Caltrans Project Management Handbook

Fourth Edition

Revision 1

September 19, 2002

Office of Project Management Process Improvement

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Preface

The Caltrans *Project Management Handbook* provides an updated overview of project management at Caltrans.

This version is effective as of October 1, 2002.

The project team thanks all individuals within the districts and headquarters for their support and contributions to the production of this handbook.

Purpose

This document provides an overview of the basic concepts that guide project management at Caltrans.

Audience

Caltrans project managers and other staff acting in a project management capacity.

Background

This edition is a reorganization, clarification, and completion of the information in the Third Edition dated April 1999. Only a small amount of policy/subject matter has changed. The goal of this edition is to make the present policy/subject matter more useful and easier to understand.

This document supersedes all previous editions of the Caltrans *Project Management Handbook* and the Project Management Terms and Definitions contained in any Project Management Directive published before May 13, 2002.

Revisions

Revision 1 represents the original version of the 4th edition.

Conventions

Titles of books appear in *italics*.

Web site URLs appear in ***bold italics***.

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Basic Concepts

This chapter:

- Defines what "project," "project management," "program management," and "portfolio management" mean at Caltrans
- Explains the purpose and goals of project management at Caltrans
- Provides a "big picture" view of project management as one of the five knowledge and skill sets needed for project success

What Is a Project?

A Guide to the Project Management Body of Knowledge (*PMBOK® Guide*)[1] defines a project as "...a temporary endeavor undertaken to produce a unique outcome." A Caltrans capital project produces a unique physical improvement to the transportation system in California. "Project" refers to the work that is performed. Projects produce products. A project is temporary because it has a definite beginning and a definite end. The outcome is unique because it differs in some distinguishing way from all similar products or services. For example, Caltrans may be engaged in many highway maintenance projects, but each project is unique because it involves a unique location and work elements on a specific section of highway.

Caltrans divides each project into "components," each of which produces a major product required by law. Collectively, these components constitute the "project lifecycle." For more information on the Caltrans project lifecycle, see "Project Lifecycle" on page 17.

Caltrans capital projects receive funding from programs such as the State Transportation Improvement Program (STIP), the State Highway Operation and Protection Program (SHOPP), etc. See "Program Management" on page 12 for more information.

1 Project Management Institute, 2000

What Is Project Management?

The *PMBOK® Guide* defines project management as "...the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed sponsors' needs and expectations from a project." Project management balances competing demands (scope, time, cost, quality, requirements, etc.) throughout the project lifecycle and involves the interaction of three elements:

- People — People perform the work and determine the success or failure of a project. "People" on page 37, discusses the organizational structure and responsibilities of the project team and other stakeholders involved in Caltrans project management.
- Processes — Processes specify products or deliverables required for the project and identify who will perform the work and when. "Project Processes" on page 25 discusses project management processes used at Caltrans.
- Tools — People use predefined tools and techniques to manage the project. "Tools" on page 49 discusses project management tools used at Caltrans.

Why Do We Do It?

Limited available resources (compared to transportation needs) require the efficient use of tax dollars. Project management helps Caltrans maintain efficiency by making sure that the right people complete the right tasks at the right time.

Project Management Mission

Caltrans delivers transportation improvements that meet customer needs. Caltrans project teams use project management standards to deliver quality projects that are timely and cost-effective. The purpose of project management is to:

- Deliver projects that satisfy customer needs
- Improve project delivery performance related to quality, scope, schedule, and cost
- Reduce the support cost of producing the project
- Do the right things right the first time
- Anticipate and respond to issues before they become problems
- Communicate effectively with stakeholders
- Manage change
- Manage risk

Program Management

The *PMBOK® Guide* defines a program as "...a group of related projects managed in a coordinated way to obtain benefits not available from managing them individually." Laws and regulations establish programs for government projects. These laws and regulations define each program's purpose, funding sources, and funding process. In California State government, resources for programs must be approved by the legislature in the annual budget.

For 2002-03, 11 programs fund state highway improvement projects:

Program	Authority
STIP Interregional Improvement Program (IIP)	Government code 14529 (a) (1)
STIP Regional Improvement Program (RIP)	Government code 14529 (a) (2)
SHOPP	Government code 14526.5
Phase 2 and Toll Bridge Seismic Retrofit	Phase 2 retrofit: Government code 8879 Toll Bridge retrofit: Streets & Highways code 188.5
Toll Bridge Program	Streets & Highways code 30950
Transportation Enhancement Activities (TEA) – Caltrans Share	California Transportation Commission (CTC) Resolution 00-18 (This is a federal program with matching funds from the SHOPP)
Special Retrofit Soundwalls	Items 2660-302-0042 and 2660-302-0890 of the 2000 Budget Act (Chapter 52, Statutes of 2000)
"Grandfathered" Traffic Systems Management (TSM) – programmed in 1997 or earlier	Streets & Highways code 164.1 (repealed in 1997 – no projects can be added to this program)
Safe Routes to School	Streets & Highways code 2333.5
Traffic Congestion Relief Program (TCRP)	Government Code 14556
State Highway Projects Funded from Other Sources	Annual State Budget

Funds for every state highway project come from one or more of these programs. Project managers must know which programs are funding their projects, and understand the particular funding rules of those programs.

The "State Highway Projects Funded from Other Sources" program covers any project funded from sources other than the first 10 programs. Caltrans performs limited work on these projects. The Legislature provides an annual budget for this work.

Sub-Programs

Programs may have sub-programs. For instance, SHOPP includes the Minor Program and Roadway Rehabilitation Program sub-programs. Each sub-program has a particular funding process that sets it apart from the rest of its parent program.

Project Management vs. Program Management

This handbook describes the management of a single project; it does not cover program management. The following table summarizes the differences.

Project Management	Program Management
The direction and supervision of one project	The integration, coordination, communication, and simultaneous control of multiple projects
A discipline	An operating environment
Project-wide (a tactical issue)	Enterprise-wide (a strategic issue)

Portfolio Management

"Portfolio management" is the management of the projects or portions of projects assigned to a particular individual or unit.

Portfolios exist at every level of the organization:

- An individual
- A section
- A branch
- An office
- A district
- All of Caltrans

Portfolios often include projects or portions of projects funded from several different programs.

The portfolio concept is borrowed from the stock market. In this analogy, each company equates to a project, and each share equates to a task within the project. Just as each investor owns a different stock portfolio containing shares in various companies, each individual and unit has a different portfolio containing tasks on various projects.

This handbook describes the management of a single project; it does not cover program management or portfolio management.

The Big Picture

Figure 1. Knowledge and skill sets needed for effective state highway project management

For projects to be successful, the project team must understand and apply generally accepted project management techniques such as work breakdown structures, critical path analysis, and earned value. While they are necessary, these techniques alone are not sufficient for effective project management. Effective management of California state highway projects requires that the project team understand and use five knowledge and skill sets:

- Project management knowledge and practices — these consist of project lifecycle definition, five project management process groups, and nine project management knowledge areas. All of these are described in the remainder of this handbook.
- State highway project standards and procedures — the *Project Development Procedures Manual* is the primary source of these procedures. More detailed information on the standards and procedures is contained in manuals, guides, handbooks, and bulletins issued by the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), and Caltrans Headquarters Divisions. In some instances, districts may have procedures to address their unique situations (such as a district hydraulics manual that addresses the particular hydrology in that geographic area). Many procedures are standard to an employee's profession and are documented in academic textbooks and professional journals.

- Understanding of the project context — the project team must understand the project in its social, biological, and physical environment. The team must understand how the project affects people and how people affect the project. This may require an understanding of aspects of the political, economic, demographic, educational, ethical, ethnic, religious, and other characteristics of the people who will be affected by the project or who have an interest in the project. Some team members must be familiar with applicable federal, state, and local laws and with the relevant portions of the budgets of the entities that are funding the project. Other team members must be knowledgeable about the flora, fauna, geology, and physical geography of the region around the project.
- General management knowledge and practices — these are needed for the management of any enterprise. They include strategic planning, health and safety practices, marketing and sales, financial management and accounting, and personnel administration.
- Human relations skills — these are often called "soft skills," including the management of relationships with others and the management of oneself. Soft skills include communication, teamwork, leadership, conflict management, negotiation, problem solving, motivation, delegation, personal time management, and stress management. Every person can improve his/her soft skills through training and practice.

It is not necessary for every team member to possess all these knowledge and skill sets. In fact, it is unlikely that any one person will have all of the knowledge and skill necessary for project success. Some aspects of these knowledge and skill sets might not be needed on a particular project, but they should be available "on call" within Caltrans or through consultants.

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Project Lifecycle

This chapter describes each component in the project lifecycle.

Lifecycle Overview

Caltrans divides each project into project components, each with its own outcomes, or "deliverables." The Caltrans Project Delivery Work Breakdown Structure (WBS), described on page 52, defines the deliverables for each component.

Together, the project components make up the project lifecycle.

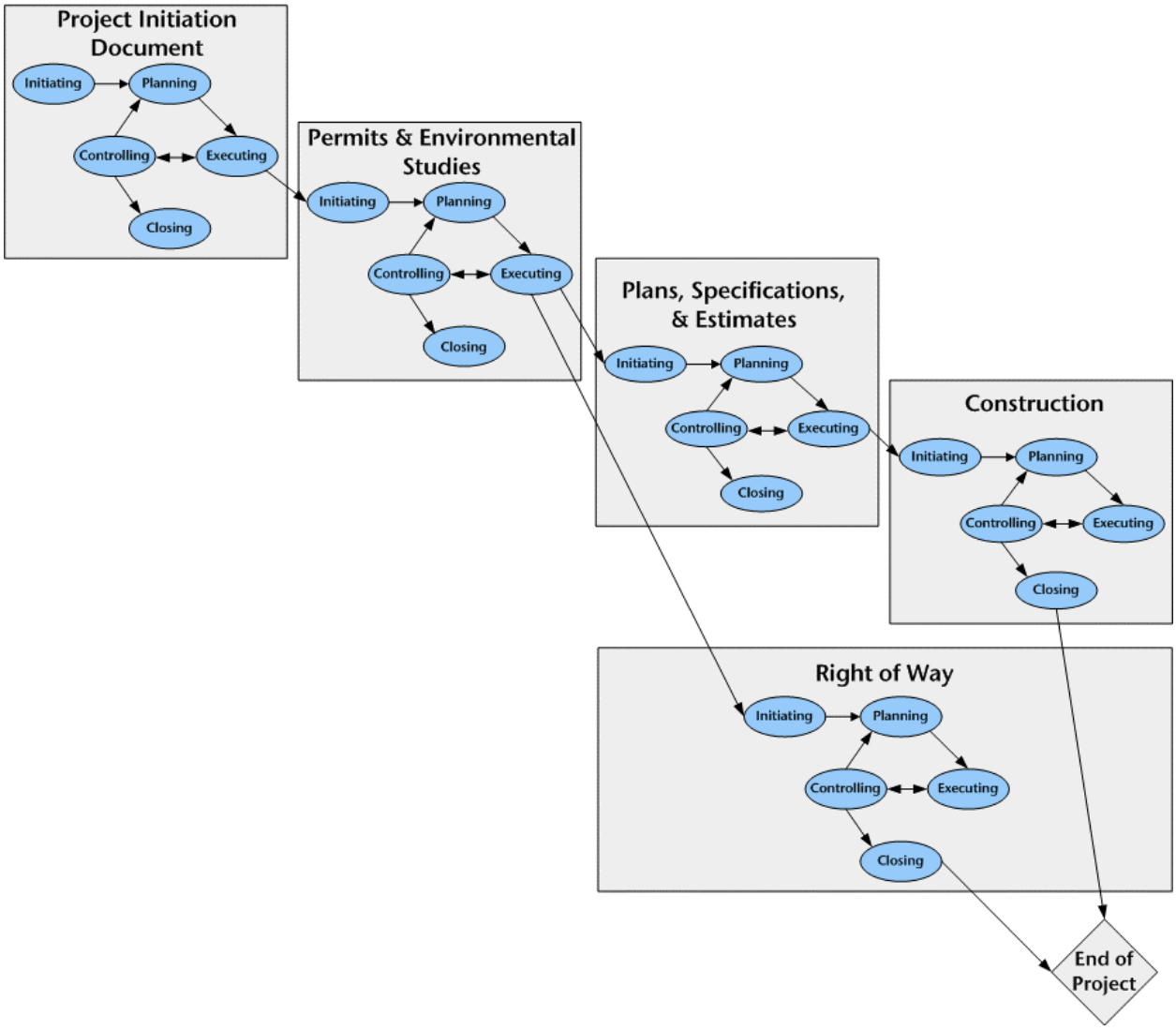

Figure 2. Components in the project lifecycle

Project Initiation Document Component

Caltrans capital projects start with a problem that needs to be solved. Before a project starts, the Planning Division generates a list of potential projects, each with a "purpose and need" statement. Any work on the project, throughout the project's lifecycle, must relate back to the original purpose and need statement.

PID Deliverables

The main deliverables for the Project Initiation Document (PID) component are:

- The PID — contains a defined project scope, a reliable capital and support cost estimate for each alternative solution, and a project workplan for the alternative recommended for programming the project.
- The Stakeholders List — is a communication tool that becomes part of the Project Communication Plan. Appendices A and B of the Caltrans *Project Communication Handbook* explain the Project Stakeholders List and Analysis.

Permits and Environmental Studies Component

For a capital project to proceed, it must receive official federal, state, and environmental approvals as well as approval from all the stakeholders and the public. By the end of this component, the stakeholders should agree on a preferred alternative that has a reasonably mitigatable impact on the environment.

Permits and Environmental Studies Deliverables

The main deliverables for the Permits and Environmental Studies component are:

- The Final Project Report — further refines the purpose and need, identifies the alternative selected, describes how that alternative was decided upon, and describes how consensus was reached between Caltrans and stakeholders. It also includes more detailed engineering designs required under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).
- The Final Environmental Document — contains required environmental approvals. For more information, see the Caltrans *Standard Environmental Reference*.

Plans, Specifications, and Estimate Component

Construction companies must know what a project requires in order to bid for the contract. The plans, specifications, and estimate created in this component provide companies with the information they need to develop an accurate bid.

PS&E Deliverable

The Plans, Specifications, and Estimate (PS&E) package — includes the detailed designs/plans for the project, detailed project specifications (material to use, contract guidelines, permits needed, etc.), and estimates for the exact amounts of materials needed and their costs. This package includes only capital costs (costs for materials), not support costs. The PS&E forms the basis for the contract bidding process.

When the PS&E package is complete, the project should be biddable and buildable. That is, contractors have enough information to bid accurately, and they can build what they bid to do.

Right of Way Component

Caltrans is required to obtain property rights for the construction of many of its transportation projects. The Right of Way component involves preparing maps and legal documents, preparing appraisals, obtaining legal and physical possession of property, relocating occupants, and clearing all physical obstructions, including utilities. Other required activities include managing properties, selling excess properties, monumentation of the right of way, relinquishments and vacations, and preparing right of way record maps.

Right of Way Deliverables

The main deliverables for the Right of Way component are:

- The Right of Way Certification —summarizes the status of all right of way matters pertaining to a proposed construction project. The Right of Way Certification is included in the PS&E package.
- Legal right of way — secures all real property rights that are required for the project, and relocates occupants according to federal and state laws, regulations, and procedures.
- Clearance of physical obstructions from the right of way — removes improvements, relocates utilities, and executes all railroad agreements.

Construction Component

After the construction contract for a Caltrans capital project has been awarded, construction can begin.

Construction Deliverables

The main deliverables for the Construction component are:

- The constructed physical improvement — follows the guidelines in the current edition of the *Construction Manual*.
- The Final Estimate — includes the final quantity and cost of the work for which the contractor has been paid.
- The As-Built Plans —reflects what was actually built, including any plan changes made during construction.
- The Project History File — follows the guidelines in Section 3 of Chapter 15 of the *Project Development Procedures Manual.*

3

Project Processes

This chapter explains how the *PMBOK® Guide* process groups and knowledge areas apply to project management at Caltrans.

Processes Overview

Each component involves a series of processes from five "process groups." The *PMBOK® Guide* defines a process as "a series of actions bringing about a result." Project processes fall into one of two categories:

- Project management processes — describe and organize the work of a project. For example, during the PID component (page 18), the project manager distributes information to and from stakeholders, defines the scope of the project, and facilitates decision-making.
- Product-oriented processes — specify and create the product. These processes are summarized in the "executing processes" section of this chapter (on page 29). More detailed descriptions are provided in the *Guide to the WBS* and in the manuals, guides, and handbooks that are referenced in the *Guide to the WBS*.

Process Groups

Caltrans divides project management activities into five generally accepted process groups, matching those in the *PMBOK® Guide*:

- Initiating Processes (page 28)
- Planning Processes (page 28)
- Executing Processes (page 29)
- Controlling Processes (page 31)
- Closing Processes (page 31)

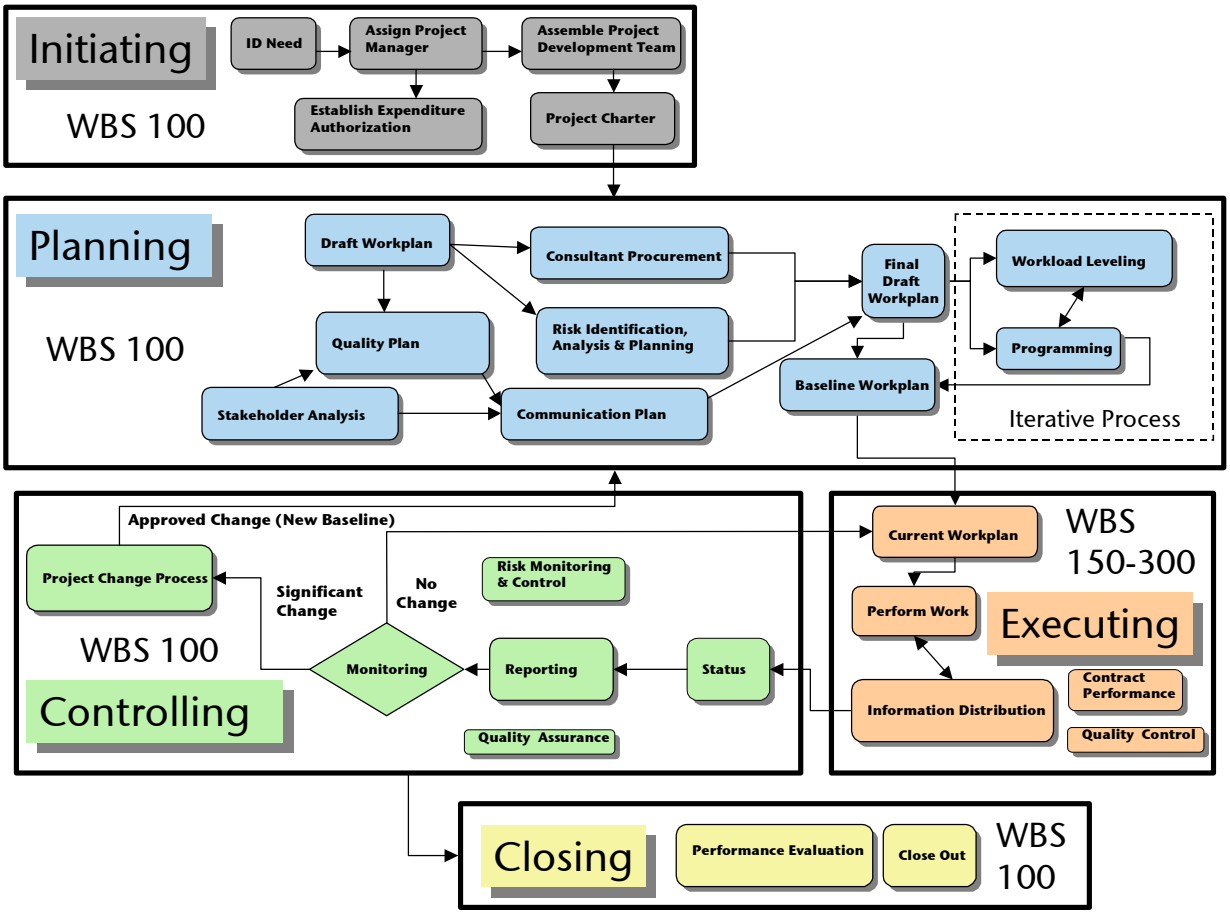

Figure 3. Process group interaction

These process groups:

- Link to each other by the results they produce — the outcome of one process group usually becomes an input to another.

  For example, planning processes produce plans that the project team must execute, so the project manager engages in executing processes to coordinate the team's efforts.

- Overlap at varying levels of intensity throughout each component of the project.

  For example, the project manager performs executing processes to guide the team's efforts at the same time that he/she performs controlling processes to monitor those efforts.

- Cross project lifecycle components such that the execution of one component leads to the initiation of the next component.

  For example, the plan for the Permits and Environmental Studies component is a product of the PID component.

For more information on lifecycle components, see "Project Lifecycle" on page 17.

Initiating Processes

Initiating processes involve recognizing that a component should begin and authorizing the project manager to proceed. All initiating processes are project management processes. At Caltrans, this process group involves the following processes.

Initiating processes for the PID component:

- Identify a need
- Assign a project manager
- Establish an expenditure authorization (EA)
- Assemble a project development team (PDT)
- Develop a project charter

Initiating processes for all other components:

- Establish EAs — a support EA for each component and separate capital EAs for the Right of Way and Construction components
- Update the project charter

Planning Processes

Planning processes involve devising and maintaining a workable scheme to achieve the desired result of the component. All planning processes are project management processes. At Caltrans, this process group involves the following processes.

Planning processes for the PID component:

Core (mandatory) processes	Create a PID workplan (PID WBS, Resource Breakdown Structure (RBS) assignments, cost, and schedule) Perform stakeholder analysis
Facilitating (optional) processes	Create a PID Quality Management Plan Create a PID Communication Plan Create a PID Risk Management Plan

Planning processes for all other components:

Core (mandatory) processes	Draft a workplan for all items that are to be programmed (WBS, RBS assignments, and initial schedule) Update the stakeholder analysis Finalize the draft workplan for programming (WBS, RBS assignments, cost, and schedule) Complete project programming Create a baseline workplan (adjust final draft workplan to match the outcome of programming)
Facilitating (optional) processes	Create a Project Quality Management Plan Create a Project Communication Plan Create a Project Risk Management Plan Manage consultant procurement Perform workload leveling

Executing Processes

Executing processes involve coordinating people and other resources to carry out the project plan. Executing includes both project management processes and product-oriented processes. At Caltrans, this process group involves the following processes.

Project management executing processes for all components:

- Collect project information for use by the project team
- Distribute project information to the project team
- Maintain project files
- Ensure proper hand-off of project deliverables from one team member to another
- Report time
- Administer consultant contracts

Product-oriented executing processes and their corresponding WBS elements:

Component	WBS	Process
PID	150	Prepare, Review, and Approve the PID
Permits and Environmental Studies	160	Perform the Preliminary Engineering Studies and Prepare Draft Project Report
	165	Perform the Environmental Studies and Prepare Draft Environmental Document (DED)
	175	Circulate the Draft Environmental Document and Select Preferred Project Alternative
	180	Prepare and Approve Project Report and Final Environmental Document
	205	Obtain Permits, Agreements, and Route Adoptions
PS&E	185	Prepare Base Maps and Plan Sheets
	190	Prepare Structures Site Plans
	210	Prepare Preliminary Structures Design Data
	215	Prepare Structures General Plans
	230	Prepare Draft PS&E
	235	Mitigate Environmental Impacts and Clean-up Hazardous Waste
	240	Prepare Draft Structures PS&E
	250	Prepare Final Structures PS&E Package
	255	Circulate, Review, and Prepare Final District PS&E Package
	260	Prepare Contract Documents
	265	Advertise, Open Bids, Award, and Approve Contract
Right of Way	195	Manage Right of Way Property and Excess Land
	200	Coordinate Utilities
	220	Perform Right of Way Engineering
	225	Obtain Right of Way Interests for Project Right of Way Certification
	245	Post Right of Way Certification Work
	300	Perform Final Right of Way Engineering Activities

Component	WBS	Process
Construction	270	Perform Construction Engineering and General Contract Administration
	285	Prepare and Administer Contract Change Orders
	290	Resolve Contract Claims
	295	Accept Contract, Prepare Final Construction Estimate, and Prepare Final Report

Controlling Processes

Controlling processes monitor and measure progress to ensure that project objectives are being met. If necessary, the project manager may have to take corrective actions to get the project back on track. All controlling processes are project management processes. At Caltrans, this process group involves the following processes.

For all components:

- Assure quality
- Report milestone status
- Monitor project performance (percent complete and earned value)
- Report performance to management and project sponsors
- Document the project and programming change requests
- Monitor and control risk

Closing Processes

Closing processes formalize the conclusion of the project or component, bringing it to an orderly end. This process group involves the core processes of contract closeout and administrative closure. All closing processes are project management processes. At Caltrans, this process group involves the following processes.

For all components:

- Close out cooperative agreements
- Close out consultant contracts
- Record lessons learned
- Archive project records
- Suspend EAs
- Complete final accounting for the component

Knowledge Areas

Caltrans project managers use various tools (reference documents, templates, computer applications, etc.) and techniques (skills, defined methods, procedures, etc.) to perform the tasks in each process group. The *PMBOK® Guide* divides these tools and techniques into nine knowledge areas:

- Project Integration Management (below)
- Project Scope Management (page 33)
- Project Time Management (page 33)
- Project Cost Management (page 33)
- Project Quality Management (page 33)
- Project Human Resource Management (page 34)
- Project Communications Management (page 34)
- Project Risk Management (page 34)
- Project Procurement Management (page 35)

For example, the project manager uses project scope management knowledge to complete processes within the following process groups: initiating, planning, executing, and controlling. For more information on process groups, see "Process Groups" on page 27.

Project Integration Management

Project integration management tools and techniques ensure the proper coordination of the various elements of the project.

Caltrans project managers use the following project integration management techniques:

- PDTs, formed at the beginning of the project lifecycle

  Each team's level of involvement varies according to the current project component.

- Roles and responsibilities determined by the PDT
- The basic purpose and need statement in the project charter and PID

  At the start of each component, and when introducing new team members, the project team refers back to the purpose and need statement to ensure that they are still working towards the stated goal.

- Multi-year project workplans and work agreements to guide the execution and control of project work and resources

- Project management directives that define department-wide standards
- Flexibility in processes to recognize district- or project-specific uniqueness

Project Scope Management

Project scope management tools and techniques ensure that the project includes all the work required, and only the work required, to complete the project.

Caltrans project development teams select elements from a standard WBS to produce a project-specific WBS. This project WBS organizes and defines the total scope of the project. Any work not included in the project WBS is outside the scope of the project.[2]

Project Time Management

Project time management tools and techniques ensure timely completion of the project.

Caltrans project managers use project time management techniques to produce resource-loaded critical path schedules. Work on the critical path is always fully resourced, using a combination of in-house staff, brokering, overtime, consultants, and contractors. Non-critical work elements with the least float (flexibility of schedule) are completed first and are scheduled in such a way as to minimize workload fluctuations. Caltrans maintains standard templates for use as starting points in developing critical path schedules.

Project Cost Management

Project cost management tools and techniques ensure that the project team completes the project within the approved budget.

Caltrans project managers use project cost management techniques such as the Program Evaluation and Review Technique (PERT) to develop budgets. Using PERT, Caltrans can be assured, within statistical limits, that the actual expenditures will be within the amounts allowed by State law.[3] Effective use of PERT requires that the project manager regularly compare actual expenditures to planned expenditures at the level used in budget development.

Project Quality Management

Project quality management tools and techniques ensure that the project will satisfy the needs for which it was undertaken.

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[2] PMBOK® Guide – 2000 Edition, Section 5.3.3.1, pages 59-60.

[3] Streets & Highways Code 188.8 (e)

Caltrans project managers, project sponsors, and PDTs prepare a project charter at the start of the PID component. They review and amend this charter at the start of each succeeding component. The charter is the starting point for the development of the project-specific WBS.

The project manager prepares a Quality Assurance (QA) plan to regularly evaluate overall performance and provide confidence that the end product will meet the customers' needs and expectations. QA is a part of the controlling process group.

Each lowest-level project-specific WBS element is assigned to a task manager who prepares a Quality Control (QC) plan. The QC plan describes how the specific WBS deliverable will be reviewed or checked to determine if it meets expectations. QC is a part of the executing process group.

Project Human Resource Management

Project human resource management tools and techniques ensure the most effective use of the people involved in the project. They ensure that people with the needed skills are available at the right time to execute the product-oriented processes.

Caltrans project managers use a standard Organizational Breakdown Structure (OBS) and various project resource management techniques to produce a project-specific OBS. Similarly, they use a standard RBS and various project resource management techniques to produce a project-specific RBS.

Project Communications Management

Project communications management tools and techniques ensure the timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information.

Caltrans project managers use project communications management techniques to:

- Develop a communication plan for the project
- Distribute information via the methods that reach customers most effectively
- File data using the Uniform Filing system
- Archive records in accordance with the Caltrans Records Retention policies

The Caltrans *Project Communication Handbook* contains detailed information on communications management processes.

Project Risk Management

Project risk management tools and techniques are used to identify, analyze, and respond to project risk.

Caltrans project managers use project risk management techniques to produce a risk management plan for the project and to manage the plan as risks arise.

The Caltrans *Project Development Procedures Manual* has detailed information on risk management processes.

Project Procurement Management

Project procurement management tools and techniques are used to acquire goods and services from outside Caltrans.

The principal types of procurement on state highway projects are the:

- Procurement of architectural, engineering, and other consulting services to supplement Caltrans staff in project delivery
- Relocation of utilities, through contracts with utility companies
- Purchase of real property
- Procurement of construction services through contracts with construction companies

Specific laws and procedures control each of these types of procurement.

4

People

People perform the work and determine the success or failure of a project. This chapter discusses the organizational structure, roles, and responsibilities of the people involved in Caltrans projects.

Roles

The people involved in a Caltrans project fill a variety of roles, each important to the project's success.

Stakeholders

A stakeholder is anyone who has a vested interest in the project. Stakeholders are individuals and organizations who are actively involved in the project, or whose interest may be positively or negatively affected as a result of project execution or successful project completion.

Stakeholders often have conflicting objectives, needs, and expectations. Finding appropriate resolutions can be one of the major challenges of project management. The project team must identify the stakeholders on a project, determine what their needs and expectations are, and then manage and influence those expectations to ensure a successful project. In general, differences between or among stakeholders should be resolved in favor of the customer. Understanding the customer is key to determining the true requirements of a project.

Stakeholder identification is difficult, but necessary. Naming or grouping stakeholders is primarily an aid to identify which individuals and organizations can facilitate or hinder the delivery of a project. For more information, see the Caltrans *Project Communication Handbook*.

Customers

Customers for any Caltrans capital project are either internal or external to the project.

- External Project Customers — transportation system users who pay for projects through fuel taxes, vehicle fees, tolls, bonds, sales taxes, fares, and other charges (in other words, the general public or their elected representatives)
- Internal Project Customers — individuals who will use the deliverables or information produced at various stages of the project (internal to the project, not necessarily to Caltrans)

Sponsors

Project sponsors are individuals or groups that represent external project customers by advocating a project or group of projects. They may be internal or external to Caltrans. Types of sponsors include:

- Deputy District Directors for Transportation Planning and District Division Chiefs for Transportation Planning — the internal sponsors of interregional improvement projects

- Deputy District Directors for Maintenance and Operations and District Division Chiefs for Maintenance and Operations — the internal sponsors of SHOPP projects
- Regional transportation planning agencies, county transportation commissions, cities, and counties — the external sponsors of regional projects
- Sponsoring local entities — the external sponsors of locally funded projects (Sales Tax Authorities, counties, cities, etc.)

Project Team

See "Project Team" below.

Regulatory Agencies

Regulatory agencies can facilitate the delivery of a project by providing permits and other documents of approval. Examples include the California Department of Fish and Game, the EPA, and other governmental agencies.

For more information, see the current editions of the Caltrans *Standard Environmental Reference* and the Caltrans *Construction Manual*.

Opposition Stakeholders

Opposition stakeholders are stakeholders who feel that their interests will be harmed by the project. Examples could include local governments, homeowner associations, environmental advocacy groups, landowners, and others.

Project Team

Every project has a project team. The project team consists of every person who works on a project, including state employees, consultants, contractors, utility companies, resource agencies, and property owners. Project team members are responsible for delivering products with the quality promised, in a timely and cost effective manner. Each team member is an internal customer for some deliverables and a supplier of other deliverables.

Caltrans uses interdisciplinary teams that initiate, plan, execute, control, and close the various components of the project lifecycle to ensure the successful delivery of a project. Project success hinges on effectively meeting stakeholder needs or communicating why their needs cannot be met.

Project teams may be formally or informally organized, depending on the complexity of the project. Individual team members may be active or inactive as a project progresses through the project lifecycle.

Project Development Team

A PDT is an interdisciplinary team composed of key members of the project team and external stakeholders.

A sub-set of the project team, PDT members:

- Advise and assist the project manager in directing the course of studies
- Make recommendations to the project manager and district management
- Work to carry out the project workplan
- Participate in major meetings, public hearings, and community involvement
- Serve as the nucleus for a Value Analysis Team
- Conduct studies and accumulate data throughout project development to the PS&E component
- Oversee the execution of the early components of the project activities, culminating in project approval

The PDT continues to address significant project issues that may arise during any component of the project lifecycle. For further discussion of the PDT, see the Caltrans *Project Development Procedures Manual*.

Formal Approach to Stakeholders

On large or complex capital projects, the PDT uses a formalized approach to obtaining stakeholder input. These projects usually involve one or more of the following:

- Significant new right of way
- Route adoption by the CTC
- Work on access controlled facilities requiring a new or revised Freeway Agreement
- Significant increase in capacity

During the early components of a project, the PDT formally solicits project stakeholder input into the planning, development, and evaluation of the various project alternatives. This is primarily due to the fact that on a PDT, external stakeholders are given an active role in solving their problems.

Informal Approach to Stakeholders

On smaller projects that do not meet the criteria listed above, the PDT uses an informal approach to obtain stakeholder input. Generally this means that the stakeholders are less actively involved, but still consulted.

Responsibilities

Every member of a project team has a different set of responsibilities. This section details these responsibilities.

Concepts

These concepts of responsibility, empowerment, and authority apply to every member of the project team.

Responsibility

Responsibility is the commitment to accomplish the work with the quality promised in a timely and cost-effective manner. Each member of the project team is accountable for meeting his/her commitments.

Empowerment

Project complexity combined with customer demand for responsiveness requires management to empower the project team to meet customer needs. Empowerment does not mean that managers abdicate their leadership role. Rather, it means that managers need to define the boundaries for, or delegate a level of authority to, each project team member in accordance with that individual's capabilities.

Project team members are then free to:

- Carry out their assignments using their own judgment, skills, and methods
- Make unilateral decisions affecting how they do work
- Accept responsibility for the outcome of their efforts

Authority

Authority is the power of individuals to make decisions that others are expected to follow. An individual may derive formal authority from his/her job title or an organizational position. An individual may derive informal or earned authority through his/her knowledge, skills, abilities, and personal effectiveness.

The project manager has formal authority derived from his/her organizational assignment. Project managers can also acquire informal or earned authority on the basis of their knowledge and reputation, which includes the ability to influence others and solve problems.

Overlapping Responsibilities

Any project has the potential for overlapping responsibilities. Prior to the initiation of the project or a particular project component, the project team must agree on who will assume what responsibilities.

Responsibility Matrix

Every member of the project team has specific responsibilities. The following table outlines the tasks assigned to each role. See "Stakeholders" on page 38 for role definitions.

Role	Process Group	Action
Project Sponsor	Initiate	Identifies and prioritizes projects for which he/she is the sponsor Sets goals for the project and works toward agreement on the charter Serves as advocate for his/her projects and solicits funding from the various funding programs (STIP, SHOPP, Minor, Congestion Mitigation and Air Quality (CMAQ), Toll, Sales Tax, etc.) Arranges funding for projects — for external sponsors, this includes working with the CTC to arrange funding for STIP projects Establishes performance measures for evaluating the quality of capital improvements
Deputy District Director for Program and Project Management (DDDPPM) *Has overall responsibility for the management of the capital program in a district or region.*	Initiate	Manages delivery of the district's portfolio of state highway projects Ensures that his/her district meets the programmed project delivery performance measures Identifies delivery trends and takes corrective action to improve delivery Works with RTPAs concerning changes to externally sponsored projects Manages capital outlay support resources Makes decisions on how to apply resources, staff, overtime, and consultants Maintains staff/supervisor/manager ratios Manages his/her district's project management plan Makes decisions on which projects to implement, tools to use in managing projects, and business processes to implement for effective project management Works with other managers to establish priorities and manage production of project delivery Ensures that business processes and procedures are in place to meet delivery objectives Directs project managers, the project management support unit (PMSU), and the consultant services unit (for more information about these units, see "Project Management Support Unit" on page 46, and "Consultant Services Unit" on page 46) Assigns workload and resources to project managers Provides project managers with training and direction in the use of resources Sets priorities between competing resource demands

Role	Process Group	Action
Project Manager *Has full authority, delegated from the DDDPPM, to produce the intended results, on schedule and within budget, and to keep the project sponsors and customers satisfied.*	Initiate	Identifies the needs and expectations of the project sponsors
	Plan	Leads the project team in the development of a project management plan that defines the project scope, schedule, cost, resource needs, risk, and communication needs Ensures that the project management plan includes all the work required, and only the work required, to produce the product Assigns resources in the following order: ▸ First, assigns WBS elements to functional managers in his/her own district or region ▸ Second, brokers WBS elements to functional managers in other districts, regions or divisions, if functional managers in his/her own district or region are unable to meet the delivery requirements ▸ Third, uses consultants to produce work elements, if neither local district or region staff nor brokering will meet the delivery requirements Modifies workplans to account for the use of project-specific consultant contracts
	Control	Coordinates and facilitates the work performed throughout the project lifecycle Monitors project performance and takes corrective action if necessary Communicates sensitive issues and project progress to district management, the sponsors, and the project team Provides input into the performance evaluation of project team members, and recommends changes to the project team membership when necessary Serves as the single point of contact on matters involving overall project scope, cost, or schedule Resolves problems that affect project scope, cost, or schedule Controls change to the project scope, cost, or schedule throughout the project lifecycle Manages the interaction between task managers, ensuring that they know who will receive and use their products Coordinates the efforts of the overall team, including the Division of Engineering Services Chairs project team meetings Controls the project budget (both support and capital)
	Close	Provides timely project completion Ensures that the final product meets the needs of the project customers Discusses the final product with sponsors to gauge their level of satisfaction Prepares a final report on the project, with recommendations for improvement Provides feedback to the team on lessons learned

Role	Process Group	Action
Functional Manager	Plan	Prepares and reviews project resource estimates Assigns an equitable workload to individual employees Assigns project team members when requested by the project manager or task manager by: ▸ Determining his/her functional unit's ability to meet project delivery schedules using in-house staff ▸ Using "on-call" consultant resources when his/her functional unit is unable to meet its delivery commitments with in-house staff Modifies workplans to account for the use of "on call" consultant contracts
	Execute	Directs project team members in the delivery of products within the timeframe agreed in the project management plan Supervises a functional unit Acts as the immediate supervisor of the staff who work on the project Provides opportunities for staff members to strengthen their skills Empowers staff to do their jobs with the minimum supervision necessary according to each individual's capabilities Provides technical and procedural direction to staff performing the work Approves staff and other project expenditures Ensures that there are adequate quality control and quality assurance processes in place for deliverables Provides quality assurance on contract and cooperative agreement work
	Control	Monitors and provides feedback to staff
	Close	Ensures that intermediate products (including reports, estimates, environmental documents, etc) meet the needs of internal customers and have the required features to comply with all applicable standards, regulations, and policies
Task Manager *Assumes both project manager and functional manager responsibilities for the production of particular WBS elements; may have a title such as*	Plan	Is appointed by the functional manager (if the WBS elements are produced entirely by one functional unit) or by the lowest-level supervisor or manager who manages all the involved functional units (if the WBS elements are shared among several functional units) Participates in the development of the project management plan Provides expert knowledge and analysis for the preparation of the project scope, schedule, and resource estimates Commits to the scope, schedule, and resource estimates of his/her portion of the project management plan Commits to delivery of his/her portion of the project workplan

Role	Process Group	Action
"Project Engineer," "Project Coordinator, etc.	Execute	Leads project team members in the delivery of products within the timeframe agreed in the project management plan Provides activity status information to the project manager (e.g. start date, remaining duration, finish date, percent complete, and hours at completion) Coordinates with other functional areas on planned products Communicates sensitive project problems, issues, conflicts, or changes to the project manager and the functional manager Resolves technical problems, issues, or conflicts raised by staff so that the overall project scope, cost, schedule, and product quality are not compromised Provides feedback to staff, functional managers, and the project manager on lessons learned Provides early identification to the project manager of issues that might impact the budget or scheduled delivery Provides products on time and within budget Ensures that products meet all applicable standards, regulations, and policies
Functional Coordinator *Appointed by a Functional Deputy District Director or by a Deputy Division Chief in the Division of Engineering Services*	Control	Coordinates the work of several functional units Performs full-time task management duties Takes responsibility for WBS elements that are shared among several functional units Monitors project performance and cost, and takes corrective action if necessary Provides input into the performance evaluation of project team members and recommend changes to the project team membership when necessary Coordinates the efforts of the members of the project team Assists the project manager to resolve problems that affect project scope, cost, or schedule
	Close	Provides feedback to the project manager on lessons learned
Project Team	Plan	Provides input into the development of the project management plan
	Execute	Delivers products within the timeframe agreed upon in the project management plan Works together in a team environment Monitors production and progress
	Control	Communicates sensitive issues and project progress to task managers Controls change to activities and products
	Close	Provides feedback to functional managers on how work can be done more effectively and efficiently

Functional Deputy District Directors and Deputy Division Chiefs in the Division of Engineering Services

Functional Deputy District Directors (FDDD) and Deputy Division Chiefs (DDC) in the Division of Engineering Services are responsible for entire functional areas in a district, region, or division.

They:

- Manage functional managers
- Report directly to District Directors, Chief Deputy District Directors, or the Chief of the Division of Engineering Services
- Facilitate interaction between project managers and functional managers
- Provide functional managers with training and direction in the use of resources

Project Management Support Unit

PMSUs, located in each of the districts or regions, provide administrative support to project managers — collecting data, preparing reports on project status, developing exhibits for the project manager's presentations, etc. While PMSUs support multiple projects at one time, Caltrans recommends a one-on-one relationship with PMSU staff — a project manager should contact the same PMSU staff person throughout the project lifecycle.

Consultant Services Unit

Consultant services units, located in each of the districts or regions, manage the procurement of outside resources necessary to deliver projects. The consultant services unit develops the scope of services or deliverables for each contract using the statement of work and other input provided by the project manager, project workplan, and other functional units that are involved in the project.

One-Hat and Two-Hat Project Managers

Caltrans categorizes its project managers as either “one-hat” or “two-hat.” These terms are unique to Caltrans.

One-Hat Project Managers

A one-hat project manager’s duties consist solely of project management and do not include supervision. One-hat project managers determine what tasks are done, when they are done, and how much each task costs. One-hat project managers are generally assigned to all major capital projects, including the following:

- STIP, SHOPP, seismic, locally funded, and toll projects
- Projects with multiple functional unit involvement
- Projects with a significant amount of local or private entity involvement

Current Caltrans policy guidelines require that most project managers be one-hat.

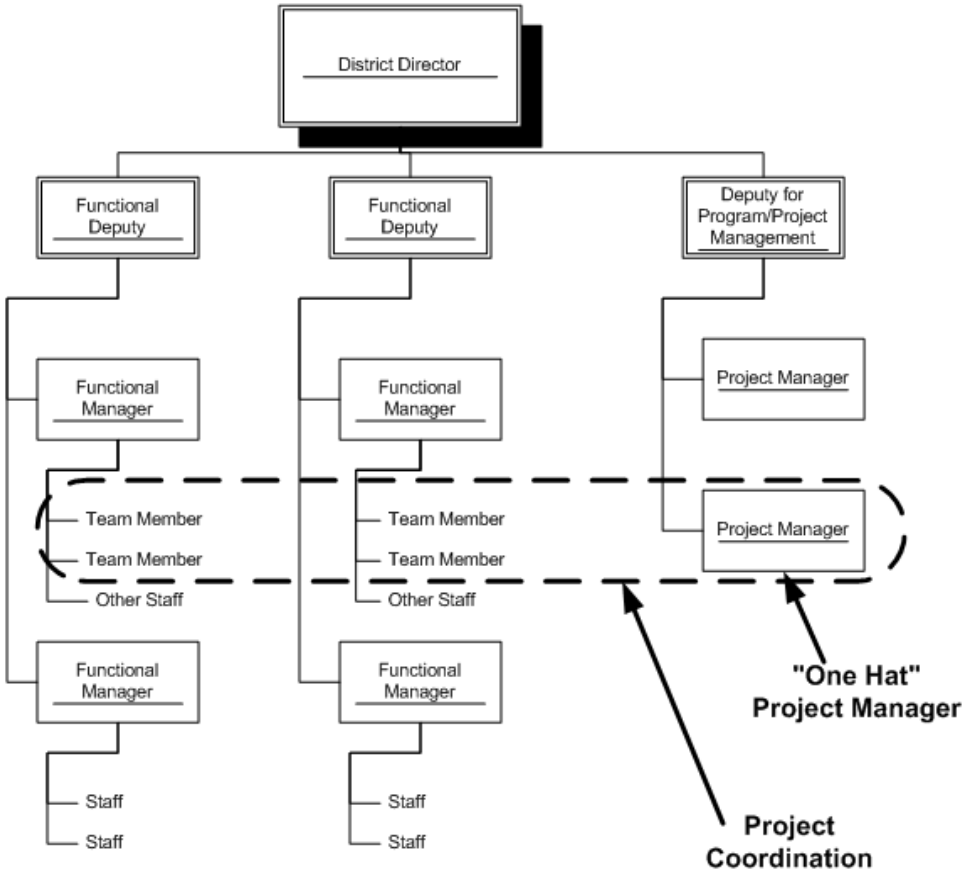

Figure 4. Organizational structure: one-hat project manager

Two-Hat Project Managers

Two-hat project managers are those whose duties consist of both project management and supervision of a functional unit. Two-hat project managers may be assigned to:

- Smaller projects, such as Minor B and highway maintenance projects
- Smaller specialty projects, such as landscaping-only or traffic signal projects

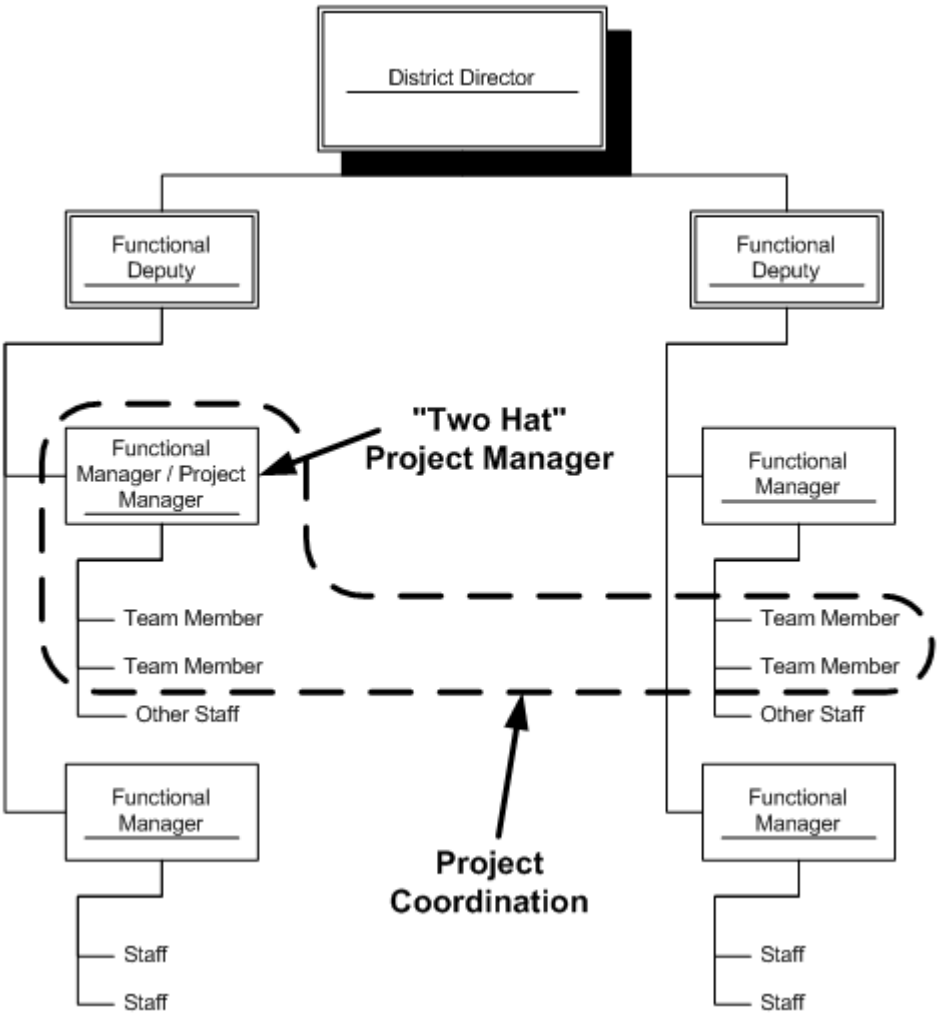

Figure 5. Organizational structure: two-hat project manager

5

Tools

This chapter describes some of the tools and information systems used by Caltrans project managers.

Project Management Plan

A project management plan is a group of documents used to guide project execution and control throughout the project lifecycle. The plan addresses the project's problem and need (why), goals and objectives (what), schedule (when), and roles (who). The project management plan includes, but is not limited to, the following:

- Project charter (page 51)
- Workplan (page 52)
- Quality management plan (manual in development at the time of this printing)
- Communication management plan (see the *Project Communication Handbook*)
- Risk management plan (see the *Project Risk Management Handbook*)
- Procurement management plan (manual in development at the time of this printing)

The project manager is the single point of contact for the project management plan, ensuring that only one set of documents is created and maintained.

Project Charter

A charter documents the agreement between the sponsor and project manager on the key elements of a project and component. It helps the project manager guide the project team efficiently and effectively through the project lifecycle. It is also used to identify and meet customer satisfaction requirements.

Many capital projects suffer from rework (due to scope changes), which leads to schedule and cost overruns. The charter process helps to manage project scope and reduce rework by preventing unnecessary scope changes.

The project manager, assisted by the PDT, creates a charter at the beginning of the PID component and revises it at the beginning of each subsequent project lifecycle component.

Workplan

A workplan is a resourced project schedule. It identifies the project's tasks and defines the cost, timeline, and requirements for each.

For any task in the workplan, the project manager assigns a WBS element, a RBS element, and an OBS element.

Work Breakdown Structure

The WBS is a deliverable-oriented grouping of project elements that organizes and defines the total scope of the project. Each descending level represents an increasingly more detailed definition of the deliverables.

Project managers use the WBS to assign deliverables to functional managers. The WBS defines the deliverables, and not the activities, staff, timelines, dependencies, or other factors needed to produce them.

Resource Breakdown Structure

The RBS is a standardized, hierarchical list of roles that might be needed to produce a project deliverable. Roles are grouped by functions. The construction function, for instance, includes roles such as Construction Engineer, Resident Engineer, Inspector, Construction Office Engineer, Structures Representative, etc. In addition, the RBS contains a consultant resource category to separate consultant resources from Caltrans staff resources in the workplan.

Project team members use the RBS to determine what roles are needed to produce project-specific WBS elements.

Organizational Breakdown Structure

The OBS describes the Caltrans organization chart. It groups personnel into successively smaller units, each reporting to a single manager or supervisor. Districts and divisions consist of offices, which are subdivided into branches. In large districts and divisions, branches may be further subdivided into sections, and sections sometimes subdivided into squads.

Project managers use the OBS to identify the units or persons within the organization who will perform the WBS activities in the workplan.

Information Systems

Caltrans uses several systems to store and process the information needed to monitor and manage projects.

California Transportation Improvement Program System (CTIPS)

CTIPS shows the project description and authorized funding for STIP and SHOPP projects, and the fiscal year of delivery for each STIP and SHOPP project. This information is essential to the project team because it identifies the scope, budget, and schedule that they are expected to meet.

Project Resource and Schedule Management (PRSM)

PRSM is a resource and scheduling management tool currently under development. For state highway projects it will replace Xpert Project Manager (XPM) and Time Reporting System (TRS). PRSM will show the project schedules, which are currently in XPM, and it will act as the employee time-entry system. The most essential feature of PRSM is a requirement to: "Plan the work. Work the plan." It will not allow employees to enter unplanned work on projects. At the same time, it will allow functional managers (first line supervisors) to update their portion of the project plans. The employee will therefore be reporting on planned work assigned by his/her supervisor.

Caltrans has selected Primavera Enterprise as the software developer for PRSM. Descriptions of this product are available at ***www.primavera.com***.

Transportation Accounting and Management System (TRAMS)

The Caltrans mainframe accounting database, TRAMS, provides financial information, including expenditure information, by project. Staff members use preprogrammed or ad hoc reports to access the data.

Systems Being Replaced

Caltrans intends to replace several systems.

Project Management Control System (PMCS)

PMCS is a mainframe project database containing:

- Capital cost, scope, and schedule data
- Project characteristics (existing conditions, traffic, and accident information, etc.)
- Projections for person/year needs

PMCS provides online entry and viewing of project data. Preprogrammed batch reports provide multi-project information. The various functions of PMCS will be replaced by several integrated financial systems.

Xpert Project Manager (XPM)

XPM is the current project scheduling and resourcing software. It will be replaced by PRSM.

Time Reporting System (TRS)

TRS is a mainframe system that allows online reporting of labor and leave data. Its purpose is to furnish timely, cost effective reporting of labor information. Time reporting is done on a weekly basis and therefore is available on a more timely basis than information from the monthly reporting cycle for TRAMS. TRS will be replaced by PRSM.

Project Management Data Warehouse (PMDW)

PMDW is a database containing general project information, project schedule, capital costs, and operating expense data extracted and integrated from existing databases. Staff and managers use desktop computer query tools to access the data.

PMDW is a database that correlates information in XPM with information in TRS. PMDW data is accessible to project delivery staff and managers for query purposes using desktop computer query tools. PMDW will be replaced by PRSM.

G

Glossary

Baseline Workplan — The original workplan approved by the stakeholders. For programmed state highway projects, the cost estimates in the baseline workplan are within 10 percent of the amounts shown in the programming document and the delivery year matches the programming document.

Capital Project — A temporary endeavor undertaken to create a unique physical improvement to the transportation system in California. The word "project" refers to the work that is performed. Projects produce products.

Communications Management Plan — A plan detailing to whom information will flow, what methods will be used to distribute various types of information, a description of the types of information to be distributed, a schedule for information production and distribution, how information will be updated, and how it can be accessed between scheduled communications.

Critical Path Method (CPM) — A scheduling method that uses diagrams to graphically display the logical sequence of workplan activities. Caltrans uses this method to determine the length (time) of a project and to identify the activities that are critical to the completion of the project on time.

Current Workplan — The baseline workplan plus changes approved by the project manager and project team. The current workplan guides the day-to-day operations of project execution and project control. It reflects the current reality and can be compared to the baseline workplan to assess progress and performance.

Customer	See **external project customers** and **internal project customers**.
Expenditure Authorization (EA)	The key to the Caltrans accounting system. It identifies an expenditure of funds. Every expenditure of Caltrans funds must be charged to an EA.
External Project Customers	Transportation system users who pay for projects through fuel taxes, vehicle fees, tolls, bonds, sales taxes, fares, and other charges.
Federal Project	An authorization to incur federally reimbursable costs for a specific scope of work within specific geographic limits.
Functional Coordinators	Individuals who coordinate the work of several functional units. Functional coordinators are appointed by a Deputy District Director, Deputy Division Chief in the Division of Engineering Services, or Office Chief in the Southern Right of Way Service Center.
Functional Managers	The immediate supervisors of the staff who work on the project.
Functional Unit	A group of people supervised by a functional manager.
Internal Project Customers	Individuals who will use the deliverables or information produced at various stages of the project. They are internal to the project, not necessarily internal to Caltrans. (See also **external project customers** and **project team**.)
Portfolio Management	The management of the projects or portions of projects assigned to a particular individual or unit.
Product-oriented Processes	Processes concerned with specifying and creating the project product.
Product Scope	The features and functions to be included in a product. (See also **project scope**.)
Program	A group of related projects managed in a coordinated way to obtain benefits not available from managing them individually. Laws and regulations establish programs for government projects and define each program's purpose, funding sources, and funding process.
Program Analysis and Review Technique (PERT)	An event-oriented network analysis technique used to estimate program duration when there is uncertainty in the individual activity duration estimates. PERT applies the CPM using durations that are computed by weighted averages of optimistic, pessimistic, and most likely duration estimates. PERT computes the standard deviation of the completion date from those of the path's activity durations.
Program Management	The coordinated management of programs to obtain benefits not available from managing them individually.

Programmed Project A proposed transportation improvement in a geographic location that is listed in a programming document or in a report to the CTC. The improvement and location are specified in the programming document or report to the CTC.

Programming Document A document that lists the projects that are authorized in a program.

Project A temporary endeavor undertaken to produce a unique outcome. A Caltrans capital project produces a unique physical improvement to the transportation system in California.

Project Change Request The process used to obtain approval for project scope, cost, and/or schedule changes (reference: Scope, Cost, Schedule Change Process memo dated May 15, 1992).

Project Charter The charter process defines the key elements of the project. These include the purpose and need, component deliverables, and known constraints, assumptions, and risks. The charter documents the agreement between the sponsor and project manager, who represents the project team.

Project Components The highest-order deliverables on a project. On government projects, these are normally deliverables required by laws or regulations. On California State Highway projects, the components are defined in Government Code sections 14529 (b) and 14556.13(b).

Project Development Team An interdisciplinary team composed of key members of the project team and external stakeholders, that acts as a steering committee in directing the course of studies required to evaluate the various project alternatives during the early components of the project lifecycle.

Project Initiation Document (PID) Concept approval document for candidate projects that contains a defined project scope, a reliable capital and support cost estimate for each alternative solution, and a project schedule (workplan) for the alternative recommended for programming the project.

Project Lifecycle A generally sequential arrangement of the components of a project. Each of the lifecycle components involves the five project management process groups – initiating, planning, executing, controlling, and closing. When all components are complete, the project is complete.

Project Management The application of knowledge, skills, tools, and techniques to project activities in order to meet (or exceed) sponsors' and external customers' needs and expectations from a project.

Project Management Body of Knowledge® (PMBOK) Guide A standards document published by the Project Management Institute.

Project Management Plan A group of files used to guide project execution and control throughout the project lifecycle.

Project Manager The individual responsible for managing a project.

Project Scope The work that must be done in order to deliver a product with the specified features and functions.

Project Sponsors Individuals or groups that represent external project customers by advocating a project or group of projects. Project sponsors may be internal or external to Caltrans.

Project Team Every person who works on a project, including state employees, consultants, and contractors. Each team member is an internal customer for some deliverables and a supplier of other deliverables.

Quality Improvement Project A temporary endeavor undertaken to improve the way in which capital projects meet customer needs. Quality improvement projects include those designed to produce process improvements, training, and tools.

Regional Transportation Planning Agency A transportation planning agency designated in Government Code 29532. In this handbook, the term "Regional Transportation Planning Agency" is used loosely to include the councils of governments and local transportation commissions described in Government Code 29532 (b) and (c) as well as the regional transportation planning agencies described in Government Code 29532 (a) and (d).

Right of Way Only Project An entry in a programming document that has funds programmed only for right of way.

Scope Document See **Project Initiation Document** (PID).

Stakeholder Individuals or organizations who are actively involved in the project or whose interests may be positively or negatively affected as a result of project execution or successful project completion.

Task Managers Individuals who are delegated the responsibilities of both the project manager and the functional manager for the production of particular elements in the project WBS.

Value Analysis Team A team that performs value engineering.

Value Engineering The systematic application of recognized techniques by a multi-disciplined team that identifies the function of a product or service; establishes a worth for that function; generates alternatives through the use of creative thinking; and reliably provides the needed functions at the lowest overall cost.

Work Breakdown Structure A deliverable-oriented grouping of project elements that organizes and defines the total scope of the project. Any work not included in the WBS is outside the scope of the project.

Workplan A resourced schedule. The workplan identifies the project-specific WBS elements and defines the cost, timeline, and requirements for each.

A

Acronyms

AASHTO	American Association of State Highway and Transportation Officials
CEQA	California Environmental Quality Act
CMAQ	Congestion Mitigation and Air Quality
CPM	Critical Path Method
CTC	California Transportation Commission
CTIPS	California Transportation Improvement Program System
DDC	Deputy Division Chiefs
DDDPM	Deputy District Director for Program and Project Management
DED	Draft Environmental Document
EA	Expenditure Authorization
FDDD	Functional Deputy District Directors
FHWA	Federal Highway Administration
IIP	Interregional Improvement Program

NEPA	National Environmental Policy Act
OBS	Organizational Breakdown Structure
PDT	Project Development Team
PERT	Program Evaluation and Review Technique
PID	Project Initiation Document
PMBOK	Project Management Body of Knowledge
PMCS	Project Management Control System
PMDW	Project Management Data Warehouse
PMSU	Project Management Support Unit
PRSM	Project Resource and Schedule Management
PS&E	Plans, Specifications & Estimate
QA	Quality Assurance
QC	Quality Control
RBS	Resource Breakdown Structure
RIP	Regional Improvement Program
RTPA	Regional Transportation Planning Agency
SHOPP	State Highway Operation & Protection Program
STIP	State Transportation Improvement Program
TEA	Transportation Enhancement Activities
TCRP	Traffic Congestion Relief Program
TRAMS	Transportation Accounting and Management System
TRS	Time Reporting System
TSM	Traffic Systems Management
WBS	Work Breakdown Structure
XPM	eXpert Project Management

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