TRAFFIC OPERATIONS MANUAL

Chapter 110
Transportation Management Centers

Traffic Operations

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California Department of Transportation
Division of Traffic Operations

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Section 1 Introduction

Topic 1 Preface

The purpose of this document is to provide guidelines on transportation management center (TMC) operations. This document guides TMC personnel on roles, responsibilities, operating procedures, systems, technology, and available resources for effective traffic management on the State Highway System (SHS). California Department of Transportation (Caltrans) personnel will use this document to improve TMC operations by standardizing operating procedures.

Currently, operating capabilities, organization, and systems in use vary across the state. Thus, each TMC facility may have supplemental operating manuals, memos, or other guidance documents containing district-specific information. As we strive toward standardizing all infrastructure and operations, employees are encouraged to refer to their district procedure manuals as necessary to supplement this guidance.

For additional information, refer to the Transportation Management Center Onramp web page.

Topic 2 History of Caltrans Transportation Management Centers

Caltrans and the California Highway Patrol (CHP) established the first Traffic Operations Center (TOC) in Los Angeles on November 23, 1971. In the following years, Caltrans' transportation system management and CHP incident management programs continued to evolve.

Figure 110-1 Governor Ronald Reagan Visits the District 7 Traffic Operations Center

In April 1992, both departments signed a memorandum of understanding (MOU) on the development and operation of co-located TOCs. This agreement states that the co-location of TOCs, the Caltrans maintenance communications center, and the CHP communications center benefits the public by supporting enhanced communication among departmental personnel, improving response to traffic incidents, and providing a more coordinated approach to traffic management.

In the ensuing years, greater emphasis was placed on intermodal transportation, making it essential to create partnerships with local entities such as metropolitan planning organizations (MPOs) and local transit operators.

Caltrans and CHP created the TMC Master Plan in June 1993 and revised it in December 1997. In it, an MOU adopted the TMC Master Plan as the standard for developing and operating all TMC facilities. To maintain consistency, the TMC Master Plan requires that TMC operations be defined with set standards. This chapter meets this objective.

Topic 3 Transportation Management Center Overview

TMCs allow Caltrans to accomplish the following:

- Monitor and manage traffic flow.
- Communicate traffic conditions to the traveling public.
- Conduct traffic incident management (TIM).
- Coordinate traffic management during emergencies or planned lane closures.

The growing challenges of highway traffic congestion and the resulting increase in environmental impacts from greenhouse gas emissions have highlighted the need for continued innovative and cooperative efforts to enhance mobility on California's highways. TMC operations play a critical role in achieving this goal. This section outlines the key functions that TMCs perform.

Traffic Management

TMCs are critical hubs for managing traffic that provide the public with the following benefits:

- Improved safety through effective TIM, resulting in reduced secondary collisions.
- Enhanced traveler mobility.
- Reduced traffic congestion.
- Reduced greenhouse gas emissions.
- Reduced incident-related lane closure time.
- Increased effectiveness of traveler information management, contributing to informed travel planning.

- Enhanced multi-agency emergency response coordination using state highway infrastructure.
- A safer and more efficient multimodal highway system.
- Increased regional economic activity.

Traffic Incident Management

Coordinated traffic management is a high priority for Caltrans TMC personnel and CHP. Both departments have agreed to joint responsibility for incident detection, verification, and management. However, Caltrans is primarily responsible for managing highway corridor systems impacted by incidents. CHP has jurisdiction over highway incident scene management and scene traffic control. The agreement on TMC joint operations can be found in the MOU for joint operational policies, which are periodically updated. For more information, refer to Chapter 130, "Traffic Incident Management."

Emergency Response Coordination

TMCs support Caltrans emergency operation centers (EOCs), CHP, and other emergency response activities by leveraging TMC infrastructure, such as closed-circuit television (CCTV), highway advisory radio (HAR), changeable message signs (CMSs), or the California Highway Information Network (CHIN). If an emergency results in a full closure requiring an alternate route, coordination with the appropriate public agencies (including CHP and Caltrans field personnel) and any involved private sector entities will be necessary. If the incident requires emergency repair or specialized maintenance services, these contacts may also need to be made through the TMC. Such emergency services include electrical maintenance, structure maintenance, municipal or private utility services, or private sector entities under the listing of contacts. A list of contacts from all areas shall be maintained at the TMC.

Topic 4 Transportation Management Center Statewide Organization

Caltrans operates 12 district TMCs throughout the state and 1 satellite TMC.

Standalone and California Highway Patrol Co-Located Transportation Management Centers

Five TMCs, located in Districts 3, 7, 8, 11, and 12, are standalone facilities co-located with CHP. Both CHP and Caltrans TMC operators, dispatchers, and managers provide integrated transportation management and improve highway system performance. These secure co-located TMCs are where Caltrans staff have full access to the CHP VisiCAD for more effective TIM functions.

Other District Transportation Management Centers

The remaining seven TMCs, located in Districts 1, 2, 4, 5, 6, 9, and 10, are positioned within Caltrans district buildings and are managed only by Caltrans personnel. Activities are coordinated as needed with CHP offices and CHP command centers. Some of these separated TMCs only have access to a limited and redacted CHP Media Computer-Aided Dispatch (CAD), while others have full access to CHP VisiCAD.

Satellite Operations Centers

Satellite operations centers (SOCs) are fixed facilities for the seasonal management of snow operations, recreational traffic, seasonal peaks, weather restrictions, and any other major highway incident. SOCs are activated through an area-specific response procedure and may be set up anywhere.

SOC responsibilities include:

- Managing unusual situations, snow operations, seasonal peak activity, dust storms, environmental disasters, or any other transportation emergencies.
- Coordinating with other TMCs.
- Opening only as needed with sufficient staffing and equipment.

Currently, Caltrans operates one SOC at the Kingvale Maintenance Station in District 3.

Topic 5 Hours of Operation

Some TMCs (Districts 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, and 12) operate 24 hours, while District 5 operates on weekdays from 6:00 a.m. to 6:00 p.m.

TMC personnel work in shifts, with staff working a 5-day/40-hour week, a 4-day/10-hour week, or a 9-day/80-hour biweekly schedule based on specific TMC operational and staffing needs. Exact start and end times, shift durations, and shift overlaps vary by district according to MOUs and district-specific needs and requirements.

Shift designations for TMCs operating 24 hours are known as the "day shift" (typically 06:00-14:00), the "swing shift" (typically 14:00-22:00), and the "graveyard shift" (typically 22:00-6:00)." Shift designations for TMCs operating less than 24 hours are generally known as the "a.m. shift" and the "p.m. shift."

Topic 6 Key Partners and Stakeholders

To keep pace with the expanding role of TMCs in transportation system management, partnerships with stakeholders are critical for effectively meeting the needs of the public. These partnerships address a variety of issues, such as funding, system operations and maintenance, technology development and implementation, public information, and resource sharing.

The steady growth of transportation-related challenges, such as congestion and delays, establishes the need for continued efforts to maximize the efficiency of existing transportation facilities. Creating partnerships with public and private entities is important in meeting the needs of transportation users, adopting new technologies, and overcoming resource shortages. The goal of partnerships is to integrate private sector technological advances with current academic research to address the transportation needs of different regions in an innovative way.

Caltrans and CHP have partnered on several initiatives for managing traffic on state highways, particularly through developing and deploying personnel in state TMCs. The two agencies have agreed that co-location and cooperation benefit the public by enhancing communication between departments, improving response times to incidents, and improving traffic management coordination.

The following is a brief overview of some of the stakeholders involved in TMC operations and their roles.

Caltrans

Caltrans is responsible for SHS management, incident response, planned lane closures, and special events affecting the SHS. Caltrans recognizes that quick incident removal and return to normal operations saves lives and reduces congestion and potential injuries. Caltrans provides real-time traveler information and coordinates incident response with CHP and partner agencies. Caltrans also plans, designs, constructs, operates, and maintains the SHS.

California Highway Patrol

CHP is responsible for state highway incident management, emergency road closures, law enforcement, and maintenance of CHP automated computer systems. CHP also provides motorist safety services and traffic supervision. CHP's law enforcement activities maintain the dynamic operations of the SHS, maximize safety, and assist other law enforcement agencies.

Metropolitan Planning Organizations

In urban areas, partnerships with MPOs help identify needs, prioritize strategies, develop integrated multimodal transportation, gain public support, and secure funding for transportation projects. MPOs are responsible for developing the blueprint for mass transit, highway, airport, seaport, and railroad facilities.

Regional transportation agencies coordinate on managed lane dynamic pricing events, lane incidents, and message coordination that affect express lane operations and general-purpose lanes.

Local Agency Transportation Management Centers

In corridor traffic management efforts, interconnections are implemented between Caltrans-operated and local TMCs (TMCs owned and operated by cities and counties). Traffic management activities should use all available transportation system capacity

within an entire corridor. State and local officials must be able to communicate and coordinate to provide effective corridor management.

Local Emergency Responders

Local emergency responders help coordinate an efficient response to incidents on the SHS and provide emergency services to the impacted public.

Local Mass Transit

Transit operators such as buses, trains, or ferries are important in making transit ridership a viable alternative to automobile travel. Real-time information (provided to and from transit vehicles) allows for vehicle tracking, alternate routing, fleet management, passenger and fare management, maintenance, and security. Additionally, transit vehicles can report the transportation system's condition to the TMC.

Academic Institutions

Partnerships with academic institutions are an important part of developing transportation management strategies for the present and future. Academic institutions examine, evaluate, and advance available traffic systems technology through research that addresses current issues while training future professionals for this growing field.

Media and Online Platforms

Partnerships with the media play a critical role in providing accurate information to the public. It is vital to provide real-time traffic information to the largest possible public audience. This is achieved using commercial radio, television, social media, online news and maps, and global positioning system platforms. TMC personnel must follow established policies and protocols for communicating with the media.

Federal Highway Administration

The Federal Highway Administration (FHWA) provides the means for funding, demonstrating, and implementing advanced transportation systems (ATSs). Partnering with FHWA allows Caltrans to stay informed and influence issues surrounding the national transportation Traffic Management System (TMS) environment.

Private Entities

Developing partnerships with the private sector fosters advancements in ATS. These partnerships allow collaboration on transportation and information system projects that need testing, evaluation, and implementation. Partnerships with private entities support technology and resource sharing and are mutually beneficial.

Topic 7 Security Clearance for Transportation Management Center Personnel and Visitors Policy

All Caltrans employees, service providers, and guests who enter the operating floor of a TMC that has CHP VisiCAD must either (a) be escorted at all times while in the TMC to ensure that they are not exposed to confidential law enforcement information, or (b) undergo a California Department of Justice (DOJ) background check and sign CHP Form 101A, "Agreement With Outside Entities to Establish Remote Access Privileges to CHP Automated Computer Systems and Information" (Form CHP 101A) to have unescorted access. This policy has been in place since 1995 and applies to all Caltrans personnel, including janitorial or maintenance staff working on the TMC floor, without exception.

If the TMC fails to comply with this security policy, CAD access can be removed from the TMC. This would hinder Caltrans' ability to manage traffic and incidents. Applicants for positions in CAD-equipped TMCs should have ample notice of the information security policy both before and after they apply for a position.

As a primary law enforcement agency, CHP subscribes to the California Law Enforcement Telecommunications System (CLETS). CLETS was designed to provide law enforcement agencies with confidential information. The DOJ is responsible for providing CLETS service and monitoring and regulating access to CLETS information.

All individuals with access to CLETS information are required to undergo a security clearance to determine their suitability for access. Since all Caltrans employees working in a TMC may have the opportunity to view CLETS information on CAD screens or record printouts, a joint policy was developed to require that background checks be performed on all TMC personnel.

The *CLETS Policies, Practices, and Procedures Manual* requires that any person who has access to CLETS information be fingerprinted and subjected to a DOJ security clearance. Each applicant's background check requires both DOJ and Federal Bureau of Investigation (FBI) Criminal Offender Record Information (CORI). Caltrans Headquarters (HQ) Division of Traffic Operations is responsible for establishing an interagency contract with DOJ for Live Scan fingerprint services and billing. Refer to "Live Scan Interagency Agreement with the Department of Justice" for more information.

Additionally, each Caltrans employee working in a TMC will be required to sign CHP Form 101A and an interagency MOU. Form 101A and the MOU inform employees of the confidentiality of CLETS information and the CLETS system and include a brief statement of the penalties imposed for its misuse (see Appendix 110 A). Confidential automated information obtained from CHP VisiCAD and CLETS shall be used exclusively for the official business of the state. CHP VisiCAD and CLETS information cannot be shared with any unauthorized person. Misuse of information from CAD or CLETS may result in suspension or loss of employment and prosecution for state and federal crimes.

As a primary subscriber to CLETS, CHP takes responsibility for ensuring that TMC personnel who have access to CLETS comply with DOJ security rules and regulations. TMCs that are co-located or have CAD access are required to comply with these guidelines. Noncompliance can result in increased departmental liability, individual employee liability, and the potential loss of CHP access to the CLETS system.

Live Scan Interagency Agreement with the Department of Justice

The Live Scan contract is an interagency agreement with the DOJ to submit fingerprint images and related information electronically and have the DOJ provide Caltrans with DOJ and FBI fingerprint Live Scan information. Caltrans will request this information electronically by completing form BCIA 8016, "Request for Live Scan Service" with the originating agency identifier A1582 entered in the form field labeled "ORI." The DOJ is responsible for receiving and processing the Caltrans requests. The DOJ shall provide Caltrans with the following information:

- DOJ or a no-record response and (if authorized) subsequent arrest notifications.
- FBI or a no-record response for initial submissions.
- Child Abuse Central Index.
- Peace Officer Carry Concealed Weapon.

Topic 8 Transportation Management Center Activities Administration

Audio or video recording inside the TMC is prohibited unless explicitly authorized under a Caltrans- and CHP-approved agreement (such as a Live Commercial Broadcasting MOU) and conducted from designated areas with information security safeguards. Training captures or screenshots must adhere to CHP and CLETS privacy rules and internal policies. However, it is recommended that TMC operations personnel maintain records of specific activities to provide an organized format for recording various events and a convenient means to retrieve key pieces of information involved in the daily activities of the TMC. TMC operations personnel should maintain records of the following activities:

- Radio communications.
- Equipment usage (such as CMS, HAR, or CHIN).
- Incident occurrences.
- Major incidents.
- Incident notifications and callouts.
- Lane or road closures.
- Other miscellaneous occurrences.

- Ongoing traffic management activities.
- Special situations (such as chain control, Sigalerts*, or traffic advisories).
- Major issues that need to be relayed to the following shift.
- Equipment malfunctions.
- Status of repair efforts.
- Summary of road conditions.
- Ongoing travel restrictions.
- Weather conditions that affect travel (such as 10-13 reports completed daily during the winter season).

Note*: Sigalerts are issued for unplanned major incidents that affect one or more lanes and will block the roadway for at least 30 minutes, causing congestion and delay. CHP issues Sigalerts either from the TMC or from the CHP communications center. Examples of Sigalerts may include congestion-causing traffic incidents, spilled loads, leaking gas, or special events.

Major Issues to Relay to the Following Shift

TMCs should have a method for providing information to the next shift concerning ongoing activities or major incidents that have cleared but may still need an explanation, such as any administrative issues, contact or coordination problems, office and field system failures, or any other major issues and highlights of TMC activities.

Transportation Management Center Equipment Malfunction Report

Maintain a report of all equipment failures that occur during a TMC shift. This report may be used to notify TMC support personnel of the equipment problem, the time of occurrence, and the exact nature of what is not functioning in its normal manner. The TMC Equipment Malfunction Report may also be used to track the status of repair efforts and the return to full operation upon completion of repairs.

Section 2 Roles and Responsibilities

Topic 1 Overview

TMC operations are managed by TMC functional managers, performed by operators and dispatchers, and supported by several other personnel. This chapter summarizes TMC personnel roles and duties. Individuals listed below may perform multiple functions during their day within a TMC. The number of personnel and roles vary depending on the TMC size.

As described in Section 1, Topic 7 "Security Clearance for Transportation Management Center Personnel and Visitors Policy," TMC personnel with unescorted access to the TMC operating floor where CHP VisiCAD is accessible are subject to DOJ background checks and fingerprinting. Confidential automated information obtained from CHP VisiCAD and CLETS shall be used exclusively for the official business of the State. CHP VisiCAD and CLETS information cannot be shared with any unauthorized person. Misuse of information from CAD or CLETS may result in suspension or loss of employment and prosecution for state and federal crimes.

Topic 2 System Operations Personnel

Transportation Management Center Functional Managers

The TMC functional manager oversees the TMC operations, staff, and building. The main roles and responsibilities may include:

- Supervising traffic operations, incident response, and facilitating the safe and efficient operation of the SHS and TMC work environment.
- Communicating the TMC operational needs and activities to all internal and external stakeholders as needed.
- Training technical staff.
- Maximizing public safety and minimizing motorist delays that result from incidents and congestion. Analyzing incidents, providing engineering judgment, and communicating information to field staff and the traveling public to assist with making informed decisions.
- Overseeing maintenance and identifying future needs of TMC operational elements and the TMC building.

Transportation Management Center Lead Worker

The lead worker oversees the technical operations of the TMC floor, such as incident management and the Advanced Transportation Management System (ATMS). The main roles and responsibilities include:

- Directing and overseeing the day-to-day operations of the district TMC.
- Directing and supporting major traffic incident clearance and investigations.
- Reviewing and examining major incidents.
- Monitoring and analyzing real-time traffic data to provide support where needed.
- Preparing and reviewing traveler information messages for various devices, such as CMSs and HARs.
- Working closely with the traffic management team (TMT) for traffic-related activities and responses.
- Performing traffic engineering calculations and traffic delay and reduction methodologies to provide independent engineering decisions.
- Participating in staff meetings with the Division of Maintenance, CHP partners, or both for traffic operational awareness.

Transportation Management Center Operators and Dispatchers

TMC operators and dispatchers work together to monitor traffic operations and manage incidents on the SHS. The following lists the main roles and responsibilities of operators and dispatchers.

Operators

- Actively monitoring traffic information sources such as CCTV, QuickMap, CHP VisiCAD, and CHP MediaCAD for traffic incident identification, verification, and response.
- Communicating and coordinating with field personnel and incident response units for incident response and traffic management activities.
- Notifying designated personnel and agencies of major incidents, traffic restrictions, emergency response, and roadway conditions or closures.
- Coordinating responses with other TMCs and agencies if an incident has regional impacts.
- Providing traffic updates and messages by CMS, CHIN, and HAR.
- Ensuring traveler information messages are accurate and timely, and relaying updated information to CHP and partner agencies.

Dispatchers

- Inputting data and maintaining reports of TMC activities.
- Inputting Lane Closure Status into the LCS system.
- Managing communications between TMC and maintenance field personnel.
- Generating and maintaining Integrated Maintenance Management System (IMMS) service requests for maintenance activities.
- Providing timely response to CHP requests for field maintenance assistance.
- Providing ongoing chain restriction status through Transportation Management Center Activity Logging (TMCAL) or ActiveITS, and updating the HQ Communications Center.

Other System Operations Personnel

The following is a list of other system operations personnel and a description of their role.

Integrated corridor coordinator: Monitors traffic and incident data on the highway and local streets within the limits of the integrated corridor.

Ramp metering engineer: Monitors and adjusts ramp metering modes and rates and their effect on traffic flow to provide maximum operational efficiency on highways and local street systems.

District traffic manager: Coordinates with personnel to develop and implement transportation management plans (TMPs). Responsible for the day-to-day decisions about traffic impacts from planned activities on the SHS.

Traffic signal system engineer: Interacts with incident response and planned lane closure personnel to coordinate traffic management response activities involving signal re-timing.

Headquarters Communications Center

The primary function of the Headquarters Communications Center (HCC) is to receive and distribute accurate information from the TMCs regarding the status of the SHS. The HCC must receive timely information and updates regarding every reportable incident that will affect the public use of any state highway or Caltrans facility. For more information, refer to the Highway Condition Report Requirements (HCRR) available on Onramp.

The HCC advises the California State Transportation Agency, the Governor's Office of Emergency Services (CalOES), the Caltrans director and chief deputy director, statewide deputy directors, designated staff, as well as the Caltrans emergency management coordinator, designated division chiefs and office chiefs, and the FHWA. In addition, the HCC informs and advises the public through CHIN and QuickMap.

Topic 3 System Support Personnel

The normal work location for system support personnel may be either within the TMC control room or in other adjacent rooms specifically designated for support functions. The following is a list of system support staff and a description of their role.

Database administrator: Manages, monitors, verifies, retrieves, and archives historical data. Supports disaster recovery and planning, data backup policies, and data restoration policies.

System administrator: Configures the operating system, updates system software, and manages user accounts, devices, space usage, network services, and system security.

Traffic data analyst: Provides baseline traffic data and runs summary reports for traffic data, ramp metering, and traffic system performance.

System electrical engineers: Troubleshoots electronic equipment and computer system software to correct system malfunctions and keep the system running at full capability. May also perform planning and design reviews for TMS Systems.

Communications engineer: Troubleshoots communications equipment to correct communication outages and keep the communications network running reliably. Interacts with vendors, contractors, and leased telecommunication service providers for installing or modifying the communications network.

Field maintenance technicians: Troubleshoots and repairs field equipment, keeping the system operating as intended.

Field maintenance liaison: Interacts with system operators to coordinate with field maintenance personnel who respond to incidents.

Topic 4 Traffic Management Team

Most districts have a TMT or major incident response team or both, consisting of staff with specialized truck-mounted CMSs geared to respond to major incidents and special events in coordination with TMC staff. These teams implement traffic management strategies to reduce delays, prevent secondary collisions, and improve mobility and safety. The staffing-level classification ranges from maintenance employees to engineers. The core group has full-time job assignments in either the incident or special event response unit or the planned lane closure unit. This primary group responds to most situations that occur during normal work hours. The remaining TMT members have full-time job assignments in other functions and act as volunteers on an as-needed basis.

As the number of personnel varies depending on the size of the district, team members include a TMT leader, a TMT spotter, and TMT sign truck operators. At the incident scene (command post), the team leader coordinates with other first responders to manage traffic incident response procedures. The TMT provides traffic management assistance

without duplicating the efforts of CHP and maintenance personnel. Team functions include:

- Providing end-of-queue protection to oncoming traffic to prevent secondary incidents.
- Providing advance notification to travelers of road closures, blockages, and lengthy delays, where necessary.
- Providing detour and alternate route signing as appropriate.
- Maintaining communications with TMC staff and providing updates on changing traffic conditions for district staff and HCC.
- Assisting with maintenance and construction activities, which may cause delays to the traveling public.

Topic 5 Transportation Management Center Building Manager

The roles and responsibilities of the TMC building manager include:

- Ensuring TMC facilities are operational and compliant with all local and state laws, codes, and regulations relating to health and safety.
- Managing TMC facility maintenance, operations, and repairs in an efficient, cost-effective, and prompt manner.
- Coordinating facility maintenance, operations, and repairs with CHP and the Department of General Services (DGS).

Topic 6 Transportation Management Center Staffing Administration

Positions at TMCs may be filled under several classifications depending on district needs and staffing structures. Typical classifications include Transportation Engineering Technician, Analyst I, and Analyst II. These classifications provide flexibility to staff TMCs with personnel who have the appropriate technical, analytical, or administrative expertise.

All TMC personnel are required to perform their duties professionally and efficiently to best serve the public. All TMC personnel shall establish and continue to foster good working relationships with CHP to improve cooperative and coordinated efforts while performing TMC duties. Communications with external and internal partners (such as CHP, field maintenance personnel, private information service providers (ISPs), public affairs staff, HQ staff, and others) will be handled in a timely fashion while demonstrating a professional attitude, good work ethic, and respect toward others.

Reporting for Duty and Shift Management

All TMC personnel shall report to work on time and be prepared for a briefing at the start of their assigned shift. All personnel shall immediately report directly to their assigned positions and relieve the previous shift.

Caltrans

Caltrans personnel shall report directly to the TMC at the beginning of their respective shifts.

Caltrans policy and MOUs in force will determine the method of overtime compensation. Overtime scheduling will be based on the need to effectively manage the TMC operations. Shifts will be offered to employees based on equitable overtime distribution and staff availability. All overtime requires the TMC supervisor's prior approval.

Before the monthly schedule is completed, TMC personnel will be given a preliminary schedule with the days on which overtime will be needed. If no employees volunteer for overtime work, the supervisor may ask other staff members within operations to fill the need.

All TMC personnel shall be assigned to a specific shift at the discretion of district management. Each person may state a preference for the shift they are interested in working. Shift assignments will be based on the needs of TMC operations. Preference may be based on the time of service within the TMC. Duplicate requests for shift assignments are processed by TMC management using seniority within the TMC classification and are consistent with MOUs and operational coverage requirements.

If one of the TMC personnel leaves the TMC resulting in a vacancy, the remaining personnel may request assignment to the shift with the opening immediately after the position becomes vacant. However, the selection process will also be based on the needs of the TMC.

California Highway Patrol

CHP personnel shall report directly to the TMC at the beginning of their respective shifts. Shift coverage by CHP personnel for TMCs operating 24 hours per day generally consists of three shifts, known as the "A Watch" shift, the "B Watch" shift, and the "C Watch" shift. The officers assigned to the TMC are accountable to and under the direct supervision of the CHP traffic management unit (TMU) commander. They assist in coordinating the responsibilities of CHP, Caltrans, and other allied agencies in manual and electronic traffic monitoring and in handling emergency incidents.

CHP personnel shall complete a CHP 415 Form online and submit it to the TMU commander each day. All overtime requires the TMU commander's approval before being worked.

Uniforms

Caltrans

While no uniform is prescribed for TMC operations personnel, employees should dress appropriately for a professional office setting. Caltrans identification badges shall always be worn in plain view inside the TMC facility.

California Highway Patrol

Uniformed members shall always wear a long-sleeve shirt and necktie while on duty, except:

- A short-sleeved shirt may be worn from April 1 through October 31.
- TMC commander may authorize CHP personnel to wear appropriate civilian attire, as necessary.

Firearms

Caltrans

Caltrans personnel shall follow Caltrans policy regarding firearms as detailed in Deputy Directive 022-R4 on Weapons Prohibited.

California Highway Patrol

- Uniformed members shall comply with CHP departmental policy regarding firearms. Firearms shall be left in a secure location when not on the officer's person.
- When not in uniform, CHP personnel shall wear proper identification or CHP departmental badges in plain view while inside the TMC and surrounding facility.

Shift Briefing

At the beginning of a new shift, it is imperative to share information regarding what occurred in the previous shift. This shift briefing can be done informally and must cover the following subjects as appropriate.

Current System Status

Inform the next shift about which signs are in use and their messages, as well as any closure information on the district-specific platform. Report all malfunctions to the system support personnel and keep the record in the district-specific platform. Also, notify the following shift of any malfunctions that may impair the TMC's effectiveness.

Active Incidents

Keep the incident status board updated. Inform the following shift of the status of any active incidents that are occurring, especially if any TMC equipment is in use. This will

help to avoid giving false information. An example of this would be leaving CMS messages up after an incident is cleared.

Special Events

Special events are usually planned, and the TMT may develop an oral or written response plan in consultation with the event representative. Include any existing response plans in the shift briefing to avoid confusion when an event occurs.

Special Instructions

Examples of special instructions include turning on a CMS at a scheduled time for purposes such as traffic studies, public information, or media updates, notifying about scheduled TMC tours, or informing system support personnel of planned work that may affect TMC operations.

Caltrans Personnel Leave Reporting Requirements

Vacation Leave

TMC operations personnel should inform their supervisor in writing at least one month in advance to request any vacation leave of one week or longer in duration. This is necessary to arrange the schedule so that other personnel can be scheduled to cover the shift.

Vacation leave of less than one week should be requested at least one week in advance so that the schedule can be arranged accordingly.

In cases where two or more employees apply for time off during the same period, priority will be given to the individual with the highest seniority in the TMC branch. Seniority will not nullify the approved vacation of junior staff.

Sick Leave

Illnesses that prevent an employee from coming to work should be reported at least two hours before the beginning of their shift. The employee shall notify their supervisor by telephone. If there is no supervisor available, the employee may leave a message with their alternate supervisor. Depending on the nature and duration of the illness, a doctor's note may be required. A courtesy phone call to the TMC floor to alert staff immediately of the impending shift vacancy shall also be made.

During non-business hours, weekends, and holidays, illnesses that prevent an employee from coming to work should be reported at least four hours before the beginning of an employee's shift. The employee may contact the TMC and leave a message for their supervisor with the lead worker on duty.

Sick leave requests due to medical or dental appointments for the employee or the employee's family shall be reported to the supervisor at least two days in advance.

Jury Duty

To maintain staffing needs and to assist in scheduling changes, an employee that receives a jury duty notification shall advise their supervisor as soon as their first notification is received. Employees should follow the rules in their union contract MOU for leave and time reporting for jury duty.

Emergencies

When an emergency arises, the affected employee should contact their supervisor and the TMC floor operator as soon as possible, provide as much detail as is available, and provide the expected duration of the emergency. Each case will be evaluated individually, and every effort will be made to accommodate the needs of the employee.

Section 3 Transportation Management Center Operations

Topic 1 Overview

TMCs are the focal point for many different transportation-related functions and operations. As illustrated in Figure 110-2, TMCs are the center for monitoring real-time traffic operations on the SHS. TMCs provide system personnel with the tools and resources to communicate and manage transportation operations safely and efficiently from a central facility. This section discusses the operational resources and procedures used within a TMC.

Figure 110-2 Transportation Management Center Connections

Topic 2 Central Systems and Traffic Flow Monitoring

One of the TMC's primary functions is routinely monitoring traffic flow. Observing unusual patterns of reduced speed, congestion, or other abnormalities in the usual flow may indicate a traffic flow constriction. This may be caused by a temporary reduction in capacity due to an incident, lane closure, or excessive demand.

Effective traffic flow monitoring involves paying constant attention to the highway system using various tools in the TMC, such as CHP VisiCAD, Caltrans radio, CCTV, QuickMap, and Google Maps.

Traffic Flow Data

The basic tool for obtaining traffic flow information is a detector sensor system. In general, this system consists of remote electronic sensors contained within or adjacent to a highway, which relay traffic data over a communication system to a TMC central processing location.

Caltrans uses the following types of traffic detection sensors:

- Inductive loop
- Magnetic detectors
- Microwave radar
- Video detection
- Thermal image detection
- Piezo
- Bluetooth or Wi-Fi
- Third-party data (such as WAZE, HERE, INRIX, Google, or TomTom)

These sensors relay data that quantifies traffic volumes, occupancy, and vehicle speed separated by direction and lane. Summary reports for traffic data are compiled and produced using a central computational processor located within a TMC. The central computer generates traffic data summaries compiled in various formats and displayed as either textual or numerical values or graphical depictions. Traffic data review and interpretation can reveal the exact locations and even the nature of observed traffic flow abnormalities.

Graphical Display

Graphics are used to visualize real-time traffic conditions on a monitor, large projection screen, or video wall. The highway electronic detection system is displayed using a series of green, yellow/orange, and red-light icons along the highways represented on the graphics display screen. An example of colors associated with estimated vehicle speeds is shown in Table 110-1. Graphics may indicate an incident as described in "Surveillance System and Graphics Display."

Table 110-1 Icon Color Ranges

Icon Color	Speed in mph
Red	< 20
Yellow/Orange	=> 20 < 35
Green	=> 35

Note: Color ranges vary by district.

Monitoring Recurrent Congestion, Planned Lane Closures, or Special Events

Whenever traffic congestion is anticipated, such as for planned lane closures, special events, or even the normal daily recurrent commuter congestion, it is necessary to monitor the extent of congestion. The purpose of monitoring congestion is to discern any unusual patterns that may indicate the presence of a secondary problem within the traffic queue. This may include moving traffic to different routes with the assistance of allied agencies due to abnormally extended delays from the anticipated traffic congestion. Traffic surveillance device checks should be made at frequent intervals.

Topic 3 Incident Detection

Another TMC function is traffic incident detection. Detection can occur based on information received from various sources, as outlined in this topic.

California Highway Patrol Computer-Aided Dispatch Sources

CAD, the computerized log operated by CHP, contains information collected from cellular 911 emergency calls, roadside motorist call boxes, CHP field patrol units, airborne surveillance, or public telephone calls received at CHP communication centers.

TMCs primarily receive incident information details through CHP VisiCAD by monitoring the CHP VisiCAD terminal. Added information may be received directly from members of CHP dispatch, if they are present in the TMC, to help verify the severity of an incident by coordinating with the TMC liaison officer. The CHP communications center will issue Sigalerts and traffic advisories and coordinate with the TMC by obtaining details of the incident and the status of response efforts at the incident scene.

TMC operations personnel should continually interact with all CAD-generated logs that may affect transportation management.

Cellular 911

Cellular 911 calls are answered by the appropriate dispatch, which includes city dispatches and the CHP communications center in the area. When answered by a CHP communications center, a service operator initiates a CAD log identifying the incident. CAD automatically routes the log to the dispatcher, who then contacts the CHP patrol unit to potentially respond.

CHP Patrol Units

CHP patrol units usually receive radio calls to respond to incidents that may affect traffic. Once the CHP officer arrives at the scene, the officer assumes incident scene management and verifies the details and severity of the incident. If necessary, the

officer may request the appropriate emergency service personnel and equipment. The officer may initiate a Sigalert or traffic advisory, and Caltrans may be notified to respond.

Airborne Surveillance

Airborne surveillance is also used to detect and verify incidents. CHP fixed-wing or helicopter aircraft may arrive at a scene before ground units and expedite incident verification. Airborne surveillance is particularly useful in rural areas. A CHP aircraft may land at the scene and assume scene management responsibilities until ground units arrive.

Freeway Service Patrol

The Freeway Service Patrol (FSP) is a fleet of tow trucks that circle continuously on fixed travel routes, known as "patrol beats." FSP is intended to provide early detection and rapid removal of minor incidents, such as a stalled vehicle blocking a lane or a disabled vehicle stranded on the shoulder. FSP will also fix a flat tire, supply gasoline, restart a vehicle, or tow a vehicle to a safe location off the highway. FSP services are always free of charge to motorists. FSP tow trucks are active during commute times on Monday through Friday, with selected routes also working outside of the normal peak traffic periods, including midday, night, and weekend operations.

CHP trains FSP drivers to recognize and remove vehicles and objects that cause slowing on the SHS. FSP drivers also discover many impediments while on patrol, receive directions from CHP dispatchers, and are supervised in the field by CHP officers.

Freeway Service Patrol Dispatch

Dispatchers obtain data from CHP officers, cellular phones, call boxes, and FSP units. This information is routed to the FSP dispatcher on the CAD system through the dispatch office. Similarly, FSP drivers alert CHP officers and the TMC of any incidents.

Automatic Vehicle Locators

FSP tow trucks are equipped with automatic vehicle locators (AVLs) to assist CHP officers and dispatchers with the whereabouts of a particular truck. The AVLs are programmed to identify tow trucks and plot truck locations on a computer screen. This process occurs at selected intervals and can be done quickly to locate a truck in the event of a radio failure or other emergency.

Surveillance System and Graphics Display

Another method for incident detection is the computerized electronic surveillance system, where available. This system can provide a graphic visual that can be quickly scanned to identify the location of a potential incident. A series of yellow lights indicates that a slowing condition exists, while red lights indicate that traffic congestion has developed.

Graphics may indicate an incident by showing a series of red and yellow icons, increasing in numbers upstream from the incident. The graphic screen shall be monitored for unusual groupings of red or yellow icons, or both. All suspected situations will be investigated by querying CHP VisiCAD, the electronic surveillance system data terminal, Caltrans communications dispatchers, FSP, Caltrans field units, or CCTV. Table 110-2 lists some commonly occurring patterns for identifying a potential incident.

Table 110-2 Icon Depiction of Traffic Patterns

Pattern	Likely Situation
Solid red to a point, then green downstream.	An incident with lanes blocked.
Solid red in both directions to a common point, then green downstream in each direction.	Incident on one side of the highway with lanes blocked, visible from the other side of the highway.
The number of red locations in one direction is greater than in the other.	A longer queue indicates the direction of the incident.
Red and yellow are interspersed and randomly change from one color to the other.	Normal recurrent congestion, and likely no lanes are blocked.
Yellow to a point, perhaps one red location, then green downstream.	Unusual activity causing a distraction located on the shoulder.

Data Incident Detection

Some electronic systems include automatic incident detection (AID) algorithms. This specialized software program continuously analyzes upstream and downstream traffic flow data and senses a sudden change in traffic flow from one reporting station to the next in a short time interval. This condition will trigger the AID alarm, which is usually depicted by a flashing red light on the status display map. As the alarm can be falsely triggered by recurrent traffic congestion conditions, it is only an indication of a potential traffic incident.

A more reliable means to detect incidents is by examining traffic volumes and speed. Traffic volume data can indicate a reduction in capacity due to an incident. A cursory inspection of traffic volume and speed values can indicate a possible incident. Table 110-3 shows some general patterns and their possible indications.

Table 110-3 Incident Influences on Traffic Flow

Change in Traffic Data Observed	Nature of Potential Incident
Reduction in flow of 300 vehicles per lane per hour.	Incident on the shoulder, not blocking a lane.

Change in Traffic Data Observed	Nature of Potential Incident
Reduction in speed below 20 mph.	Likely one lane blocked on a multilane facility.
Reduction in speed below 10 mph.	Likely two or more lanes blocked.

Other Sources

Closed-Circuit Television

CCTV relays real-time video images from cameras along highways to monitors in the TMC. CCTV cameras are primarily used for monitoring roadway operating conditions and incident verification. However, on occasion, CCTV serves as the initial means to verify incident details. The use of CCTV camera video can pinpoint the exact location of an incident and provide important details such as the number of vehicles involved, the number of lanes blocked, the length of the queue, and more. Once the appropriate emergency-response notifications have been given, CCTV monitors should be checked intermittently to observe the status of incident clearance activities and impacts on traffic.

Caltrans Field Personnel

Caltrans field personnel include maintenance, construction, and traffic management employees. Mobile phones and two-way radios are used to communicate between field units and the TMC in everyday operations, including reporting incidents.

Media

Commercial television and radio stations may also be used as a tool for incident detection. Radio stations provide the traveling public with reports on updated traffic conditions regularly. They can be used as a cross-reference as they are provided with information from airborne surveillance and reports from the public. Local broadcast and cable television stations also obtain information from airborne surveillance and other sources. CHP MediaCAD and Caltrans video links can also provide the TMC with video images and detailed reports from areas that are not under TMC electronic observation. Caltrans public information officers (PIOs) also provide information to the TMC and local media stations.

Local Agencies

Local agencies are a valuable source of information, especially during an incident that transpires within their area of jurisdiction and in the vicinity of the SHS. A list of local agency contacts should be made readily available for quick reference.

Social Media

Social networks and social media have become valuable sources of real-time information. TMC personnel may check social media sites such as X (formerly Twitter)

and Facebook for incident detection. These sources may contain information and visuals to help identify the location and severity of an incident.

Topic 4 Incident Verification

Caltrans' incident verification tools include communication with Caltrans field units from the Divisions of Traffic Operations, Maintenance, or Construction, CHP VisiCAD, and CCTV. CCTV is a critical tool for information gathering because it relays real-time visual information directly to the TMC.

Initial incident information and verification can be obtained from CHP through cellular 911 calls, roadside call boxes, and CHP field patrol units. Information from all CHP sources is entered into the CAD system, where TMC personnel can access it. Often, multiple reports, such as a series of cellular 911 calls, can help determine the incident severity and more accurately detect the location and direction of the incident.

Upon receiving information about a possible incident, the CHP communications center creates a CAD log describing the incident. Based on severity and availability, CHP may respond to the scene of the reported incident and confirm its severity. Additional details are added to the CAD log as they are received by the CHP communications center.

CHP or FSP officers on road patrol may be the first to observe and report an incident. The CHP communications center would then generate a CAD log indicating that the officer is at the incident scene. In this situation, TMC operations personnel will regard the incident as verified.

Aerial surveillance can be used to verify the severity and details of a traffic incident. Helicopters or fixed-wing aircraft provide support for responding ground units. If necessary, specialized CHP aircraft may safely transport injured parties from the incident scene to local hospitals. Once the injured parties are removed from the scene, CHP and Caltrans personnel will then quickly work to reopen the highway.

Another verification source is the FSP. Often, FSP is the first to arrive at the scene of an incident, particularly a minor incident, and can provide details on the exact location, the number of lanes blocked, and the need for additional response efforts from CHP to restore full traffic capacity quickly. Tow trucks in the field relay information by voice or data radio to the FSP dispatch center, which is then logged into the CAD system.

Incident information can also be retrieved from commercial radio and TV stations.

Topic 5 Incident Classification

Traffic incidents significantly reduce the reliability and available capacity of the transportation system. Early detection is critical, as it enables personnel to respond quickly, clear the roadway, and restore normal traffic flow. The type and scale of response, however, must be carefully matched to the incident's severity, safety considerations, and the expected duration of traffic impacts.

Incident Duration

According to the *California Manual on Uniform Traffic Control Devices* (*CA MUTCD*), traffic incidents can be divided into three general classes of duration. These classes are:

- Minor (expected duration under 30 minutes).
- Intermediate (expected duration of 30 minutes to 2 hours).
- Major (expected duration of more than 2 hours).

To better understand incident duration, Figure 110-2 illustrates the incident timeline of the seven stages in the TIM process. Table 110-4 identifies and defines the key incident characteristics or "times" that can be obtained from the incident timeline. Caltrans, with support from CHP, has established incident clearance time (ICT) goals and actions to be taken to minimize the impact on traffic.

Figure 110-3 Incident Timeline

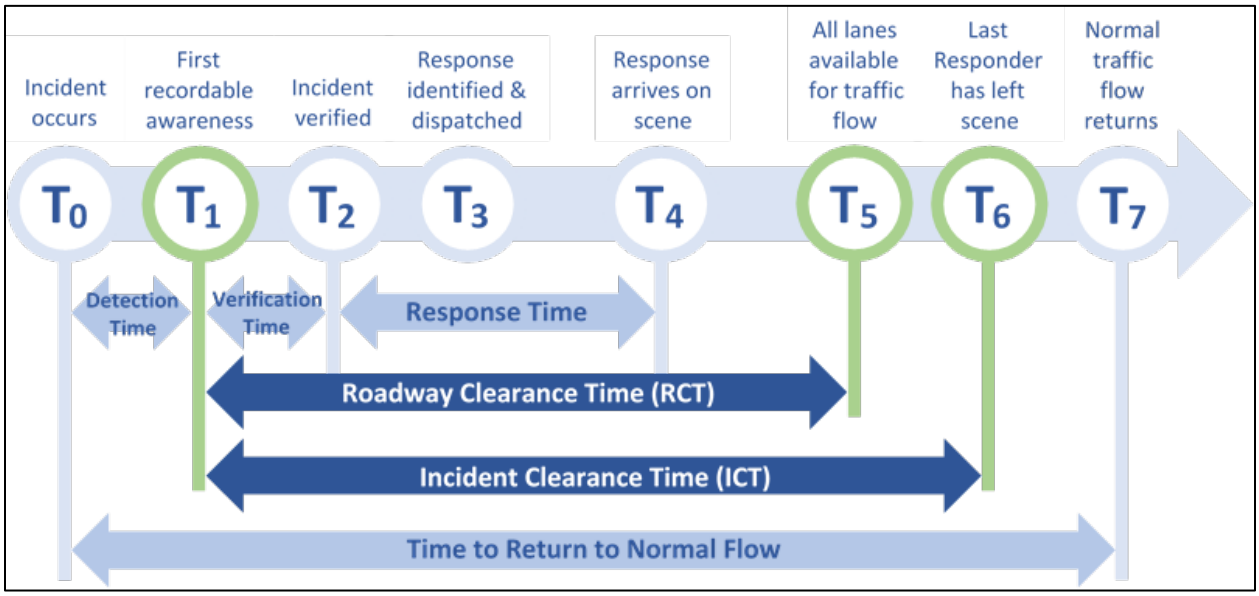


Table 110-4 Key Incident Characteristics From Incident Timeline

Measure	Calculation	Definition
Detection Time	T1 – T0	The time between the incident occurring and the incident being reported. Detection time is not typically reported since the incident's actual time is often unknown.
Verification Time	T2 – T1	The time between reporting the incident and verifying the incident. TMCs can typically assist with verification by using CCTV cameras.

Measure	Calculation	Definition
Response Time	T4 – T2	The time between verifying the incident and the first responder arriving on the scene. Law enforcement may not always be the first to arrive.
Roadway Clearance Time (RCT)	T5 – T1	The time between the first recordable awareness of the incident by a responsible agency and the first confirmation that all lanes are available for traffic flow.
Incident Clearance Time (ICT)	T6 – T1	Time between the first recordable awareness of the incident by a responsible agency and the time that the last responder left the scene.

Incident Severity

Incident severity focuses on fatalities, suspected serious injury, suspected minor injury, possible injury, property damage, and impacts on traffic flow. A TMC needs the following information to properly allocate resources to an incident:

- What is the incident type and description? Examples include an overturned truck, spilled load, jackknifed truck, multi-vehicle incident, and others.
- What is the roadway type, direction, location, and number of lanes involved?
- Is a truck or heavy vehicle involved?
- Are there reported injuries or fatalities?
- Is there a spill, what is the material, how much has been spilled, and is it actively spilling?
- Are hazardous materials (HAZMAT) or fire involved?

It may be helpful to use a checklist to gather key information for proper incident management. Every district maintains a TMS for tracking the details and status of an incident.

An important factor in providing the appropriate response effort is determining the anticipated impact on the flow of traffic based on normal traffic demand. The four periods of normal traffic flow demand are as follows: (1) a.m. peak, (2) p.m. peak, (3) midday, and (4) night. As traffic conditions vary from one facility to another and from one region of the state to another, each TMC must determine and set the actual hours when each flow condition applies. An example is:

- Morning (a.m.) peak: 6:00 a.m. – 9:00 a.m.
- Evening (p.m.) peak: 3:00 p.m. – 7:00 p.m.
- Midday: 9:00 a.m. – 3:00 p.m.

- Night: 7:00 p.m. – 6:00 a.m.

Sigalerts are issued for unplanned major incidents that affect one or more lanes and will block the roadway for at least 30 minutes, causing congestion and delay. Sigalerts are issued by either CHP officers in the field or from the CHP communications center. Examples of Sigalerts may include congestion-causing traffic incidents, spilled loads, leaking gas, or special events. A traffic advisory is a situation of a continuing nature spanning several days or that will occur each day for a predetermined period. Examples of traffic advisories may consist of high winds or blowing sand, flooding, construction or maintenance closures, and special events.

Highway Condition Report Requirements

HCRR is the requirement to report the incident depending on the severity, which is available through the HCRR Onramp web page. The HCRR identifies types and examples of incidents that TMCs and maintenance dispatch shall report to HCC within 10 minutes of notification of the incident, as well as to their district executive management. In addition, the district's weekly duty officer shall call the Caltrans Deputy Director of Maintenance and Operations with all relevant information upon the occurrence of the following incidents:

- Any incident that results in on-duty department personnel or contractor employee fatality.
- Significant media incidents, as determined by district directors, depending on the level of media or political focus in that district.
- Full closure of a major state route that causes significant delay.
- When a Significant Incident Report is requested, please follow the instructions found on the Highway Condition Report Requirements Onramp web page.

Traffic incidents identified in the HCRR will require a high level of response and should be prioritized.

Major Incident Database

The Major Incident Database (MIDB) is a web application that TMC personnel can access statewide to log major incidents. Major incident recording allows Caltrans to calculate TIM performance measures from the TIM timeline (Figure 110-2). These measures help Caltrans to promote safe and quick clearance and create strategies for improvements in incident response. TMC dispatchers will access and provide this information.

Topic 6 Traffic Management Response

This topic outlines the general notification call-out procedures and personnel for traffic management response. The procedures, field elements, and personnel may differ slightly by district.

Response personnel may include the TMT, maintenance, CHP, special services, duty officers (districts or HQ), and personnel from allied agencies. In addition to coordinating with incident response personnel, the TMC actively provides traveler information during incident response and special events, as detailed in Section 3, Topic 9 "Traveler Information." This includes utilizing available field elements like CMS, CHIN, HAR, and QuickMap to notify the traveling public of unusual driving conditions and possible alternate routes. Refer to Section 4, "Systems and Tools," for more information on using traffic management tools.

After the last responder has left the scene (refer to Figure 110-2), the TMC will compile the incident report for the TMT and TMC supervisor to review. The after-action report should reflect all communication about the incident involving the TMC and TMT. The TMC will also notify the district management and all other entities originally notified of the closure or incident that the incident is closed.

Traffic Management Team Call-Out

For districts that have a TMT, this section serves as a guideline for making the proper call-out and notification. The first step is determining if the incident requires TMT support. The following incident classifications or scenarios require TMT notification:

- Major incidents.
- Reportable incidents (as described in the HCRR).
- Incidents that cause significant traffic delays of 30 minutes or more.
- Maintenance or construction closures that cause significant traffic delays of 30 minutes or more.
- Long-term closures where a detour is made available to the public.

Note: When in doubt, call the TMT. Consult the TMT if an incident falls outside of these definitions and allow the TMT to determine whether to mobilize.

In general, the TMT lead is provided with a call-out map or a list of available TMT personnel. The list contains team members' contact information, function, vehicle type, and rank in order of call-out priority. The TMC operator will refer to the list to select and contact the primary TMT using a state-issued cell phone. If the primary TMT does not answer, leave a brief message with the date, time, and nature of the call on the TMT's voicemail. Continue the call-out with the next TMT in the same manner, in the order stated on the call-out list. If unable to contact any of the above personnel, contact the TMC supervisor.

Maintenance

The TMC will notify district maintenance of incident details just before contacting the primary TMT. Incident callouts will normally be made by TMC dispatchers or CHP dispatch after normal working hours. Maintenance will update and maintain call-out maps and lists, and make them available for all personnel to access.

California Highway Patrol

TMC staff should not enter Caltrans TMT unit status into CHP's CAD or VisiCAD unless specifically requested by CHP. Routine tracking and status of TMT units are maintained through Caltrans' internal systems.

Call-Outs for Non-24-Hour Transportation Management Centers

In districts where the TMC is not operated continuously, an after-hours call-out procedure needs to be identified. Each district should develop and formalize a procedure that best suits its individual needs. The list of contact personnel should be distributed to all locations where it is needed, such as maintenance communications, the CHP communications center, or local law enforcement agencies. In general, during TMC non-operating hours, the CHP communications center will notify the identified Caltrans contact (such as the maintenance supervisor, lead, or member of TMC personnel), then the Caltrans contact will call out personnel requested by CHP.

Special Services

For some incidents, CHP may request that the TMC notify other special services for support in dealing with an incident. Such situations may require notifying a HAZMAT team or other state, regional, federal, or local government agencies. If the incident involves HAZMAT, the district hazardous materials coordinator must be contacted as soon as possible. These notifications should be carried out through the established procedures and designated contacts as defined in each district.

If the situation requires emergency repair or specialized maintenance services, these contacts may also need to be initiated through the TMC. Such emergency services include electrical maintenance, structure maintenance, municipal or private utility services, or private sector entities under the listing of contacts. A list of contacts from all areas shall be maintained at the TMC.

District Weekly Duty Officer

After sufficient incident details are determined, a notice of the incident may need to be relayed to the district's weekly duty officer. The TMC should call the duty officer to give a full report for any of the following scenarios at any time; however, these scenarios may vary by district:

- Incidents that cause more than four miles of traffic backup in addition to normal congestion and that are expected to last four or more hours.
- Full closure of a major state route (in one or both directions) that causes significant delay.
- Any incident involving a Caltrans vehicle or employee that results in a fatality to either the employee or another party.
- Any incident involving a contractor performing Caltrans work resulting in a fatality to the contractor's employee or another party.
- Any incident that could be considered politically sensitive or would be likely to attract extensive media attention (such as cross-median incidents resulting in fatalities).

The designated district weekly duty officer contact information shall be provided to the TMC. During normal weekday office hours, the TMC shall contact the designated duty officer on their state-issued cell phone and give detailed incident information. Outside normal working hours, the TMC shall contact the designated duty officer per the contact list. The list contains the call order, specific instructions, contact information, and the location of each contact.

After each call is made, the incident report should be updated to note the person contacted with a brief description of the information given. The duty officer will reference the HCRR Onramp web page to determine when to notify the Deputy Director of Maintenance and Operations.

Caltrans Headquarters Communication Center

The HCC shall be notified through the TMC and maintenance dispatch of all directional closures, full closures, or incidents of unusual circumstances. Refer to the HCRR Onramp web page for more information on reportable incidents.

Information provided shall include:

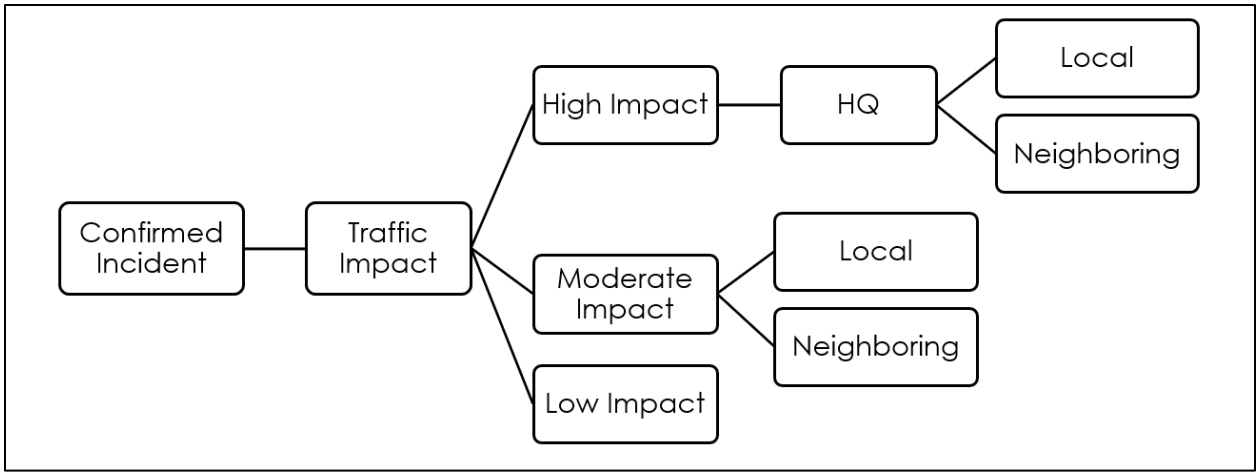
- Limits of closure or occurrence.
- Reason (including a description of HAZMAT, if involved).
- Actual occurrence time of closure.
- If a detour is available.
- District and city, including the county, route, and post mile.
- Additional desirable information, such as an expected time of opening and detour details, if available.

Closure information shall be relayed to Caltrans HCC through CHP VisiCAD, telephone, fax, or Caltrans radio.

Neighboring Transportation Management Center and State Traffic Operations

Once a confirmed incident's impact on traffic has been classified (such as low, moderate, or high), the TMC will need to estimate the impact on neighboring districts and agencies. If the situation affects only a localized area, then it is deemed of local significance only. If the situation affects a much wider area, potentially disrupts interregional travel, affects directional travel across district boundaries, or is anticipated to be an exceedingly long-duration incident, then the neighboring district TMC and the neighboring state department of transportation (DOT) should be notified following the process flow chart shown in Figure 110-3.

Figure 110-4 Notification Process



Incident Notification Process

1. Confirm the incident.
2. Assess incident traffic impact as:
   - High impact (incident duration is greater than 1 hour).
   - Moderate impact (incident duration is greater than 30 minutes, but less than 1 hour).
   - Low impact (incident duration is less than 30 minutes).
3. If the incident traffic impact is high or moderate, determine whether it affects only the local area or a larger regional area.
4. If the incident is identified as significant in the HCRR, report it to HQ.

If the incident affects only the local area, handle it appropriately within the confines of the TMC. If the incident affects neighboring areas, report the incident to HQ and the neighboring TMC or state DOT if any of the following conditions exist:

- If the incident causes unusually significant traffic congestion and is likely to become a newsworthy event.
- If the incident affects interregional travel for a long duration.
- If alternate routes need to be provided or coordinated with adjoining regions.

Allied Agencies

When a confirmed incident has the potential to substantially disrupt an allied transportation agency or transit provider's facilities or operations, the TMC should relay a notification of the incident, along with details of the potential impacts to the agency as soon as is practical after incident confirmation. District PIOs are the primary contact to relay notification of incidents to outside agencies, including details of potential impact. Examples of organizations to be notified include:

- Local transportation or traffic management agencies.
- Area or regional transit providers.
- Airport, harbor, or park authorities.
- Commuter or regional rail operators.
- Toll facility operating authorities.

The TMC should define in advance which situations require notification and provide contact details for participating organizations. Creating informal written agreements can help ensure that all parties understand the notification criteria.

Topic 7 Traffic Management Plans

A TMP is a method for minimizing activity-related traffic delays and incidents by using traditional traffic handling practices and an innovative combination of strategies. TMP strategies are designed to improve safety and mobility for the traveling public and highway workers. These strategies include:

- Public information
- Motorist information
- Incident management
- Construction methods
- Demand management
- Alternate route planning

TMPs can be classified by the anticipated impact of the highway work on the traveling public. A blanket TMP is used for low-impact maintenance and encroachment permit activities performed during off-peak hours on roadways with low volumes. A minor TMP

is used for capital and maintenance projects where traffic impacts are not significant, and strategies need to go beyond those included in a blanket TMP.

Major TMPs are prepared for capital, encroachment permit, and maintenance projects that could significantly impact traffic. Major TMPs are required for high-impact projects. Generally, major TMPs are identified by the following characteristics:

- Multijurisdictional in scope, encompassing CHP, city, county, or regional governments, state DOTs, employers, merchants, developers, transit operators, ridesharing agencies, neighborhood and special interest groups, emergency services, and transportation management associations.
- Multifaceted, comprised of an innovative mix 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 a longer period, sometimes implemented up to a year or more before the start of actual construction, with specific elements often implemented incrementally to coincide with construction phasing.

TMPs are required for all construction, maintenance, encroachment permit projects, planned emergency restorations, locally or specially funded projects, or other activities on the SHS. Traffic management activities coordinated by the TMC may encompass items such as planned lane closures, special events, and emergency road closures.

Definitions

Significant traffic impact is an individual traffic delay of 30 minutes or more above normal recurrent travel time on the existing facility, but may also refer to work that may affect traffic conditions over a long period.

Major lane closures are lane closures that are expected to result in significant traffic impacts despite the implementation of TMPs.

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 exceeds the 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.

Responsibilities

The following outlines the individual responsibilities of TMP personnel, including the district traffic manager, the district TMP manager, and the district construction engineer or resident engineer.

District Traffic Manager

- Responsible for the day-to-day decisions of traffic impacts from planned activities on the SHS. Determines the extent of a TMP.
- Coordinates with TMC staff (as well as adjacent districts) and PIOs to respond with appropriate measures when planned lane closure activities result in significant travel delays on the SHS.
- Facilitates review, approval, modification, or denial of planned lane closure requests.
- Recommends terminating or modifying active lane closure operations without compromising the safety of the public or workers when traffic impact becomes significant.

District Traffic Management Plan Manager

- Acts as the single focal point for planning and developing TMPs.
- Works with the district traffic manager, TMC manager, and the project development team as appropriate to determine the scope and extent of a TMP and ensure that the TMP is updated during all phases of a project.

District Construction Engineer or Resident Engineer

- Serves as a liaison between construction, the district traffic manager, the district TMP manager, and the TMP manager.
- Coordinates with the district traffic manager and the district TMP manager to consider traffic and construction impacts if an event is scheduled in an active work zone or construction area.

Planned Lane Closures

Planned lane closures are non-emergency lane closures that are scheduled in advance by the following areas: construction, maintenance, and encroachment permits. TMPs are required for all projects with work that requires planned closures, and are to be reviewed in advance by the district traffic manager. All planned lane closures are submitted through the Lane Closure System (LCS) and are approved by the LCS coordinator or district traffic manager. Changes to the approved lane closure can only be made by the LCS coordinator or district traffic manager.

The TMC should be notified of planned lane closures to monitor traffic conditions around the closure area while the project is actively in progress. The TMC is responsible for updating the status of a lane closure in the LCS once reported. If traffic congestion occurs, the TMC may be requested to activate CMS, coordinate with TMT field units, and work with CHP to issue traffic advisories as needed.

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.

- A closure is already in place, and the engineer authorized an on-duty officer to conduct a traffic break.

Special Events

Any special event (such as a sporting event, county fair, parade, concert, or air show) that is expected to cause a significant traffic impact should be handled in the same way as a planned lane closure. A traffic management response effort will be predetermined and put into action in conjunction with the scheduled event. The TMC should be notified of special events to monitor traffic conditions around the event area. The TMC may be requested to activate CMS, coordinate with TMT field units, and work with CHP to issue traffic advisories as needed.

Emergency Lane or Road Closures

An emergency closure is an unplanned, unscheduled lane or roadway closure for public safety. As with planned lane closures, the TMC must monitor traffic conditions near the emergency area. Upon receiving the initial notification of closure, the TMC should request as much detail as possible, especially the number of lanes affected and the duration. This information, together with knowledge of the time of day (TOD), traffic volume, and more, will help to determine if a traffic advisory will need to be issued and if the TMT will be needed. Since an emergency closure is unplanned, the TMC will follow notification and coordination procedures outlined in the *Emergency Traffic Management Guide*.

If an emergency results in a full closure requiring an alternate route, this usually involves coordinating with the appropriate public agencies (including CHP and Caltrans field personnel) as well as any involved private sector entities to develop an emergency TMP. This may include the use of roadway closures, special signing, detours, public information advisories, and other methods that would assist the motorist around the closed facility, as well as expedite highway worker and emergency responder efforts to reopen the facility. Occasionally, interaction with local agency traffic engineers is required to modify traffic signals along a specific highway detour route.

Topic 8 Recurrent Congestion Management

Ramp Metering

Ramp metering is a traffic management strategy that uses a system of traffic signals at highway entrances and connector ramps to regulate traffic volume and the spacing of vehicles entering a highway corridor. This strategy is beneficial because it increases highway throughput and operating speeds, maintains safer merging operations, and reduces collisions. For additional ramp meter design and operation materials, refer to the *Ramp Metering Design Manual* and *Traffic Operations Manual*, Chapter 215, Part 4, "*Ramp Metering Operations.*"

Components

A ramp metering system contains two categories of components: ramp meter components and ramp meter data collection components. A full list of components can be found in *Traffic Operations Manual* Chapter 215, Part 4, Section 2, "Basic Ramp Meter Layout." The following components may be relevant for TMC communications and operations:

- Controller – A controller is used to control the sequence and duration of ramp meter indications. All meters should use a Model 2070 controller.
- Communications – The ramp metering systems must be in constant communication so that every 30 seconds they can transmit traffic data and operational statuses to the TMC or other operating districts' central system.
- Ramp meters and associated equipment.

Modes of Operation

Ramp meters can operate in different modes to set or adjust the rate at which vehicles enter a highway facility. Flow rates can be fixed by the time of day (TOD) or automatically adjusted to be responsive to fluctuating traffic demand. The different modes of operation can be found in the *Traffic Operations Manual* Chapter 215, Part 4, Section 3, "Operational Requirements," and are as follows:

- Fixed-Rate – Ramp meter shall actively meter and have fixed green, yellow, and red interval lengths.
- Traffic responsive – Ramp meter shall actively meter at a determined metering plan rate based upon the measured mainline flow, occupancy, and speed, and compare those values to the corresponding thresholds in the selected metering plan. The mainline flow, occupancy, and speed may be measured adjacent to the onramp or over the length of a highway segment. Queue override may be selected as the highest priority.
- Rest-In-Dark – Metered lane shall advance to the pre-metering non-green interval.
- Rest-In-Green – Metering interval shall advance to the pre-metering green interval.

Operational Considerations

For some of the ramp metering modes, the system estimates the current capacity (vehicles per hour) of each critical bottleneck on the highway. Since capacity varies with road conditions, weather, and driving behavior, it is not easily defined. It is also necessary for the ramp meter system to predict demand on the system for the next sample interval (usually 30 seconds, but may vary by district). If the demand exceeds capacity, the ramp meter system allocates the available main lane capacity between the various locations. If demand is below capacity, the ramp meter system allocates the excess capacity between any ramps or connectors that have queues.

Ramp meters can also be programmed to compensate for vehicles that use the non-metered high-occupancy vehicle bypass and adjust the metering rate accordingly.

Integrated Corridor Management

As an alternative to building new highways and streets, Caltrans works with local agencies to utilize advanced traffic management strategies and optimize the flow of traffic within a transportation corridor. These management strategies are designed to improve the flow of traffic and decrease congestion through a corridor, consisting of a highway segment and associated major parallel arterial streets. Integrated corridor management (ICM) requires cooperation between agencies, including Caltrans and CHP, regional transportation agencies, and local jurisdictions.

The fundamental objective of ICM is to maximize the efficiency and throughput of the existing highway and surface street network. The following presents key ICM elements and techniques:

Congestion Monitoring

The ICM central processing system continuously monitors traffic conditions in the corridor. The system will adjust corridor surface street traffic signals and highway ramp meters to balance system flows. CCTV cameras and field observations are used to monitor the effects of timing changes.

Incident Detection

The ICM central system will detect if there is a significant change in traffic speed between detection stations, identifying a potential traffic incident. When the ICM central system suspects an incident, it notifies Caltrans or local agency control center operators, or both. TMC personnel will attempt to confirm suspected incidents using CCTV cameras and through field personnel.

Motorist Information

The TMS is a component of the ICM central system that provides current traffic condition information and suggested alternate route advice to motorists through:

- CMSs on highways and streets.
- HAR broadcasts.
- QuickMap and other mobile apps like Google Maps.
- Media traffic reports.

Operational Considerations

The ICM functionality is obtained through a mix of computer automation and operator involvement. Routine ICM operation is to be performed by the personnel designated as ICM coordinators. Currently, procedures outlining the use of these systems are guided by general concepts for ICM operation as mutually agreed upon by participating agencies. If stationed within the TMC, the ICM coordinator should handle all requests for

assistance as well as requests to combine traffic management response efforts with participating agencies.

Topic 9 Traveler Information

Traveler information is an important part of the TMS. This includes communication devices used to report real-time traffic conditions, such as CMSs, CHIN, HARs, and QuickMap. These devices are also used to alert drivers to construction and maintenance activities that may affect normal travel patterns.

One of the primary functions of the TMC is to provide the most up-to-date traffic information to help travelers make informed travel plans. Traveler information should be traffic-related and consist of the following information:

- Number and type of lanes blocked.
- Number and type of vehicles involved in an incident.
- Expected duration of the blockage.
- Queue length.

TMCs are typically joint operations between CHP and Caltrans. Together, they monitor traffic conditions and coordinate responses to incidents on the SHS. The TMCs share traffic information with the public through Caltrans Public Affairs and commercial media platforms. This data is open-source and available to third-party users at their discretion.

Caltrans and CHP PIOs often collaborate with regional agencies and media ISPs to distribute multimodal travel information through Advanced Travel Information Systems (ATIS). ATIS refers to the delivery of real-time information on traffic, transit, and other travel modes, either directly to travelers or through intermediaries. As per DD-19-R3, "Caltrans Public Information Officers (PIO) are responsible for handling media inquiries in accordance with the California Public Records Act (refer to Deputy Directive 79), and Caltrans' policies."

Commercial and media ISPs are companies that repackage, enhance, and redistribute this open-source data in various formats and media. Because the data is publicly available, ISPs can freely access resources such as the Commercial Wholesale Web Portal 2 (CWWP2), CHP MediaCAD, QuickMap, HAR, CMS, etc. Distributing this information to ISPs and other stakeholders enhances public awareness of current road conditions, benefiting consumers by helping them make informed travel decisions. This broad access supports more efficient use of the transportation system for business, family, and personal travel needs.

Note: **Never report** fatalities or the status of injured individuals in the traffic information provided to the public or the media. This would violate individual privacy.

Commercial Wholesale Web Portal 2

In accordance with DD-078 on Travel Information, the CWWP2 is a centralized platform that provides open-source traffic and transportation data from Caltrans to external users, including media outlets, developers, researchers, and private sector companies such as navigation and mapping services. Key Features of CWWP2 include the following:

- Data Access: Users can download real-time and archived transportation data, such as traffic speeds, lane closures, incidents, road conditions, construction updates, and CMS messages.
- Public and Commercial Use: The data is open source, meaning it's freely available for third-party use without requiring an MOU.
- Developer-Friendly: CWWP2 offers access via URLs and APIs, allowing developers and commercial ISPs to integrate Caltrans data into their apps, services, or research tools.
- Supports Traveler Information Systems: The data from CWWP2 helps power travel information platforms like QuickMap and is often repackaged by media and navigation services (such as Google Maps, Waze, and others).

CWWP2 promotes transparency, collaboration, and improved mobility by enabling the wide distribution of accurate, real-time travel data. It supports Caltrans' goals of reducing congestion, improving safety, and helping travelers make informed decisions.

Commercial Television Broadcasts from TMC Facilities

CHP and Caltrans share joint responsibility for overseeing live broadcasts originating from TMC facilities. ISPs seeking to conduct live broadcasts within a TMC must do so in accordance with an approved Live Commercial Broadcasting MOU. Once the MOU is in place, the ISP may carry out live broadcasts from designated locations and in a manner authorized by Caltrans or CHP, or both. For more information, refer to Appendix 110 A, Topic 2 "Live Commercial Broadcasting Memorandum of Understanding."

To protect privacy and ensure operational security, Caltrans or CHP, or both, reserve the right to review, screen, or edit any broadcast content. Additionally, during state or federally declared emergencies or major incidents, the ISP must provide access to its broadcast feed upon request by Caltrans or CHP.

Commercial television broadcasting is already established at several TMC locations. For instance, the District 4 TMC supports commercial broadcasts through the Bay Area's 511 Partnership. In accordance with DD-19-R3 on Media Relations/Public Information and the *Traffic Operations Manual*, TMC managers are required to provide equal and consistent access to all ISPs requesting broadcasting rights, ensuring fairness and uniform compliance across all TMC facilities.

Changeable Message Signs and Highway Advisory Radio

CMSs and HARs provide real-time traffic information to motorists directly. These elements relay information concerning incidents, planned lane closures, road conditions, special events, or other unusual traffic conditions to motorists. Messages must be updated promptly to remain accurate in changing conditions. Updating CMSs and HARs is the highest priority activity in the TMC.

Caltrans Highway Information Network

Messages similar in content and format to those broadcasted over HAR may also be conveyed through CHIN. CHIN is a computer-based recording system that makes current highway condition information available to the entire state by telephone at (800) 427-7623. Each TMC will supply information to HCC for placement into CHIN. CHIN messages are also made available to view on QuickMap and are the responsibility of the HCC.

QuickMap

The Caltrans QuickMap web page and mobile app present several types of real-time traffic information layered on a Google Map. The information includes traffic speed, lane and full closures, CHP incidents, highway information, CMS content, camera snapshots, active chain control requirements, and the locations of snowplow operations. Much of the information presented by Caltrans QuickMap is also available on the Road Information website, which includes lane closures, CHIN messages, and chain controls. QuickMap also presents information from the Media CHP Traffic Incident Information web page.

In addition to the information presented by Caltrans QuickMap, links to regional 511 sites are accessible in the Caltrans QuickMap drop-down menu labeled "Regional Sites." These sites are provided by other organizations, in partnership with Caltrans, to supply comprehensive commuter and multimodal traveler information within their regions.

Media

Media organizations use direct information from Caltrans (such as CMSs, HARs, and QuickMap) to report traffic news to the motoring public. The information provided may consist of incidents, road conditions, planned lane closures, special events, and areas of recurrent congestion. Each district has a public information office that the TMC contacts to assist with producing public notices. Each public information office also posts real-time traffic alerts on social media to inform the public.

In some districts, CHP provides traffic incident information to the media through regularly scheduled commercial radio or television broadcasts sent from the TMC and CHP MediaCAD. Incidents that trigger the issuance of a Sigalert are broadcasted through the CHP communications dispatch center and are monitored by traffic-reporting media organizations.

Emergency road closures not caused by a traffic incident, such as closures due to flood, fire, earthquake, mudslide, or snow, are usually handled in the same manner as incidents for purposes of media access. In the case of adverse travel conditions when the facility remains open to traffic, such as high winds, reduced visibility due to fog or snow, or icy road surfaces, the notice is generally provided as a traffic advisory. A traffic advisory is handled the same way as a Sigalert if the traffic conditions meet the criteria of a Sigalert.

Third Party

Third-party systems are widely used and can provide transportation users with timely travel information to improve mobility, reduce travel costs, and increase personal travel convenience. Mobile apps like Google Maps feature GPS turn-by-turn navigation along with real-time traffic and weather alerts. Both web applications rely on user data and receive information on traffic conditions from QuickMap. Google's database of historical traffic data allows the app to alert drivers when traffic is better or worse than usual, and how much additional time is added due to incidents and slowdowns.

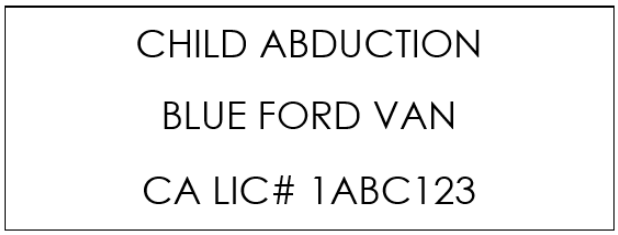
Topic 10 California Highway Patrol Missing Person Alerts

CHP's Emergency Notification and Tactical Alert Center (ENTAC) is responsible for issuing America's Missing Broadcast Emergency Response (AMBER) Alerts to get community assistance in the search for and safe recovery of an endangered, missing, or abducted person. Not all AMBER Alerts will have CMS support. If an AMBER Alert meets certain criteria to require CMS support, then the TMC will be requested for CMS support. CHP will contact the TMCs in the region, and Caltrans will activate CMSs and HARs in the impacted area and the possible path of travel.

Missing Person Alert (AMBER Alert) Messages

CHP and Caltrans have agreed on the standard content and format for CMS messages during Missing Person Alerts. CHP will provide Caltrans with the CMS wording in the agreed-upon format, in compliance with the *CA MUTCD* and *Changeable Message Sign (CMS) Guidelines*. AMBER Alert messages are typically a one-phase, three-line message that gives motorists information about a missing person. The message should display a vehicle description and license plate number (or partial number). An example of an AMBER Alert message for a child abduction is shown in Figure110-4.

Figure 110-5 AMBER Alert Message Example



The second line of an AMBER Alert message is the most important component. The CMS operator may need to omit some information and display only what is most helpful for the public. Experience has shown that motorists are less familiar with the vehicle year than with the vehicle color. For example, it is more effective to show "WHITE FORD ESCAPE" as opposed to "2025 FORD ESCAPE."

AMBER Alert Activation and Deactivation

To activate an AMBER Alert, ENTAC first needs to call the TMC and request CMS support for an AMBER Alert. TMC personnel should then activate CMS or HAR or both, create an incident management log, and contact HCC when the activation is complete. When an AMBER Alert has been deactivated, CHP will immediately contact Caltrans and request the message removal. Upon deactivation, TMC personnel are to deactivate CMS and HAR field elements and notify HCC when the deactivation is complete.

Caltrans may remove the AMBER Alert message on specific signs when local traffic conditions warrant posting traffic control messages.

Caltrans will only respond to AMBER alert requests from the CHP ENTAC. If Caltrans is contacted by a law enforcement agency other than CHP for AMBER activation, the call should be immediately forwarded to CHP.

Post-Alert Reporting

Every participating TMC must, within 24 hours, file an online Post-Alert Participation Report to HQ Traffic Operations.

This information is needed for logging Caltrans' activity level. It is important to file the report on time and as completely as possible. Reporting this data helps present a complete picture of Caltrans' efforts and support improvement recommendations.

The following is a list of data needed for the Post-Alert Report:

- District.
- City or area where activation was requested.
- City or area where the individual was found.
- Conclusion (person found, canceled, or other).
- Request received by Caltrans (date and time).
- Activation of CMS and HAR (date and time).

- Activation speed (number of minutes it took to activate all field elements).
- Deactivation of CMS and HAR (date and time).
- Deactivation speed (number of minutes it took to activate all field elements).
- Personnel hours (estimated total involvement).
- Message displayed.
- Message displayed #2 (if modified).
- Number of permanent CMS used.
- Number of portable changeable message signs (PCMS) used.
- Number of CMS used for traffic alerts.
- Number of CMS not used.
- Reasons for not using the unused CMS.
- Number of HAR used.
- Traffic impacts (such as delays or incidents).
- Operational impacts (such as overtime).
- HAR message.
- Effectiveness of CMS and HAR use (high – low).
- Other notes.

Topic 11 Traffic Data Analysis

Traffic data analysis is used to assist with planning and management efforts. Data analysis can reveal locations of constrained traffic flow (bottlenecks), shifting patterns of travel demand, or temporary seasonal variations in traffic flow. Ongoing short-term data analysis can provide the means to optimize traffic flow and balance minor fluctuations in the overall system operation.

More extensive analysis of stored traffic data patterns can lead to the development of major construction or reconstruction projects. Traffic data may indicate the need for auxiliary lanes, interchange modifications, widening, or roadway realignment projects. Data analysis may also reveal the locations where such roadway improvements would be most cost-effective. Once implemented, project effectiveness evaluations can be performed again by analyzing traffic data in the post-construction phase.

Traffic Information Sources

Active Intelligent Transportation System

The Active Intelligent Transportation System (ITS) is a computerized system used to gather highway volume and occupancy data from inductive loop detectors located

at frequent intervals on the highways and to provide an interface for controlling field element operation (e.g., CMS, CCTV). The central traffic system then analyzes the data to provide hard copy reports or electronic displays (either wall maps or computer color graphics) of the highway conditions. The information is displayed on graphic workstations located both within and outside the TMC.

Closed-Circuit Television

Closed-circuit television (CCTV) provides real-time video images from cameras along highways to monitors in the TMC. The video images from the cameras are transmitted to the TMC using communication media. The cameras are used to assist with the verification of traffic incidents and roadway operating conditions and are an exceptional tool for providing details, such as the number of vehicles involved, the number of lanes blocked, and the length of the queue. On occasion, cameras can serve as the initial source to detect an incident.

Caltrans Performance Measurement System

The Caltrans Performance Measurement System (PeMS) provides real-time and historical traffic data. Different types of performance data are available, such as volumes, speeds, delays, vehicle miles traveled, vehicle hours traveled, travel times, and annual average daily traffic. PeMS collects data from the following sources:

- ITS vehicle detector stations (VDS).
- Traffic census stations.
- Weigh-in-motion sensors.
- CHP incident data.
- Caltrans LCS.
- Real-time CMS.

Transportation Safety and Mobility Information System

The Transportation Safety and Mobility Information System (TSMIS) is a database tool for storing and reporting traffic volumes. The TSMIS can generate reports to summarize hourly, daily, and monthly traffic volumes. The TSMIS is only available internally to Caltrans and requires an account login. Some TSMIS traffic volume data is available publicly through the Caltrans Traffic Census Program web page. Traffic volumes stored on the TSMIS are validated and are generally more accurate than historical volumes available on PeMS. In addition to traffic volumes, the TSMIS includes other data elements such as traffic collisions and truck percentages.

Research

Traffic data analysis may include research efforts in conjunction with other agencies or private parties. The following includes categories of research efforts.

Agency-Sponsored Analysis

Analysis conducted by agency personnel for research purposes may include applications such as land use planning, origin and destination studies, or assessment of the future need for local infrastructure expansion.

Academic Research

Academic research using historical traffic data may be aimed at improving traffic flow theory, developing or optimizing traffic control strategies, enhancing traffic management decision support systems, or verifying the predictions of previous travel forecasting models.

Private Third-Party Research

Private sector research efforts may involve analyzing potential traffic impacts of proposed new land developments, determining historic recurrent congestion patterns for new product development, or developing or refining private motorist information systems.

System Assessment

Traffic data can be analyzed to assess how effectively traffic management and control strategies have been performed over time, to gauge the congestion level on the highway system and any trends that occur, to calibrate input parameters for variables used in traffic control software, and to determine the need for central processing system upgrades or enhancements to application software.

Performance

Analysis of recurrent traffic congestion patterns and observation of any changes in trends can be used to determine the effectiveness of congestion management strategies. Historical data analysis can identify the need to implement congestion management practices and determine where their use would be most effective. In some types of improvement projects, the sponsoring agency requires a comparison of before and after traffic conditions to measure the project's effectiveness.

Calibration

A sufficiently large sample size of data can be used to refine traffic management and control application programs. Historical data analysis can yield the proper threshold values to insert into AID algorithms to improve their detection rate and reduce the number of false alarms. Data can also be used to fine-tune metering rates and optimize other traffic signalization, which affects traffic flow on the SHS. Data may also produce useful input to traffic management decision support systems, improving their performance.

Upgrade and Enhancement

A secondary result of analyzing historical traffic data over a long period is identifying the need for improved manipulation of traffic data within the central computational

processing system. Experience may show the need for different data formats, different means of summarizing the data into more convenient forms, or the need to develop new processing algorithms to analyze the data differently.

Topic 12 Snow Operations

Caltrans snow operations primarily include chain controls, snow plowing, seasonal closures, and monitoring roadways and weather conditions. When chain control is warranted, district maintenance staff notifies the TMC of the locations and level of chain requirements. The TMC will then create an incident management log, activate both CMSs and HARs, and notify HCC. HQ will update CHIN to show chain control areas.

Levels of Chain Requirements:

- Requirement 1 (R1): Chains are required on all vehicles except passenger vehicles and light-duty trucks under 6,000 pounds gross weight and equipped with snow tires on at least two drive wheels. Chains must be carried by vehicles using snow tires. All vehicles towing trailers must have chains on one drive axle. Trailers with brakes must have chains on at least one axle.
- Requirement 2 (R2): Chains or traction devices are required on all vehicles except four-wheel or all-wheel drive vehicles with snow-tread tires on all four wheels. Note that four-wheel or all-wheel-drive vehicles must carry traction devices in chain control areas.
- Requirement 3 (R3): Chains or traction devices are required on all vehicles, with no exceptions.

R-1 and R-2 are the most common conditions. A highway will often be closed before an R-3 condition is imposed. Some districts may use variations of these designations.

Transportation Management Center Snow Operations Procedures:

- Track the 10-13 (as shown on form CHP 254, "Aural Brevity Codes") for chain controls, weather conditions, and snow level totals.
- Monitor Caltrans maintenance radios and document when chain controls are established or changed.
- The TMC must notify HQ when chain controls are established or changed. Information provided shall include the limits of chain requirements and the restrictions for each affected route.
- Activate or update CMS and HAR with chain control conditions.
- Relay information between CHP and maintenance on snow plowing status and updates.
- After an incident, communicate with CHP when a mountain pass escort is required and estimate delays. Notify HQ.

Topic 13 Earthquake Monitoring

The TMC monitors earthquakes using the California Integrated Seismic Network (CISN) real-time California ShakeMaps. The CISN provides reliable monitoring and continuous reporting of all significant earthquake activity in California. For earthquakes of a magnitude of 3.5 and higher, the CISN produces maps depicting the intensity of ground shaking. The ShakeMap is distributed electronically within minutes of the earthquake and is updated as additional data becomes available.

The TMC will notify HQ of an earthquake of any magnitude that causes damage to the SHS or any earthquake of 4.0 in magnitude or higher, regardless of damage. Reference the HCRR web page for more information.

Transportation Management Center Earthquake Procedures:

1. Check the CISN to determine if the earthquake status is verified. Use the ShakeMap to locate impacted areas.
2. Create an incident report, including the CHP VisiCAD number and start time.
3. Notify supervisors in various areas, such as maintenance, landscape, bridge, and electrical.
4. Contact CHP dispatch if they are not co-located with Caltrans.
5. Advise the TMT unit if there are reports of any full or partial roadway closures or structural damage to any bridges.
6. Activate field elements if needed to advise of any road closures.
7. Update incident status, including the incident report, HQ, and field elements.
8. Notify HCC.

Section 4 Systems and Tools

Topic 1 Overview

ATMS is comprised of software and field elements, such as ramp meters, traffic detection sensors, and CCTVs, used to observe and manage the transportation system. TMCs operate TMS elements to effectively manage highway traffic and communicate traveler information. Additional software and systems are also used to manage TMC operations. This chapter discusses those systems and TMS elements used in TMCs.

TMCs currently use different control systems in various combinations across the state. Over the years, control systems have changed as new applications were added to meet the needs of each district, and will continue to change with new technology, methods, and innovation. Thus, each district's TMC control system grew independently, resulting in multiple costly annual statewide maintenance contracts. This independent growth challenges the notion of statewide standardization, efficiency, and interoperability among the districts.

Caltrans plans to replace the 12 different existing TMC control systems with the California Advanced Transportation Management System (CATMS). CATMS is a new statewide TMS platform that will standardize and integrate the 12 TMCs, providing enhanced services, greater work efficiency, and laying the foundation for future growth.

Topic 2 Reporting and Application Systems

A key function of TMC systems and applications is to record the TMC activities involved in traffic and incident management. TIM activity reporting has been an important part of Caltrans TMC operations since TMCs opened. Historically, TMC TIM activities were recorded in paper logs during the 1990s and through the early 2000s. TIM activity reporting later evolved to Microsoft Excel spreadsheets, and then to district-developed applications.

TMCs report TIM activities for the following reasons:

- Increases the safety of the SHS for all users and responders.
- Provides supporting information for legal staff and claims.
- Supports incident management among operators and dispatchers.
- Creates an audit trail for the activities performed.
- Improves incident response.
- Captures RCTs.
- Captures ICTs.

- Captures secondary incident identification.
- Captures workload performance.

The following is a brief overview of the major incident management applications and systems that are currently in use.

While districts are diligent about reporting TMC activities, their methods vary. The following list shows how each district reports information:

- District 1 – IRIS logs, paper logs, TMCAL (for some incidents and chain control).
- District 2 – TMCAL (chain control), info relays for CMS, RWIS, and CCTV to the Commercial Wholesale Web Portal.
- District 3 – TMCAL, both dispatch and operations.
- District 4 – Bay Area Incident Response System (BAIRS), the website for ENTAC Alerts.
- District 5 – TMCAL (operations and dispatching).
- District 6 – TMCAD and TMCAL (chain control).
- District 7 – TMCAL (operations and dispatching) and ATMS (operations).
- District 8 – ReDIAL and TMCAL (chain control).
- District 9 – Paper logs and TMCAL (chain control).
- District 10 – TMCAD and TMCAL (chain control).
- District 11 – ATMS (operations) and TMCAL (dispatching).
- District 12 – Active ITS.
- HCC – Database web portal.

Transportation Management Center Activity Logging

TMCAL is a MySQL database system that captures CHP VisiCAD data, providing TMC operators and dispatchers with a tool to monitor all activities performed within the TMC. TMCAL interfaces with systems such as CHIN, CHP MediaCAD, and QuickMap.

Transportation Management Center Activity Database

The Transportation Management Center Activity Database (TMCAD) integrates District 6 procedures so the operator or dispatcher can check off the required tasks before closing the incident. TMCAD has a series of displays for field elements to enter the activities for using CMS, PCMS, and HAR with messages posted. TMCAD is a standalone application that does not link to other systems. All entries are made by the operator or dispatcher.

Bay Area Incident Response System

BAIRS is an integrated incident tracking system that provides tools to improve Caltrans' incident response capability. BAIRS operates in a regional environment with interfaces

to several key elements. BAIRS is a web-based incident log with the following capabilities: Geographical Information System (GIS), enhanced reporting, performance metrics, mobile devices, increased incident information availability for both dispatcher and supervisor, online contact availability, and qualification information availability.

Daily Incident Activity Logger

The Daily Incident Activity Logger (DIAL) has an efficient interface for operators. DIAL provides easy access to contacts and phone books and links the CAD ID to all activities with a single user selection, improving operator performance.

Renewed Daily Incident Activity Logger

The Renewed Daily Incident Activity Logger (ReDIAL) is a lightweight, custom-built incident management platform designed by and for Caltrans TMC operations. Unlike off-the-shelf tools, ReDIAL was built from the ground up to match real-world workflows, helping operators stay focused on traffic management rather than data entry.

ReDIAL passively captures and standardizes operator activity, enabling accurate, real-time logging of incidents. This improves consistency across staff, supports accountability, and preserves critical data for performance tracking and reporting.

Advanced Transportation Management System

The ATMS and Advanced Transportation Management System Replacement (ATMSR) are legacy and replacement systems used to manage the SHS using vehicle detectors and video from roadside cameras. The ATMS and ATMSR also send operator messages and travel times to variable message signs and control roadside video cameras. The ATMS and ATMSR contain an event management application that monitors incidents and provides operators with incident response plans that are used to manage incidents in real time.

As Caltrans transitions to the CATMS, the capabilities of ATMS and ATMSR will be integrated into a more unified, scalable, and future-proof platform that standardizes statewide operations while remaining adaptable to emerging technologies and data sources.

Intelligent Roadway Information System

The Intelligent Roadway Information System (IRIS) monitors the highway system and roadside weather systems. IRIS also controls field devices such as CMS and roadside cameras.

Active Intelligent Transportation System

Active ITS allows operators to show multiple camera feeds on the application. The user can adjust the camera angle, zoom, and IRIS. The user can also show multiple cameras on the same screen, creating a video wall. Active ITS also allows you to make a slide show (tour) showing new cameras for a set amount of time. Another use of this system is the ability to change dynamic message sign (DMS) messages with approved terms. DMS signs can also be grouped to show the same message.

Personal Computer Data Concentrators

Personal computer data concentrators provide the ATMS with the ability to interact with field equipment, including VDS, ramp metering systems, multi-lane metering systems, and extinguishable message sign devices.

Camera Control System

Camera control systems are used to monitor traffic and confirm incidents using ITS software and CCTV field elements.

Fog Detection and Warning System

Fog detection and warning systems consist of visibility sensors, speed detectors, and cameras used to detect congestion and visibility problems that could affect driver and passenger safety.

Topic 3 Field Traffic Management System Elements

Closed-Circuit Television

CCTV relays video images from cameras along the highways to the TMC and web applications (such as the Caltrans CCTV Map). The TMC uses cameras to assist with verifying traffic incident details and roadway operating conditions. On occasion, cameras can serve as the initial source to detect an incident.

Video images from CCTV cameras are used to assess the cause and status of non-recurrent traffic congestion, verify the existence and location of traffic incidents, and monitor the status of recurrent traffic congestion. Video images reliably and consistently provide detailed information on roadway conditions to help determine the proper traffic management response and mitigate congestion. Expediting incident details and removal reduces the potential for secondary incidents and enhances safety and security. CCTV camera video images also enable TMC operations personnel to immediately provide timely and accurate traffic information to the motoring public.

Changeable Message Signs

CMSs perform a critical role on highways by advising drivers of real-time roadway conditions and, in some cases, a suggested course of action as well. CMSs can reduce traffic congestion and delays and improve traveler safety. For more information on CMSs, please refer to the *Changeable Message Sign (CMS) Guidelines*.

CMSs manage traffic by displaying early warnings, advisories, and alternate route messages. These messages perform the following functions:

- Advisory messages provide motorists with useful information about a specific roadway condition impacting travel along the route where the CMS is located. This information enables motorists to consider alternate routes to reach their destination.

- Alternate route messages influence drivers to travel to their chosen destination using different routes than originally selected. Travelers are alerted to the roadway conditions ahead and encouraged to use an available alternate route, or in severe cases, notified that an alternate route must be used. Alternate route messages can also be used in addressing reduced capacity due to unusual conditions.
- Early warning messages effectively reduce secondary incidents by giving travelers advance notice of traffic slowing or "queuing" ahead. This reduces rear-end incidents by approaching traffic.

To be effective, CMSs must provide timely, accurate, and reliable information. The signs should be activated when unexpected conditions require specific driver actions, such as reducing speed, changing lanes, or using alternate routes.

CMSs shall only display information that meets the following criteria:

- Timely, accurate, and reliable.
- Related to traffic, roadway, or weather conditions.
- Associated with unexpected conditions or non-recurrent congestion.

Highway Advisory Radio

HAR messages are a way for Caltrans to provide travel-related information to motorists through standard amplitude modulation receivers. HAR messages consist of warnings, advisories, directions, or other information useful to motorists. HAR messages are transmitted from low-power roadside radio transmitters, which can be permanent or mobile. The broadcasts are relatively short, usually less than a minute. Appropriate signs advise motorists approaching a HAR site on where to set the radio dial to receive the message.

Federal Communications Commission (FCC) rules and regulations restrict the locations of all HAR transmitters. Messages can be recorded for continuous repetition, with the message length adjusted to permit a motorist to hear at least two full repetitions while passing through the zone of coverage at maximum speed. The agency operating the HAR system is responsible for monitoring and maintaining the system and changing the message content as the situation warrants it.

FCC rules allow HAR messages to contain non-commercial voice information about traffic and road conditions, traffic obstructions, travel advisories, directions, availability of motorist services, and descriptions of special events. Note that it is not permissible to identify the names of commercial businesses whose services may be available within the broadcast coverage area. When emergency conditions exist, emergency instructions are broadcast describing the road and traffic conditions and providing information to the motorist regarding appropriate actions.

HARs in the vicinity of major construction zones describe the type of work being done, give applicable traffic control restrictions, and may also recommend alternate routes when applicable.

Ramp Metering

Entry control metering (commonly referred to as ramp metering) is a traffic management tool used primarily to combat peak-period recurrent highway congestion.

Ramp metering is used on high-volume traffic corridors. The purpose of ramp metering is to adjust the highway traffic volume to less than the amount that would disrupt the highway flow. Ramp metering uses traffic signals to limit the number of vehicles per hour entering the highway from an entrance ramp. Entry ramp metering is occasionally used on direct connectors between highways. Vehicles are released one or two at a time in each entrance ramp lane. Vehicles are spaced at intervals as they enter the outside lane of the downstream facility. Depending on volume, this spacing may enable vehicles to merge with through traffic without severely impacting the speed of vehicles in the through lane.

Ramp meter locations consist of field controllers, detection equipment, traffic signal heads, and warning signs and are generally connected to a central processing control system. This central system monitors individual ramps and the mainline highway using loop detectors or other detecting equipment in each lane. Ramp meter signals are activated when the traffic volume reaches a threshold volume or the speed drops to a predetermined level. Metering systems attempt to limit the number of vehicles on the highway to a number slightly less than the breakdown level. During peak periods, ramp metering personnel may activate and deactivate ramp meters at selected highway on-ramps, based on unusual traffic conditions. When there is an incident on a highway, TMC operations personnel may need to interact with ramp metering personnel to determine if any adjustments to the metering rates would improve traffic flow in response to the incident. At times, there may be a report of a ramp meter that is not phasing and is "stuck on red." If the meter is accessible through ATMS, the TMC operator may turn off the ramp meter until field personnel can respond.

Signalized Intersections

An additional traffic management tool available to TMCs is the State Traffic Signal Control System. In locations where the traffic signal field controllers are tied into the TMC (or elsewhere within the district office) through remote communications, TMCs should consider the option to modify or temporarily adjust traffic signal timing (or phasing) in response to incidents. In general, traffic signal operations personnel need to be contacted to initiate adjustments to the State Traffic Signal Control System. If the incident response would benefit from signal timing adjustments on adjoining local streets, a State Traffic Signal Control System representative stationed within the TMC should coordinate with local agency traffic signal operations staff.

Roadside Weather Information System

The Roadside Weather Information System (RWIS) utilizes meteorological measurement stations strategically positioned alongside highways to collect local pavement and atmospheric data. Each RWIS station utilizes sensing devices that are placed in the highway subgrade, on the road surface, and above the roadway on towers (some as tall as 33 feet high). At the tower's height, weather data such as air temperature, precipitation, and wind speed are measured and collected. Road sensors are used to determine if the roadway surface is wet, dry, frosted, snow-covered, or iced. Some stations utilize video cameras to relay visual information about weather and road conditions, such as fog, rain, and snow.

RWIS information allows traffic operations and maintenance staff to make more informed decisions during winter storms. RWIS equipment and computer programs monitor air and pavement temperature to forecast how winter storms may impact highways.

The information RWIS sends to TMCs also assists with dispatching, activating CMSs or HARs with preselected messages, and updating websites with current roadway condition information for motorists.

Extinguishable Message Signs

An extinguishable message sign provides motorists with a clearly visible fixed message. This strategically placed sign improves overall safety by providing motorists with pertinent roadside information or warnings. Extinguishable message signs (EMS) are used to display a fixed message, such as "TUNE RADIO TO 1610 AM" or "ALL TRUCKS EXIT AT SCALES." Another type of EMS is a roadside sign, which displays fixed messages with flashing beacons to draw attention to the activated sign.

Integrated Corridor Management

TMC floor staff can activate, store, retrieve, and execute congestion management plans for ICM. For example, they can automatically determine ramp metering timing rates and recommend signal timing patterns across the corridor.

Reversible Lane Control

Reversible lanes, also known as variable lanes, are shared lanes that accommodate peak-period traffic flow. The direction of traveling traffic in shared lanes changes depending on the time and day of the week.

Reversible lanes must be considered for projects, as mandated by California Streets and Highways Code, Section 100.15.

Reversible lane duties include:

- Activating and deactivating fixed CMSs during a barrier move.

- Raising and lowering roadway candlesticks for lane delineation using the electronic lane control system.
- Turning roadway in-pavement lights on or off for lane delineation using the electronic lane control system.
- Changing electronic message signs and variable message signs in the vicinity of the candlesticks.
- Confirming all above actions with field maintenance personnel over an 800-Megahertz (MHz) radio.

Topic 4 External Interfaces

California Highway Patrol Media Computer-Aided Dispatch

TMCs primarily receive incident information details by monitoring the CHP VisiCAD or CHP MediaCAD terminal. Added information may be received directly from CHP dispatch to help verify the incident by coordinating with the TMC liaison officer. The CHP communications center will issue Sigalerts and coordinate with the TMC by obtaining incident details and the status of response efforts at the incident scene.

Additional details on traffic conditions and incident information can be obtained from CHP personnel by monitoring CHP radio scanners at the TMC.

The CHP VisiCAD system is a system that CHP uses to monitor and dispatch 911 calls and officer resources. The Media CHP Traffic Incident Information website, as well as the site's XML feed, allow the public to view live and recent incident information. The CHP MediaCAD website filters incident information and does not display all incidents reported by CHP to protect private and confidential information. Although heavily redacted for privacy and operational purposes, MediaCAD is publicly available and does not require special permissions. It serves as the public-facing version of CHP VisiCAD, allowing access to information about conditions on the SHS without disclosing sensitive or critical incident management details.

VisiCAD

VisiCAD is a CHP system accessible to most TMCs that does not filter incidents or incident details and contains private and confidential information such as CHP unit location(s), statuses, and private citizen vehicle and contact information. This allows the TMC floor staff to access more incident details on demand.

Section 5 Transportation Management Center Facility Management

Topic 1 Overview

The TMC is a critical facility. The TMC facility manager plays a key role in maintaining the TMC facility and working areas to facilitate TMC operations. This includes ensuring the facility meets health and safety requirements, assisting with preventative maintenance, managing tenants, overseeing contractors and vendors, ensuring accessibility, and communicating with stakeholders such as DGS, CHP, and others. The roles and responsibilities of the facility manager include:

- Ensuring the facility is operational and compliant with all local and state laws and regulations relating to health and safety.
- Providing facility maintenance, operations, and repairs in an efficient, cost-effective, and expeditious manner.
- Ensuring uniformity of the furnishings throughout the TMC. Caltrans and CHP will coordinate the selection of colors, styles, and materials. Each party is responsible for purchasing replacement furniture for their portion of the facility.

Five out of the twelve TMCs (Districts 3, 7, 8, 11, and 12) are standalone facilities independent of the district Caltrans offices. Caltrans and CHP are co-located at these facilities. Caltrans and CHP have an interagency agreement establishing fiscal obligations, roles, and responsibilities of both departments toward the development, maintenance, and operation of these five TMC facilities. Caltrans has agreed to develop the building infrastructure and maintain the facilities through a dedicated facility manager, with CHP sharing the financial requirements. Facility managers at these five TMCs are responsible for implementing the interagency agreement with CHP, managing numerous contracts associated with facility interior and exterior needs, procurements, and other responsibilities.

For the remaining seven TMCs that are located within the district office buildings and the satellite TMC located at Kingvale Station, both Caltrans and DGS provide facility management support. This support is typically limited to exterior and interior building maintenance services, such as carpet and flooring, heating, ventilation, air conditioning (HVAC), workstations, furniture and cabinets, and roofing. TMC functional managers or delegated staff manage internal TMC operating systems, terminals, and associated infrastructure procurement, installation, and maintenance.

Topic 2 Tenants or Partners Present in the Transportation Management Center

TMCs enable highway traffic monitoring and management functions, which include incident management, emergency response coordination, and more. This is a multidivisional and multiagency collaborative effort, and thus, representatives of different divisions and agencies involved in these efforts may be located or work at TMCs as needed. This includes CHP, local law enforcement, CalOES, DGS, Caltrans Division of Maintenance, EOC, Office of Radio Communications, and mobile communication companies.

In addition to the TMC floor where all operations are performed, TMC facilities may have additional spaces for resting, showers, eating, and a wellness center to meet the needs of employees working extended shifts. Facility managers manage the use of these working spaces with CHP and other agencies working at the TMC.

Topic 3 Facility Manager Responsibilities

Facility managers are responsible for performing and coordinating several tasks. While these vary across the state, the following is a list of tasks and activities that the facility manager is responsible for or supports:

All Transportation Management Centers

- Support the TMC functional manager with workspace needs.
- Facilitate all building or equipment requests and changes.
- Manage applicable permits, licenses, and regulations for building operations.
- Conduct mailbox, floor plan, and space evaluations.
- Maintain building evacuation plans.
- Manage fleet, parking, and lighting.
- Maintain rack and vault space.
- Supervise the tower and the Office of Radio Communications.
- Maintain HVAC, generators, and other equipment.
- Maintain the building's exterior and interior workspaces.
- Ensure basic health and sanitation services are available.

Standalone Transportation Management Centers

In addition to general tasks for all TMCs, facility managers for standalone TMCs may also perform the following tasks:

- Onboard new employees, collect fingerprints, coordinate entrance form completion, and assign employee keys, cards, mailboxes, desks, and phone lines.
- Ensure Caltrans staff leaving the TMC complete the exit form and return keys, cards, and any other state property.
- Develop, monitor, and manage budget operating expenses, annual reviews, life cycle costs, and five-year plans.
- Post notifications and memos, as necessary.
- Conduct security, clearance, and access activities, camera review, and reporting.
- Provide phone, telecommunications, and network support.
- Maintain inventory, property control, logs, and as-built or plan management.
- Track bi-decade and benchmark due dates on equipment.
- Process monthly billing for the interagency agreement with CHP and invoices on contracts with other facility vendors and service providers.
- Purchase custodial supplies, building equipment, office supplies, and other items.
- Manage maintenance and service contracts as needed.

Contracts Managed by the Transportation Management Center Facility Manager

Maintenance and service needs vary for each of the five standalone TMC facilities. Many facility maintenance services are secured through contracts. The following is a list of service contracts that facility managers maintain to support building operational needs:

- Roof maintenance and repair.
- Elevator maintenance and repair.
- Electrical, switchgear, and power maintenance and repair.
- Generator maintenance and repair, and generator panel monitoring.
- Mechanical system maintenance and repair.
- Fire suppression system monitoring, maintenance, and repair.
- Window and interior cleaning.
- Batteries and uninterrupted power systems maintenance and repair.
- Video and camera system maintenance and repair.
- Access system maintenance and repair.

- Designated underground storage tank operation.
- Plumbing.
- Air handlers and chiller maintenance.
- Refuse, recycling, and compost.
- Hydronic boiler.
- Building and restroom sanitation services.
- Closed-loop water treatment.
- Pest control.
- Remote alarm monitoring service.
- Gates maintenance.
- Locksmith services.
- Landscaping.
- Drinking water service.
- Fire devices (updates and upgrades).
- E-waste services.
- Moving and installation services.
- Door and glass.
- Data cleaning services.
- Vertical and roller blind repair.
- Upholstery (wall panels) and furniture repair.
- Metal restoration (exterior) and marquee.
- Window and vinyl seal repair.
- Floor mat service.
- HVAC system maintenance and repair.
- Drain system.
- Security camera system updates, upgrades, and maintenance.
- Dispatch consoles.
- Gas line.
- Sewage line.
- Phone system.
- Carpet cleaning.

- Scaffolding and flapper.
- Painting services.

Maintenance Schedule

Maintenance task schedules vary for each TMC facility based on their infrastructure type, age, location, and other factors. The following is a typical schedule provided for reference:

Daily

- Building temperature monitoring and adjustment.
- DGS building systems monitoring.
- Custodial.
- Grounds and building rounds.

Weekly

- Landscaping.
- Garbage and recycling (twice a week).
- Restroom sanitation system maintenance.

Monthly

- Pest control service.
- Elevator service.
- Fire suppression, alarm monitoring, and alarm service.
- Generator and switchgear monitoring and service.
- Emergency battery monitoring.
- Underground storage tank monitoring and service.
- Gate maintenance.
- Audio-visual equipment monitoring.
- Operating Expenses and Pending Expenses Report.
- CHP Payment Review and Charge Report.
- Tenant location map updates.

Quarterly

- Carpet cleaning.
- Closed-loop water treatment testing.
- Preventative plumbing maintenance.

- Emergency battery service.

Every Six Months

- Plumbing services on lines and in the basement.
- Generator and switchgear testing and maintenance.
- Fire suppression testing.
- External window washing.
- Underground storage tank test and maintenance.
- Internal door service and maintenance.
- Restroom deep cleaning.
- Data cleaning service.

Annually

- Roof membrane review and repairs on warranty.
- Solar review and cleaning on warranty.
- Elevator permit renewal.
- Fire system testing and maintenance.
- Generator and switchgear testing, maintenance, and permit.
- Generator exhaust permit.
- Camera and reader software upgrade.
- Underground diesel tank permits and tests.
- Door and lock preventative maintenance.
- Plumbing jetting and basement pipe exam.
- Air handler testing and maintenance.
- Spring tree and landscape health exam and planting.
- Spring internal window and sill cleaning.
- Boiler maintenance.
- Roller blinds service and repairs.

Every Three Years

- Source testing generator engine.

Every Five Years

- Check window strips and seals.
- Replace backup batteries.

- Re-grout restrooms.
- Arc flash evaluation.
- Purchase emergency water and meals ready to eat.

Topic 4 Contract Procurement Resources for Facility Managers

Contact Caltrans Division of Procurement and Contracts for information on how to complete purchases or contracts. The following is a list of additional contract and procurement educational resources:

- New ADM-0360 Service Contract Process
- Contract Manager's Handbook
- Form ADM-4033, "Contract Manager Checklist for IFB & IFPQ Contract Requests" Non-IT Service Contracts - Training & Resources

Topic 5 Facility Security

The normal business hours for general access to TMC buildings are from 8:00 a.m. to 5:00 p.m. on weekdays. The facility has restricted access to only authorized personnel outside these hours. Building security is provided 24 hours a day. During normal business hours, TMCs can be accessed through "all employee" entrances. The TMC operations center is a secure facility. Only authorized personnel with proper security clearance are permitted access through the electronic security system. Parking for staff assigned to the TMC is provided in designated parking areas.

In addition to following departmental policy and procedures for identification badges and facility security desks, TMC personnel with unescorted access to the TMC operating floor where CHP VisiCAD is accessible are subject to DOJ background checks and fingerprinting as described in Section 1, Topic 7, "Security Clearance for Transportation Management Center Personnel and Visitors Policy." The commanding CHP officer at the TMC has the authority and responsibility to ensure compliance with DOJ security rules and regulations.