A single plan

Redefining the way projects are selected

The 2017 State Highway System Maintenance Plan (SHSMP) represents a significant departure in the way Caltrans lays out its plans to care for the existing transportation system for the decade ahead. It pulls together for the first time the 10-year State Highway Operation Protection Plan and Five-year Maintenance Plan, creating an integrated document that is expected to be the first in the nation to meet federal performance-management regulations.

When the SHSMP is released in late January 2017, it will represent a notable shift in Caltrans planning — from a program-by-program approach to a system-wide method. And it will clearly link maintenance and rehabilitation projects with strategic objectives.

The plan is intended to illustrate how individual projects help meet specific goals in the department's Strategic Management Plan. It likewise gives more details about the precise needs and investments in each of the strategic areas.

Caltrans is required by state law to update its maintenance and rehabilitation plans every two years. The SHSMP fulfills that requirement and satisfies many of the standards set by the Moving Ahead for Progress in the 21st Century Act (MAP-21), which requires departments of transportation in all 50 states to implement a comprehensive transportation asset management plan.


Caltrans photos by Steven Hellon

These new measures change the way existing conditions are reported. For example, measuring bridge health in square-foot increments rather than by entire structures will help decision makers compare the benefits of proposed bridge rehabilitation projects.

When the SHSMP is released in late January 2017, it will represent a notable shift in Caltrans planning — from a program-by-program approach to a system-wide method.

The needs assessment portion of the plan will explain what it would take to meet specific performance targets in each of the transportation system's 34 objective areas.

Caltrans is expected to present the SHSMP to the California Transportation Commission (CTC) in January 2017. The final plan will go into effect July 1.

California, like many states, has no plans for major system expansion. Instead, it is increasingly focused on the kind of repairs and upgrades that will maximize safety conditions and efficiency of the existing system.

Caltrans applies this fix-it-first approach to the operation and maintenance of 50,000 state highway lane-miles, more than 13,000 bridges and more than 200,000 drainage structures.

It is critical to use rehabilitation dollars on projects that provide the best benefit, because the costs of repairing the system far exceed the funds available to do so. The SHSMP is designed to stem deterioration of the state highway system and avoid closures and more expensive repairs in the future.

Good/Fair/Poor

The CTC in October approved performance goals based on the "good-fair-poor" rating system on the state's four biggest asset classifications. The SHSMP will use the new rating system to determine what it would cost to close the gap between current conditions and established goals.

For example, reaching performance targets for bridges would take about $550 million a year, an increase of about $155 million. The same kind of gap between needs and resources exists for virtually every class of assets on the transportation system.

The CTC adopted the good-fair-poor system to conform to requirements of the MAP-21 and the Fixing America's Surface Transportation Act (FAST Act), which require the development of a transportation asset management plan with national performance measures for pavement and bridges. Caltrans had previously begun measuring its culverts and Intelligent Transportation Systems (ITS) using a similar good/fair/poor rating system.

Examples of Targets and Current Conditions for Asset Classes

Asset Class	Units	Good		Fair		Poor	
		Current	Target	Current	Target	Current	Target
Culverts	Length	65%	80%	23.5%	10%	11.5%	10%
ITS Elements	Each	64.5%	90%	Not Applicable		35.5%	10%

These are the current conditions and targets for bridges and culverts. Similar performance goals will be set for pavement and bridges, beginning in 2017.

Transportation departments in all 50 states have until April 2018 to adopt the new ratings for bridges and pavement, so it will be possible to know exactly how well those assets in California compare with those in the other states.

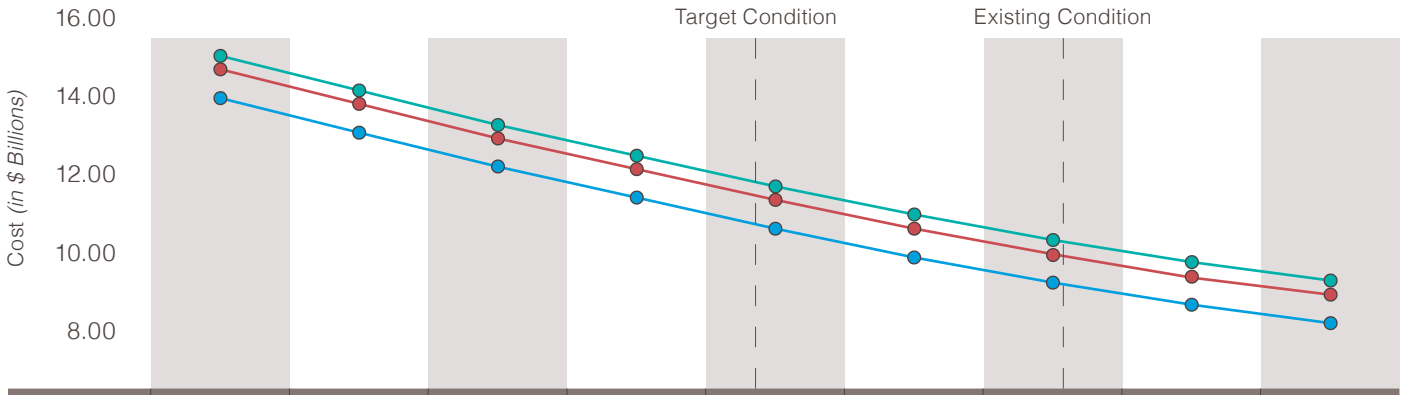
These new measures and targets differ from all prior SHOPP plans and are not directly comparable. The federal government is scheduled to release the specific technical guidelines for the new rating system in December 2016.

It is important to note, too, that a "poor" rating in any of the asset classes does not mean "unsafe." Any Caltrans asset found to be unsafe would be immediately closed and repaired.

The targets attempt to strike a balance between cost and performance analysis, recognizing, for example, the practical realities that make achieving a zero-percent "poor" condition impossible. At the same time, the goal is to move much more of Caltrans assets from "poor" and "fair" into a "good" rating.

Of course, there's a cost associated with that goal, which is most easily explained by taking a closer look at pavement preservation and rehabilitation, which represents the single largest asset class investment in the SHOPP. More than half of state-managed pavement is considered Class 1, which is made up of 26,000 miles of interstates, principal arterials and urban freeways and expressways. Like

Pavement — Class 1: Performance-Cost Curve



Fair Target	20	25	30	35	40	45	50	55	60
Poor 1%	15.62	14.75	13.88	13.09	12.30	11.58	10.93	10.37	9.90
Poor 2%	15.27	14.39	13.52	12.73	11.94	11.22	10.57	10.01	9.54
Poor 4%	14.54	13.66	12.80	12.01	11.22	10.49	9.85	9.29	8.82

This chart illustrates how improving Class 1 pavement (used on interstates, other principal arterials and urban freeways and expressways) from 4 percent "poor," which is the current condition, to 1 percent (goal), will cost the state billions of dollars over a decade.

Estimated SHOPP Funds Needed to Achieve Recommended Unconstrained Targets

Asset Class	Proposed 2017 Ten Year Plan (Annual Estimates)	2015 Ten Year Plan (Annual Estimates)
Pavement	$1.86 Billion	$2.0 Billion
Bridges	$0.55 Billion	$0.40 Billion
Culverts	$0.26 Billion	$0.49 Billion
ITS Elements	$0.19 Billion	$0.19 Billion
Total	**$2.86 Billion**	**$3.09 Billion**

This table summarizes the estimated SHOPP funds that will be needed to achieve the recommended unconstrained targets.

all other asset classes, the "poor" targets are set very low to minimize risk and improve the ride quality. The fair target for all assets consider life-cycle cost, unit cost, deterioration rates and typical project delivery time periods.

As seen in the chart illustrating the 10-year plan for such pavement (page 23), improving Class 1 pavement from 4 percent "poor," which is the current condition, to 1 percent (goal), will cost the state billions of dollars over a decade.

Not all asset classes will be similarly affected. Costs are expected to drop from the 2015 plan to achieve the targets set for culverts, for example. This change is being influenced by a more complete inventory (see story, page 16) and by changing performance units from a simple count to linear feet and changes in the "fair" condition target.

Other similar variations are expected in all Caltrans assets as the department reaches full implementation of its asset management plan by 2020. MM

Source: *State Transportation Asset Management Engineer Michael B. Johnson*

Pavement: Examples of Good, Fair, Poor

Following the new MAP-21 federal guidelines, pavement condition is rated using specific technical criteria to measure roughness, cracking, rutting and faulting.

Bridges: Examples of Good, Fair, Poor

Following the new MAP-21 federal guidelines, bridge condition is rated using specific technical criteria for the deck, superstructure, substructure and culverts. Three Northern California bridges were chosen to illustrate "good," "fair" and "poor," although from a distance the reasons for the ratings are difficult to detect. These bridges are, from left, the Miner Slough bridge over the Sacramento River on State Route 84 in Solano County; the Capell Creek Bridge in Napa County; and the Benicia Viaduct 23-0143L, in the North Bay.