

## California Department of Transportation

Joint Hearing  
Budget Subcommittee No. 3 on Resources  
and Transportation and Assembly Transportation  
Room 4202, State Capitol  
Sacramento, California

May 9, 2011

Its Capital Outlay Support Program Should Strengthen  
Budgeting Practices, Refine Its Performance Measures,  
and Improve Internal Controls  
(April 28, 2011, Report 2010-122)

Statement by  
ELAINE M. HOWLE, CPA  
California State Auditor



Independent NONPARTISAN  
TRANSPARENT Accountability





**CALIFORNIA  
STATE AUDITOR**

Elaine M. Howle, State Auditor

**BUREAU OF STATE AUDITS**

## **BACKGROUND**

The Caltrans Capital Outlay Support Program (support program) provides engineering, design, environmental studies, right-of-way, and construction management services for state highway projects. Support program functions for a project begin after the California Transportation Commission (commission) allocates funding for a project and continue until the project is completed. The 2010–11 Budget Act allocated \$1.8 billion for the support program. This amount funds the fiscal year 2010–11 support activities associated with about 2,500 capital outlay projects and about 9,500 positions within Caltrans and its 12 districts.

Caltrans has two primary programs that provide funding for capital outlay projects:

- State Transportation Improvement Program (STIP), which is a five-year plan of projects designed to increase the capacity of transportation infrastructure.
- State Highway Operation and Protection Program (SHOPP), which is a four-year plan of projects designed to rehabilitate or preserve existing transportation infrastructure.

Each project receives funding through multiple budget acts, and the support program budget reflects the total for the support activities in a given year.

## AUDIT HIGHLIGHTS

- Caltrans has done little analysis to determine the frequency or magnitude of support cost budget overruns and to inform stakeholders of the overruns.
- Sixty-two percent of the projects that completed construction during fiscal years 2007–08 through 2009–10 had support costs budget overruns, which totaled more than \$305 million of the \$1.4 billion of such cost expenditures made during that period.
- Differences between a project’s budgeted and actual support costs were due primarily to an increase in the hourly rate for support costs—one project we reviewed was about 14,600 hours under budget yet nearly \$6.8 million over the cost budgeted.
- Some potential causes for support cost overruns include:
  - Project managers did not use a detailed approach to develop a support budget when the project was ready for construction.
  - Project managers monitored their budgets based primarily on the hours charged and not the dollars spent.
- Although Caltrans has established a goal of reducing total support costs to 32 percent of the total capital costs, it has historically failed to use a consistent method to calculate the ratio over time, and has generally not met its goal for the last three fiscal years.
- Caltrans’ time-reporting system lacks strong internal controls.
- Better project monitoring and the use of performance metrics could help it minimize cost overruns.

Ultimately, our audit concludes that Caltrans has poorly monitored support costs, projects’ support costs frequently exceed budgeted amounts, and its data systems contain inaccurate support budget data. Until about five years ago, Caltrans placed a greater emphasis on ensuring that capital costs were within budget because these costs were generally the larger part of the project’s budget.

### **Caltrans Has Not Adequately Prioritized Its Monitoring of Capital Outlay Support Costs and Its Project Support Costs Exceed Budgeted Amounts**

- Despite a stated goal to reduce project cost overruns, Caltrans has done little analysis to determine the frequency or magnitude of support cost budget overruns.
- The capital outlay support costs for 476 of the 766 (62 percent) projects that completed construction in fiscal years 2007–08 through 2009–10 exceeded their respective budgets. These overruns totaled more than \$305 million of the \$1.4 billion in total support cost expenditures for these projects. Budget overruns can deprive other projects of necessary funding, potentially causing projects to be delayed.
  - The average support cost overrun for STIP projects we reviewed was \$1.5 million and the average budget for those projects was \$4.3 million.
  - The average support cost overrun for SHOPP projects we reviewed was \$329,000 and the average budget for those projects was \$1.3 million.
- Although opportunities exist to inform stakeholders of the extent of these overruns, Caltrans has not done so, limiting valuable information on the efficiency and effectiveness of the support program.

**Table 2**  
**Support Cost Budget Overruns for 766 Projects That Completed Construction**  
**Fiscal Years 2007–08 Through 2009–10**

FISCAL YEAR	STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP) PROJECTS				STATE HIGHWAY OPERATION AND PROTECTION PROGRAM (SHOPP) PROJECTS				TOTAL STIP AND SHOPP PROJECTS			
	NUMBER OF COMPLETED PROJECTS	NUMBER OF COMPLETED PROJECTS ABOVE BUDGET	NUMBER OF COMPLETED PROJECTS ABOVE BUDGET BY GREATER THAN 20 PERCENT*	BUDGET OVERRUN RATIO	NUMBER OF COMPLETED PROJECTS	NUMBER OF COMPLETED PROJECTS ABOVE BUDGET	NUMBER OF COMPLETED PROJECTS ABOVE BUDGET BY GREATER THAN 20 PERCENT*	BUDGET OVERRUN RATIO	NUMBER OF COMPLETED PROJECTS	NUMBER OF COMPLETED PROJECTS ABOVE BUDGET	NUMBER OF COMPLETED PROJECTS ABOVE BUDGET BY GREATER THAN 20 PERCENT*	BUDGET OVERRUN RATIO
2007–08	18	16	9	50%	272	170	143	90%	290	186	152	79%
2008–09	16	13	9	54	218	142	97	59	234	155	106	58
2009–10	21	15	8	39	221	120	93	57	242	135	101	51
<b>Totals</b>	<b>55</b>	<b>44</b>	<b>26</b>	<b>46%</b>	<b>711</b>	<b>432</b>	<b>333</b>	<b>68%</b>	<b>766</b>	<b>476</b>	<b>359</b>	<b>62%</b>

Source: Bureau of State Audits' analysis of data provided by the California Department of Transportation (Caltrans) from its California Transportation Improvement and Programming System and its Transportation Accounting Management System.

Notes: We analyzed 766 of 877 projects that completed construction in fiscal years 2007–08 through 2009–10. We excluded projects that were, among other things, exempt from budget accountability requirements and projects that were implemented by local entities—not Caltrans—such as county transportation commissions. According to the chief of Caltrans' Division of Project Management, projects can undergo scope and budget changes, be divided into separate projects, or be combined with another project after the original budget has been established. She indicated that, as a result, the original budgets for projects generally undergo various changes before construction begins. She noted that the budget information for the 766 projects we reviewed is typically what was available at the time the project was ready to begin construction, not the original budget. She stated that if changes to the support budget are made after the original budget has been established, they are typically to revise the budget upward. Thus, the budget overrun ratios presented in this table are conservative.

We calculated the support cost overrun ratio by analyzing the difference between the total support cost expenditures and total support cost budgets for all projects that completed construction in fiscal years 2007–08 through 2009–10. According to this approach, large projects, in terms of dollars, have a greater impact on the resulting ratio. The support cost overrun ratio is based only on those projects that experienced a cost overrun.

\* State law requires that STIP project costs may not be changed to reflect differences that are within 20 percent of the amount programmed for actual project costs. Further, according to the chief of Caltrans' Division of Project Management, although there are no written requirements, Caltrans' practice is to manage SHOPP projects similar to STIP projects when a SHOPP project is 20 percent over its support budget.

## Recommendations

- Create and incorporate an analysis of support cost budget variances in its quarterly report to the Business, Transportation and Housing Agency and in its annual report to the Legislature and the governor. The analysis should report on the number of completed projects with budget variances and on the number of open projects for which the estimates at completion predict budget variances. Further, the analysis should report on the overrun and underrun ratios for those projects, and the portions of the variances due to rates and hours.
- Caltrans should establish a measurable goal for reducing variances in its strategic plan.

## Due to a Lack of Emphasis on Support Costs, Caltrans Systems Do Not Provide Adequate Data on Support Budgets

- Our review of the data provided by Caltrans for projects that completed construction during fiscal years 2007–08 through 2009–10 found that Caltrans did not ensure that the California Transportation Improvement and Programming System (CTIPS)—which Caltrans uses, in part, to capture project budgets—effectively and accurately tracked a project’s total support budget.
- Caltrans explained that for SHOPP projects initiated before the 2008 SHOPP was approved, the support budgets in CTIPS were informational only; thus, Caltrans did not enforce rigid accountability of these support budgets.
- Similarly, for STIP projects that were programmed before 2004, Caltrans did not consistently require project managers to be accountable for support costs. In fact, the chief of programming stated that Caltrans did not have a process for its headquarters to track projects’ total support budgets and instead relied on its districts to do so.
- Some STIP projects programmed in 1996 or earlier, before the enactment of SB 45, were excluded from support budgeting and accountability requirements; thus, these projects have no established support budgets.
  - Caltrans estimates it has 24 such projects yet to complete construction, with a total value, including estimated support and capital costs, of nearly \$250 million.
- Caltrans’ practice of splitting and combining projects makes it difficult to compare actual support costs to budgeted support costs.
- According to Caltrans, its forthcoming Project Resource and Schedule Management (PRSM) system should allow it to better compare budgeted support costs with actual support costs for projects.
  - Caltrans anticipates piloting PRSM at the Marysville district in June 2011 and estimates that it will implement the system on a departmentwide basis in 2012.

## Recommendations

- Establish budgets for those STIP projects programmed before 1997 so that overruns may be reported in the quarterly report to the agency and in the annual report to the Legislature and the governor.
- Develop a system to report on the total budgets of support program projects—including initial project support budgets—of projects that have been divided into multiple projects or combined into a larger project.

## Two Factors Generally Contribute to Support Cost Overruns

- Differences between the budgeted and actual support costs of a project generally can be caused by one or a combination of two factors—a difference between the expected and actual quantity of hours, or a difference between the expected and actual cost of staff time.
- Based on a random sample of 18 projects that completed construction during fiscal years 2007–08 through 2009–10, we used an accounting technique called “price-volume analysis” and determined that support cost overruns were due primarily to increases in labor costs (rate).
  - For example, for 14 of the 18 projects, the actual support costs greatly exceeded the project’s original budget by amounts ranging from 29 percent to 382 percent.
  - In one instance, the project was about 14,600 hours under budget but exceeded its budgeted cost by nearly \$6.8 million, representing a cost overrun of 83 percent.
  - Annual salaries for certain Caltrans employees, including engineers, increased by more than 40 percent during fiscal years 2005–06 through 2008–09.
- We also reviewed 40 projects in four Caltrans districts—Fresno, Los Angeles, Oakland, and San Diego. The project managers for 12 of 40 projects indicated they monitored primarily on hours charged, and not on dollars spent.
- Further, project managers for 10 of 40 projects indicated they used a less detailed “top down” approach in which the budget for support was based on a percentage of the total capital costs; rather than the more detailed approach of developing budgets based on project tasks.
- If project managers do not pay attention to costs, changes in rate can affect their budgets, even if the project remains under budget. Moreover, projects with cost overruns require additional funding originally allocated for other projects, which may result in the delay of those projects.

## Recommendations

- Instruct project managers to submit requests to update the budget when assumptions on which the budget was based are no longer valid, regardless of the phase of the project.
- Direct project managers to use a detailed approach based on project tasks, such as those included in a project work plan, when finalizing project support budgets before construction.

### Recent Developments Suggest a Change in Focus

- Caltrans told us that until about five years ago, it placed a greater emphasis on ensuring that capital costs were within budget, because these costs were generally the larger part of the project's total budget. However, more recently Caltrans has been increasing its emphasis on managing support costs separately from capital costs.
  - A memorandum that took effect in July 2010 requires Caltrans, on a quarterly basis, to produce a list of projects that are expected to exceed their budgets, and the project managers are required to prepare funding plans to address these potential cost overruns.
  - Further, our review of 10 active STIP and 10 active SHOPP projects (that were part of the fiscal year 2010–11 budget) revealed that the data in CTIPS for those projects included reliable budget information.

### Recommendations:

- Continue to implement the policies described in its February 2010 memorandum to the districts describing an approach Caltrans will take to monitor support costs within budget. Moreover, Caltrans should direct its project managers to monitor budgets for all projects according to both hours and costs.

### STIP Reform

- Because the commission does not track or review construction support cost overruns for STIP projects, neither counties nor Caltrans is held accountable for support cost overruns during this phase.
  - We examined 55 STIP projects that completed construction during fiscal years 2007–08 through 2009–10 and found that 48 percent of total support costs happen during construction and that the overrun ratio for these projects was 46 percent.
  - State law does not allow the commission to change project budgets after construction begins without a supplemental allocation.
  - Caltrans told us that support budgets are not updated after construction.
  - Overruns during the construction phase do not reduce funds available to the entity, such as a county or Caltrans.
  - Given the limited funds available for STIP projects within the State, overruns on current projects impair the State's ability to undertake future projects.

### Recommendation

- To increase accountability for budget overruns of support costs, the Legislature should consider legislation that would expressly require the commission to review and approve project construction support costs when they differ from the amount budgeted by 20 percent or more.

**Caltrans Has Generally Not Met Its Goal for Its Support-to-Capital Ratio, Has Calculated This Ratio Inconsistently, and Could Improve the Manner in Which It Measures Efficiency**

- In its current strategic plan, Caltrans has a performance measure that compares support costs to capital costs, referred to as the *support-to-capital* ratio. This performance measure, which measures past efficiency and is calculated only for those projects that have completed construction, allows a comparison of the ratio of capital outlay support costs to capital outlay expenditures over the life of an individual project or single set of projects.
- Although Caltrans has established a goal of reducing total support costs to 32 percent of total capital costs, our assessment of 766 projects that completed construction during fiscal years 2007–08 through 2009–10 and for which construction costs were available found that Caltrans failed to meet its 32 percent goal in all but one year—fiscal year 2009–10—for the STIP.
- Further, Caltrans has historically failed to use a consistent method to calculate this ratio, decreasing the value of the ratio for assessing its performance in managing the support program over time.

**Table 4**  
**Support-to-Capital Ratios for 766 Projects That Completed Construction**  
**Fiscal Years 2007–08 Through 2009–10**

FISCAL YEAR	STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP) PROJECTS		STATE HIGHWAY OPERATION AND PROTECTION PROGRAM (SHOPP) PROJECTS		TOTAL STIP AND SHOPP PROJECTS	
	SUPPORT-TO-CAPITAL RATIO	NUMBER OF COMPLETED PROJECTS	SUPPORT-TO-CAPITAL RATIO	NUMBER OF COMPLETED PROJECTS	SUPPORT-TO-CAPITAL RATIO	NUMBER OF COMPLETED PROJECTS
2007–08	35%	18	39%	272	38%	290
2008–09	43	16	34	218	36	234
2009–10	30	21	34	221	33	242
<b>Totals</b>	<b>34%</b>	<b>55</b>	<b>36%</b>	<b>711</b>	<b>35%</b>	<b>766</b>

Source: Bureau of State Audits’ analysis of data provided by the California Department of Transportation’s (Caltrans) Transportation Accounting Management System for projects completed in each fiscal year.

Notes: We analyzed 766 of 877 projects that completed construction in fiscal years 2007–08 through 2009–10. We excluded projects that, among other things, were exempt from budget accountability requirements and projects that were implemented by local entities—not by Caltrans—such as county transportation commissions. We calculated the support-to-capital ratio by analyzing the difference between the total support cost expenditures and total capital cost expenditures for the 766 projects that completed construction in the fiscal years 2007–08 through 2009–10.

- Moreover, Caltrans’ support-to-capital ratio has limitations. For example, smaller projects—those with less than \$1 million in total capital costs—had a 103 percent support-to-capital ratio for STIP and SHOPP projects completed during fiscal years 2007–08 through 2009–10. However, large projects—those with \$50 million or more in total capital costs—had a support-to-capital ratio of 24 percent.
  - According to the assistant division chief, smaller projects will likely have higher support-to-capital ratios because a certain amount of support is necessary regardless of project size. For this reason, as project size increases, the amount of support needed relative to capital costs decreases.



- Although Caltrans aims to reduce the support-to-capital ratio to 32 percent or lower, this performance measure could be more effective if Caltrans refined it to account for project size and scope as we suggest in Table 5.

**Table 5**

**Project Support-to-Capital Ratios for 766 Projects of Different Sizes That Completed Construction  
 Fiscal Years 2007–08 Through 2009–10**

PROJECT SIZE*	PERCENTAGE OF TOTAL PROJECTS	PERCENTAGE OF TOTAL CAPITAL VALUE	STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP) PROJECTS		STATE HIGHWAY OPERATION AND PROTECTION PROGRAM (SHOPP) PROJECTS		TOTAL STIP AND SHOPP PROJECTS	
			NUMBER OF COMPLETED PROJECTS	SUPPORT-TO-CAPITAL RATIO	NUMBER OF COMPLETED PROJECTS	SUPPORT-TO-CAPITAL RATIO	NUMBER OF COMPLETED PROJECTS	SUPPORT-TO-CAPITAL RATIO
Small (less than \$1 million)	33%	3%	11	119%	245	102%	256	103%
Medium (between \$1 million and \$50 million)	65	76	35	41	461	35	496	36
Large (\$50 million or more)	2	21	9	28	5	15	14	24
<b>Totals</b>	<b>100%</b>	<b>100%</b>	<b>55</b>	<b>34%</b>	<b>711</b>	<b>36%</b>	<b>766</b>	<b>35%</b>

Source: Bureau of State Audits' analysis of the California Department of Transportation's (Caltrans) data generated from the Transportation Accounting Management System.  
 Note: We analyzed 766 of 877 projects that completed construction in fiscal years 2007–08 through 2009–10. We excluded projects that, among other things, were exempt from budget accountability requirements and projects that were implemented by local entities—not by Caltrans—such as county transportation commissions.  
 We calculated the support-to-capital ratio by analyzing the difference between the total support cost expenditures and the total capital cost expenditures for the 766 projects that completed construction in fiscal years 2007–08 through 2009–10.

\* Project size is the sum of capital costs and right-of-way capital costs.

**Recommendations:**

- Devise, use, and publicize a consistent method for reporting the support-to-capital ratio on Caltrans' Web site and in other reports to the public. Further, Caltrans should recalculate past support-to-capital ratios using the method devised to allow for comparison across years.
- Develop goals—and publicly report on the progress against those goals—for the support-to-capital ratio, based on project type (STIP or SHOPP) and project size.
- Continue to explore the use of additional metrics, such as a measure based on a productivity index as described in a March 2011 draft study by the University of California, Davis.
  - The Legislature should require Caltrans to include in its annual report an expanded methodology for reporting support-to-capital ratios to include, in addition to a support-to-cost ratio analysis based on costs incurred up to the award of the construction contract of STIP projects, a separate support-to-capital ratio analysis for STIP projects that have completed construction. Further, the Legislature should require Caltrans to report on similar ratios for SHOPP projects based on costs incurred up to the award of the construction contract and for those projects that completed construction.

### **Changes to Caltrans' Internal Controls Could Improve Its Management of Support Costs**

- Caltrans' current time-reporting system does not prevent its employees from charging time to projects to which they are not assigned, and it lacks strong internal controls to ensure that its employees charge time appropriately.
- Caltrans uses an online reporting system into which employees manually enter their hours worked. However, according to the office chief of transaction services, Caltrans' time-reporting system does not have a mechanism in place to prevent employees from charging to projects to which they were not previously assigned, as long as those projects are active.
- According to the deputy director of the Fresno district office, there is neither a list that documents the names of individual employees who are authorized to charge to a specific project, nor a list that tracks changes in the projects employees are authorized to charge.
- He stated that project managers manage 10 to 20 projects on average, making it difficult to catch every improper charge and to constantly be aware of who is authorized to charge to a particular project.
  - We noted at one district that, in one fiscal year, 120 people charged time to one project.
- According to Caltrans, the PRSM system will interface with Caltrans' time-charging system to facilitate more accurate and standardized time charges to projects.
  - PRSM will assign every resource a unique "cost center" number, which are organized into functional categories like engineering or construction. This will allow only those employees with approved cost centers to charge to the project.

### **Recommendation**

- Ensure that the PRSM system contains strong controls that ensure employees only charge time to projects and phases for which they are assigned.

### **Standardizing Its Approach to Using Earned Value Metrics Could Help Districts Better Manage Projects**

- Earned value management integrates measures of a project's scope, cost, and schedule to help the project management team assess and measure project performance and progress.
- Caltrans does not have a standardized earned value management policy, and we noted that some Caltrans districts are using earned value metrics in different ways.
  - The Los Angeles district's (District 7) implementation of earned value appears robust. District 7's reporting system creates reports displaying project schedule and cost performance indexes for the project as a whole and for each of the respective project tasks.
  - The Irvine district (District 12) only used earned value reports for about 20 percent of its projects.
  - The San Diego district (District 11) does not use any earned value performance metrics but does track expenditures in relation to the budget for project phases over time.

## Recommendations

- Implement earned value management throughout its districts in a manner similar to the implementation in District 7.
- Caltrans should ensure that these performance metrics are available at the task level for both active and completed projects.
- Caltrans should instruct districts to aggregate this information for all projects by task level, to better assess the effectiveness and efficiency of support expenditures by task level.
- Caltrans should also make available to project managers graphical displays of project cost and schedule performance.

## Increased Use of Consultants to Handle Large, Temporary Infusions of Funding May Help Caltrans Better Manage Workloads

- Although Caltrans recently attempted to address a temporary increase in workload by seeking approval from the Department of Finance for consultants rather than hiring permanent employees, it faced challenges in doing so because requests for consultants have historically been revised during the legislative budget process to align with a staffing ratio of 10 percent consultants to 90 percent state staff.
- Caltrans believes its best resource for addressing short-term workload demands is the consultant community, which includes firms that already perform Caltrans' work and understand its requirements.
- Studies comparing the costs of permanent state staff to the costs of consultants have produced inconclusive results.

## Recommendations

- Caltrans should commission an independent study of the costs and benefits of using consultants to address temporary increases in workload and, if the study reveals cost savings, use consultants. To the extent possible, Caltrans should also use temporary staff appointments for temporary increases in workload when consultants are unavailable.