or DTM manager, or both, in consultation with the construction office. Post-TMP meetings with CHP and other partners can also be held to identify the elements that went well and those that could have been done differently. Samples of past after-action or Lessons Learned Reports can be obtained from the individual district traffic operations offices.

Topic 6 Contingency Plans

There are two types of contingency plans. A construction contingency plan is developed to back up construction operations equipment and materials. The second plan, developed by the Division of Traffic Operations, is the traffic handling contingency plan.

Construction Contingency Plan

If required by the special provisions, the contractor (permittee) develops a construction contingency plan that identifies the activities, equipment, processes, and materials that may cause a delay in the opening of a closure to traffic.

The contingency plan must include:

1. A list of additional or alternate equipment, materials, or workers necessary to ensure continuing activities and on-time opening of closures if a problem occurs. If the additional or alternate equipment, materials, or workers are not on-site, specify their location, the method for mobilizing these items, and the required time to complete mobilization.
2. A general time-scaled logic diagram displaying the major activities and sequence of planned operations. For each activity, identify the critical event when the contingency plan will be activated.

Critical equipment is any equipment that is necessary to complete the planned work in the closure for which there are no on-site replacements, and if rendered inoperative, would cause the closure to be kept in place past the lane opening time indicated in the lane requirement charts.

Critical activities are activities performed in a lane, shoulder, ramp, or connector closure that would make the traveled way unsafe or render any portion of the traveled way unsuitable for public traffic use. The activities would then cause the closure to be kept in place past the lane opening time indicated in the lane requirement charts.

The following operations may require a contingency plan:

- Any activity that requires a full roadway closure.
- Blasting.
- Rapid-set concrete activities, including concrete slab replacement.
- Excavating roadways that encroach on the traveled way and are not protected by temporary railings (barrier systems).
- Cold planing hot mix asphalt (HMA) to depths of 2 inches or more.
- Paving.
- Grinding asphalt or concrete.
- Chip sealing activities.
- Sealing asphalt or concrete pavement.
- Bridge work.
- Placing bar reinforcing steel or structural members.
- Erecting, removing, or adjusting falsework.

- Bridge demolition.
- Striping.

The contractor verifies or updates the construction contingency plan and submits the written schedule of planned closures. If a revision is required, the contractor should not close any lanes until the construction contingency plan has been reviewed and approved by the resident engineer.

Traffic Handling Contingency Plan

The traffic handling contingency plan is an operational method that consists of strategies or actions taken to restore or minimize effects on traffic when the congestion or delay resulting from construction, maintenance, or encroachment permit activities exceeds original TMP estimates. This situation may result from unforeseen events such as work zone incidents, higher-than-predicted traffic demand, or late lane closure openings.

These traffic-handling contingency strategies may include the following:

- Notifying the TMC.
- Requesting TMT assistance.
- Activating CMS or PCMS.
- Activating the HAR system.
- Notifying CHP.
- Notifying transit agencies.
- Notifying the media.
- Activating a detour.
- Following up with the resident engineer if activating the contractor's construction contingency plan is appropriate.
- Notifying the HQ Communication Center if the district TMC is not available.
- Communicating with the TMCs in other states and across the border when an event may impact traffic across the border.

Depending on the district or the situation, the district traffic manager, the construction traffic manager, or the TMC may implement these strategies.

For lane closures that will be implemented outside of typical lane closure hours and are expected to have additional traffic impacts, the PDT, TMP, or district traffic manager Team should develop a specific traffic handling contingency plan that may include:

- Activating a TMT when available to monitor congestion and queues.
- Determining trigger points to identify when certain traffic handling strategies should be taken.

- Including a "decision tree" with clearly defined lines of communication and authority.
- Outlining specific duties of all participants during lane closure operations, such as coordination with CHP or local agencies.
- Distributing the names and telephone numbers for the district traffic manager or their designee, resident engineer, maintenance superintendent, encroachment permit inspector, on-site traffic advisor, CHP division or area commander, and appropriate local agency representatives. This contact information can be distributed using the *Work Zone Enforcement (COZEEP/MAZEEP) Pocket Guide*, which should be prepared for individual projects.
- Coordinating strategy and special agreements (if applicable) between the district traffic manager, resident engineer, on-site traffic advisor, Division of Maintenance personnel, CHP, local agencies, and district PIO.

Section 4 Lane Closure Review Committee

Topic 1 District Lane Closure Review Committee

This process applies to all planned major lane closures on the SHS. Major lane closures are lane closures that are expected to result in significant traffic impacts despite the implementation of TMP strategies. A "significant traffic impact" is defined in DD-60-R2 as "…an individual traffic delay of 30 minutes or more above normal recurrent travel time on the existing facility or the delay time set by the District Traffic Manager…whichever is less." This term may also refer to work that may affect traffic conditions over a long period. When a planned lane closure is expected to have a significant traffic impact, DLCRC review and approval are required. The DLCRC concurrence is required on full-facility closures, extended highway closures, and highway-to-highway connector closures. The project manager must prepare and submit the major lane closure request memo to the DLCRC for approval as detailed in this section.

The DLCRC does not have to review and approve emergency closures due to natural events or incidents; however, the TMC and the district traffic manager must be notified, and every effort must be made to minimize traveler delay and reopen traffic lanes as soon as possible.

Topic 2 Headquarters Lane Closure Review Committee Review

For any activities that are of an interregional, statewide, environmental, or otherwise sensitive nature, the Traffic Operations DDD shall contact the HLCRC to discuss the specific project, its anticipated impacts, and to obtain approval.

The DLCRC is expected to resolve most issues at the district level with a focus on mitigating delays over 30 minutes or developing full or extended closures that would reduce overall traveler delays for projects that may extend for several months or years.

The division chief of Traffic Operations serves as chair of the HLCRC and may refer the decision back to the district or meet first with the district to discuss major concerns before deciding to call the full committee together. A full HLCRC review is only warranted in rare circumstances, such as the full closure of a major bridge or highway.

If the district is confident that the necessary TMP strategies are planned and will be implemented when needed, it is not necessary to request a meeting with the HLCRC. The DLCRC, however, should prepare adequate information (a one- or two-page fact sheet) so the district director can inform the director of the steps being taken to minimize potential traffic problems for projects that may be press-worthy.

In its evaluation of the proposal, the DLCRC will consider the accuracy, reliability, and completeness of the information provided, as well as other reliable sources of information available to the DLCRC.

Proposals will be evaluated based on effectiveness in the following areas:

- Traveler and worker safety improvements.
- TMP strategies and tools to reduce delay and queueing.
- Coordination with adjacent construction, maintenance, encroachment permits, and special event activities.
- Coordination with the TMC and field personnel.
- Coordination with public media.
- Use of existing field elements such as traffic surveillance loops, CMS, HAR, and CCTV cameras.
- Lines of communication and the chain of command.
- Plans for monitoring delay or corresponding queue length during lane closure operations.
- Proposed closure alternatives.
- Contingency plan viability.
- Coordination with local agencies, particularly as strategies pertain to detours on local roadways.
- Plans for coordination with the trucking industry on routes with heavy truck traffic.
- Plans for coordination with transit agencies.
- Bicyclist accommodation and pedestrian access.

Topic 3 Contents of Major Lane Closure Request Submittal

The project manager prepares a major lane closure request submittal with support from the PDT. The request provides sufficient information to ensure a complete understanding of the proposal. At a minimum, the following information is recommended:

- Location and vicinity maps showing the state highway, local street network, and other adjacent lane closures or nearby work that may affect traffic during the same period, including special events.
- Dates, times, and locations of each lane closure.
- Brief description of the work that will be performed during each lane closure.

- Brief description of each lane closure and its anticipated effect on traffic conditions and transit services.
- Amount of expected delay and corresponding queue length for each lane closure.
- Summary of TMP strategies that will be used to reduce delay and motorist inconvenience during each lane closure. A copy of the approved TMP for the project, if available.
- Detailed detour information, if applicable.
- Construction contingency plan.
- Map of transit routes and pedestrian or bicyclist facilities.
- Summary of plans that have been coordinated with emergency services and other impacted groups (such as ambulance, CHP, fire department, and transit services).
- List of alternatives that were considered to reduce impact.

Section 5 Transportation Management Plan Evaluation Process

Topic 1 Transportation Management Plan Strategy Effectiveness

Monitoring traffic impacts during highway construction helps evaluate how well the TMP strategies are performing or if the TMP strategies have been implemented properly. Field personnel should observe traffic conditions to determine if the actual impacts comply with Caltrans policies and fall within a reasonable range of the impacts that were expected. Monitoring strategies may involve manual traffic volume counts, surveys using "floating cars" to assess travel time through the work zone, or automatic measuring devices. Collecting traffic data for project events and traffic incidents (such as incidents and traffic queues) may also serve as a reliable source of information.

The resident engineer and district traffic manager or TMP manager should determine whether the implemented strategies are reaching the predetermined goals for reducing congestion within reasonable cost limits. If an element's predetermined goal is not immediately reached during implementation, but there is a general trend toward meeting that goal, the element can remain in effect but may be modified as appropriate. Elements that show no sign of approaching their predetermined goals as determined by the district traffic manager or TMP manager should be revised or discontinued, and other actions may be taken to minimize congestion through the work zone.

The effectiveness of TMP strategies can be evaluated through the methods described in this section.

A. Field Counts and Surveys

Field count and survey methods may include:

- Field measurements of actual road user delay through electronic or manual data collection.
- Caltrans TMT personnel or contractor field observation of congestion queues.

B. Public Surveys

Public surveys may include:

- Questionnaires regarding how and when the road user found out about the work.
- Public responses received through Caltrans web pages or telephone calls.

C. Transportation Management Plan Effectiveness Checklist Reporting Factors

The TMP effectiveness checklist reporting factors include:

- Actual delay experienced.
- Additional travel time.
- Queue length.
- Number of incidents in or near the work zone.
- Incident response (e.g., incident response times and contractor responsiveness).
- Impacts on adjacent construction activities.
- Number of times that planned lane closures were opened late and the corresponding reasons.
- Delay to transit services and ridership impacts.
- Delay to bicyclists and pedestrians.

Topic 2 Post-Closure Evaluation Statement

A Post-closure Evaluation Statement, if necessary, may be submitted to the HQ Division of Traffic Operations, Office of Traffic Management, for projects that cause major delays. Typically, post-closure evaluation statements are prepared for closures formally approved by the DLCRC under this process; however, any delay over 30 minutes should trigger a post-closure evaluation statement.

The functional unit performing or overseeing the lane closure will prepare the statement within five working days of the date the lane closure exceeded the threshold criteria. No more than one page is suggested. The statement should explain the following:

- The cause and impact of delays.
- Actions taken to avoid or mitigate an occurrence or reoccurrence.
- Why the expected delay was exceeded, and why it was necessary to exceed the closure window.

Topic 3 Transportation Management Plan Process Review

The objective of the process review is to evaluate statewide TMP practices and strategies and use the results to improve Caltrans safety and mobility policies. These reviews may include the evaluation of work zone data at the state level or field observations of selected projects. The district traffic manager or TMP managers should

analyze and review this information and make recommendations to revise policy or standard specifications, identify training needs, or update guidelines as needed.

A joint Work Zone Safety Committee comprised of Caltrans and Associated General Contractors representatives meets quarterly to address safety and mobility issues and recommend policy or specification changes. The committee includes Caltrans personnel, district traffic managers, TMP managers, contractors, and suppliers.

The Division of Construction conducts ongoing reviews of construction practices on randomly selected projects and publishes a yearly report titled "Contract Administration Process Evaluation." Issues that have been addressed in recent years include work zone safety equipment and apparel, construction contingency plans, cost-plus-time bidding practices, construction methods, and flexible work windows.

Construction safety meetings are held twice a year to discuss work zone safety issues and make recommendations to improve policy and specifications, modify the *Construction Manual*, and improve work zone training. Other topics include discussions on collisions and changes that may be needed in work zone practices to improve safety.

Section 6 Transportation Management Plan Training

Topic 1 Training Program and Materials

The TMP training materials were prepared by HQ Division of Traffic Operations, Office of Traffic Management. The districts have since modified and updated the training materials to reflect their unique issues and needs. The course consists of PowerPoint presentations and videos, as well as technical handouts and interactive class exercises.

Topic 2 Target Audience

TMP training is for all statewide personnel directly involved in the TMP process. Generally, this includes the Divisions of Planning, Environmental, Design, Project Management, Maintenance, Construction, and Traffic Operations (including the Office of Encroachment and Outdoor Advertising Permits, and the Office of Commercial Vehicle Operations).

Section 7 Transportation Management Plan Funding and Programming

Topic 1 Transportation Management Plan Charging Practices

When identifying funding for TMP elements, it is important to distinguish between capital outlay costs and capital outlay support (COS) costs. Work done by district staff for planning, designing, and implementing TMP activities for capital projects is an integral part of the project development process and should be charged as COS. Please refer to district charging practices guidelines for details. The district traffic manager or TMP manager and each functional manager should work closely with the project manager to ensure that TMP activities are included in project workplans for all phases of the project.

The TMP support activities to consider include ridesharing programs, construction tow truck services, public awareness campaigns, route improvements, temporary bicyclist and pedestrian facilities, and the request for proposal process up to the awarding of the contract. Some of these activities may also have a capital component in addition to the support component discussed here.

The workload required to develop and implement TMPs is established during project development activities. Workload hours for TMP activities must be included in the project workplan at an appropriate work breakdown structure (WBS) to ensure they are funded by COS. These activities should then be charged to each unique project identifier, using the appropriate WBS code for that phase of the project. TMP-related work should be charged only to the WBS codes reserved for TMP activities. These codes can be found in the current *Workplan Standards Guide (WSG)*. The WSG is available on the Division of Project Management Workplan Standards Onramp web page.

Work performed by district staff for implementing TMP strategies during the construction of capital projects is also a normal part of the project development process. TMP managers must ensure that the workload (hours) used for implementing TMP activities are included in the project workplans to be funded by COS. These activities should then be charged to the appropriate WBS code in phase 3 (WBS 270-Construction Engineering and Contract Administration and 270.66-Technical Support).

Certain TMP elements, such as route improvements and HAR, could be a phase of the construction contract or separate construction contracts, while others, such as public awareness campaigns and transit subsidies, must be separate contracts or cooperative agreements.

The TMP elements that must be in place before the start of construction are identified and funded as first order of work under a single package presented to the California Transportation Commission (CTC). Service contracts for public services, consultant

services, information campaigns, or telephone hotlines must be arranged separately with consultants and other providers. For most projects, it takes four to six months to obtain a service contract. This means that all consultant contracts have been advertised, the consultant has been selected, and the contract is ready for signature and will be awarded immediately following the CTC fund allocation. Other activities, such as route improvements, are usually included in the main construction contract and as a first order of work under a cooperative agreement.

In some cases, the CTC can be petitioned to fund a portion of the TMP as an initial phase of the main project. This is usually for a high-priority project where the PS&Es for the main project are not finalized, but early funds are needed to initiate the TMP activities, such as making transit arrangements with local governments. The petition to fund an initial phase comes from the district and explains why a portion of the project must proceed before funding for the main project is allocated. These early funds are taken from the overall programmed funds for the main project.

Topic 2 Charging for Encroachment Permit and Maintenance Transportation Management Plan Activities

TMPs and contingency plans for encroachment permit projects are developed by the permittee. Caltrans staff time used to review TMPs and contingency plans for encroachment permit projects is charged to the unique project identifier through the Caltrans Encroachment Permit System (CEPS). According to Caltrans maintenance TMP practices, the district traffic manager approves project TMPs normally developed by field maintenance staff. Staff from field maintenance and other functional areas that spend time on a Division of Maintenance TMP charge to the unique project identifier for maintenance.

However, the TMP for maintenance engineering projects is developed by the traffic management unit, and the time spent by the staff is charged to the unique project identifier.

Topic 3 Construction Tow Truck Service Funding

The construction tow truck service funding is built into the capital outlay project cost. These services can be provided through one of the following methods:

- Agreements with the regional transportation planning agencies that administer the traditional FSP and CHP to supervise the construction tow truck services.
- A requirement of the contractor as part of the construction contract. If there are any issues with the construction contract towing service, they can be referred to the NSSP.

If an agreement with the regional transportation planning agency is required, it should be initiated when it is determined that construction tow truck services will be needed. In addition, an interagency agreement with CHP is required for field supervision and dispatch operator services. Contact the HQ Division of Construction for more information on the current interagency agreement.

When agreements with regional transportation planning agencies and CHP are utilized, Caltrans reimburses CHP for training, dispatching, and oversight of the construction tow truck services. Unlike traditional FSP, construction tow truck services do not require local agencies to match a portion of state funds. Under the Freeway Service Patrol Act (Streets and Highways Code Sections 2560 et seq.), traditional FSP requires local agencies to contribute matching funds of at least 25% of the state's funding.

Topic 4 COZEEP and MAZEEP Funding

Caltrans contracts with CHP to provide enhanced enforcement services in work zones through COZEEP and MAZEEP. CHP is the sole provider of these services. On oversight and encroachment permit projects, the local agency typically contracts with CHP to provide these services. Consult with the district COZEEP and MAZEEP coordinator for a current estimate of hourly and mileage costs. For additional information on COZEEP funding, refer to the *Construction Manual*, Section 2-215A(1), "Estimating COZEEP Funding Requirements."

For more information on CHP interagency agreements, refer to the following:

- COZEEP Caltrans Onramp Intranet web page.
- MAZEEP Contract Caltrans Onramp Intranet web page.

Topic 5 Item Codes

The TMP elements that are not part of the main contract but are identified as COS costs tied to the main project should be itemized as department-furnished materials and supplemental work items using the appropriate AASHTOWare, formerly Basic Engineer's Estimate System (BEES), item codes shown in Table 125-1. The item codes are managed by the Division of Construction. For more information, refer to the Bid Item Guidelines web page on Caltrans Onramp Intranet.

Table 125-1 AASHTOWare Item Code Examples

Item Code	Item
120100	Traffic Control System
120090	Construction Area Signs
128651	Portable Changeable Message Sign

Topic 6 Charges to Other Project Phase 4 (Construction) Funds

Funds from other construction contracts in the district may be used if the projects are in the vicinity of, or will be affected by, the project requiring TMP funds. At the discretion of the DDD for the Division of Construction, a list of chargeable project identifiers may be submitted to the HQ Division of Accounting for prorated charging.

Topic 7 Projects Funded by Others

DD-60-R2 applies to all projects on state facilities, including those that are not state-funded. District directors are responsible for ensuring local compliance. Caltrans and local entities must work cooperatively to develop an effective TMP. Caltrans is responsible for approving all project study reports, and at this point in the project, agreements should be reached concerning the costs and scope of TMP strategies.

The project manager must ensure that the TMP manager is included in discussions regarding projects with traffic-handling issues. The TMP manager must be contacted early in the project development phase to ensure that adequate TMP strategies and hours for TMP and district traffic manager tasks are included for projects funded by others. The local agencies and consultants preparing the traffic-related specifications must be familiar with the TMP process and the specification requirements. The TMP unit will review the TMP, specifications, and traffic analysis submitted by the local agencies and consultants for completeness and accuracy, and to make sure that the submitted documents conform to current Caltrans policies and standards.