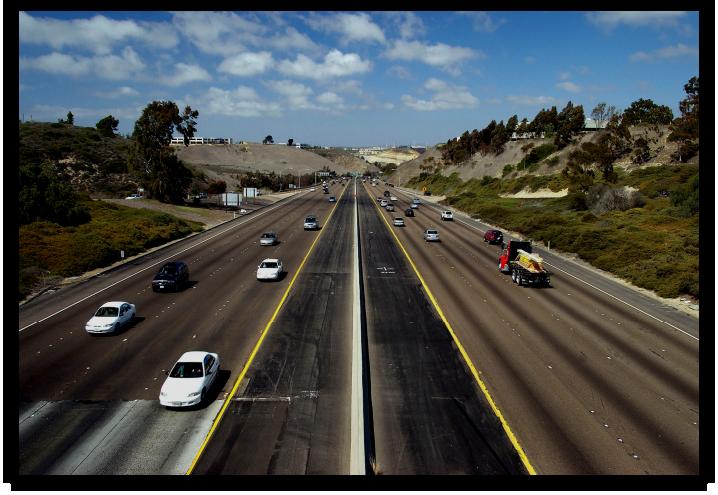
2009 Ten-Year State Highway Operation and Protection Plan

Fiscal Years 2010-11 through 2019-20

January 31, 2009

Prepared by the California Department of Transportation

Business, Transportation and Housing Agency



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EXECUTIVE SUMMARY

The California Department of Transportation (Department) is responsible for maintaining and operating the 50,000 lane-mile State Highway System (SHS), the backbone of California's transportation system. The Department monitors the condition and operational performance of the SHS through periodic inspections, traffic studies, and system analysis. The Department uses the information obtained through these activities to prepare the Ten-Year State Highway Operation and Protection Plan (Plan) as required by Streets and Highways Code section 164.6. The Plan provides input for the funding distribution in the Fund Estimate (FE) adopted by the California Transportation Commission (Commission).

Streets and Highways Code section 164.6 requires the 2009 Plan to include identified needs for the ten-year period from fiscal years (FY) 2010-11 through 2019-20, based on quantifiable accomplishments. The Plan is to include a cost estimate for at least the first five years.

The amounts represent the current cost estimate for capital construction, right-of-way acquisition, and project development support. This estimate does not include expected future increases in construction costs.

	Inventory	2009 Ten-Year SHOPP Goal Constrained Needs			
		Average Annual Capital Cost ($Million)	Average Annual Support Cost ($Million)	Total Average Annual Cost ($Million)	Performance Goal
Emergency Response	N/A	$ 180	$ 79	$ 259	Restore damage within 180 days
Collision Reduction	N/A	$ 329	$ 155	$ 500	Reduce collisions by 10 percent
	N/A	$ 10	$ 6		Reduce 3,600 hours of worker exposure to traffic per year
Mandates	N/A	$ 532	$ 198	$ 730	Comply with laws and regulation
Mobility Improvements	N/A	$ 401	$ 203	$ 604	Reduce 240,000 daily vehicle hours of delay
Minor Program	N/A	$ 100	$ 76	$ 176	Not applicable
Bridge	12,559 Bridges	$ 693	$ 291	$ 984	3 percent of bridges distressed (400 bridges)
Roadway	49,677 Lane Miles	$ 1,860	$ 540	$ 2,400	10 percent of system distressed (5,000 lane miles)
Roadside	27,920 Acres	$ 192	$ 109	$ 437	20 percent of acres distressed (6,000 acres) and mandate compliance at 220 locations
	87 Rest Areas	$ 87	$ 49		Immediate safety and mandate needs at all existing locations and address capacity needs for safety
Facilities Improvements	444 Facilities	$ 84	$ 48	$ 132	Rehabilitate 26 facilities
Support for development of planning documents			$ 61	$ 61	
	TOTAL	**$ 4,468**	**$ 1,815**	**$ 6,283**	

The sole funding source for the State Highway Operation and Protection Program (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 (FHTF), redirection of funding for highway maintenance, and Grant Anticipation Revenue Vehicles (GARVEE) Bond debt service obligations.

Projected SHA funding available for the SHOPP is $1.5 billion per year, which is 24 percent of the estimated need. As funding is insufficient to preserve and maintain the existing State transportation infrastructure, the Department will focus available resources on the most critical categories of projects in the SHOPP (safety, bridge, and pavement preservation). Even with this focus, the SHS will continue to deteriorate (distressed pavement will grow from 26 percent to 60 percent during the next ten years). In addition, few improvements to office facilities, repairs to roadside rest areas, and mobility improvements will be made.

In the absence of new revenue sources, the condition of the transportation system will continue to deteriorate, which will result in closure of roadside rest areas and other consequences.

If additional funding becomes available to the SHOPP through a federal economic stimulus strategy, it will be used to both fund delivered projects that cannot be afforded with SHA funds available in FY 2008-09 and to accelerate the delivery of safety, bridge and pavement rehabilitation projects.

I. OVERVIEW OF THE SHOPP

A. Background and Purpose of the SHOPP

The Department develops and manages the SHOPP as authorized in Government Code section 14526.5 and Streets and Highways Code section 164.6 (refer to Appendix A). The purpose of the SHOPP is to maintain and preserve the investment in the SHS and its supporting infrastructure. Capital improvements programmed in the SHOPP are limited to maintenance, safety, and rehabilitation of State highways and bridges, which do not add a new traffic lane to the system.

B. The California State Highway System

The California SHS includes nearly 50,000 lane-miles of pavement; 12,559 bridges; 205,000 culverts and drainage facilities; 87 roadside rests; and 27,900 acres of roadside landscaping. Also included in the transportation infrastructure are the additional support facilities, including maintenance stations, equipment shops, and transportation laboratories. Much of this system was built in the 1950s, 1960s, and early 1970s to serve the growing population and economy of the State. Many of the transportation infrastructure assets 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.

Figure 1 – The California State Highway System

C. 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 (VMT) increased 20 percent. The increasing VMT combined with the age of the system is causing a faster rate of pavement and bridge deterioration, new vehicle collision concentration locations, and increasing hours of traffic congestion. The increase in VMT also increases the use of roadside elements such as safety roadside rest areas and vista points. Shown below is a chart depicting the increase in annual VMT as compared to the investment in the SHS.

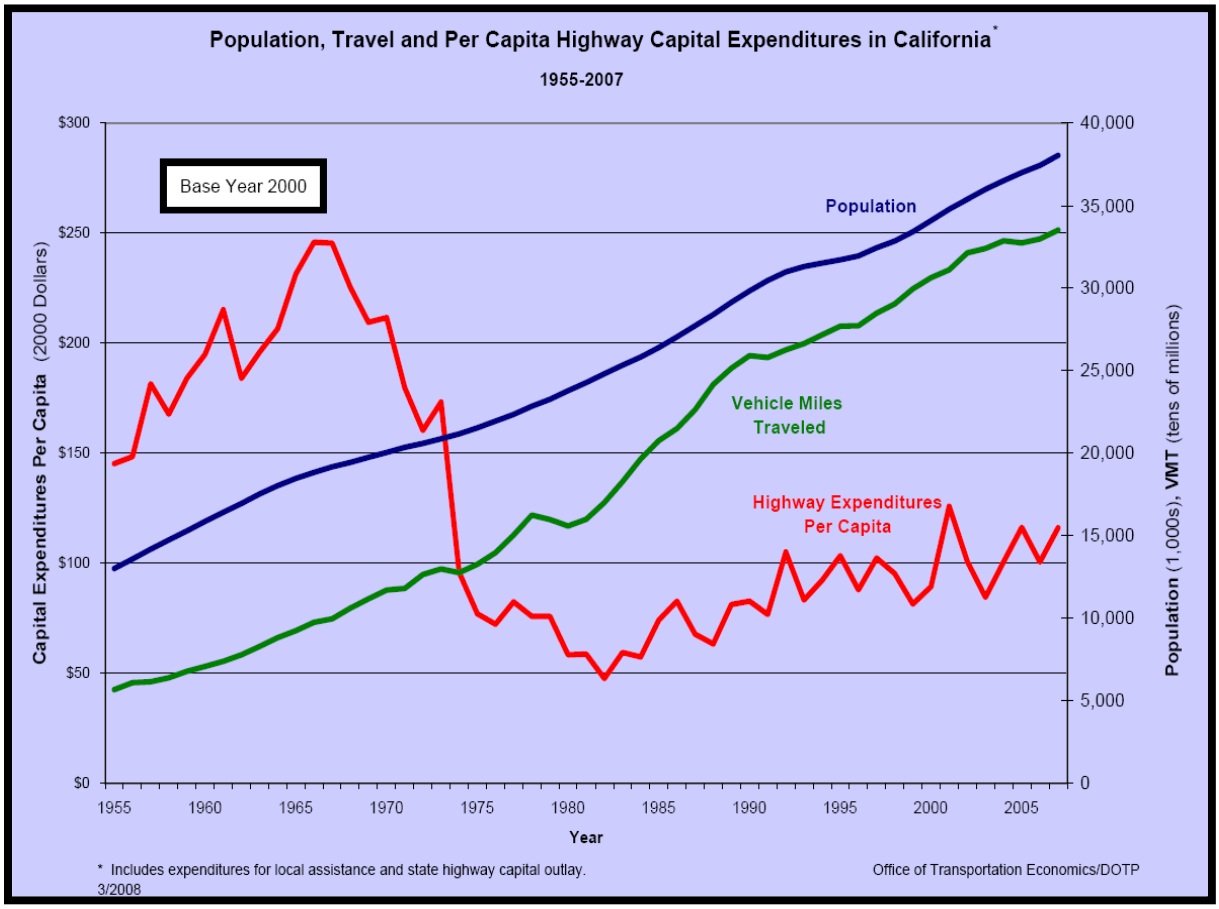

Figure 2 – Population, Travel, and Per Capita Highway Capital Expenditures in California

Increased Goods Movement and the resulting increase in truck traffic is 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] Much of the growth will occur in urban areas and on the Interstate highway system. This growth will continue to increase the rate of pavement deterioration and wear on bridges.

[1] *Freight Analysis Framework*, Office of Freight Management and Operations, Federal Highway Administration, United States Department of Transportation, April 2002.

D. Structure of the SHOPP

The SHOPP has eight categories: (1) Emergency Response, (2) Collision Reduction, (3) Legal and Regulatory Mandates, (4) Bridge Preservation, (5) Roadway Preservation, (6) Mobility Improvement, (7) Roadside Preservation, and (8) Facility Improvement.

These eight categories compose two major groupings, those that relate to its operational performance (Emergency Response, 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).

E. Operational Performance

The Department continually measures and evaluates the operational performance of the transportation system.

Emergency Response. The goal of the emergency response 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. Emergency response projects resulting from a federally declared disaster are eligible for federal reimbursement.

As expected, the level of emergency response varies annually in response to human-caused and natural disasters. In general, as the SHS ages, the impact of damaging events and the cost to restore the impacted SHS to predamage condition has increased.

Collision Reduction. The goal of the collision reduction category is to reduce the number and severity of fatal and injury (F&I) collisions.

Collision reduction improvements implemented through the SHOPP have significantly contributed to improvements in traffic and worker safety. In the ten-year period from 1997 to 2006, the fatality rate on freeways declined by 1.4 percent, from 0.71 to 0.70 fatalities per 100 million vehicle miles (MVM). Similarly, the fatality rate on nonfreeways for the same period dropped by 14 percent, from 2.78 to 2.39 fatalities per 100 MVM.[2] Seventy-one Department employee fatalities have occurred since 1970, 44 percent involved workers on foot, on the shoulder, or within 30 feet of vehicle traffic.

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 Clean Water Act, the Porter-Colonge Water Quality Control Act and evolving stormwater requirements, Americans with Disabilities Act (ADA), and hazardous waste remediation regulations.

[2] *Highway Safety Improvement Program Annual Report Fiscal Year 2007-08*, California Department of Transportation, Business, Transportation and Housing Agency, August 2008.

The Department's stormwater discharges are subject to a permit issued under the Federal Clean Water Act (33 U.S.C. 1251 et. seq.) and pursuant to separate authority under the Porter-Cologne Water Quality Control Act (California Water Code, Division 7 -Water Quality), various water board orders, and other legal mandates.

These regulations have direct impact on the Department's right-of-way acreage in need of treatment. The stormwater needs have increased considerably starting in FY 2006-07 as compared to previous years due to Environment Improvement Program retrofit needs in Lake Tahoe Basin and the court orders to U.S. Environmental Protection Agency to complete total maximum daily loads for all of Los Angeles Region's impaired water bodies by 2012.

Another significant legal requirement is the retrofitting and updating the SHS to meet the requirements of the ADA of 1990. 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 and restore productivity of the SHS. Mobility improvements include operational improvements, transportation management systems, weigh stations, and weigh-in-motion (WIM) facilities.

Mobility improvements focus on reducing vehicle delay on the SHS. Daily Vehicle Hours of Delay (DVHD) is 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 shown in the figure, California's urban freeway recurrent congestion increased 4 percent from 560,362 DVHD in 2006 to 581,674 DVHD in 2007.[3]

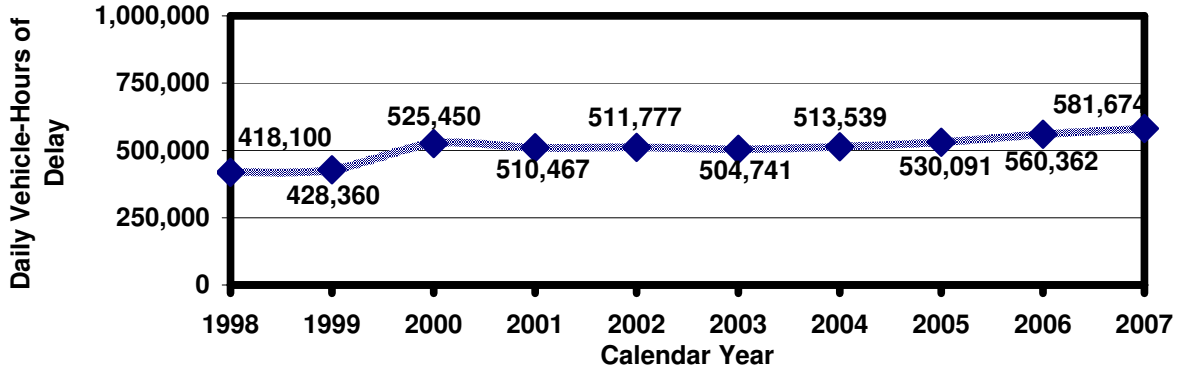

Figure 3 – Daily Vehicle-Hours of Delay

As stated in the adopted 2008 State Transportation Improvement Program (STIP) Guidelines, operational improvements that do not expand the design capacity of the system and are intended to address spot congestion are eligible for SHOPP funding. Regions may nominate these types of projects in their Regional Transportation Improvement Program (RTIP) if timely implementation through the SHOPP is not possible.

[3] *2007 State Highway Congestion Monitoring Program*, California Department of Transportation, Business, Transportation and Housing Agency, June 2008.

F. System Condition

The Department 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 will occur.

The SHS contains 12,559 bridges. As shown in the figure, the median age of bridges on the SHS is 41 years. Many of these bridges are reaching the end of their service life and are in need of rehabilitation and reconstruction.

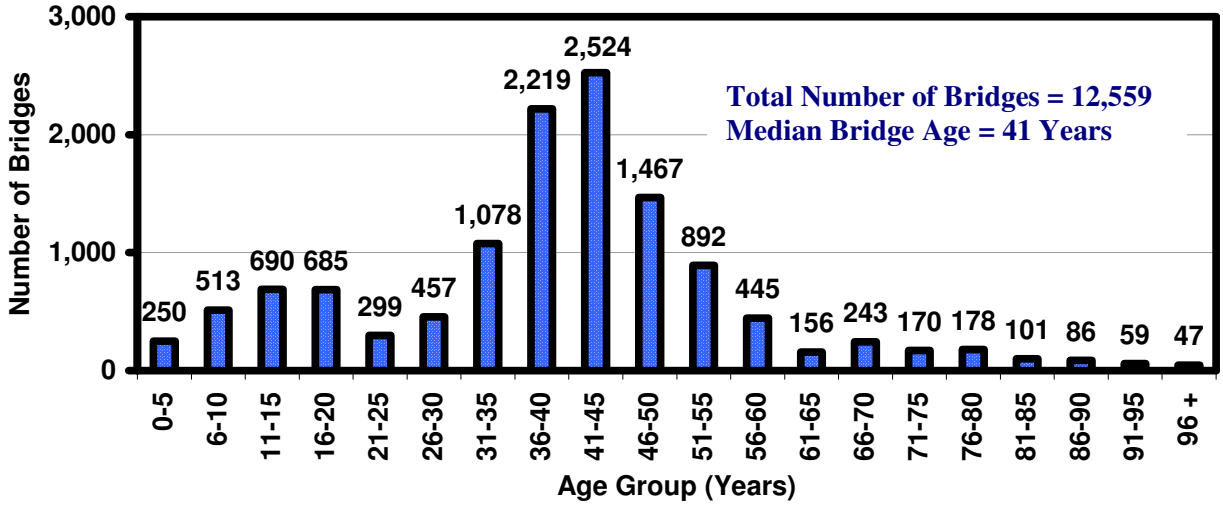

Figure 4 – California State Highway Bridges by Age

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 the Department 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. The 2007 Pavement Condition Survey reports 41 percent (20,424 lane miles) of the SHS in excellent condition, 32 percent (16,055 lane miles) requires pavement maintenance and 26 percent (12,998 lane miles) are distressed and require rehabilitation and reconstruction work.[4]

[4] *2007 State of the Pavement*, State of California Department of Transportation, Business, Transportation and Housing Agency, August 2008, page 4.

Roadside Preservation. The goal of the roadside preservation category is to reduce the long-term maintenance costs of roadside infrastructure, improve worker and traveler safety, reduce deficient landscaping, comply with regulatory and legal mandates, and improve operations and accessibility at safety roadside rest areas and vista points.

Approximately 60 percent of the roadside inventory has deteriorated beyond the ability of maintenance forces to correct. The number of distressed acres of landscaping has increased from 12,000 to 17,000 in the past five years. In addition, 41 percent of the safety roadside rest areas have capacity, water quality, or operational deficiencies.

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

II. TEN-YEAR COSTS AND PERFORMANCE OUTCOMES

A. Goal-Constrained and Financially Constrained Plan Cost Estimates

The total ten-year, goal-constrained need for the rehabilitation and operation of the SHS is $63 billion for FYs 2010-11 through 2019-20. This amount represents the current cost estimate for capital construction, right-of-way acquisition, and project development support. This estimate does not include expected future increases in construction costs.

The sole funding source for the SHOPP is the 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 FHTF, redirection of funding for highway maintenance, and GARVEE Bond debt service obligations.

Projected SHA funding available for the SHOPP is $1.5 billion per year, which is 24 percent of the estimated need. As funding is insufficient to preserve and maintain the existing State transportation infrastructure, the Department will focus available resources on the most critical categories of projects in the SHOPP (safety, bridge, and pavement preservation). Even with this focus, the SHS will continue to deteriorate (distressed pavement will grow from 26 percent to 60 percent during the next ten years). In addition, no new improvements to office facilities, repairs to roadside rest areas, and mobility improvements will be made.

The following two pages present a summary of the total ten-year funding needs to achieve SHOPP goals and the Department's constrained annual funding plan based on forecasted SHA funding.

GOAL-CONSTRAINED NEEDS PLAN (ANNUAL ESTIMATES IN 2008 DOLLARS)					
Category	Annual Cost ($ in Millions)			Annual Performance Units	
	Capital	Support	Total		
Emergency Damage Repair	$ 80	$ 35	$ 115	TBD	
Permanent Restoration	$ 80	$ 35	$ 115	TBD	
Roadway Protective Betterment	$ 20	$ 9	$ 29	TBD	
EMERGENCY RESPONSE	**$ 180**	**$ 79**	**$ 259**		
Safety Improvements	$ 200	$ 95	$ 295	455	F&I Collisions
Collision Severity Reduction	$ 120	$ 57	$ 177	216	Reduced
Median Barrier Upgrades	$ 9	$ 3	$ 12	5	Centerline Miles
Roadside Safety Improvements	$ 10	$ 6	$ 16	450	Locations
COLLISION REDUCTION	**$ 339**	**$ 161**	**$ 500**		
Relinquishments	$ 12	$ 4	$ 16	12	Centerline Miles
Railroad At-Grade Crossings	$ 0.1	$ -	$ 0.1	1	Location
Hazardous Waste Mitigation	$ 0.5	$ 0.1	$ 0.6	1	Location
Stormwater	$ 304	$ 113	$ 417	3,747	Acres Treated
ADA Curb Ramp	$ 15	$ 6	$ 21	6,000	Curb Ramps
ADA Pedestrian Infrastructure	$ 200	$ 75	$ 275	1,080	Components
MANDATES	**$ 532**	**$ 198**	**$ 730**		
Operational Improvements	$ 190	$ 96	$ 286	24,000	DVHD Reduced
Transportation Management Systems	$ 180	$ 91	$ 271	1,260 72	Field Elements Miles of Fiber
Weigh Stations and WIM Facilities	$ 31	$ 16	$ 47	14	Locations
MOBILITY IMPROVEMENTS	**$ 401**	**$ 203**	**$ 604**		
Minor Program	**$ 100**	**$ 76**	**$ 176**	TBD	
SUBTOTAL OPERATIONAL PERFORMANCE	**$ 1,552**	**$ 717**	**$ 2,269**		
Bridge Rehabilitation	$ 269	$ 115	$ 384	81	Bridges
Bridge Scour Mitigation	$ 30	$ 13	$ 43	19	Bridges
Bridge Rail Replacement/Upgrade	$ 122	$ 51	$ 173	35,270	Feet
Bridge Seismic Restoration	$ 228	$ 96	$ 324	35	Bridges
Bridge Preventive Program	$ 31	$ 10	$ 41	166	Bridges
Permit Requirements for Bridges	$ 12	$ 5	$ 17	7	Bridges
Bridge Widening	$ 1.3	$ 0.5	$ 1.8	1	Bridge
BRIDGE	**$ 693**	**$ 291**	**$ 984**		
Roadway Rehabilitation Pavement Preservation Pavement Rehabilitation Long-Life Pavement Corridors	$ 1,600	$ 488	$ 2,088	3,980	Lane Miles
Drainage System Restoration	$ 260	$ 52	$ 312	2,255	Culverts
Signs and Lighting Rehabilitation	$ 0.2	$ 0.1	$ 0.3	7	Signs
ROADWAY	**$ 1,860**	**$ 540**	**$ 2,400**		
Highway Planting Rehabilitation	$ 174.5	$ 99	$ 273.5	1,678	Acres
Roadside Protection and Restoration	$ 17.4	$ 10	$ 27.4	22	Locations
Roadside Rest Area Rehabilitation	$ 35.5	$ 20	$ 55.5	6	Locations
New Safety Roadside Rest Areas	$ 51.3	$ 29	$ 80.3	4	Locations
ROADSIDE	**$ 278.7**	**$ 158**	**$ 436.7**		
Equipment Facilities	$ 11.8	$ 7	$ 18.8	2	Facilities
Maintenance Facilities	$ 51.7	$ 30	$ 81.7	22	Facilities
Office Buildings	$ 16.5	$ 9	$ 25.5	1	Facility
Materials Lab	$ 4	$ 2	$ 6	2	Facilities
FACILITIES IMPROVEMENTS	**$ 84**	**$ 48**	**$ 132**		
SUBTOTAL SYSTEM CONDITION	**$ 2,916**	**$ 1,037**	**$ 3,953**		
Support for development of planning documents		$ 60.6	$ 60.6		
TOTAL ANNUAL NEED	**$ 4,468**	**$ 1,815**	**$ 6,283**		

Figure 5 – 2009 Ten Year Goal Constrained Needs Plan

FINANCIALLY CONSTRAINED PLAN (ANNUAL ESTIMATES IN 2008 DOLLARS)					
Category	Annual Cost ($ in Millions)			Annual Performance Units	
	Capital	Support	Total		
Emergency Damage Repair	$ 50.0	$ 16.2	$ 66.2	TBD	
Permanent Restoration	$ 50.0	$ 16.4	$ 66.4	TBD	
Roadway Protective Betterment	$ 10.4	$ 3.9	$ 14.3	2	Locations
EMERGENCY RESPONSE	**$ 110.4**	**$ 36.6**	**$ 147.0**		
Safety Improvements	$ 200.0	$ 69.2	$ 269.2	455	F&I Collisions
Collision Severity Reduction	$ 49.7	$ 20.6	$ 70.2	117	Reduced
Median Barrier Upgrades	$ 9.3	$ 2.6	$ 11.9	5	Centerline Miles
Roadside Safety Improvements	$ 2.7	$ 1.1	$ 3.9	122	Locations
COLLISION REDUCTION	**$ 261.7**	**$ 93.5**	**$ 355.2**		
Relinquishments	$ 12.0	$ 3.9	$ 15.9	12	Centerline Miles
Railroad At-Grade Crossings	$ 0.1	$ -	$ 0.1	1	Location
Hazardous Waste Mitigation	$ 0.5	$ 0.1	$ 0.6	1	Location
Stormwater	$ 91.7	$ 31.0	$ 122.7	912	Acres Treated
ADA Curb Ramp	$ 7.7	$ 3.2	$ 11.0	455	Curb Ramps
ADA Pedestrian Infrastructure	$ 5.3	$ 2.1	$ 7.4	31	Components
MANDATES	**$ 117.2**	**$ 40.5**	**$ 157.7**		
Operational Improvements	$ 17.0	$ 7.5	$ 24.6	236	DVHD Reduced
Transportation Management Systems	$ 22.3	$ 8.2	$ 30.5	193 5	Field Elements Miles of Fiber
Weigh Stations and WIM Facilities	$ 7.3	$ 3.5	$ 10.8	3	Locations
MOBILITY IMPROVEMENTS	**$ 46.6**	**$ 19.2**	**$ 65.8**		
Minor Program	**$ 67.8**	**$ 42.2**	**$ 110.0**	TBD	
SUBTOTAL OPERATIONAL PERFORMANCE	**$ 603.7**	**$ 232.0**	**$ 835.7**		
Bridge Rehabilitation	$ 139.4	$ 45.8	$ 185.2	45	Bridges
Bridge Scour Mitigation	$ 24.5	$ 10.5	$ 34.9	8	Bridges
Bridge Rail Replacement/Upgrade	$ 16.6	$ 5.8	$ 22.5	11,287	Feet
Bridge Seismic Restoration	$ 50.2	$ 15.9	$ 66.0	40	Bridges
Bridge Preventive Program	$ 31.1	$ 10.8	$ 41.9	166	Bridges
Permit Requirements for Bridges	$ 6.8	$ 2.1	$ 8.9	2	Bridges
Bridge Widening	$ 1.3	$ 0.5	$ 1.8	1	Bridge
BRIDGE	**$ 269.9**	**$ 91.3**	**$ 361.2**		
Roadway Rehabilitation	$ 94.0	$ 28.6	$ 122.7	98	Lane Miles
Pavement Preservation	$ 121.7	$ 37.2	$ 158.9	309	Lane Miles
Pavement Rehabilitation	$ 0.4	$ 0.2	$ 0.6	1	Lane Mile
Long-Life Pavement Corridors	$ 0.1	$ 0.1	$ 0.2	1	Lane Mile
Drainage System Restoration	$ 7.1	$ 4.2	$ 11.3	90	Culverts
Signs and Lighting Rehabilitation	$ 0.2	$ 0.1	$ 0.3	7	Signs
ROADWAY	**$ 223.6**	**$ 70.3**	**$ 293.9**		
Highway Planting Rehabilitation	$ 1.4	$ 0.6	$ 2.0	17	Acres
Roadside Protection and Restoration	$ 0.7	$ 0.2	$ 0.9	1	Location
Roadside Rest Area Rehabilitation	$ 8.5	$ 4.0	$ 12.5	2	Locations
New Safety Roadside Rest Areas	$ 0.7	$ 0.2	$ 0.9	TBD	
ROADSIDE	**$ 11.3**	**$ 5.0**	**$ 16.3**		
Equipment Facilities	$ 0.4	$ 0.3	$ 0.7	2 Facilities in ten-year period	
Maintenance Facilities	$ 4.3	$ 2.2	$ 6.5	3 Facilities in ten-year period	
Office Buildings	$ 0.1	$ 0.01	$ 0.1	1 Facility in ten-year period	
Materials Lab	$ 2.0	$ 0.7	$ 2.7	4 Facilities in ten-year period	
FACILITIES IMPROVEMENTS	**$ 6.8**	**$ 3.2**	**$ 10.0**		
SUBTOTAL SYSTEM CONDITION	**$ 511.5**	**$ 169.8**	**$ 681.4**		
Support for development of planning documents		$ 27.2	$ 27.2		
TOTAL ANNUAL NEED	**$ 1,115.2**	**$ 429.0**	**$ 1,544.3**		

Figure 6 – 2009 Ten Year Financially Constrained Plan

B. Trends for SHOPP Funding

During the past three SHOPP programming cycles, the identified needs continued to grow, while the available funding has remained stagnant. The figure below displays the trend in the annual value of needs defined in prior ten-year plans versus the annual value of programmed projects in past programming documents. The increase in value of the ten-year need is a symptom of the age of the infrastructure, increased usage, delay of needed rehabilitation, and increased cost of meeting legal and regulatory mandates.

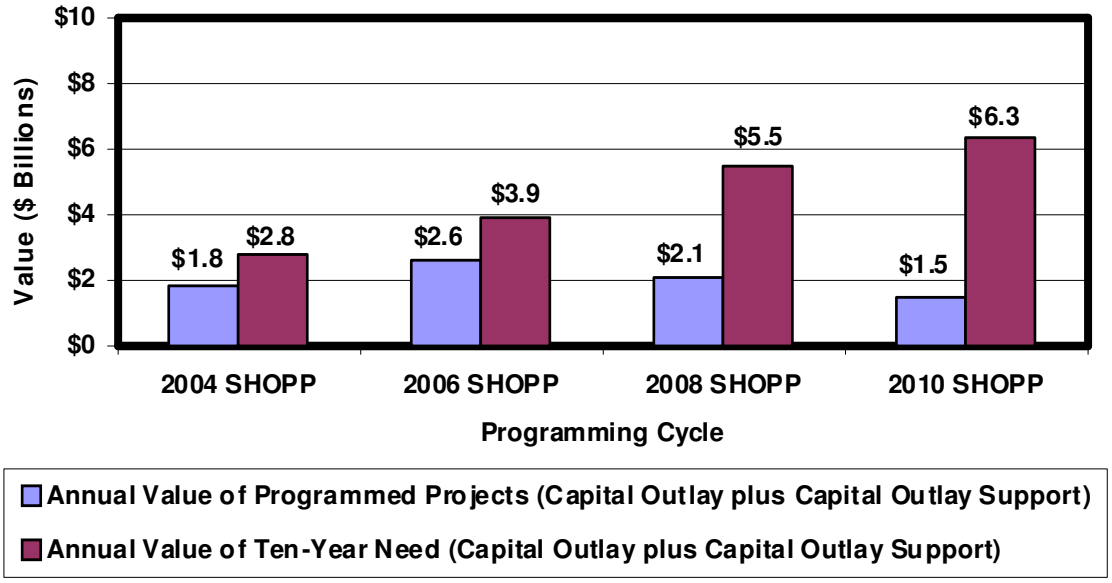

Figure 7 – Comparison of Needs versus Programmed SHOPP

Deferring necessary rehabilitation and restoration results in degraded system condition and leads to lower operational performance, higher operating costs and ultimately higher overall long-term repair costs when needed repairs are ultimately undertaken.

Furthermore, increasing construction costs reduce buying power of the limited SHOPP resources. The Highway Construction Cost Index between 1981 and 2007 is shown on the following chart. Highway construction costs increased at predictable and steady rates between 1980 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 are still significantly above levels experienced in 2003. Escalating construction costs reduce the buying power and further limit the ability of the SHOPP to effectively maintain and preserve the investment in the SHS.

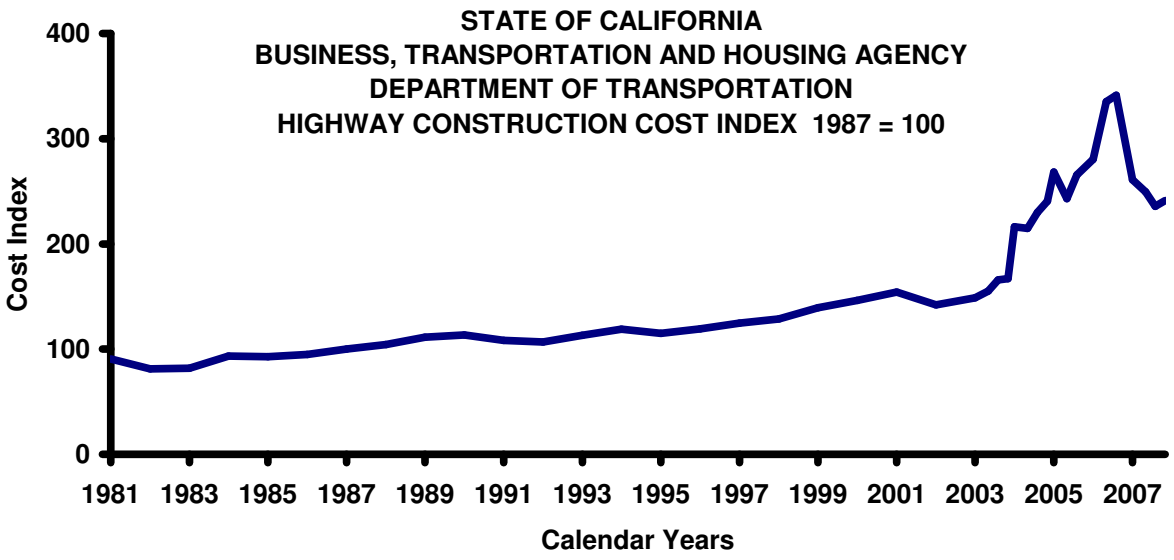

Figure 8 – Highway Construction Cost Index

In the ten-year horizon, the available SHA funding 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 the funding will be directed to meet emergency response, collision reduction, and regulatory mandates leaving a corresponding smaller percentage available for pavement, bridge, mobility, roadside, facility, and minor program needs. This condition is illustrated in the figure below.

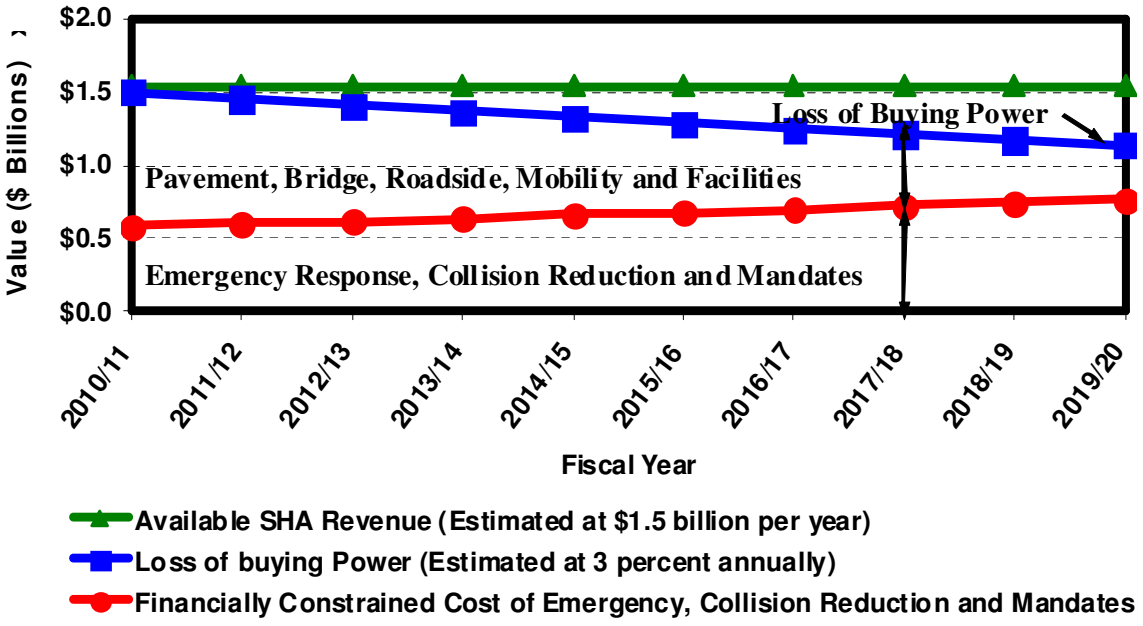

Figure 9 – Impact of Escalation on the SHOPP

C. Consequences of Constrained Funding

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

Emergency Response: Need $259 million per year, Available $147 million per year
This funding is used to respond to emergencies and other sudden, unforeseen infrastructure needs. The need of $259 million per year 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 $500 million per year, Available $355 million per year
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 savings associated with reduced collisions to 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 improvement projects.

With the available funding, immediate safety projects will be addressed. However, due to the shortfall in funding about 50 percent of collision-severity reduction projects to upgrade existing safety features will be delayed.

Legal and Regulatory Mandates: Need $730 million per year, Available $158 million per year
The mandates programs comply with various court orders, State and federal laws and regulations for stormwater, ADA, and relinquishment of redundant SHS segments to local agencies.

The following are major consequences of the funding shortfall:

- Delays in compliance with the Clean Water Act and other laws resulting in the risk of enforcement actions and court orders. (Funds 18 percent of existing stormwater permit requirements.)
- Increases in complaints by persons with disabilities, leading to possible discrimination lawsuits and federal court intervention. (Funds 10 percent of identified ADA projects.)

Mobility Improvements: Need $604 million per year, Available $66 million per year
The mobility improvements programs reduce congestion on the SHS by constructing auxiliary lanes, widening shoulders, and building weigh stations and WIM facilities. These programs also enhance the existing transportation system by providing traveler information and managing traffic flow through 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 DVHD from an estimated 712,300 DVHD in 2009 to an estimated 880,300 DVHD by 2019.
- Requires the Department to convince local and regional agencies to fund high-benefit operational improvements on the SHS.
- Delays in construction of WIM facilities, negatively affecting federal requirement to report annual WIM information.
- Closes weigh stations due to mold damage, leaking roofs, inoperable heating systems, and failed septic systems, which will adversely affect workplace conditions for California Highway Patrol personnel.

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 STIP. As stated in Section 13 of the adopted 2006 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 $176 million per year, Available $110 million per year
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 under-funded programs, including mobility improvements, pavement preservation, and drainage improvements.

The following are major consequences of the funding shortfall:

- Limits the Department's ability to respond to urgently needed projects for mobility improvements, pavement preservation, and drainage improvements resulting in more costly emergency and rehabilitation repairs in the future.
- Reduces the Department's ability to meet the 25-percent small business participation goal.

Bridge Preservation: Need $984 million per year, Available $361 million per year
The bridge programs preserve 12,559 of the State highway bridges. The available funding in the SHOPP is insufficient to address the deterioration of the bridge inventory due to aging and effects of increasing traffic, as well as seismic and scour vulnerability. Although a number of significant seismic bridge projects (5th Avenue, High Street, Schuyler Heim, and the Marina viaduct) have been programmed, representing an investment in seismic safety of over $1 billion, the current investment level will not be adequate to address future identified needs.

Major consequence of the funding shortfall will result in bridge rehabilitation or replacement needs increase from 1,060 bridges to 1,225 bridges (15 percent) over the ten-year period.

Roadway Preservation: Need $2.4 billion per year, Available $294 million per year
The roadway programs preserve the 49,677 lane miles of State highways and 205,000 drainage culverts.

The following are major consequences of the funding shortfall:

- Increases in pavement rehabilitation or reconstruction needs from 13,000 lane miles (26 percent) to 29,800 lane miles (60 percent) over the ten-year period.
- Risks to highway closures due to culvert collapse.

Roadside Preservation: Need $437 million per year, Available $16 million per year
The roadside programs address worker and motorist safety, environmental commitments, and mandates on 27,920 acres of roadside 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. The Department will not be able to address commitments to roadside safety and stewardship because of the funding shortfall. Between 1972 and 2007, 84 percent of Department employee fatalities involved maintenance employees and 35 percent of maintenance injuries involved roadside tasks.

The following are major consequences of the funding shortfall:

- Restricts ability to program new projects over the next ten years.
- Requires closure of some roadside rest areas.
- Increases the number and duration of maintenance tasks, resulting in increased worker exposure to traffic.
- Increases exposure to stormwater regulatory agency compliance fines and third-party lawsuits.
- Increases exposure to ADA and Cal/OSHA compliance fines and third-party lawsuits.

Facility Improvements: Need $132 million per year, Available $10 million per year
The facilities programs preserve the 444 buildings that support the operations and maintenance of the SHS.

The following are major consequences of the funding shortfall:

- Restricts ability to program new projects over the next ten years.
- Increases possibility of litigation and public agency citations for code violations in office buildings, materials testing laboratories, and equipment shops.
- Increases response times during winter operations because of delayed repairs to salt and sand storage facilities.

III. OTHER REQUIREMENTS

A. Process Improvements

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

- **Minor Projects Delegation.** The Commission delegated to the Department the authority to suballocate construction funds to projects that were identified at the beginning of the fiscal year. This delegation expedited advertising and award of construction for these projects by about 30 days per project.

- **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.

- **Division of Pavement Management.** The Department evaluated other states pavement organizations and developed a proposed organizational structure that includes key elements: design, rehabilitation, preservation, and pavement management. The first deliverables of the pavement management organization include a pavement management system (PMS) capable of predicting performance and the implementation of mechanistic-empirical pavement design methods. This new organization is intended to enhance the effectiveness of the limited financing available by emphasizing preservation, design life and cost effectiveness to enhance the effectiveness of the limited financial resources available to the SHOPP.

- **Contract for Delivery.** In June 2005, the Department initiated delivery contracts between the Director and District Directors to improve project delivery schedule performance for major projects planned for delivery in FY 2005-06. These contracts significantly improved on-time project delivery performance. Due to the successful experience in FY 2005-06, the delivery contracts continue to be an effective management tool to plan and execute balanced SHOPP delivery across the fiscal year.

- **Reinvestment Opportunities.** During recent years, the Department directed available SHA resources to fund additional SHOPP projects from future fiscal years whenever possible. These resources were primarily derived from savings as construction contracts were awarded for less than the amount originally programmed. In FY 2007-08, 36 projects originally planned for FYs 2008-09 and 2009-10 worth an aggregate $234 million were allocated earlier than programmed due to available savings.

B. Relationship to Other Initiatives

Five-Year Maintenance Plan

Streets and Highways Code section 164.6 also requires the Department to prepare a five-year maintenance plan that addresses the maintenance needs of the SHS. Together, the 2009 Plan and the 2009 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 five-year maintenance plan prevents the deterioration and extends the life of roadway, bridges, 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 $442,000 while the average cost for preventive maintenance is $90,000 per lane-mile. Thus, preventive maintenance results in a cost-benefit ratio of about 5:1. Similarly, the benefit ratio for structures is 12:1 ($720,000 for minor damage rehabilitation versus $60,000 for preventive maintenance), and 2:1 for drainage ($115,000 for minor damage versus $56,000 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. The table below summarizes the cost-benefit ratios for preventive maintenance of roadway, structural, and drainage elements of the SHS.

	Cost of Rehabilitation	Cost of Preventive Maintenance	Unit of Measure	Cost-Benefit Ratio
Roadway	$ 442,000	$ 90,000	Lane Mile	5:1
Structural	$ 720,000	$ 60,000	Bridge	12:1
Drainage	$ 115,000	$ 56,000	Culvert	2:1

Figure 10 – Comparison of Preventive Maintenance versus Rehabilitation Costs

The annual baseline funding for the 2009 Maintenance Plan is $412 million. This level of investment is projected to produce future SHOPP cost avoidance of approximately of $3.03 billion: $1.054 billion for pavement, $1.861 billion for bridges, and $115 million for drainage. The 2009 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 732 bridges annually, and $23 million of drainage projects to preserve 585 culverts annually.[5]

[5] 2009 Five-Year Maintenance Plan, January 2009, pages 17-19

The Highway Safety, Traffic Safety, Air Quality, and Port Security Bond Act of 2006
On November 7, 2006, the voters of the State of California passed the Highway Safety, Traffic Safety, Air Quality, and Port Security Bond Act of 2006 (Proposition 1B).

The bond act created the Highway Safety, Rehabilitation, and Preservation Account and made available $500 million for allocation by the Commission for the purposes of the SHOPP as described in Government Code section 14526.5. A portfolio of pavement rehabilitation, vehicle detection, and operational improvement projects was selected by the Department and presented to the Commission in June 2007. The majority of these projects are currently under construction.

Grant Anticipation Revenue Vehicles bond financing
GARVEE Bonds are used in the SHOPP to finance large rehabilitation and reconstruction projects that would not be afforded otherwise by the available SHA funding. GARVEE Bonds are not new money. It is a financing tool to change the timing of funding to maximize the economic benefit. This technique is advantageous when the benefits of early financing, such as reduced maintenance, reduced user-delay, and reduced construction costs outweigh the costs of bond administration and debt service. Bond financing projects today also avoids future construction cost escalation.

By policy and statute, the State may issue GARVEE Bonds up to a maximum of 15 percent of annual federal transportation funds deposited into the SHA in the State Transportation Fund for any consecutive 12-month period within the preceding 24 months. Debt service for GARVEE Bonds on SHOPP projects will become a liability for the SHA. The California State Treasurer's analyses for 2008 reports a bonding capacity ranging from a low of $1.51 billion to a high of $2.73 billion.[6] Factors affecting the bonding capacity include maturity structures, interest rates, and receipts from the FHTF.

Although bond financing allows significant infrastructure projects to be delivered to construction early, bond debt service limits future flexibility.

The Commission approved a portfolio of GARVEE-financed SHOPP projects totaling $2.18 billion in the 2008 SHOPP approved on March 13, 2008.[7]

[6] Analyses of GARVEE Bonding Capacity 2008, State Treasurer Bill Lockyer, April 2008
[7] 2008 SHOPP, California Department of Transportation, March 2008

IV. CONCLUSION

The total ten-year goal-constrained need for the rehabilitation and operation of the SHS is $63 billion for the period from FY 2010-11 through FY 2019-20. The cost is a result of the following conditions:

The need for transportation infrastructure rehabilitation and reconstruction.

- The continuing increase in vehicle travel and goods movement contribute to an increasing rate of pavement and bridge deterioration, new traffic collision concentration locations, and increasing hours of traffic congestion.
- The continuing under-funding of preservation and rehabilitation delays needed projects and ultimately increases the cost when projects are undertaken.
- The increasing price of construction has led to loss of buying power.
- The increasing cost of meeting legal, statutory and regulatory mandates.

Projected SHA funding available for the SHOPP is $1.5 billion per year, which is 24 percent of the estimated need. As funding is insufficient to preserve and maintain the existing State transportation infrastructure, the Department will focus available resources on the most critical categories of projects in the SHOPP (safety, bridge, and pavement preservation). Even with this focus, the SHS will continue to deteriorate (pavement needs growing from 26 percent to 60 percent during the next ten years). In addition, no new improvements to office facilities, repairs to safety roadside rest areas, and mobility improvements will be made.

In the absence of new revenue sources, the condition of the transportation system will continue to deteriorate, which will result in closure of safety roadside rest areas and other consequences as presented in the Plan.

Appendix A - Requirements of Streets and Highways Code Section 164.6 and Government Code Section 14526.5

The Plan represents the State rehabilitation plan as required by Streets and Highways Code section 164.6 and Government Code section 14526.5.

Text of 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.

Text of 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 - Description of the Elements in Each SHOPP Category

Emergency Response Category

Emergency response has three elements – Emergency Opening, Permanent Restoration, and Roadway Protective Betterments.

Major Damage – Emergency Opening - The primary purpose of this element is to reopen facilities damaged or 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 activities 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.
- Drainage facilities needed to forestall immediate threat of additional washout or erosion replacement of traffic safety devices (such as guardrail, signals, etc.) when lost due to catastrophic damage.

It is expected that emergency opening projects 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 the Department to allocate funds for emergency projects.

Major Damage—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. The typical scope for such projects may 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 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.

Protective betterments 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

Collision reduction 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 such as, but not limited to:

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

The element also includes projects that meet the warrant for study program criteria and following an analysis, 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. Projects will include:

- Installation of new guardrail end treatments and crash cushions.
- Install rumble strips, glare screen, rock fall mitigation, 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.).

The intent of this program is to be proactive in enhancing the safety of the SHS. As such, this program will not be subject to an SI analysis, but rather will define numeric quantities that will be achieved for each of the categories of situations. Projects will be prioritized based on the projected collision severity reduction benefits.

Roadside Safety Improvements. The primary purpose of this program element is to reduce the frequency and duration of highway workers' exposure to traffic by providing features to reduce recurrent maintenance activities and safe access.

Typical project elements 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.
- Inert materials for slopes and low-visibility areas.
- Access gates, staircases, trails for light-duty vehicles, and maintenance vehicle pullouts.

Legal and Regulatory Mandates Category

This 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 that are considered to be "in the best interest of the State."

Stormwater Mitigation. The primary purpose of this element is to ensure that the Department's stormwater discharges to the waters of the United States and the State meet applicable water quality standards. The purpose of this program element is to construct stormwater mitigation projects that arise from judicial and regulatory orders, or improvements that comply with the Department's National Pollution Discharge Elimination System (NPDES) permits.

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

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

Bridge Preservation Category

This 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 based on bridges with the most urgent needs and the highest benefit cost ratios.

Included is work to meet standards as required under ADA and Cal/OSHA, 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 for 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 program 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. The program will identify the number and locations of noncrashworthy rails and develop an implementation plan to bring these rails to the current 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 or 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/overweight vehicles and loads on major State highways.

Roadway Preservation Category
The roadway preservation category has four elements - Roadway Rehabilitation, Pavement Rehabilitation, Long-Life Pavement Rehabilitation, and Drainage System Restoration.

The historic goal of the Department 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. The primary purpose of this element is to rehabilitate roadways that ride rougher than established maximums or exhibit substantial structural problems. Work incidental to pavement rehabilitation or replacement of other highway appurtenances which are failing, worn out, or functionally obsolete, such as drainage facilities, retaining walls, lighting, signal controllers, and fencing may be included.

A roadway or appurtenance that is rehabilitated under this task should normally provide ten years or more of service life with relatively low maintenance expenditures. 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 PMS criteria.

Pavement Rehabilitation. The primary purpose of this element is to provide corrective maintenance for pavement under the Capital Preventive Maintenance (CAPM) guidelines. This task may be used to correct pavement distress as an intermediate fix until the full roadway rehabilitation project may be delivered. The expected life of a CAPM project is five to seven years.

Pavement Rehabilitation projects must qualify on the basis of existing PMS guidelines. Traffic safety and other operational improvements will not be added to pavement preservation work. Other work (geometric corrections, widening, etc.) is typically not added to a Pavement Rehabilitation project.

Long-Life Pavement Rehabilitation. The primary purpose of this element is to implement Long-Life Pavement Rehabilitation corridors on roadways where the average daily traffic is greater than 150,000 vehicles and 50,000 average daily truck traffic.

Long-Life Pavement Rehabilitation has provision of extending the service life of the pavement to at least twice the normal rehabilitation project and will upgrade the existing corridor to current federal standards. Other roadway improvements, such as signing and lighting upgrades, traffic safety, and operational improvements may be added to this work if justified by vehicle collision statistics or are required by federal standards to qualify the project for federal funding. The expected life of a long-life pavement is 20 to 40 years.

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 which have lost serviceability due to 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.

Mobility Improvement Category

The mobility improvement category has three elements – Operational Improvements, Transportation Management Systems, Weigh Stations, and WIM Facilities.

Operational Improvements. The primary purpose of this program 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 STIP Guidelines, State highway operational improvements that do not expand the design capacity of the system and are intended to address spot congestion are eligible for SHOPP. Regions may nominate these types of projects in their RTIP if timely implementation through the SHOPP is not possible.

Operational Improvement projects include, but are not limited to:

- Interchange modifications (but not to accommodate traffic volumes that are significantly larger than the existing facilities were designed for).
- Ramp modifications (acceleration - deceleration/weaving).
- Auxiliary lanes for merging or weaving between adjacent interchanges.
- Curve corrections/improve alignment.
- 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 systemwide 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.

Transportation Management System projects include, but are not limited to:

- Traffic sensors.
- Changeable message signs.
- Close circuit television cameras.
- Ramp meters.
- Communications systems and highway advisory radio.

- Traffic signal interconnect projects.
- Traffic Management Centers, including the necessary computer software and hardware.

Weigh Stations and Weigh-in-Motion Facilities. The primary purpose of this element is to provide for Commercial Vehicle Enforcement Facilities (commonly called weigh stations) and WIM 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 our highways from premature damage.

The WIM sites provide data for federally required data systems and special studies, design and maintenance strategies, size and weight policies, enforcement and planning strategies, and the traffic and truck volumes publications.

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 mandates, reduce highway facility life-cycle costs and improve worker safety.

Typical project elements include:

- Fish and wildlife preservation and protection.
- Experimental or new features, treatments, and practices.
- Historical markers and information systems such as logo signs.
- Elimination of qualifying junkyards.
- Nonconforming outdoor advertising sign removal.
- Roadside ecological viewing areas.
- Scenic enhancements.
- Compliance with Surface Mining and Reclamation Act of 1975 requirements.
- Rehabilitation of vista points.
- Relinquishment of environmental mitigation sites.

Highway Planting Rehabilitation. The primary purpose of this element is to provide for replacement, restoration, and rehabilitation of existing highway plantings to an economically maintainable state following damage by weather, acts of nature, or deterioration.

This program also provides for erosion control to comply with NPDES permit requirements, design for 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 program element is to correct deficiencies and restore existing safety roadside rest areas to a safe and healthy condition. Project scope may include:

- Operational improvements.
- Capacity expansion (parking and comfort stations).
- Existing comfort stations or other structural elements rehabilitation or replacement.
- Facility upgrades to meet health and safety codes and the ADA and Cal/OSHA requirements.
- Maintenance facilities, crew room, and office space for California Highway Patrol.
- Sewage system, water supply, and electrical system upgrades.
- Ramp upgrades to current design standards.
- Existing safety roadside rest areas relocation.
- Auxiliary facility construction where expansion and upgrading at an existing site is not feasible.

New Safety Roadside Rest Areas. The primary purpose of this element is to provide for new, conveniently spaced safety roadside rest areas 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 safe.

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, for example, 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, ADA, and Cal/OSHA requirements, and to improve operational efficiency. The facility improvement category has four elements: Equipment Facilities, Maintenance Facilities, Office Buildings, and Materials Laboratories.

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

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

At these facilities, mechanics repair and maintain the Department’s fleet of equipment, for example trucks, pickups, loaders, and snowplows.

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

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

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

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

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