

Memorandum

To: CHAIR AND COMMISSIONERS
CALIFORNIA TRANSPORTATION COMMISSION

CTC Meeting: January 8, 2013

Reference No.: 4.3
Information Item

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Chief Financial Officer

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Subject: **REVIEW AND COMMENT ON THE PROPOSED 2013 TEN-YEAR STATE HIGHWAY
OPERATION AND PROTECTION PROGRAM PLAN**

SUMMARY:

In accordance with Streets and Highways (S&H) Code Section 164.6, the Department of Transportation (Department) prepares a ten-year state rehabilitation plan every two years that identifies the rehabilitation and reconstruction needs of all highways and bridges on the State Highway System. Additionally, S&H Code Section 164.6 requires that the Department to submit the plan to the California Transportation Commission (Commission) for review and comment by January 31 before transmittal to the Governor and the Legislature by May 1 of each odd-numbered year.

BACKGROUND:

The Department prepares a ten-year state rehabilitation plan every two years that identifies the rehabilitation and reconstruction needs of all highways and bridges owned by the state. Because the projects to implement the plan are primarily funded through the State Highway Operation and Protection Program (SHOPP), the plan is also referred to as the Ten-Year SHOPP Plan (Plan). The proposed 2013 Plan covers Fiscal Years (FY) 2014-15 through 2023-24. The plan provides input for the funding distribution in the fund estimate adopted by the Commission in August of each odd-numbered year. S&H Code Section 164.6 contains specific requirements as to the content of the plan, all of which are included in the attached document. Additionally, S&H Code Section 164.6 requires submittal of the plan to the Commission for review and comment by January 31 before transmittal to the Governor and the Legislature by May 1 of odd-numbered years.

Attachment



PROPOSED

**2013 TEN-YEAR STATE HIGHWAY OPERATION
AND PROTECTION PROGRAM PLAN**

Prepared by the
California Department of Transportation
Business, Transportation & Housing Agency

January 8, 2013

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EXECUTIVE SUMMARY

The California Department of Transportation (Caltrans) is responsible for maintaining and operating the approximately 50,000 lane-mile State Highway System (SHS), the backbone of California’s transportation infrastructure. Caltrans monitors the condition and operational performance of the SHS through periodic inspections, traffic studies, and system analysis. Caltrans uses information obtained through these activities to prepare the Ten-Year State Highway Operation and Protection Program Plan (SHOPP Plan) as required by Government Code section 14526.5 and Streets and Highways Code section 164.6. The SHOPP Plan provides input for the funding distribution in the State Transportation Improvement Program (STIP) Fund Estimate. Streets and Highways Code section 164.6 requires the SHOPP Plan to include identified needs for a ten-year period based on quantifiable accomplishments and a cost estimate for at least the first five years.

The total ten-year goal-constrained need for the rehabilitation and operation of the SHS for the period from FY 2014–2015 through FY 2023–2024 is \$71 billion. This equates to an average annual cost of \$7.1 billion per year. This is the current cost estimate for capital construction, right-of-way acquisition, and project development and construction engineering support. This estimate does not include expected future increases in construction costs caused by escalation. The goal-constrained needs do not address all the needs on the SHS.

	Inventory	2013 TEN-YEAR SHOPP GOAL-CONSTRAINED NEEDS			Performance Goal
		Average Annual Capital Cost (\$ Million)	Average Annual Support Cost (\$ Million)	Total Average Annual Cost (\$ Million)	
Major Damage Restoration	N/A	\$ 250.0	\$ 96.3	\$ 346.3	Restore damage within 180 days
Collision Reduction	N/A	\$ 299.3	\$ 132.7	\$ 432.0	Reduce collision trend by 10 percent. Reduce roadside worker fatalities to zero. Retain safe stopping locations
Mandates	N/A	\$ 298.1	\$ 127.7	\$ 425.8	Comply with laws and regulations
Mobility Improvement	N/A	\$ 334.9	\$ 215.3	\$ 550.2	Reduce daily vehicle hours of delay (DVHD) by 10 percent
Minor Program	N/A	\$ 90.0	\$ 60.0	\$ 150.0	N/A
Bridge Preservation	12,924 bridges	\$ 908.2	\$ 391.6	\$ 1,299.8	Reduce to 3 percent of bridges distressed (400 bridges)
Roadway Preservation	49,518 lane miles	\$ 2,649.0	\$ 654.0	\$ 3,303.0	Reduce to 10 percent of system distressed (5,000 lane miles)
Roadside Preservation	29, 830 acres	\$ 224.8	\$ 112.4	\$ 337.2	Reduce to 20 percent of acres distressed (6,000 acres) and mandate compliance at 580 locations
	87 rest areas				Implement immediate safety and mandate needs at all existing locations and address capacity needs for safety
Facility Improvement	440 facilities	\$ 124.2	\$ 55.7	\$ 179.9	Rehabilitate 22 facilities
Support for development of planning documents			\$ 103.0	\$ 103.0	
TOTAL				\$ 7,127	

As the roadways, bridges, and ancillary infrastructure on the SHS age and near the end of their service lives, the demands of vehicle and truck traffic are accelerating the deterioration of these assets. Compounding this deterioration is the deferment, due to lack of funding, of necessary rehabilitation and restoration work to restore the transportation infrastructure to good operating conditions. The increased demands and deferred rehabilitation and restoration result in lower operational performance, higher user operating costs (additional vehicle repair costs, increased fuel consumption, increased tire wear, and accelerated vehicle depreciation), and ultimately require a higher investment when needed repairs to the system are eventually undertaken. Deferred funding for infrastructure such as signs, lighting, drainage, planting, mandate compliance, and maintenance over the past 10 years has resulted in increased worker exposure to traffic due to the need for more frequent maintenance and preventable expenditures for emergency repairs.

The sole funding source for the SHOPP is the State Highway Account (SHA), funded primarily through excise taxes on gasoline and diesel fuel. SHA funding is declining as a result of reduced fuel consumption, funding shortfalls in the Federal Highway Trust Fund, and redirection of funding for highway maintenance.

Projected SHA funding available for the SHOPP is \$2 billion a year, which is 28 percent of the estimated goal-constrained need. Because funding is insufficient to preserve and maintain the existing transportation infrastructure, Caltrans will continue to focus available resources on the most critical categories of projects in the SHOPP (emergency, safety, bridge, and pavement preservation). Even with this strategy, the percentage of lane miles of highway pavement in a distressed condition, which is pavement with significant rutting, cracking, potholes, or other signs of deterioration, is projected to increase during the next ten years. In addition, few maintenance facility, safety roadside rest area, highway planting, and mobility improvements will be made. The condition of the SHS will continue to deteriorate.

As compared to the prior SHOPP Plan, \$7.1 billion per year is a four percent reduction. Three areas of significant decrease between the 2011 and 2013 SHOPP Plan are in the needs estimated for collision reduction, ADA compliance, and highway planting preservation. Needs for collision reduction reduced to match the continued downward collision trend, needs for ADA compliance reduced to match the recent lawsuit settlement, and needs for highway planting preservation reduced as a result of new highway planting strategies to achieve lower life-cycle costs.

The long-term growth trend in the estimated needs for rehabilitation and operation of the SHS has been momentarily slowed by the infusion of one-time funding from the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 (Proposition 1B). However, this one-time infusion of funding into the SHOPP has only served to temporarily slow the growth of backlogged necessary rehabilitation and reconstruction work. In the absence of new revenue sources, the condition of the transportation system will continue to decline, affecting Caltrans' ability to improve mobility across California, and in turn affecting California's economic vitality and security.

I. OVERVIEW OF THE SHOPP

BACKGROUND AND PURPOSE OF THE SHOPP

Caltrans develops and manages the State Highway Operation and Protection Program (SHOPP) as authorized in Government Code section 14526.5 and Streets and Highways Code section 164.6 (see Appendices A and B for full text of both sections). The purpose of the SHOPP is to maintain and preserve the State Highway System (SHS) and its supporting infrastructure. Projects in the SHOPP are limited to capital improvements relative to maintenance, safety, and rehabilitation of State highways and bridges, capital improvements that do not add capacity to the system.

THE CALIFORNIA STATE HIGHWAY SYSTEM

The transportation system assets that comprise the California SHS includes nearly 50,000 lane miles of pavement, 12,924 bridges, 205,000 culverts and drainage facilities, 87 roadside rest areas, 29,830 acres of roadside landscaping and 182,225 acres of non-landscaped roadside. The magnitude of the transportation system is illustrated in figure 1. Also included in the transportation infrastructure are the additional support facilities, including maintenance stations, equipment shops, and transportation materials laboratories and testing facilities. Much of this system was built in the 1950s, 1960s, and early 1970s to serve California's growing population and economy. Many of the infrastructure assets have reached or are reaching the end of their service lives and are at an age where deterioration is accelerating at a faster rate than in previous decades. Appendix D describes examples of some deficiencies on the SHS.

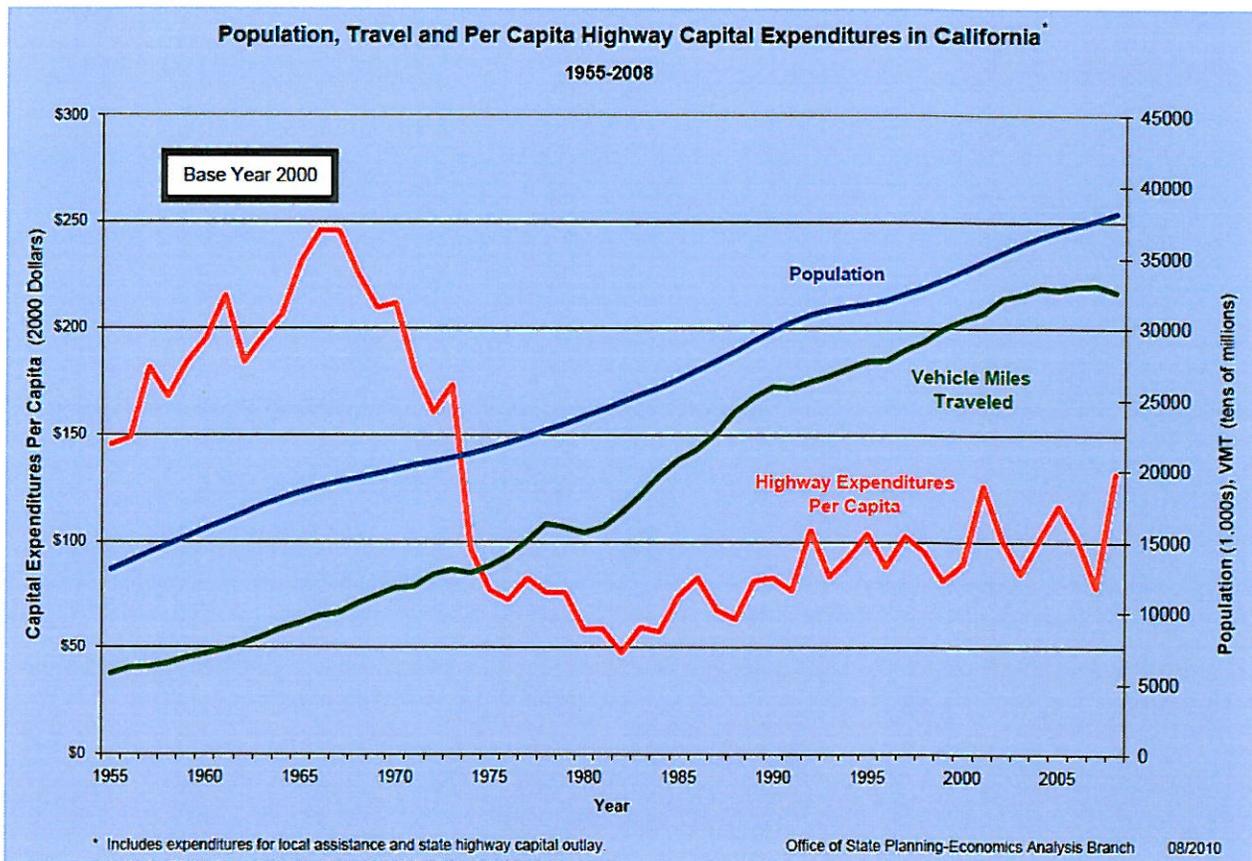
Figure 1. The California State Highway System



OPERATIONAL DEMANDS

The demands placed upon the transportation infrastructure continue to increase at a steady pace. In the decade between 1995 and 2005, annual vehicle miles traveled increased 20 percent. The increasing travel combined with the advanced age of the transportation system is causing a faster rate of pavement and bridge deterioration, new vehicle collision concentration locations, and increasing hours of traffic congestion. The growth in vehicle miles traveled also increases the use of roadside assets, such as safety roadside rest areas and vista points. Shown below in Figure 2 is a chart depicting the increase in annual vehicle miles traveled as compared with the investment in the SHS

Figure 2. Population, Travel, and Per Capita Highway Capital Expenditures in California



Increased goods movement and the resulting increase in truck traffic are also expected to continue. The Federal Highway Administration, Office of Freight Management, projects the tons of freight moved on California highways in 2035 will more than double over 2002 volumes, increasing from 971 million tons in 2002 to 2,179 million tons in 2035.¹

¹ "Freight Analysis Framework," Office of Freight Management and Operations, Federal Highway Administration, U.S. Department of Transportation, April 2002.

Much of the growth will occur in urban areas and on the fifty-year-old Interstate Highway System. This growth will continue to increase the rate of pavement deterioration and wear on bridges.

STRUCTURE OF THE SHOPP

The SHOPP has eight categories: (1) major damage restoration, (2) collision reduction, (3) legal and regulatory mandates, (4) mobility improvement, (5) bridge preservation, (6) roadway preservation, (7) roadside preservation, and (8) facility improvement.

These eight categories compose two major groupings, those that relate to its operational performance (major damage restoration, collision reduction, legal and regulatory mandates, and mobility improvement) and those that relate to the condition of the transportation system (bridge preservation, roadway preservation, roadside preservation, and facility improvement).

OPERATIONAL PERFORMANCE

Caltrans continually measures and evaluates the operational performance of the transportation system.

Major Damage Restoration.

The goal of the major damage restoration category is to respond to earthquakes, floods, fires, and other emergencies to restore the roadway to essential traffic within 180 days after major damage and full restoration to predisaster conditions within three years. Major damage restoration projects resulting from a federally declared disaster are eligible for federal reimbursement.

As expected, the level of major damage restoration varies annually in response to human-caused and natural disasters. In general, as the SHS ages, system assets are more vulnerable to the impact of damaging events and increases the cost to restore the affected SHS to predamage condition.

Collision Reduction.

The goal of the collision reduction category is to reduce the number and severity of fatal and injury collisions and reduce roadside worker fatalities to zero.

In the ten-year period from 2001 - 2010, the fatality rate for users of State highways decreased by 39 percent. For the same period, the fatality rate for users of freeways decreased by 40 percent and the fatality rate for users of nonfreeways decreased by 36 percent. Although there are many factors involved, collision reduction improvements implemented through the SHOPP have contributed significantly to these reductions. An analysis of completed projects in the collision reduction category shows a 31.84 percent reduction of fatal collisions and a 5.7 percent reduction of injury collisions, with fatalities reduced by 39.6 percent and injuries reduced by 9.8 percent.²

The risk of injury or fatality increases with the length of time an employee is exposed to traffic without protection. Ninety Caltrans employee fatalities have occurred since 1972: 45 percent involved workers on foot, on the shoulder, or within 30 feet of vehicle traffic. Improvements implemented through the Roadside Safety Improvements program will significantly reduce worker exposure to traffic.

Seventy-four percent of the safety roadside rest areas do not meet water quality mandates. Preventing closures due to noncompliance with drinking water quality and wastewater treatment standards will maintain the traveler safety benefits provided by the Safety Roadside Rest Area System. Fatigue-related collisions decrease by a statistically significant amount downstream of rest area locations. The number of collisions due to fatigue tend to decrease immediately downstream of rest areas, while suddenly increasing after about 30 miles.

Legal and Regulatory Mandates.

The goal of the legal and regulatory mandates category is to comply with State and federal laws and regulations, such as the Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.) and evolving stormwater requirements, the Federal Clean Water Act (CWA) (33 U.S.C. 1251 et seq.), the Americans with Disabilities Act (ADA) of 1990 (P.L. 101-336 [July 26, 1990], as amended by P.L. 110-325 [September 25, 2008]), and various hazardous waste remediation regulations.

Caltrans' stormwater discharges are subject to National Pollutant Discharge Elimination System (NPDES) permit issued under the CWA and pursuant to separate authority under the Porter-Cologne Water Quality Control Act (including regional water quality control board basin plans), various water board orders, and other legal mandates. In addition, Caltrans' stormwater systems are also subject to the total maximum daily load requirements (TMDLs) of the CWA. The State Water Resources Control Board (SWRCB) defines TMDLs as a written plan that describes how an impaired water body will meet water quality standards.

Section 303(d) of the CWA requires states to identify water bodies that do not meet water quality standards and pollutants that impair them. TMDLs are developed in response to the pollutant impairments. In California, TMDLs are developed either by the Regional Water Quality Control

² "2011-2012 Highway Safety Improvement Program Annual Report," California Department of Transportation, Business, Transportation and Housing Agency, August 2012.

Boards or by the United States Environmental Protection Agency (USEPA). The SWRCB has interpreted the state law to require that implementation be addressed when TMDLs are incorporated into Water Quality Control Plans. Caltrans is a named stakeholder for 68 adopted TMDLs and increasingly will be subject to additional TMDL regulations as they are adopted around the State.

Transportation facilities historically have been designed and constructed to collect, convey, and discharge stormwater run-off rapidly and efficiently for user safety and for the protection of property. Thus, the majority of the SHS was designed and built without water quality treatment devices for stormwater. These systems now require retrofitting to accommodate the newly approved requirements.

In addition, the California Ocean Plan, enforceable under the Porter-Cologne Water Quality Control Act, prohibits the discharge of wastes into Areas of Special Biological Significance (ASBS). Caltrans has approximately 77 direct discharge points—the most of any discharger—along 50 miles of the SHS within seven ASBS areas along the state's coastline.

The requirements of the storm water regulation are dynamic in nature. The current needs plan will be updated as the new permit, has been adopted on September 19, 2012. The new permit most likely will change the priorities of the Stormwater Program as it has extensive location specific requirements, TMDL requirements, and the requirements to maintain natural water quality at ASBS areas.

Another significant legal requirement is retrofitting and updating the SHS to comply with ADA regulations. Much of the cost of updating the SHS to enhance accessibility to persons with disabilities will be borne by the SHOPP.

Mobility Improvement.

The goal of the mobility improvement category is to reduce congestion on, and restore productivity of, the SHS. Mobility improvements include operational improvements, transportation management systems, and commercial vehicle enforcement facilities and weigh-in-motion systems.

Mobility improvements focus on reducing vehicle delay on the SHS. Daily vehicle hours of delay (DVHD) are defined as the travel time (in hours) to cover a given distance under congested conditions as compared to the travel time at 35 miles per hour. This indicator of congestion continues to increase.

As stated in the adopted 2010 State Transportation Improvement Program (STIP) Guidelines, operational improvements that do not expand the design capacity of the transportation system and are intended to address spot congestion are eligible for SHOPP funding. Regions may nominate these types of projects in their own Regional Transportation Improvement Programs (RTIPs) if timely implementation through the SHOPP is not possible.

SYSTEM CONDITION

Caltrans continually measures and evaluates the condition of the transportation system.

Bridge Preservation.

The goal of the bridge preservation category is to preserve all bridges on the SHS in a safe and economic manner so that no bridge failures occur.

The SHS contains 12,924 bridges. The median age of these bridges is 43 years. Many of these bridges are reaching the end of their service life and are in need of rehabilitation and reconstruction.

Eight percent (1,064) of the bridges on the SHS are in distressed condition and in need of rehabilitation. Distressed condition is defined as a bridge with an identified replacement, rehabilitation, scour, or seismic need that must be addressed to keep it functional and safe. The trend over the last five years is a net increase in the number of distressed bridges.

Roadway Preservation.

The goal of the roadway preservation category is to keep distressed roadway lane miles at a steady managed state. The historic goal of Caltrans has been to reduce the number of distressed lane miles of pavement to 5,000, or approximately 10 percent of the total system.

The percentage of distressed lane miles (those with poor structural condition or poor ride quality) is an indicator of the condition of the pavement on the SHS. Pavement distress is commonly associated with significant rutting, cracking, potholes, or other signs of deterioration. The 2011 Pavement Condition Survey reports 53 percent (26,132 lane miles) of the SHS are in excellent condition, 22 percent (11,053 lane miles) require pavement maintenance, and 25 percent (12,333 lane miles) are distressed and require rehabilitation and reconstruction work.³

Roadside Preservation.

The goal of the roadside preservation category is to preserve the investment in roadsides, reduce the long-term maintenance costs of roadside infrastructure, improve worker and traveler safety, reduce deficient highway planting, comply with regulatory and legal mandates, improve capacity and operations at safety roadside rest areas and vista points, and provide safe stopping opportunities on the State Highway System.

Approximately 65 percent of the highway planting and irrigation inventory has deteriorated beyond the ability of maintenance forces to correct and no longer functions as intended. Deteriorated landscape results in recurrent maintenance activities of excessive duration and frequency exposing maintenance worker to traffic. Deficient vegetation no longer performs as viable stormwater control, allows for weed growth and contains dying vegetation that increases fire risk, and does not provide for traveler safety by reducing glare and visual screening. The number of distressed acres of highway planting has increased from 12,000 to 19,000 acres in

³ "2011 State of the Pavement," California Department of Transportation

the past ten years. In addition, 72 percent of the safety roadside rest areas have capacity, or operational deficiencies.

Facility Improvement.

The goal of the facility improvement category is to address worker safety, comply with ADA and California Division of Occupational Safety and Health (Cal/OSHA) regulations, and improve operational efficiency. The facility improvement category includes projects for improvements at equipment facilities, maintenance facilities, office buildings, and transportation materials laboratories and testing facilities.

II. TEN-YEAR COSTS AND PERFORMANCE OUTCOMES

GOAL-CONSTRAINED AND FINANCIALLY-CONSTRAINED PLAN COST ESTIMATES

The total ten-year goal-constrained need for the rehabilitation and operation of the SHS for the period from FY 2014–2015 through FY 2023–2024 is \$71 billion. This equates to an average annual cost of \$7.1 billion per year. This is the current cost estimate for capital construction, right-of-way acquisition, and project development and construction engineering support. This estimate does not include expected future increases in construction costs caused by escalation. The goal-constrained needs do not address all the needs on the SHS.

The sole funding source for the SHOPP is the State Highway Account (SHA), funded primarily through excise taxes on gasoline and diesel fuel. SHA funding is declining as a result of reduced fuel consumption, funding shortfalls in the Federal Highway Trust Fund, and redirection of funding for highway maintenance.

The following two tables present a summary of the total ten-year funding needs to achieve SHOPP goals and summarize Caltrans’ constrained annual funding plan based on forecasted SHA funding. Table 1, titled 2013 Ten-Year Goal-Constrained Needs Plan, presents Caltrans’ estimated cost of rehabilitation needs to achieve acceptable performance goals. This estimate is required by Streets and Highways Code section 164.6.

Category	Annual Cost (\$ Millions)			Annual Performance Units
	Capital	Support	Total	
Emergency Damage Repair	\$ 126.0	\$ 40.3	\$ 166.3	TBD locations
Permanent Restoration	\$ 88.0	\$ 42.0	\$ 130.0	TBD locations
Roadway Protective Betterment	\$ 36.0	\$ 14.0	\$ 50.0	7 locations
MAJOR DAMAGE RESTORATION	\$ 250.0	\$ 96.3	\$ 346.3	
Safety Improvements	\$ 148.7	\$ 73.3	\$ 222.0	300 fatal and injury collisions reduced
Collision Severity Reduction	\$ 88.1	\$ 31.9	\$ 120.0	190 fatal and injury collisions reduced
Roadside Safety Improvements	\$ 62.5	\$ 27.5	\$ 90.0	1,116 locations
COLLISION REDUCTION	\$ 299.3	\$ 132.7	\$ 432.0	

Table 1 (cont.)				
2013 TEN-YEAR GOAL-CONSTRAINED NEEDS PLAN				
(Annual Estimates in 2012 Dollars)				
Category	Annual Cost (\$ Millions)			Annual Performance Units
	Capital	Support	Total	
Relinquishments	\$ 12.0	\$ 4.0	\$ 16.0	12 centerline miles
Railroad At-Grade Crossings	\$ 1.0	\$ 0.0	\$ 1.0	TBD location
Hazardous Waste Mitigation	\$ 1.0	\$ 0.0	\$ 1.0	TBD location
Stormwater	\$ 262.1	\$ 95.7	\$ 357.8	3,495 acres treated
ADA Curb Ramp	\$ 16.0	\$ 20.0	\$ 36.0	800 ADA units
ADA Pedestrian Infrastructure	\$ 6.0	\$ 8.0	\$ 14.0	300 ADA units
MANDATES	\$ 298.1	\$ 127.7	\$ 425.8	
Operational Improvements	\$ 144.2	\$ 57.7	\$ 201.9	20,000 DVHD reduced
Transportation Management Systems	\$ 82.0	\$ 66.4	\$ 148.4	529 new elements
	\$ 53.5	\$ 33.2	\$ 86.7	1,573 replacement
Commercial Vehicle Enforcement Facilities and Weigh-in-Motion Systems	\$ 25.7	\$ 27.0	\$ 52.7	2 new locations
	\$ 29.5	\$ 31.0	\$ 60.5	12 rehabilitation
MOBILITY IMPROVEMENT	\$ 334.9	\$ 215.3	\$ 550.2	
Minor Program	\$ 90.0	\$ 60.0	\$ 150.0	TBD
SUBTOTAL OPERATIONAL PERFORMANCE	\$ 1,272.3	\$ 632.0	\$ 1,904.3	
Bridge Rehabilitation	\$ 199.2	\$ 89.6	\$ 288.8	42 bridges
Bridge Preventive Program	\$ 30.3	\$ 10.8	\$ 41.1	166 bridges
Bridge Scour Mitigation	\$ 29.1	\$ 13.1	\$ 42.2	7 bridges
Bridge Rail Replacement/Upgrade	\$ 371.5	\$ 156.0	\$ 527.5	61,920 feet
Bridge Seismic Restoration	\$ 234.9	\$ 105.7	\$ 340.6	67 bridges
Permit Requirements for Bridges	\$ 43.2	\$ 16.4	\$ 59.6	11 bridges
BRIDGE PRESERVATION	\$ 908.2	\$ 391.6	\$ 1,299.8	
Roadway Rehabilitation (3R)	\$ 400.0	\$ 120.0	\$ 520.0	400 lane miles
Roadway Rehabilitation (2R)	\$ 840.0	\$ 210.0	\$ 1,050.0	1,050 lane miles
Capital Preventive Maintenance	\$ 1,068.0	\$ 214.0	\$ 1,282.0	3,050 lane miles
Drainage System Restoration	\$ 260.0	\$ 82.0	\$ 342.0	2,255 culverts
Signs and Lighting Rehabilitation	\$ 81.0	\$ 28.0	\$ 109.0	2,375 signs
ROADWAY PRESERVATION	\$ 2,649.0	\$ 654.0	\$ 3,303.0	
Roadside Protection and Restoration	\$ 24.8	\$ 11.2	\$ 36.0	58 locations
Highway Planting Rehabilitation	\$ 133.0	\$ 62.5	\$ 195.5	1,900 acres
Roadside Rest Area Rehabilitation	\$ 9.4	\$ 4.5	\$ 13.9	6 locations
New Safety Roadside Rest Areas	\$ 57.6	\$ 34.2	\$ 91.8	4 locations
ROADSIDE PRESERVATION	\$ 224.8	\$ 112.4	\$ 337.2	

Table 1 (cont.)				
2013 TEN-YEAR GOAL-CONSTRAINED NEEDS PLAN				
(Annual Estimates in 2012 Dollars)				
Category	Annual Cost (\$ Millions)			Annual Performance Units
	Capital	Support	Total	
Equipment Facilities	\$ 7.0	\$ 2.6	\$ 9.6	1 facility
Maintenance Facilities	\$ 75.7	\$ 42.5	\$ 118.2	20 facilities
Office Buildings	\$ 37.5	\$ 9.0	\$ 46.5	5 facilities in 10 years
Materials Labs and Testing Facilities	\$ 4.0	\$ 1.6	\$ 5.6	4 facilities in 10 years
FACILITY IMPROVEMENT	\$ 124.2	\$ 55.7	\$ 179.9	
SUBTOTAL SYSTEM CONDITION	\$ 3,906.2	\$ 1,213.7	\$ 5,119.9	
Support for development of planning documents			\$ 103.0	
TOTAL ANNUAL NEED			\$ 7,127	

The estimate of \$7.1 billion per year in the goal-constrained needs plan is a four percent reduction as compared to the prior plan. The three areas of significant decrease between the 2011 and 2013 SHOPP Plan are in the goal-constrained needs estimated for collision reduction, ADA compliance, and highway planting preservation.

Needs for collision reduction have declined as a result of reductions in recent fatal and injury collision statistics. In 2010, California’s traffic fatalities decreased 11.9 percent, reaching their lowest level since the federal government began recording traffic fatalities in 1975. Taking into account the downward trend in collision fatal and injury collision statistics and the inclusion of safety enhancements in other STIP and SHOPP projects, the total estimated needs for collision reduction are lower.

In addition, needs for ADA compliance have been adjusted downward following the lawsuit settlement and field assessment of infrastructure access barriers. The estimate in the prior plan was based on a possible “worst case” court decision that could have required Caltrans to improve all of its 60,000 access barriers within ten years as opposed to the annual commitment of funding required in the settlement which allows the improvements to be made over a much longer timeframe.

Finally, the estimated needs of highway planting preservation decreased as planting strategies have improved to achieve lower life-cycle costs.

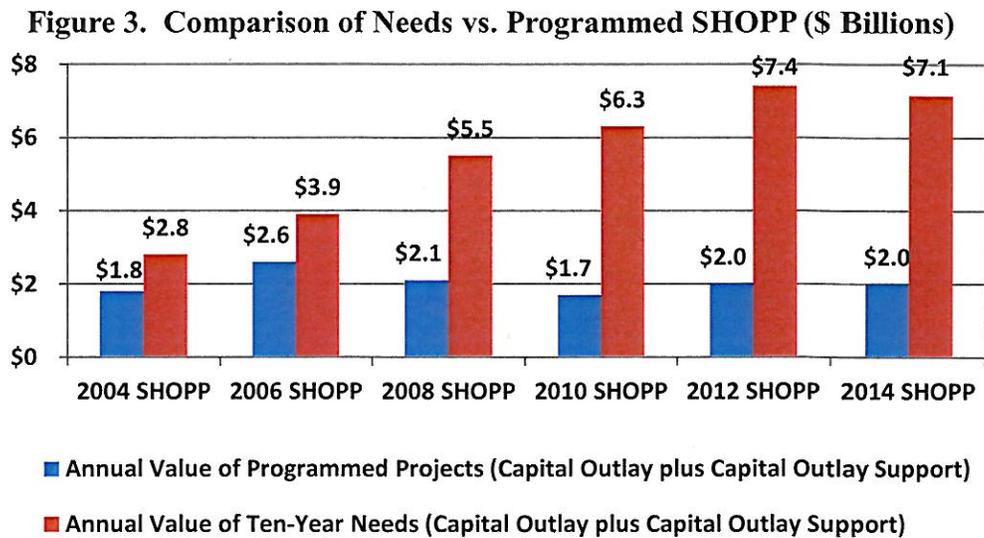
Table 2, titled 2013 Ten-Year Financially-Constrained Needs Plan, presents the estimated performance based on the anticipated funding available during the ten-year timeframe for the 2013 SHOPP Plan.

Category	Annual Cost (\$ Millions)			Annual Performance Units
	Capital	Support	Total	
Emergency Damage Repair	\$ 75.8	\$ 24.2	\$ 100.0	TBD locations
/Permanent Restoration	\$ 67.7	\$ 32.3	\$ 100.0	TBD locations
Roadway Protective Betterment	----	----	----	0 locations
MAJOR DAMAGE RESTORATION	\$ 143.5	\$ 56.5	\$ 200.0	
Safety Improvements	\$ 148.7	\$ 73.3	\$ 222.0	300 fatal and injury collisions reduced
Collision Severity Reduction	\$ 88.1	\$ 31.9	\$ 120.0	190 fatal and injury collisions reduced
Roadside Safety Improvements	\$ 62.2	\$ 27.8	\$ 90.0	1,116 locations
COLLISION REDUCTION	\$ 299.3	\$ 132.7	\$ 432.0	
Relinquishments	----	----	----	0 centerline miles
Railroad At-Grade Crossings	----	----	----	0 locations
Hazardous Waste Mitigation	----	----	----	0 locations
Stormwater	\$ 66.8	\$ 23.2	\$ 90.0	1,163 acres treated
ADA Curb Ramp	\$ 16.0	\$ 20.0	\$ 36.0	800 ADA Units
ADA Pedestrian Infrastructure	\$ 6.0	\$ 8.0	\$ 14.0	300 ADA Units
MANDATES	\$ 88.8	\$ 51.2	\$ 140.0	
Operational Improvements	----	----	----	0 DVHD reduced
Transportation Management Systems	----	----	----	0 new elements
	\$ 24.6	\$ 11.1	\$ 35.7	266 replacement
Commercial Vehicle Enforcement Facilities and Weigh-in-Motion Systems	----	----	----	0
	\$ 5.5	\$ 2.0	\$ 7.5	3 rehabilitation
MOBILITY IMPROVEMENT	\$ 30.1	\$ 13.1	\$ 43.2	
Minor Program	\$ 90.0	\$ 60.0	\$ 150.0	TBD
SUBTOTAL OPERATIONAL PERFORMANCE	\$ 651.7	\$ 313.5	\$ 965.2	
Bridge Rehabilitation	\$ 129.9	\$ 43.1	\$ 173.0	39 bridges
Bridge Preventive Program	\$ 29.6	\$ 11.5	\$ 41.1	166 bridges
Bridge Scour Mitigation	\$ 13.7	\$ 6.3	\$ 20.0	10 bridges
Bridge Rail Replacement/Upgrade	\$ 17.1	\$ 6.5	\$ 23.6	13,745 feet
Bridge Seismic Restoration	\$ 53.1	\$ 21.9	\$ 75.0	27 bridges
Permit Requirements for Bridges	\$ 6.7	\$ 2.7	\$ 9.4	11 bridges
BRIDGE PRESERVATION	\$ 250.1	\$ 92.0	\$ 342.1	
Roadway Rehabilitation (3R)	\$ 91.5	\$ 27.5	\$ 119.0	90 lane-miles
Roadway Rehabilitation (2R)	\$ 201.2	\$ 50.3	\$ 251.5	250 lane-miles
Capital Preventive Maintenance	\$ 262.1	\$ 52.4	\$ 314.5	750 lane-miles
Drainage System Restoration	\$ 5.2	\$ 2.5	\$ 7.7	61 culverts
Signs and Lighting Rehabilitation	----	----	----	0 signs
ROADWAY PRESERVATION	\$ 560.0	\$ 132.7	\$ 692.7	
Roadside Protection and Restoration	----	----	----	0 locations
Highway Planting Rehabilitation	----	----	----	0 acres
Roadside Rest Area Rehabilitation	----	----	----	0 locations
New Safety Roadside Rest Areas	----	----	----	0 locations
ROADSIDE PRESERVATION				

Table 2 (cont.)				
2013 TEN-YEAR FINANCIALLY-CONSTRAINED NEEDS PLAN				
(Annual Estimates in 2012 Dollars)				
Category	Annual Cost (\$ Millions)			Annual Performance Units
	Capital	Support	Total	
Equipment Facilities	----	----	----	0 facilities in 10 years
Maintenance Facilities	----	----	----	0 facilities in 10 years
Office Buildings	----	----	----	0 facilities in 10 years
Materials Labs and Testing Facilities	----	----	----	0 facilities in 10 years
FACILITY IMPROVEMENT	----	----	----	
SUBTOTAL SYSTEM CONDITION	\$ 810.1	\$ 224.7	\$ 1,034.8	
Support for development of planning documents			\$ 28.0	
TOTAL ANNUAL NEED			\$ 2,028	

TRENDS FOR SHOPP FUNDING

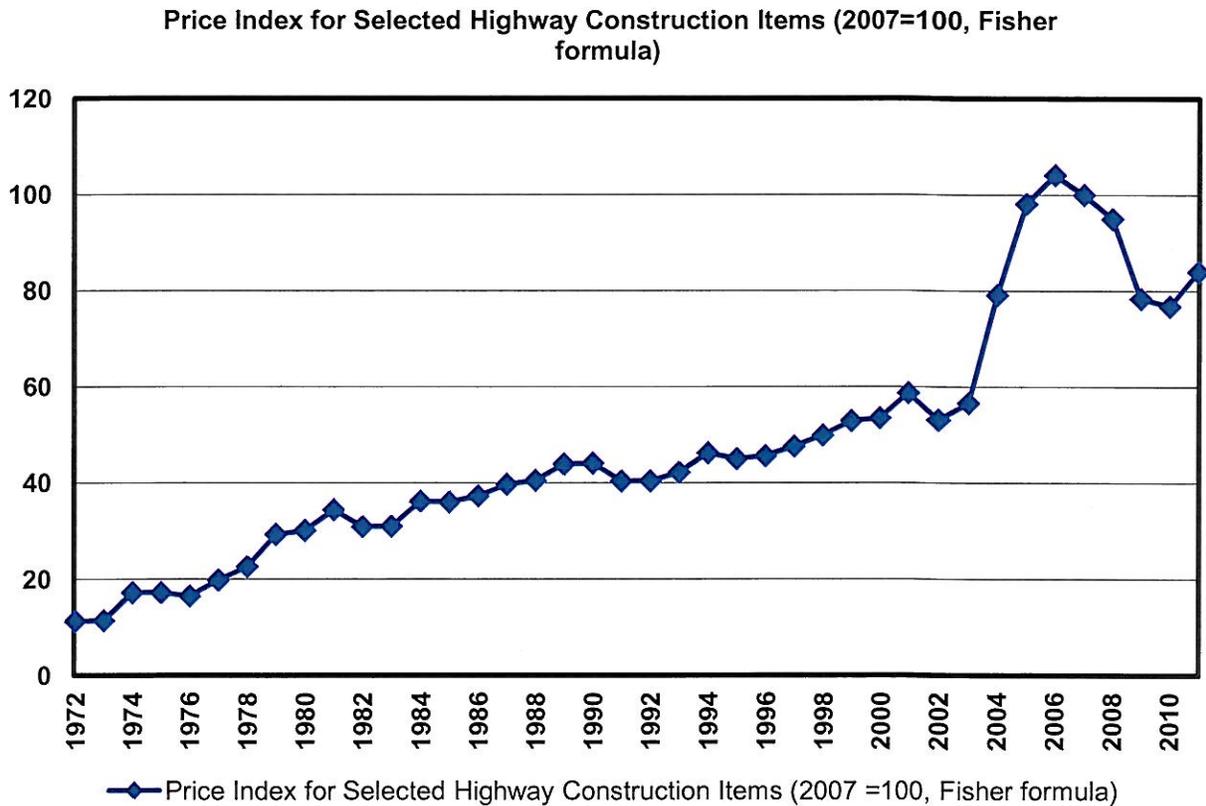
During the past five SHOPP programming cycles, the identified needs continued to grow while the available funding remained flat. Figure 3 displays the trend in the annual value of needs defined in prior ten-year plans versus the annual value of SHOPP projects in past programming cycles. The increase in value of the ten-year need is a symptom of the increased age of the infrastructure, increased usage, and deferment of needed rehabilitation. The gap between the needs and available funding continues to widen.



The functional life of the SHS is greatly affected by the ability to perform timely restoration work. The consequence of deferring necessary rehabilitation and restoration is a degraded system condition. This deferment results in lower operational performance, higher user operating costs (additional vehicle repair costs, increased fuel consumption, increased tire wear, and accelerated vehicle depreciation), and ultimately higher overall long-term costs when needed repairs to the highway are eventually undertaken.

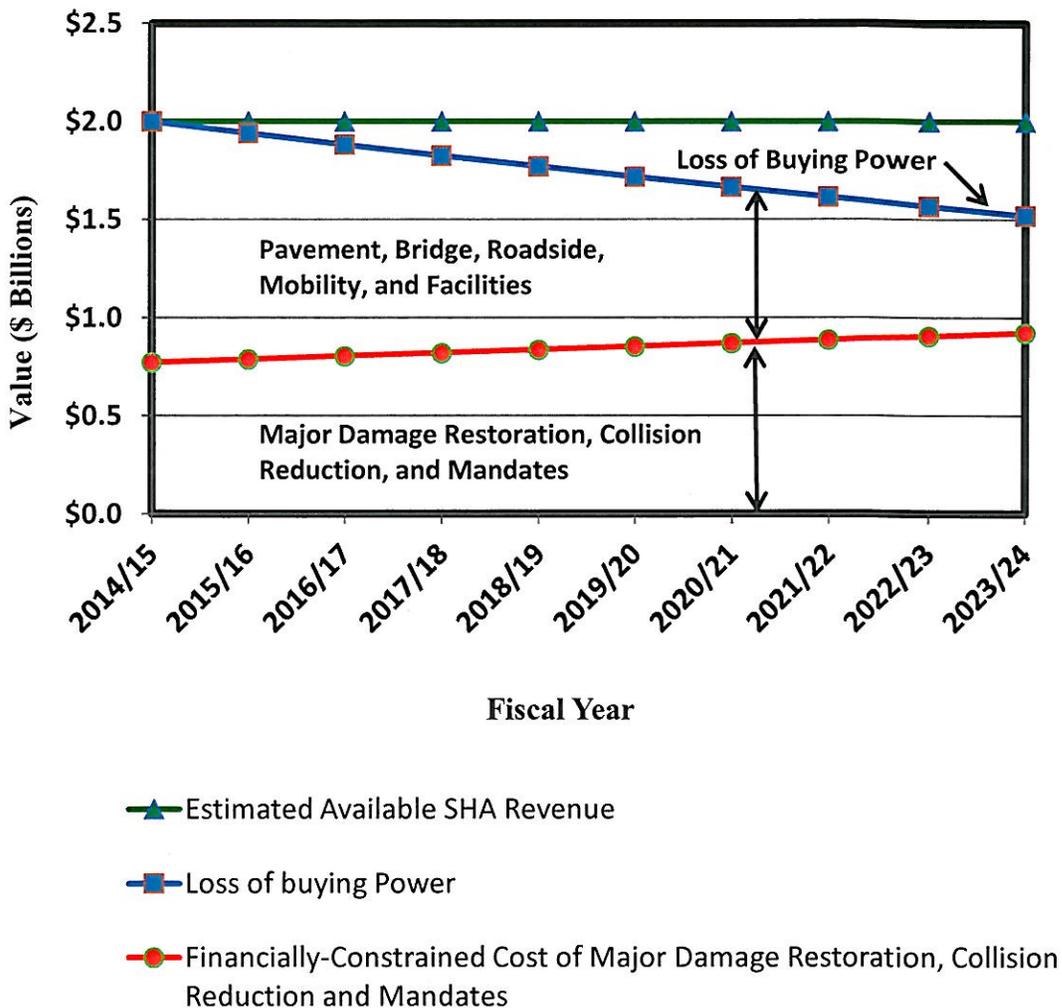
Furthermore, increasing construction costs reduce buying power of the limited SHOPP funding. The Highway Construction Cost Index between 1972 and 2011 is shown on the chart in Figure 4. This index is a measure of the cost of key materials needed for highway and bridge construction over time. Highway construction costs increased at predictable and steady rates between 1972 and 2000. From 2003 to 2007, construction costs escalated at rapid and unforeseen rates. Although costs have recently declined from peak levels in 2006 and 2007, they still are significantly above levels experienced in 2003. Escalating construction costs reduce buying power and further limit the ability of the SHOPP to effectively maintain and preserve the investment in the SHS.

Figure 4. Highway Construction Cost Index



In the ten-year horizon, the available SHA funding for the SHOPP is not expected to grow. With the passage of time, the buying power of the available funding will decline as a result of cost escalation. The result of this condition is that a larger percentage of available funding will be directed to meet major damage restoration, collision reduction, and regulatory mandates, leaving an ever declining value available for pavement, bridge, mobility, roadside, facility, and minor program needs. This condition is illustrated in Figure 5.

Figure 5. Impact of Cost Escalation on the SHOPP



CONSEQUENCES OF CONSTRAINED FUNDING

Following is a description of the consequences of the funding limitation on each category of the SHOPP.

Major Damage Restoration. Need \$346 million a year; \$200 million a year available.

This funding is used to respond to emergencies and other sudden, unforeseen infrastructure needs. The need is based on average expenditures over the last ten years (excluding major disasters, which are assumed to qualify for federal aid).

The following are major consequences of the funding shortfall:

- Delays to construction of programmed projects in other SHOPP categories if additional emergency response funding is needed.
- Increases in the need for emergency repairs as SHOPP funding decreases.

Collision Reduction. Need \$432 million a year; \$432 million a year available.

Collision reduction programs are intended to reduce the numbers and severity of collisions that occur on the SHS. The safety improvement projects are selected based on collision history and a cost-benefit analysis that compares the associated savings of reduced collisions with the project cost. Typical projects include signal installation, curve improvements, median barrier installation, run-off-road-type collision reduction, traffic safety device installation within the clear recovery zone, wet pavement improvements, and worker safety improvements.

Legal and Regulatory Mandates. Need \$426 million a year; \$140 million a year available.

The mandates programs comply with various State and federal court orders, laws, and regulations for stormwater, ADA compliance, and relinquishment of redundant SHS segments to local agencies.

The funding shortfall ultimately delays compliance with the Federal CWA and other laws, resulting in the risk of enforcement actions, violations and potential State and federal court orders. Violation of permit, state and federal laws and their implementing regulations may result in substantial administrative civil penalties, Cease and Desist Orders, citizen's suits and contempt citations. The risk level as well as financial impact is high.

Penalties for violating the CWA may include both fines up to \$50,000 a day for each violation and imprisonment. Typically, an enforcement action requires compliance and levy penalties typically at three times the cost of initial compliance. Further, the loss of credibility with regulatory agencies causes additional delay to deliver projects and increases in project costs, thus impacting the delivery and stewardship goals of Caltrans Strategic Plan. The current plan funds only 21 percent of the known TMDLs needs and none of the needs for ASBS.

Currently Caltrans is facing the following legal and regulatory mandates:

- Revised NPDES Permit adopted by the SWRCB on September 19, 2012, with extensive new requirements.
- The USEPA October 26, 2010 Order for Compliance issued to Caltrans.
- Cease and Desist Order No. 2001–198, California Department of Transportation, San Joaquin Hills Transportation Corridor (SR–73), affecting District 12 in Orange County.
- The U.S. District Court, Central District of California, Civil Action No. 93–6073 ER(JRx) Stipulation and Order, affecting District 7 in Los Angeles, the largest metropolitan area within California.

At the constrained funding level for ADA improvements, Caltrans commits only to the minimum required funding level for the 2010 ADA lawsuit settlement. If funding levels are further reduced for ADA needs, Caltrans will be in violation of the 2010 settlement agreement and will face additional lawsuits and liability.

Mobility Improvements. Need \$550 million a year; \$43 million a year available.

The mobility improvement programs reduce congestion on the SHS by constructing auxiliary lanes, widening shoulders, and building commercial vehicle enforcement facilities and weigh-in-motion systems. These programs also enhance the existing transportation system by providing traveler information and managing traffic flow through real time traffic analysis, signalization projects, ramp metering, changeable message signs, highway advisory radio, and detection stations.

The following are major consequences of the funding shortfall:

- Increases in the total recurrent and nonrecurrent daily vehicle hours of delay (DVHD) from an estimated 712,300 DVHD in 2009 to an estimated 880,300 DVHD by 2019.
- The inability to maintain existing transportation system management elements risks serious declines in Caltrans ability to effectively monitor, and manage to reduce existing, and future traffic congestion.
- The inability of Caltrans to meet Federal requirements for highway travel data reporting due to failures of traffic data collection and monitoring equipment.
- Requires Caltrans to convince local and regional agencies to fund high-benefit operational improvements and transportation management systems (TMS) on the SHS.
- Delays in construction of weigh-in-motion systems, negatively affecting the federal requirement to report annual weigh-in-motion information.
- Closes commercial vehicle enforcement facilities (CVEF) as a result of mold damage, leaking roofs, inoperable heating systems, and failed septic systems, which will adversely affect workplace conditions for California Highway Patrol personnel.
- Unconstructed, closed or underfunctioning CVEF exposes travelers to drivers and trucks that do not meet licensing or inspection standards and pose potential hazards. In addition the SHS is at heightened risk for severe pavement degradation due to the inability to intercept trucks that exceed maximum weight standards.

Although only a small percentage of the mobility needs can be funded, other funding opportunities exist for these projects outside the SHOPP. The majority of mobility needs originate in high-density population centers and result from land-use planning decisions. Opportunities include local and measure funding in addition to the State Transportation Improvement Program (STIP). As stated in section 13 of the adopted 2010 STIP Guidelines, these types of projects may be nominated for inclusion in the STIP if timely implementation through the SHOPP is not possible.

Minor Program. Need \$150 million a year; \$150 million a year available.

The minor program funding is used to respond to critical low-cost SHOPP needs in all areas. The minor program is an annual allocation for projects with construction contract values under \$1 million. The minor program most recently has been used for modest investments for underfunded programs, including mobility improvements, pavement preservation, and drainage improvements.

Bridge Preservation. Need \$1,300 million a year; \$342 million a year available.

The bridge programs preserve 12,924 of the State highway bridges. The available funding in the SHOPP is insufficient to address the deterioration of the bridge inventory caused by structural aging and the effects of increasing traffic or to address seismic and scour vulnerability.

Major consequence of the funding shortfall will result in bridge rehabilitation or replacement needs increase from 893 bridges to 1,153 bridges (8.9 percent) over the ten-year period.

Roadway Preservation. Need \$3,303 million a year; \$693 million a year available.

The roadway programs preserve the 49,518 lane miles of State highways and 205,000 drainage culverts.

The following are major consequences of the funding shortfall:

- Twenty-five percent (one out of every four lane miles) of pavement on the SHS has deteriorated to the point where it needs to be reconstructed to get it back into acceptable condition.
- Increased cost to the traveling motorist. Motorists pay twice for poor pavement conditions, first for the additional vehicle maintenance and operating costs resulting from driving on pavement in poor condition and a second time for the higher costs to reconstruct highly degraded pavement.
- Increased risk of highway closures caused by culvert collapse.

Roadside Preservation. Need \$337 million a year; no funding is available except through minor program

The roadside programs address worker and motorist safety, environmental commitments, and mandates for approximately 221,000 acres of roadsides, 29,380 acres of highway planting, and 87 safety roadside rest areas. Roadside SHOPP programs were significantly changed in 2003 to focus primarily on worker safety issues. It is not an aesthetics improvement program. Caltrans will not be able to address commitments to roadside safety and stewardship because of the funding shortfall.

The following are major consequences of the funding shortfall:

- Increases the number and duration of maintenance tasks on 19,000 acres of highway planting, resulting in increased worker exposure to traffic and increased risk of fatal and injury collision.
- Increases exposure to regulatory agency compliance fines and third-party lawsuits.
- Increases highway life-cycle and recurring maintenance costs caused by delays in the relinquishment of environmental mitigation sites to resource agencies.
- Delays reduction of fatal and injury collisions caused by drowsy and distracted driving by not providing 5,000 car and long-vehicle parking spaces to the Safety Roadside Rest Area System.
- Increases the potential for roadside fires that may spread to adjacent wildlands and urban areas.
- Reduces Caltrans' ability to implement roadside design strategies to comply with the 2000 chemical reduction Environmental Impact Report.

Facility Improvements. Need \$180 million a year; only available funded through minor program.

The facility improvement programs preserve the 440 buildings that support the operations and maintenance of the SHS.

The following are major consequences of the funding shortfall:

- Increases the possibility of litigation and public agency citations for code violations in office buildings, materials laboratories and testing facilities, equipment shops, and maintenance facilities.
- Increases response times during winter operations because of delayed repairs to salt and sand storage facilities.

III. OTHER REQUIREMENTS

PROCESS IMPROVEMENTS

Caltrans continues to define and implement process improvements to expedite the delivery and enhance the management of projects and programs. Some of these improvements already have been implemented, yielding positive results.

Programming SHOPP Capital Outlay Support. Beginning with the 2008 SHOPP, capital outlay support is a programmed element of each SHOPP project. Capital outlay support is programmed for each phase of the project (environmental, design, right-of-way, and construction). Programming capital outlay support enhances the ability to manage the entire project budget to maximize the anticipated project outcomes.

Support Estimate for Development of Planning Documents. Annual resource estimates for the development of project initiation documents has recently evolved to a workload-based methodology. This change, and the continued focus on management of shelf-ready project initiation documents, is primarily responsible for a reduction of the estimated cost for development of project initiation documents in the goal constrained needs plan.

Ten-Year Plan Development Process. The process for developing the needs identified in this plan for the ten-year horizon has improved through implementation of the following actions:

- Standardized the process used to determine the cost for meeting the goal by reviewing construction and support cost for completed projects
- Compared and contrasted changes for performance goals and cost between the 2011 and 2013 Plans.
- Ensured the projected needs identified in the financially-constrained plan are focused on the highest priority areas.
- Ensured the workplan for pre-programming development of project initiation documents is consistent and coordinated with this plan.

RELATIONSHIP TO OTHER INITIATIVES

Five-Year Maintenance Plan. Streets and Highways Code section 164.6 also requires Caltrans to prepare a five-year maintenance plan that addresses the maintenance needs of the SHS. Together, the 2013 Ten-Year SHOPP Plan and the 2013 Five-Year Maintenance Plan attempt to balance resources between SHOPP and maintenance activities in order to achieve identified milestones and goals at the lowest possible long-term total cost.

Preventive maintenance is the most cost-effective means of protecting the State’s infrastructure investment. As implemented, the Maintenance Plan prevents the deterioration and extends the life of the roadway, bridge, and drainage infrastructure that is in fair or good condition. The average cost for a SHOPP roadway rehabilitation project to treat one lane mile of minor pavement damage is \$350,000 while the average cost for preventive maintenance is \$90,000 a lane mile. Thus, preventive maintenance results in a cost-benefit ratio of about 4:1. Similarly, the benefit ratio for structures is 12:1 (\$720,000 for minor damage rehabilitation versus \$60,000 for preventive maintenance), and 5:1 for drainage (\$115,000 for minor damage versus \$27,000 for preventive maintenance). Preventive costs are a combination of State forces and contract work.

Investing in preventive maintenance while the asset is in good to fair condition avoids future SHOPP costs for rehabilitation. Table 3 summarizes the cost-benefit ratios for preventive maintenance of roadway, structural, and drainage elements of the SHS.

Table 3				
COMPARISON OF PREVENTIVE MAINTENANCE VERSUS REHABILITATION COSTS*				
	Cost of Rehabilitation	Cost of Preventive Maintenance	Unit of Measure	Cost-Benefit Ratio
Roadway	\$350,000	\$90,000	Lane mile	4:1
Structural	\$720,000	\$60,000	Bridge	12:1
Drainage	\$115,000	\$27,000	Culvert	5:1

* Costs reported above are capital construction costs only.

The annual baseline funding for the 2011 Maintenance Plan is \$412.1 million. This level of investment is projected to produce future SHOPP cost avoidance of approximately \$3.1 billion: \$1.4 billion for pavement, \$1.6 billion for bridges, and \$115 million for drainage. The 2011 Maintenance Plan implements this recommendation by including \$234 million of roadway projects to preserve 2,700 lane miles of pavement annually, \$155 million of bridge projects to preserve 689 bridges annually, and \$23 million of drainage projects to preserve 174 culverts annually.⁴

⁴ “2011 Five-Year Maintenance Plan,” California Department of Transportation, January 2011.

IV. CONCLUSION

As the roadways, bridges and ancillary infrastructure on the SHS age and near the end of their service lives, the demands of vehicle and truck traffic is accelerating the deterioration of these assets. Compounding this deterioration is the deferment, due to lack of funding, of necessary rehabilitation and restoration work to restore the transportation infrastructure to good operating conditions. The increased demands and deferred rehabilitation and restoration result in lower operational performance, higher user operating costs (additional vehicle repair costs, increased fuel consumption, increased tire wear, and accelerated vehicle depreciation), and ultimately require a higher overall investment when needed repairs to the system are eventually undertaken. Deferred funding for infrastructure such as signs, lighting, drainage, planting, mandate compliance and maintenance and office buildings over the past 10 years has resulted in increased worker exposure to traffic due to the need for more frequent maintenance and preventable expenditures for Director's Orders. In addition, the ever-increasing cost of meeting legal, statutory, and regulatory mandates is a significant contributor to the ten-year needs.

The total ten-year goal-constrained need for the rehabilitation and operation of the SHS for the period from FY 2014–2015 through FY 2023–2024 is \$71 billion. This equates to an average annual cost of \$7.1 billion per year. This is the current cost estimate for capital construction, right-of-way acquisition, and project development and construction engineering support. This estimate does not include expected future increases in construction costs caused by escalation. The goal-constrained needs do not address all the needs on the SHS.

Projected SHA funding available for the SHOPP is \$2 billion a year, which is 28 percent of the estimated goal-constrained need. Because funding is insufficient to preserve and maintain the existing transportation infrastructure, Caltrans will continue to focus available resources on the most critical categories of projects in the SHOPP (emergency, safety, bridge, and pavement preservation). Even with this strategy, the percentage of lane miles of highway pavement in a distressed condition, which is pavement with significant rutting, cracking, potholes, or other signs of deterioration, is projected to increase during the next ten years. In addition, few maintenance facility, safety roadside rest area, highway planting, and mobility improvements will be made. The condition of the SHS will continue to deteriorate.

As compared to the prior SHOPP Plan, \$7.1 billion per year is a four percent reduction. The three areas of significant decrease between the 2011 and 2013 SHOPP Plan are in the needs estimated for collision reduction, ADA compliance, and highway planting preservation. Needs for collision reduction reduced to match the continued downward collision trend, needs for ADA compliance reduced to match the recent lawsuit settlement, and needs for highway planting preservation reduced as a result of new highway planting strategies to achieve lower life-cycle costs.

Although the long-term growth trend in the estimated needs for rehabilitation and operation of the SHS has been momentarily slowed by the infusion of one-time funding from the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 (Proposition 1B). However, this one-time infusion of funding into the SHOPP has only served to temporarily slow the growth of backlogged necessary rehabilitation and reconstruction work. In the absence of new revenue sources, the condition of the transportation system will continue to decline, affecting Caltrans' ability to improve mobility across California, and in turn affecting California's economic vitality and security.

APPENDIX A

GOVERNMENT CODE SECTION 14526.5

14526.5.

- (a) The department shall prepare a state highway operation and protection program for the expenditure of transportation funds for major capital improvements that are necessary to preserve and protect the state highway system. Projects included in the program shall be limited to capital improvements relative to maintenance, safety, and rehabilitation of state highways and bridges which do not add a new traffic lane to the system.
- (b) The program shall include projects which are expected to be advertised prior to July 1 of the year following submission of the program, but which have not yet been funded. The program shall include those projects for which construction is to begin within four fiscal years, starting July 1 of the year following the year the program is submitted.
- (c) The program shall be submitted to the commission not later than January 31 of each even-numbered year. Prior to submitting the plan, the department shall make a draft of its proposed program available to transportation planning agencies for review and comment and shall include the comments in its submittal to the commission.
- (d) The commission may review the program relative to its overall adequacy, level of annual funding needed to implement the program, and the impact of those expenditures on the state transportation improvement program. The commission shall approve and submit the program to the Legislature and the Governor not later than April 1 of each even-numbered year.
- (e) Expenditures for these projects shall not be subject to Sections 188 and 188.8 of the Streets and Highways Code.

APPENDIX B

STREETS AND HIGHWAYS CODE SECTION 164.6

164.6.

- (a) The department shall prepare a 10-year state rehabilitation plan for the rehabilitation and reconstruction, or the combination thereof, by the State Highway Operation and Protection Program, of all state highways and bridges owned by the state. The plan shall identify all rehabilitation needs for the 10-year period beginning on July 1, 1998, and ending on June 30, 2008, and shall include a schedule of improvements to complete all needed rehabilitation during the life of the plan not later than June 30, 2008. The plan shall be updated every two years beginning in 2000. The plan shall include specific milestones and quantifiable accomplishments, such as miles of highways to be repaved and number of bridges to be retrofitted. The plan shall contain strategies to control cost and improve the efficiency of the program, and include a cost estimate for at least the first five years of the program.
- (b) The department shall prepare a five-year maintenance plan that addresses the maintenance needs of the state highway system. The plan shall be updated every two years, concurrent with the rehabilitation plan described in subdivision (a). The maintenance plan shall include only maintenance activities that, if the activities were not performed, could result in increased State Highway Operation and Protection Program costs in the future. These activities may include roadway, structural, and drainage maintenance. The maintenance plan shall identify any existing backlog in these maintenance activities and shall recommend a strategy, specific activities, and an associated funding level to reduce or prevent any backlog during the plan's five-year period. The maintenance plan shall include specific goals and quantifiable accomplishments, such as lane-miles of highway to be repaved and the number of bridge decks to be sealed. The maintenance plan shall contain strategies to control cost and improve the efficiency of these maintenance activities, and include a cost estimate for the five years of the plan.
- (c) The rehabilitation plan and the maintenance plan shall attempt to balance resources between State Highway Operation and Protection Program activities and maintenance activities in order to achieve identified milestones and goals at the lowest possible long-term total cost. If the maintenance plan recommends increases in maintenance spending, it shall identify projected future State Highway Operation and Protection Program costs that would be avoided by increasing maintenance spending. The department's maintenance division shall develop a budget model that allows it to achieve the requirements of this subdivision.
- (d) The rehabilitation plan shall be submitted to the commission for review and comments not later than January 31 of each odd-numbered year, and shall be transmitted to the Governor and the Legislature not later than May 1 of each odd-numbered year. The maintenance plan shall be transmitted to the Governor, the Legislature, and the commission not later than January 31 of each odd-numbered year.
- (e) The rehabilitation plan and the maintenance plan shall be the basis for the department's budget request and for the adoption of fund estimates pursuant to Section 163.

APPENDIX C

DESCRIPTION OF THE ELEMENTS IN EACH SHOPP CATEGORY

MAJOR DAMAGE RESTORATION CATEGORY

The major damage restoration category has three elements: emergency opening, permanent restoration, and roadway protective betterments.

Emergency Opening. The primary purpose of this element is to reopen facilities damaged by and protect facilities imminently threatened by natural disasters, catastrophes, or events, such as storms, floods, fires, earthquakes, tsunamis (tidal waves), or volcanic action. Responses to human-caused disasters, such as large-scale civil unrest, explosions, and acts of war or terrorism, are also included.

Typical improvements include:

- Emergency road openings to temporary or permanent levels of traffic.
- Debris removal and demolition.
- Construction or operation of detours.
- Earthwork, blasting, or replacement of rock to protect facilities from additional damage or to remove an imminent threat.
- Repair or replacement of drainage facilities needed to forestall immediate threat of additional washout or erosion and replacement of traffic safety devices (guardrails, signals, etc.) lost as a result of catastrophic damage.

It is expected that emergency opening projects will restore the roadway to essential traffic within 180 days of the damage incident.

Typically, emergency opening projects are allocated under Commission Resolution G-00-11, authorizing Caltrans to allocate funds for emergency projects.

Permanent Restoration. The primary purpose of this element is to restore facilities to their predamage condition after the emergency opening phase is complete. To be considered as permanent restoration, the project must be tied to an identifiable event.

Typical improvements include:

- Final grading and earthwork.
- Full restoration of roadway and all appurtenances to predamage condition.
- Construction of permanent geotechnical, structural, and drainage fixtures.
- New alignments when the existing damaged alignment is no longer feasible.

It is expected permanent restoration projects will achieve construction completion within three years of the damaging incident.

Roadway Protective Betterments. The primary purpose of this element is to protect facilities from anticipated future catastrophic damage from natural events (storms, floods, landslides, etc.) or human-caused events.

Typical improvements include:

- Rock slope protection.
- Rock fall prevention (rock nets, etc.).
- Stabilization trenches.
- Slope corrections.
- Pumps and pumping stations at depressed sections.
- Retaining walls and soil nailing.
- Security improvements (capital improvements only).

COLLISION REDUCTION CATEGORY

The collision reduction category has three elements: safety improvements, collision severity reduction, and roadside safety improvements.

Safety Improvements. The primary purpose of this element is to reduce the number or severity of collisions on the existing SHS. Project identification is based on the calculation of a Safety Index (SI).

Projects may be spot locations where collision history indicates a pattern susceptible to correction by a safety improvement.

Typical improvements include:

- Traffic signals (school zone signals included).
- Wet pavement corrections.
- Curve corrections.
- Shoulder widening.
- Left turn channelization.

This element also includes projects that meet the warrant for study program criteria and, following an analysis, that have been determined to improve safety by the installation of median barrier, soft barrier, or other safety improvement to address cross-median- or crossover-type collisions.

Collision Severity Reduction. The primary purpose of this element is to upgrade existing highway safety features within the clear recovery area of the roadbed that will lead to reduced collisions and severity of collisions.

Typical improvements include:

- Installation of new guardrail end treatments and crash cushions.
- Installation of rumble strips, glare screen, rock fall mitigation, and overcrossing pedestrian fencing.
- Clean Up the Roadside Environment (CURE) projects. CURE project goals are to remove, relocate, make breakaway, or shield objects within the clear recovery zone.
- Crosswalk safety enhancements.

The intent of this element is the proactive in enhancement of safety on the SHS. As such, this element is not subject to an SI analysis. Projects are prioritized based on the projected collision severity reduction benefits.

Roadside Safety Improvements. The primary purpose of this element is to reduce the frequency and duration of highway workers' exposure to traffic by providing features to reduce recurrent maintenance activities, provide safe access, and maintain traveler safety benefits provided by the SRRA System by preventing closures due to drinking and waste water quality noncompliance.

Typical improvements include:

- Relocating and clustering existing facilities to safe work locations.
- Minor pavement for areas beyond the gore, slopes adjacent to bridge structures, low-visibility areas, road edge, and narrow areas.
- Vegetation control treatment under guardrail and around sign posts, or providing low fuel alternative vegetation.
- Inert materials for slopes and low-visibility areas.
- Access gates, staircases, trails for light-duty vehicles, and maintenance vehicle pullouts.
- Upgrading safety railing, and spot location barriers and end treatments.
- Upgrading chain control areas.
- Upgrading drinking and waste water systems to comply with water quality mandates.

LEGAL AND REGULATORY MANDATES CATEGORY

The legal and regulatory mandates category has four elements: relinquishments, stormwater mitigation, ADA curb ramps, and ADA pedestrian infrastructure.

Relinquishments. The primary purpose of this element is to provide funding for Legislative relinquishments of State highways to local agencies, relinquishments considered to be in the best interest of the State.

Stormwater Mitigation. The primary purpose of this element is to ensure that Caltrans' stormwater discharges to California and federal waters meet applicable water quality standards, construct stormwater mitigation projects that arise from judicial and regulatory orders, and implement improvements that comply with Caltrans' National Pollution Discharge Elimination System permits.

ADA Curb Ramps. The primary purpose of this element is to construct curb ramps at existing crosswalks and other defined pedestrian pathways to make the path of travel accessible. It should be noted that Caltrans' actions to upgrade facilities consistent with ADA regulations are not limited to this funding category. Compliance with ADA regulations is incorporated into Caltrans' design standards.

ADA Pedestrian Infrastructure. The primary purpose of this element is to provide improvements to existing pedestrian infrastructure to make the path of travel accessible and comply with ADA regulations on all Caltrans-owned highways. Pedestrian infrastructure includes sidewalks, crosswalks, pedestrian bridges and tunnels, and pedestrian/traffic signals that facilitate the movement of pedestrians. This infrastructure also includes pedestrian pathways to Caltrans-owned facilities, such as vista points, safety roadside rest areas and park-and-ride lots.

MOBILITY IMPROVEMENT CATEGORY

The mobility improvement category has three elements: operational improvements, transportation management systems, and commercial vehicle enforcement facilities and weigh-in-motion systems.

Operational Improvements. The primary purpose of this element is to improve traffic flow on existing State highways by reducing congestion and operational deficiencies at spot locations. As stated in section 13 of the adopted 2006 State Transportation Improvement Program (STIP) Guidelines, State highway operational improvements that do not expand the design capacity of the transportation system and are intended to address spot congestion are eligible for the SHOPP.

Typical improvements include:

- Interchange modifications (but not to accommodate traffic volumes that are significantly larger than for what the existing facilities were designed).
- Ramp modifications (acceleration-deceleration/weaving).
- Auxiliary lanes for merging or weaving between adjacent interchanges.
- Curve corrections and alignment improvement.
- Signals and intersection improvements.
- Two-way left-turn lanes.
- Channelization.
- Turnouts.
- Shoulder widening.

Transportation Management Systems. The primary purpose of this element is to improve traffic flow on existing State highways by addressing system-wide recurrent and nonrecurrent congestion through system management techniques.

Transportation management systems facilitate the real-time management of the SHS by providing vehicle collision and incident detection, verification, response, and clearance. These systems provide SHS status information to travelers.

Typical improvements include:

- Traffic detection.
- Changeable message signs.
- Closed-circuit television cameras.
- Ramp meters.
- Communications systems and highway advisory radio.
- Traffic signal interconnect projects.
- Traffic Management Centers, including necessary computer software and hardware.

Commercial Vehicle Enforcement Facilities and Weigh-in-Motion Systems. The primary purpose of this element is to provide for commercial vehicle enforcement facilities (commonly called weigh stations) and weigh-in-motion systems.

The weigh stations are needed to support the Commercial Vehicle Enforcement Plan. Truck safety, size, and weight regulations are enforced by the California Highway Patrol, reducing truck-related collisions or incidents and protecting State highways from premature damage.

The weigh-in-motion systems provide data for federally required data systems and special studies, design and maintenance strategies, size and weight policies, enforcement and planning strategies, and traffic and truck volume publications.

BRIDGE PRESERVATION CATEGORY

The bridge preservation category has six elements: bridge rehabilitation, bridge preventive program, bridge scour mitigation, bridge rail replacement and upgrade, bridge seismic restoration, and transportation permit requirements for bridges.

Bridge Rehabilitation. The primary purpose of this element is to restore or replace structures when, due to deterioration or other causes, they become inadequate. Emphasis is placed on bridges with the most urgent needs and the highest cost-benefit ratios.

Included is work to meet standards as required under ADA and Cal/OSHA regulations and work required to restore or replace appurtenances attached to structures for use in maintenance, such as inspection walkways, movable scaffolds, and air and water service lines.

Major transportation structures include bridges, tunnels, tubes, drainage pumping plants, marine fenders, ferryboats, and the mechanical and electrical machinery associated therewith.

It is recognized that when bridges are replaced or rehabilitated it is sometimes appropriate to make some geometric and structural improvements. Therefore, approved improvements may be considered as part of a restoration or replacement project, but the original need for the project must have been to restore or replace structures.

Bridge Preventive Program. The primary purpose of this program is to perform timely actions to delay major rehabilitation of structures. Projects funded by this program may include deck treatments, deck joints and seal repair/replacement, painting, and other preventive work.

This program is authorized under the 2007 Five-Year Maintenance Plan as an annual reservation under the 2008 SHOPP beginning July 1, 2008.

Bridge Scour Mitigation. The primary purpose of this element is to mitigate or replace bridges that are vulnerable to collapse from erosion of channel or streambeds beneath bridge foundations.

This element may also include any monitoring projects that are necessary to collect data that will show when the bridge becomes scour critical and requires further action.

Bridge Rail Replacement and Upgrade. The primary purpose of this element is to bring all noncrashworthy bridge rails up to current federal standards.

Bridge Seismic Restoration. The primary purpose of this element is to repair seismic deficiencies of existing bridges not identified in the Seismic Retrofit Phase I Program and bridges where site conditions have changed since the retrofit program.

Transportation Permit Requirements for Bridges. The primary purpose of this element is to upgrade low and weak bridges to allow safe and efficient movement of oversized or overweight vehicles and loads on major State highways.

ROADWAY PRESERVATION CATEGORY

The roadway preservation category has four elements: roadway rehabilitation (3R), pavement rehabilitation (2R), capital preventive maintenance (CAPM) and drainage system restoration.

The historic goal of Caltrans has been to reduce the number of distressed lane miles of pavement to 5,000, or approximately 10 percent of the total system.

Roadway Rehabilitation (3R) and Pavement Rehabilitation (2R). The primary purpose of these two elements is to rehabilitate roadways that exhibit major structural distress. Both elements also address repair and/or enhancement of other important elements such as traffic safety systems, pedestrian/bicycle accessibility, curbs, dikes, and drainage facilities.. 3R Projects, in addition to the above, also may replace and upgrade other highway appurtenances and facilities within the project limits that are failing, worn out or functionally obsolete such as geometric features. The determination of whether a segment of highway is to proceed as either a 2R or 3R Project is to be made by a safety screening.

A pavement or other appurtenance that is rehabilitated under these elements should provide minimum twenty years of service life with relatively low maintenance expenditures. Life cycle cost analysis is used to determine the optimum service life and pavement strategy. Rehabilitation, with its provision of extending the service life of the facility, is distinct from maintenance, which simply repairs or preserves the facility in a safe and usable condition. Roadway rehabilitation projects must qualify for rehabilitation on the basis of existing Pavement Management System criteria.

Capital Preventive Maintenance (CAPM). The primary purpose of this element is to repair minor pavement distress and/or ride rougher than established maximums in order to extend the service life a minimum of five years. The Capital Preventive Maintenance must qualify on the basis of the existing Pavement Management System criteria. This task may also be used to correct major pavement distress as an intermediate fix until the full roadway rehabilitation project may be delivered. Other operational improvements, geometric corrections, widening is not typically added to a CAPM.

Drainage System Restoration. The primary purpose of this element is to provide for the replacement or in-place rehabilitation of culverts and highway drainage systems that have lost serviceability because of age, wear, or degradation. Upgrades or modifications of culverts and highway drainage systems to increase flow or improve drainage alignment are included. Projects to abandon culverts are also included.

ROADSIDE PRESERVATION CATEGORY

The roadside preservation category has four elements: roadside protection and restoration, highway planting rehabilitation, safety roadside rest area rehabilitation, and new safety roadside rest areas.

Roadside Protection and Restoration. The primary purpose of this element is to comply with regulatory agency mandates, improve corridor functionality, reduce highway facility life-cycle costs, and improve worker safety. Compliance with Surface Mining and Reclamation Act of 1975 (Pub. Resources Code, § 2710 et seq.) and Storm Water Construction General Permit regulations are included. Rehabilitation of vista points and experimental or new features, treatments, and practices are included. Relinquishment of environmental mitigation sites, and fish and wildlife preservation and protection are also included.

Highway Planting Rehabilitation. The primary purpose of this element is to reduce the long-term maintenance costs of roadside infrastructure, provide for replacement, restoration, and rehabilitation of existing highway plantings to an economically maintainable state following damage by weather, acts of nature, or deterioration, and improve worker and traveler safety,

This element also provides for erosion control to comply with Caltrans' National Pollution Discharge Elimination System permit requirements, design of safety features for worker safety, and improvements for roadside appearance and coordination with community character.

Safety Roadside Rest Area Rehabilitation. The primary purpose of this element is to correct deficiencies and restore existing safety roadside rest areas to a safe condition.

Typical improvements include:

- Operational improvements.
- Capacity expansion (parking and comfort stations).
- Existing comfort station or other structural element rehabilitation or replacement.
- Compliance with Cal/OSHA regulations. Maintenance facilities, crew rooms, and office space for California Highway Patrol personnel.
- Electrical system upgrades.
- Ramp upgrades to current design standards.
- Relocation of existing safety roadside rest areas.
- Auxiliary facility construction where expansion and upgrading an existing site is not feasible.

New Safety Roadside Rest Areas. The primary purpose of this element is to provide for new, conveniently spaced stopping opportunities as an integral part of the SHS where the traveler may stop, rest, relax, obtain travel information, and return to the highway more alert and driving safely.

Partnerships and joint development of safety roadside rest areas with the private sector or public agencies are included. All land, structures, landscaping, utilities, and other facilities, such as restrooms, office and storage space, tables, drinking fountains, telephones, motorist information, and trash receptacles, are included.

FACILITY IMPROVEMENT CATEGORY

The goal of the facility improvement category is to address worker safety, comply with ADA and Cal/OSHA regulations, and improve operational efficiency. The facility improvement category has four elements: equipment facilities, maintenance facilities, office buildings, and materials laboratories and testing facilities.

Equipment Facilities. The primary purpose of this element is to provide facilities needed for the support of the Division of Equipment's operations.

Typical improvements include:

- Resident mechanic facilities in maintenance stations, whether stand-alone or contiguous to a maintenance structure district shop's subshops.
- Headquarters shop.
- Equipment storage areas.

At maintenance stations and district facilities, mechanics repair and maintain Caltrans' fleet of equipment, such as trucks, pickups, loaders, and snowplows.

At the Headquarters location, in addition to repairs, the facility is primarily devoted to the fabrication of new replacement equipment for the fleet.

Maintenance Facilities. The primary purpose of this element is to provide facilities needed for the support of the Division of Maintenance's operations.

Typical improvements include:

- Rehabilitation of existing maintenance stations and construction of new ones.
- Installation of new fuel tanks and replacement of existing fuel tanks as part of a larger rehabilitation contract.

Office Buildings. The primary purpose of this element is to provide facilities needed for the support of State transportation activities, including all district and Headquarters office buildings.

Materials Laboratories and Testing Facilities. The primary purpose of this element is to provide facilities needed to conduct specialized laboratory, field-testing, and inspection services for all phases of transportation engineering work involving materials and manufactured products.

APPENDIX D

EXAMPLE PHOTOGRAPHS

EMERGENCY RESPONSE



Heavy rainfall in January 2010 caused extensive damage to highways throughout California. A large landslide damaged State Route 96 near Eureka.



The Station Fire ravaged the Los Angeles County roadside late summer 2009, causing damage along State Route 2. The area took a second hit from storms in January 2010.

COLLISION REDUCTION



This picture shows a location in need of metal beam guardrail, which reduces the number and severity of run-off-road-type collisions.



This is an example of an older and obsolete crash cushion on a State highway. It does not meet current crash-test guidelines and needs to be upgraded to a State-approved crash cushion to ensure proper performance in the event of a collision.



This photo demonstrates the current condition of many areas adjacent to ramps. Paving these areas will eliminate the need for maintenance workers to be on foot to manually control weeds and pick up trash and debris. Eliminating or relocating signage, or converting to quick change posts in these areas also contribute to reducing worker exposure to traffic.



This photo demonstrates how vegetation control treatments under guard rail eliminates the need for a worker to be on foot to manually control weeds for fire prevention.



Clustering roadside facilities at safe locations away from traffic minimizes worker exposure to traffic.

LEGAL AND REGULATORY MANDATES

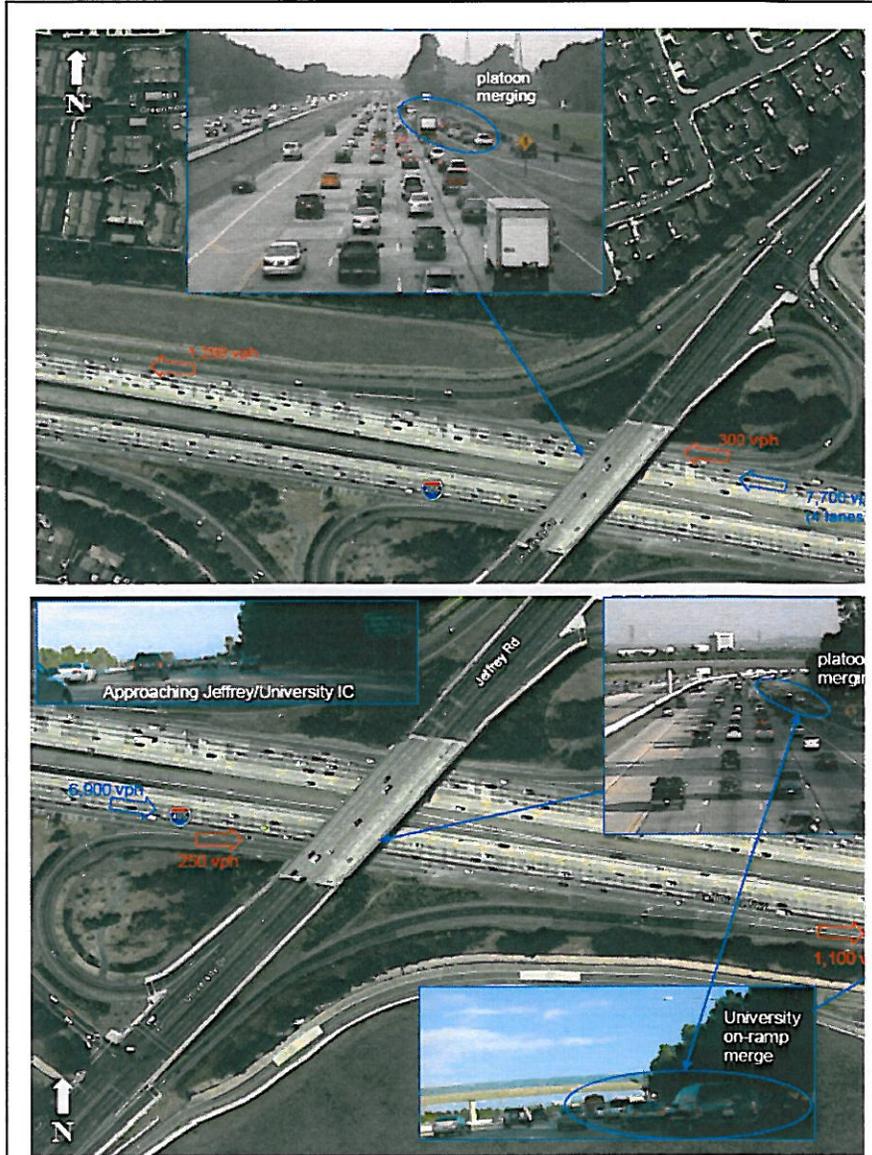


Slopes along this section of highway have repeatedly eroded, resulting in sediment deposits in the Tuolumne River, affecting the quality of State waters. Although maintenance forces have attempted to repair and stabilize the slopes, erosion continues with significant rainfall. Stormwater mitigation projects are needed to reduce maintenance efforts and ensure compliance with the National Pollutant Discharge Elimination System permit.



This photograph demonstrates the condition of pedestrian walkway facilities along a State highway. This not only is a problem for pedestrians in general but also is a barrier for those pedestrians with accessibility limitations.

MOBILITY IMPROVEMENTS

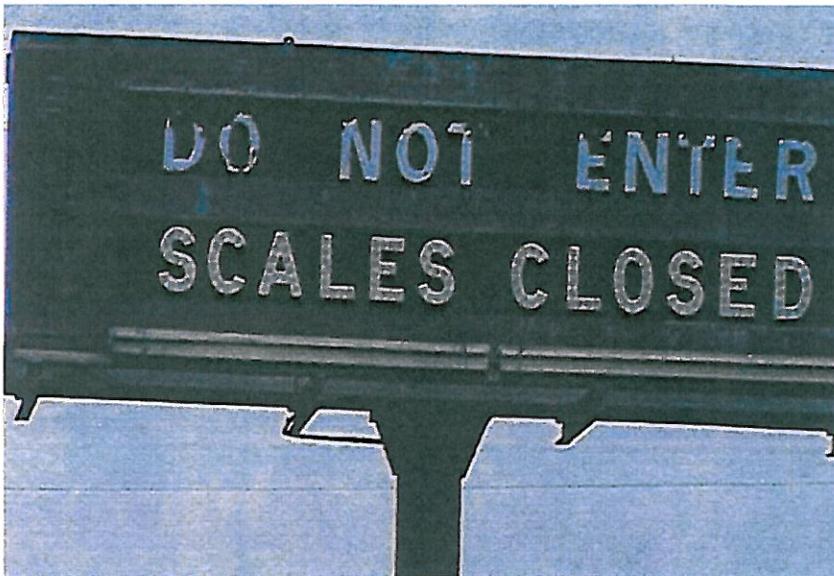


These are two bottleneck locations on Interstate 405 in Irvine. The platoon of vehicles merging onto the freeway is causing bottlenecks, which in turn cause delay on the mainline. The cumulative effect of multiple bottlenecks along a freeway segment can cause considerable delay in the corridor. Similar effects are being experienced in several freeway corridors across the State.

COMMERCIAL VEHICLE INSPECTION



Weigh stations help the California Highway Patrol efficiently conduct commercial vehicle inspections and weight enforcement to reduce pavement damage and enhance traffic safety. The pavement at this weigh station located on Interstate 5 near Santa Nella is in a severe state of disrepair. Similar conditions can be found at other weigh stations.



The sign at this weigh station located on Interstate 5 near Castaic has deteriorated and is in need of replacement.

BRIDGE PRESERVATION



A seven-foot-long hole opened up in the concrete deck of the bridge on Interstate 5 in San Diego County at the Oceanside Boulevard structure in February 2009.

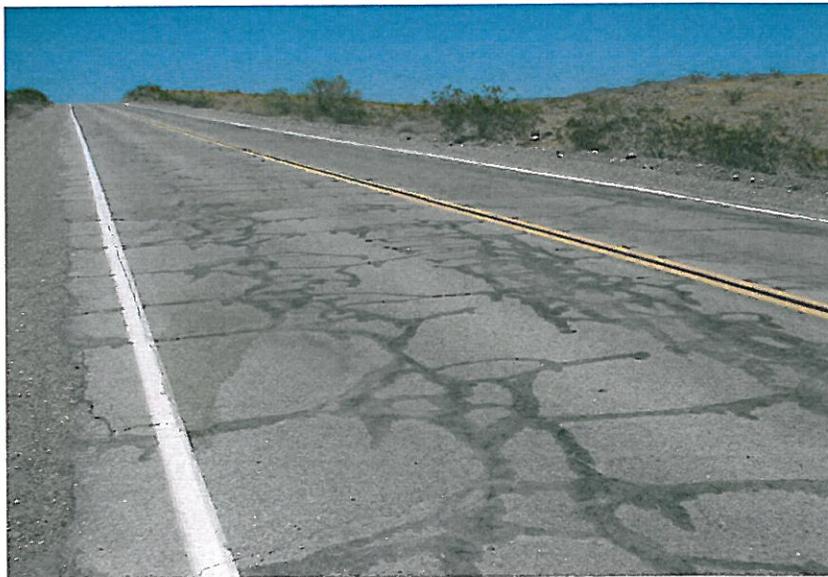


The concrete in the Temple Street overcrossing structure has become severely deteriorated, leading to corrosion of the underlying reinforcing steel.

ROADWAY PRESERVATION



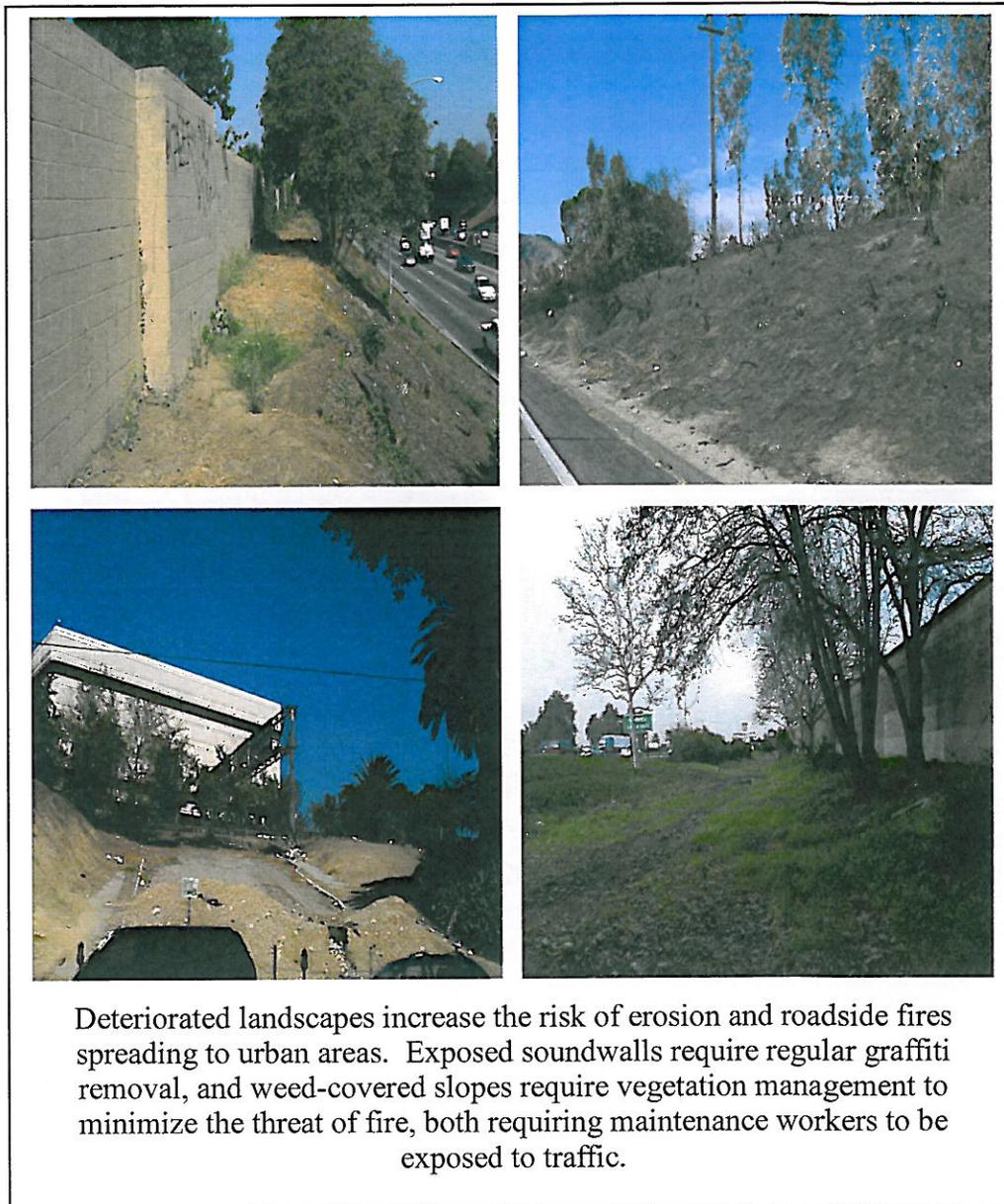
This is an example of severe corner cracking of Portland cement concrete pavement caused by loss of base support, heavy loading, and severe pumping. Maintenance forces have patched the failed pavement to keep the lane in service.



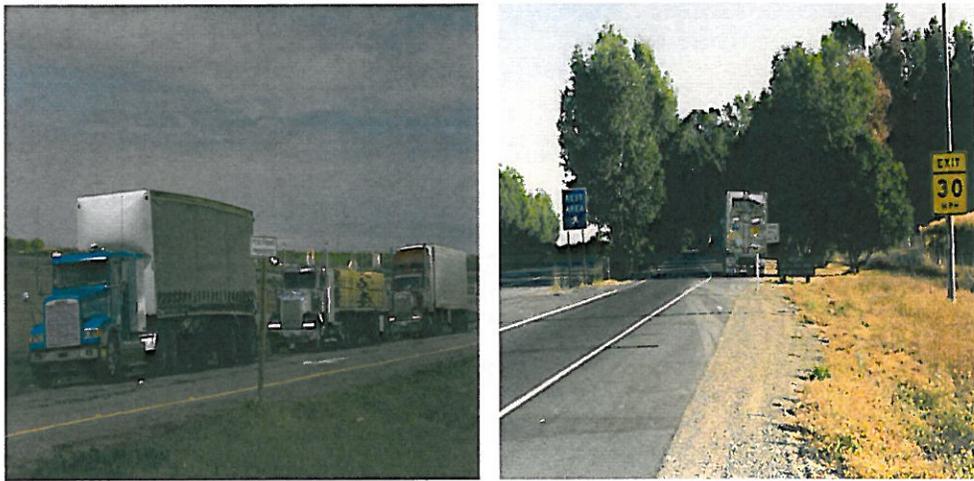
This is an example of severe fatigue cracking, also known as alligator cracking, on hot-mix asphalt concrete pavement. Maintenance forces have sealed the cracks to extend the service life of the pavement.

ROADSIDE PRESERVATION

Highway Planting Rehabilitation

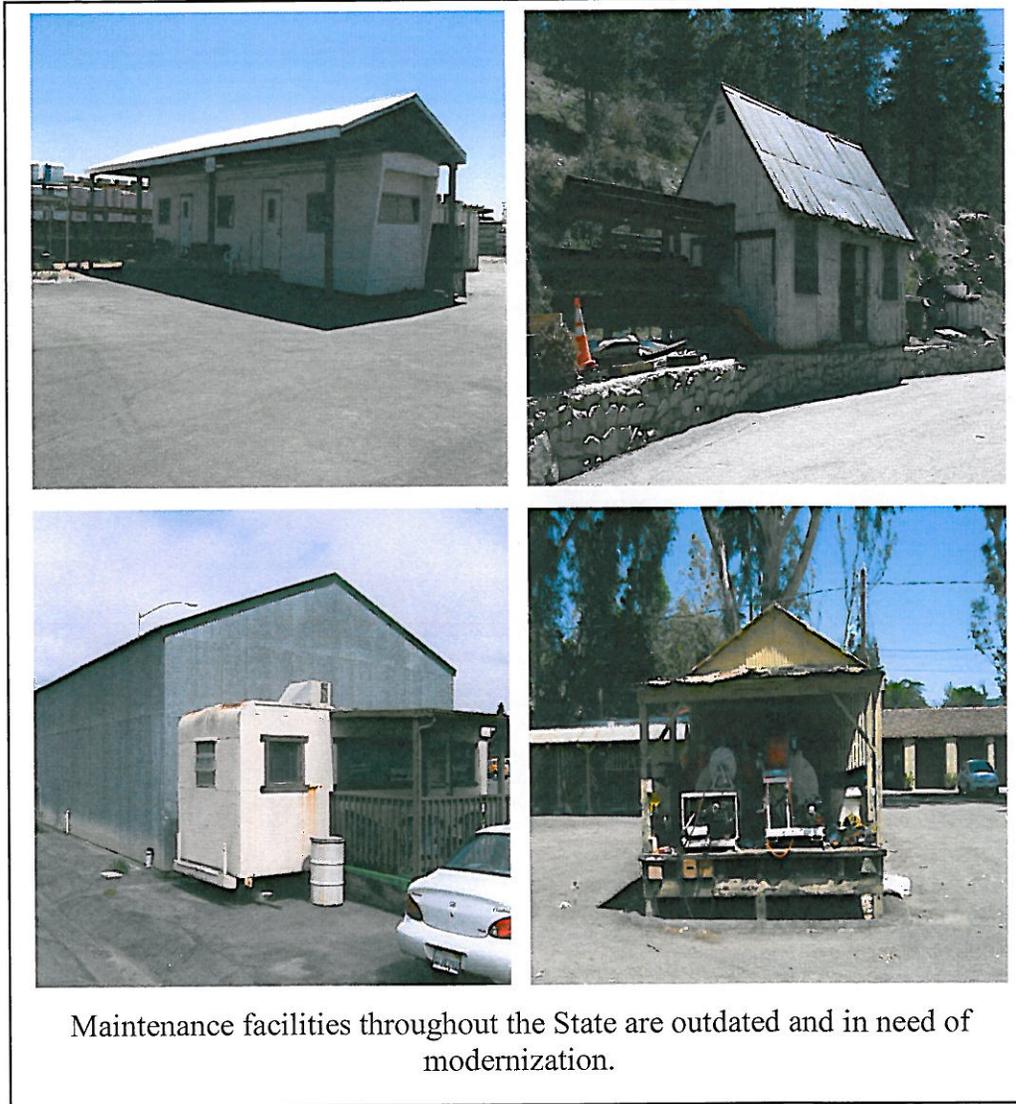


Safety Roadside Rest Areas



These photographs indicate the result of inadequate truck parking spaces at safety roadside rest areas. Parking lots are full beyond capacity, forcing truck drivers to park along ramp and mainline shoulders, causing safety concerns. Inadequate stopping opportunities result in human waste and other biohazards dumped along the roadside.

FACILITY IMPROVEMENTS





Prepared by the
California Department of Transportation
Business, Transportation & Housing Agency