CHAPTER 10
Maintenance Management

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10.01 Introduction

10.01.01 Chapter Content and Resources

This chapter contains information relevant to the Department of Transportation (Caltrans) Maintenance Management Program, which is composed of a group of interrelated management tools. These tools provide a basis for planning, scheduling, operating, and controlling the State's highway maintenance effort with economy and effectiveness. The use of this system places continuing emphasis on the economic utilization of personnel, equipment, and materials within the resources available to each Maintenance Manager, Area Superintendent, and Maintenance Supervisor.

For resources referenced within this chapter, please see:
Level of Service (LOS): https://maintenance.onramp.dot.ca.gov/roadsidemgmt/level-service

10.01.02 Definitions

BMS	Bridge Management System
CIP	Culvert Inspection Program
HM	Highway Maintenance
IMMS	Integrated Maintenance Management System
LOS	Level of Service
MAPP	Maintenance Activity Performance Plans
PMS	Pavement Management System
SHOPP	State Highway Operation and Protection Program
SHS	State Highway System

10.01.03 Resources and Hyperlinks

There are hyperlinked resource materials identified within this chapter. If any hyperlink is not accessible, please notify the appropriate personnel to ask about that resource or reference.

10.01.04 Chapter Contacts

This chapter of the Maintenance Manual is maintained by the offices listed below from within the Division of Maintenance. The list also indicates the specific sections owned by the offices.

- Office of Management Systems and Studies (IMMS)
- Office of Specialized Field Services (OSFS)
- Office of Pavement Management (PMS)
- Office of Bridge Asset Management (BMS)
- Office of Drainage and Storm Water Management (CIP)
- Chief of Staff, Division of Maintenance (Field Maintenance Monitoring and Inspections, Maintenance Asset Condition Level)

10.02 Maintenance Management

Six main systems comprise the backbone of the Caltrans Maintenance Management Program:

(A) The IMMS is a management system that allows the Division of Maintenance to effectively plan, perform, and manage maintenance work. Maintenance "Activities," which are performed to maintain assets on the State Highway System (SHS), have been defined and grouped into seventeen "Families." Sixteen of these "Families" are used to track expenditures against the Division of Maintenance funding allocation. Only one, the "Y" Family, is used to record charges when Maintenance forces are doing Work for Others, see Maintenance Manual Volume 2, "Y" Family.

Instructions for recording Maintenance work are outlined in detail in Maintenance Manual Volume 2.

(B) The Level of Service (LOS) program is a performance evaluation tool designed to measure how well the Division of Maintenance can keep up with the maintenance demands of assets on the SHS according to guidelines for these assets established in the Maintenance Manual and with the given existing resources. LOS scores can be used as a guide/planning tool for where to focus maintenance efforts.

LOS scores from assets that are visually assessed and the data from the SB1 LOS pavement scores are used to measure the Annual Field Maintenance SB1 Maintenance Activity Performance Plans (MAPP) goals, which include increasing the LOS score for pavement cracks, potholes and spalls, bridge, median barrier, guardrail, striping, signs, lighting, and signals.

Refer to the Level of Service, provided in Section 10.01.01 of this chapter, for more information

(C) The Pavement Management System (PaveM) is an optimization tool that helps predict future pavement conditions and prioritizes potential maintenance and rehabilitation recommendations within budgetary constraints. PaveM utilizes various data inputs such as the Automated Pavement Condition Survey, as-built plans, Transportation Systems Network referencing, traffic, climate, and project work plans.

(D) The Bridge Management System (BMS) is a database containing information which helps monitor the integrity of California's structure infrastructure. The BMS captures information required to maintain the structures, such as structural data, recommended maintenance, on-going projects, and historical data. The information is used to identify work to be completed by specialized Field Maintenance Crews (Bridge, Electrical/Mechanical or Paint), Major Maintenance (HM) contracts, or SHOPP contracts based on the complexity of the repair and with the goal of identifying the most cost-effective method of initiating the repairs.

(E) The Culvert Inspection Program (CIP) is used to identify and address drainage system deficiencies. The CIP identifies and rates the condition of each culvert along and across the SHS. The information collected is used to identify and budget funds to

clean, repair, or replace culverts by Maintenance forces, the Division of Construction, or by service contract. Maintenance forces need to be aware of, address, and/or report observed changes in drainage and culvert conditions as they perform their daily work.

(F) Field Maintenance Monitoring and Inspections

Maintenance forces serve an important role both informally and formally in observing and reporting changes in individual asset conditions.

1. ***Informal:*** Observations of surrounding assets including changes to their conditions while traveling or working on the SHS.

2. ***Formal:*** Scheduled inspection or monitoring of particular assets. To ensure the overall levels of maintenance are pursued, periodic inspection trips by key personnel are recommended.

    a. The Maintenance Supervisor or a specifically designated member of the Maintenance crew should travel over all State highways in the crew's assigned area, including ramps and collector systems, at least once a week to observe overall conditions and detect maintenance-related needs. Areas of known or recurring potential maintenance-related needs may require more frequent inspections.
    b. The Area Superintendent should observe overall conditions monthly within their assigned area to assure conformance with the established maintenance levels. Area Superintendents are responsible to receive, assign, and see to completion inspection work recommendations made by the inspection staff. This includes bridge, road, sign, and other related families.
    c. Facilities on the SHS maintained by other agencies should be periodically reviewed by Maintenance forces, as discussed elsewhere in this manual, for conformance with maintenance levels as required, or at a minimum of once a month.

    The frequency for formal field maintenance inspections for a specific asset is discussed in the applicable family chapters (see Chapter A through Y of this manual) for that asset. Unless specified otherwise in Chapters A through Y, no reports or other tracking is required for field maintenance inspections.

These six components discussed above (A-F) must work together as a system for the Division of Maintenance to achieve its objectives.

When identified, any maintenance needs should be reported, prioritized, and addressed as discussed elsewhere in this manual. The Maintenance Supervisor uses the information from the field inspections to schedule work or report information to the applicable decision makers as discussed in Chapters A through Y of this manual. Inspections will be an integral part of the Maintenance Supervisor's work planning and scheduling activities.

10.03 Maintenance Asset Condition Level

The maintenance asset condition level is affected by many variables such as climatic conditions, traffic density, traffic type (ex. heavy trucks with trailers), terrain, pavement types, geographical location, and the age of the facility. In addition, the maintenance asset condition level is also influenced by the type or class of road (freeway, expressway, or conventional), its surrounding environment, characteristics, and density of traffic.

It is recognized that any defined level or quality of maintenance must be tempered by the judgment and experience of those responsible for maintaining the SHS. It is imperative that these factors are considered, commensurate with the function of the facility maintained.

This chapter and/or these levels are not designed to, nor do they establish, a legal standard of care. They are published only for the information and guidance of the employees of Caltrans. They are subject to change as conditions warrant.

Maintenance personnel should be constantly alert in their travels to detect and report deficiencies to, or needs of, the SHS. SHS facilities maintained by other public agencies, whether in total or in part, should be maintained in conformance with the LOS and corresponding maintenance levels, as determined by Caltrans. Facilities of other agencies maintained by Caltrans forces should be maintained to the same level as SHS facilities unless otherwise directed by the public agency responsible. There should be a maintenance agreement or other contract between Caltrans and the other public agency, specifying which party is responsible for which maintenance activities, at which locations, and to what level of maintenance.

To ensure the overall levels of maintenance are pursued on the SHS, periodic inspection trips by key personnel are recommended.