

Transportation Management Systems 8 Resilience 10 Bike/Ped Progress 24

Mile Marker

A Caltrans Performance Report - Fall/Winter 2019

LESSONS OF THE
LOMA PRIETA EARTHQUAKE



[Home](#) [Programs](#) [Public Affairs](#) [Mile Marker](#)[Mile Marker: A Caltrans Performance Report, Winter 2019-2020](#)[Director's Message](#)

Director's Message



Toks Omishakin
Caltrans Director

Hello Caltrans, members of the State Legislature and all citizens of California. Thank you to all who have shared their best wishes after I was sworn in as the 33rd director of California's Department of Transportation. I am very appreciative that Gov. Gavin Newsom selected me to lead this great organization at such a pivotal moment for our state and society.

When I think about what will guide our state transportation system through the coming years, I believe Caltrans' existing mission statement perfectly serves this role. This is for Caltrans to provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability. This mission should propel each member of Caltrans every single day.

First, safety must remain our most important priority. "Toward Zero Deaths" is the right goal, and this includes zero deaths for anyone who uses or works on our transportation system. Presently, 10 individuals die every day on our state highways. We can do more, including better protecting our most vulnerable users such as bicyclists, pedestrians and scooter operators – of whom at least one dies on our state highways each day.

In terms of sustainability, we are all very aware of Gov. Newsom's commitment to reducing greenhouse gas (GHG) emissions. Given that the transportation sector accounts for about 40 percent of all statewide GHG emissions, a key to meeting our state goal will be creating a more integrated multimodal system. In the coming weeks and months, we will continue to take steps toward enhancing and strengthening our approach for creating a more multimodal state transportation system.

Related to both, I was happy to see \$146 million awarded this summer from the Low Carbon Transit Operations Program to 180 local public transit projects statewide. These projects help reduce GHG emissions by increasing the convenience, capacity and ridership of buses and trains around the state. Equally notable, most of the money goes to low-income, disadvantaged communities and households most affected by poor air quality.

And the last important element in our mission is to continually strive to be more efficient. With Caltrans' \$15 billion budget, it's critical we spend that money appropriately. This includes all money raised through the Road

Repair and Accountability Act of 2017, or Senate Bill 1 (SB 1). Every dollar we can save through an innovative new process or technique becomes money available for starting other vitally needed system investments.

Toward this end in the last fiscal year, Caltrans more than doubled its legislative mandate to find \$100 million in annual SB 1 efficiency savings by identifying nearly \$233 million in efficiencies. This track record bodes well, as the amount of Caltrans' work available for bid has grown significantly to \$5.5 billion in the current 2019-2020 fiscal year.

It's efforts such as these that make me so proud to lead this organization, and I know all the success Caltrans achieves will only happen through our combined efforts as a well-oiled and well-aligned team.

Last, I wish to recognize Bob Franzoia for serving so ably as Caltrans Acting Director. In his four-month tenure, he led this organization of 20,000 employees through a significant double earthquake in Ridgecrest, a major public safety power shutoff, and a nationwide search for his successor. On behalf of Caltrans, thank you for your wise and steady leadership, Bob.

- › [Director's Message](#)
- › [Shining a Light on Culvert Conditions](#)
- › ['Signals, Signs and Sensors' High on Fix-It List](#)
- › [New Life for Old Stretch of 99](#)
- › [Mileposts](#)
- › [After the Devastation, a Safer Highway System](#)
- › [Search for Cost Savings Pays Off](#)
- › [Taking a Turn Toward Active Transportation](#)
- › [Construction Turns to Tablets for Efficiency](#)
- › [Plan Identifies Highway System Needs, Fixes](#)
- › [New Inspector General Keeps Watch](#)

Statewide Campaigns

- › [ADA Access](#)
- › [Adopt-A-Highway](#)
- › [Amber Alert](#)
- › [Be Work Zone Alert](#)
- › [CAL FIRE](#)
- › [Cal OES: Power Outage and Fire Recovery Resources](#)
- › [California Climate Investments](#)
- › [California Connected](#)
- › [California Transportation Plan 2050](#)
- › [Clean California](#)
- › [REAL ID](#)
- › [Energy Upgrade](#)
- › [Save Our Water](#)

▶ [Go Safely California](#)

▶ [HeatReadyCA.com](#)

▶ [Move Over Law](#)

▶ [Stormwater Education Campaign](#)

▶ [Tenant and Landlord Resources](#)

▶ [Unclaimed Property](#)

[Back to Top](#)

[Accessibility](#)

[Privacy Policy](#)

[Conditions of Use](#)

[Register to Vote](#)

[f Facebook](#) [Twitter](#)

Copyright © 2024 State of California

[Home](#) [Programs](#) [Public Affairs](#) [Mile Marker](#)[Mile Marker: A Caltrans Performance Report, Winter 2019-2020](#)

Shining a Light on Culvert Conditions

Shining a Light on Culvert Conditions

Caltrans Steps Up Inspections of Unheralded but Key Part of Highway System



It's kind of cute, and reminds one of a movie character, but this remote-controlled roving probe inside the dark, watery interior of a Caltrans culvert. Operators get a clear view condition as part of statewide inspection program.

Culverts are an unsung hero of the state transportation system. Often out of sight and attracting little attention, culverts channel streams and stormwater under roadways and protect them from the destructive forces of flooding and erosion — supporting the safety of the traveling public above.

Caltrans has been steadily inspecting culverts in the State Highway System, many of them more than a half-century old, and anticipates completing the first round of statewide inspections within the next four years. The Road Repair and Accountability Act of 2017 (Senate Bill 1) mandates that 90 percent of Caltrans culverts be in good or fair condition by 2027.

The [Caltrans Independent Office of Audits and Investigations](#) also emphasized the importance of completing the culvert inspection program, and conducting re-inspections, in its April 2018 audit report on SB 1 performance outcomes.

All 12 Caltrans regional districts completed the inventory of culverts in their regions by end of 2018. Culvert inspections are planned and conducted at the Caltrans district level.

Altogether, there have been 212,181 culverts counted as part of the State Highway System, and 145,391 inspections conducted up through the 2018-19 fiscal year, which ended June 30. Of those culverts inspected, 66.3 percent (96,443 culverts) were in good condition and required no repairs,

and 22.6 percent (32,793) needed only corrective maintenance or minor repairs and were rated “fair.” Another 11.1 percent (16,155) fell into the “poor” category, requiring major rehabilitation or replacement.



Left: A camera mounted on the culvert robot allows Maintenance Supervisor Tom Sh conditions. **Right:** Robots can perform inspections in tight spots. Maintenance Super into a culvert on SR 152.

In the past fiscal year, Caltrans crews inspected 15,533 culverts and found that 75.4 percent (11,704), were in good condition, 13.4 percent (2,087) fair, and 11.2 percent (1,742) were in poor shape.

The good-fair-poor ratio of culverts is expected to remain approximately the same as the remaining inventory is assessed. However, the number and percentage of culverts deemed as good or fair is expected to increase with repairs funded by SB 1 and other revenue sources.

Caltrans’ Division of Maintenance, which oversees the culvert program, also has put in place a performance plan to complete statewide inspections by 2023 in line with the audit recommendations. In addition, 145 more positions were created to augment the existing culvert inspection crews statewide, expected to expedite the inspection process and perform cleanings/repairs to comply with the 2023 completion target.

The work is being tracked on a monthly basis to gauge progress toward SB 1 goals.

To meet the SB 1 performance goal, Caltrans estimates it will spend about \$412 million annually over the next decade to ensure that 90 percent of the system’s culverts are in good or fair condition. SB 1 will be the main funding source for drainage asset needs.

Inspectors rate the culverts as being either good, fair or poor through a 100-point system. Alignment, joints, materials, shape and capacity are assessed. When inspections reveal compromised functionality, solutions range from simply unclogging the culvert to making costly repairs or replacement.

Failed culverts can present hazards for motorists, cause traffic delays, require costly repairs and interrupt the transportation system. Culvert failures also can damage the surrounding environment. Debris and sediment from a culvert failure can clog streams and creeks and impede migrating fish.

Culverts fail over time for various reasons, including usage, age and environmental conditions. Some common causes for culvert failures are clogs, pipe damage, road washouts, rusted or failed culvert bottoms,

cracked concrete, exposed or corroded reinforcing steel, joint separation and backfill infiltration.

See culvert inspectors in action in [Caltrans News Flash No. 44](#) .



Robots spare their human controllers the claustrophobic experience of venturing down water and unknown inhabitants. Caltrans has counted 212,181 culverts in its system, precast concrete box structures.

Source: *Office of Stormwater and Environmental Compliance, Caltrans
Division of Maintenance*

- › [Director's Message](#)
- › [Shining a Light on Culvert Conditions](#)
- › [‘Signals, Signs and Sensors’ High on Fix-It List](#)
- › [New Life for Old Stretch of 99](#)
- › [Mileposts](#)
- › [After the Devastation, a Safer Highway System](#)
- › [Search for Cost Savings Pays Off](#)
- › [Taking a Turn Toward Active Transportation](#)
- › [Construction Turns to Tablets for Efficiency](#)
- › [Plan Identifies Highway System Needs, Fixes](#)
- › [New Inspector General Keeps Watch](#)

Statewide Campaigns

- › [ADA Access](#)
- › [Adopt-A-Highway](#)
- › [Amber Alert](#)
- › [Be Work Zone Alert](#)
- › [CAL FIRE](#)
- › [Cal OES: Power Outage and Fire Recovery Resources](#)
- › [California Climate Investments](#)
- › [California Connected](#)
- › [California Transportation Plan 2050](#)

- ▶ [Clean California](#)
- ▶ [Energy Upgrade](#)
- ▶ [Go Safely California](#)
- ▶ [HeatReadyCA.com](#)
- ▶ [Move Over Law](#)

- ▶ [REAL ID](#)
- ▶ [Save Our Water](#)
- ▶ [Stormwater Education Campaign](#)
- ▶ [Tenant and Landlord Resources](#)
- ▶ [Unclaimed Property](#)

[Back to Top](#)

[Accessibility](#)

[Privacy Policy](#)

[Conditions of Use](#)

[Register to Vote](#)

[f Facebook](#) [🐦 Twitter](#)

Copyright © 2024 State of California

[Home](#) [Programs](#) [Public Affairs](#) [Mile Marker](#)[Mile Marker: A Caltrans Performance Report, Winter 2019-2020](#)[‘Signals, Signs and Sensors’ High on Fix-It List](#)

‘Signals, Signs and Sensors’ High on Fix-It List

Function of Vast Highway Network Tied to Transportation Management Systems



Caltrans engineer David Busler inspects a closed circuit television camera that monitors a designed model with a retractable assembly that allows crews access to the unit with more than 3,000 cameras watching for incidents and traffic flow.

Largely unseen by travelers, Caltrans maintains a massive, interconnected grid of electrical devices and hardware that reduce highway user delays, provide real-time information about traffic conditions, and collect information on traffic behavior to help forecast trends and plan projects.

These components make up Caltrans’ Transportation Management Systems, performing critical functions that help the Department keep people, vehicles and goods moving. Known as TMS for short, these systems have been designated as one of the four priority areas of highway operations that are receiving money through the Road Repair and Accountability Act of 2017 (Senate Bill 1).

Under SB 1, Caltrans is responsible for repairing or replacing about 7,700 signals, signs and sensors in its TMS system by 2027. “Signals, signs, and sensors” is SB 1 shorthand for all nine TMS element types, which are closed circuit televisions, changeable message signs, traffic monitoring detection stations, highway advisory radios, freeway ramp meters, roadway weather information systems, traffic signals, traffic census stations, and extinguishable message signs. Completing those fixes in the next eight years will help achieve the 90 percent good condition goal for TMS equipment required by the new law.

It's a high bar, considering the complexity of the system and the amount of work required, but Caltrans has been making steady progress toward improving the program in just a few years since SB 1's passage. The strategy to bring Caltrans' TMS units into a state of 90 percent good condition involves managing the functional uptime and life cycle condition of TMS units.

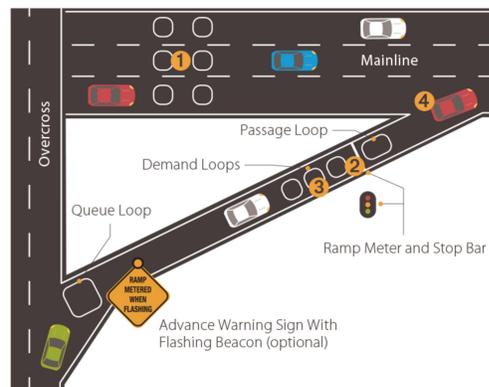
According to an August 2019 performance report compiled by Caltrans' Division of Traffic Operations, more than 67 percent of all TMS types on average are in good condition, while 33 percent are in poor condition (either beyond expected life cycle or have failed uptime criteria). While 74 percent of Caltrans' freeway detectors were working and classified in good condition, the statewide network of ramp meters was performing better overall, with 79 percent in good condition. Meanwhile, the inventory of changeable message signs is meeting performance targets with 90 percent in good condition.

To meet the double challenge of keeping these systems in good condition and optimally performing through their life cycle, the Department's Divisions of Traffic Operations and Maintenance realigned their roles so that Traffic Operations can focus on improving life cycle condition, while Maintenance can address functional uptime performance. The change in TMS management structure within Caltrans is expected to yield program benefits.

Traffic Operations engineers are responsible for establishing TMS operational and technology standards, asset management and life cycle replacement, installation or commissioning of new locations, and operation of the TMS infrastructure. Maintenance engineers oversee proactive monitoring and system health checks, asset inventory, troubleshooting and repair, minor equipment replacement and service restoration for TMS field elements and related communications systems. Maintenance engineering teams have become more proficient at monitoring true system performance by flagging TMS units that are in construction zones and vulnerable to disruptions. Those engineers are now focused on developing more proactive measures to stay ahead of functional problems. Not taking life cycle age into account, 75 percent of traffic monitoring detection stations are functioning with acceptable uptime while overall TMS uptime is at 89 percent.

How Ramp Metering Works

- 1 Speed, occupancy data continuously collected from mainline loop detectors.
- 2 Vehicle pulls up to stop bar.
- 3 Vehicle detected, signal turns green.
- 4 Vehicle merges onto freeway.



1. Speed, occupancy data continuously collected from mainline loop detectors.
2. Vehicle pulls up to stop bar.
3. Vehicle detected, signal turns green.
4. Vehicle merges onto freeway.

Thousands of components working together

Today's systems, subsystems and individual units often are highly interdependent, meaning that a single malfunction can critically impair intended traffic operations. Information from those sources is relayed via fiber optic lines and leased network and wireless services to Caltrans' transportation management centers, which serve as the nerve centers for highway operations throughout the state.

The field systems connect with a linked network of computer servers and communications software that allow real-time management of the vast state highway network, including complex integrated corridors such as those in the greater Los Angeles and San Francisco Bay areas that accommodate heavy flows of passenger and freight traffic.

Of the nine official categories of TMS units, traffic signals, traffic monitoring detection stations, and freeway ramp meters make up the majority. As of August 2019, the Caltrans TMS Inventory Database includes approximately 5,300 traffic signals, 5,000 detection stations (consisting of over 40,000 individual sensors), and 3,000 ramp meters that count and regulate traffic to as part of the operation of the State Highway System.

Traffic monitoring detection stations, using either in-pavement loop detectors or off-pavement radar, make up about 75 percent of Caltrans' total TMS inventory and represent the largest challenge to keep functioning. These stations are used to monitor overall traffic movement, measure and report travel times, and harmonize traffic flow through advanced corridor and ramp metering systems. Vehicle detectors also allow traffic signals and freeway ramp meters to control the signal timing of traffic entering the highway intersections or freeway ramps. While all TMS units are equally susceptible to the impacts of wire theft, in-pavement loop detectors are the most vulnerable to damage due to construction activities since they are not easily visible.



Extinguishable Message Signs alert motorists of specific road conditions. There are more than 700 such signs along state highways.

Constant monitoring required

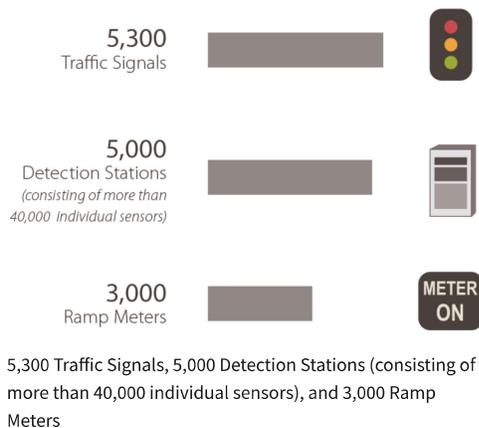
Monitoring a TMS system of the size and complexity of Caltrans' is an enormous task, a far cry from the early 1970s when the first ramp meters were installed in the Los Angeles area. More than 80,000 preventive maintenance checks and repairs are performed annually to ensure maximum TMS operability. In addition to using its Division of Maintenance crews, Caltrans also utilizes on-call private service contracts for overflow work or repairs to more specialized parts of the TMS network, such as wireless units, fiber optic equipment, and communication hubs.

Caltrans primarily relies on an automated reporting system to track the condition of its traffic monitoring detection station infrastructure. The Performance Measurement System (PeMS) is a web-based system that displays traffic data on a map collected in real-time from more than 40,000 individual detectors. These sensors span the freeway systems across all major metropolitan areas of the state.

PeMS automatically generates reports on the health of the detector sensors, but other parts of the TMS system require visual inspections. Failures are logged into an overall reporting system that provides equipment uptime status.

August 2019 TMS Inventory By the Numbers

Traffic signals, traffic monitoring detection stations, and freeway ramp meters make up the majority of components under Caltrans' Transportation Management Systems (TMS).



Forecasting what parts might fail

For Caltrans, forecasting the expected life and functionality of TMS elements is key to improving the overall system and achieving SB 1 performance targets. However, developing deterioration rates or models for TMS units, particularly planning for electronic components that can suddenly fail without warning, is complex, and the technology is constantly changing. Overall life cycles for TMS units range from 10 to 25 years. More than 30 percent are operating beyond their expected life cycle.

Continuous investment in TMS infrastructure is required to maintain functionality by replacing and updating obsolete equipment, according to Caltrans' 2019 State Highway System Management Plan. Thankfully, SB 1 revenues are delivering a much-needed boost to upgrade the system. The TMS program received \$216 million in funding in 2019, more than double the \$85 million allocated in 2015 prior to the passage of SB 1. This funding is focused on improving the health of traffic monitoring detection stations.

Technological improvements of individual components are expected to improve overall TMS performance, and collection methods also are expanding. Caltrans has traditionally relied on its TMS infrastructure to collect the necessary data to operate and monitor highways.

Recently, the Department has been exploring the option of purchasing traffic information from outside companies that collect data information through driver cellphone location or in-vehicle units to augment Caltrans' traffic data. While purchased data can readily be used to provide overall travel times, it cannot deliver all traffic data needs where specific lane volumes and vehicle classifications are necessary. The future model will likely include a hybrid of purchased and physical infrastructure for detection purposes.

Caltrans is piloting the use of "purchased data" in three regional districts to obtain traffic information in more remote areas where the cost of installing conventional, hard-wired detection devices is prohibitive. The travel time data is stripped of any personal identifying elements and packaged to provide the contracted information. The trial use of this mode of traffic information shows promise for reducing the reliance on Caltrans' TMS infrastructure in the future.

Areas of need identified, addressed

Outside analysis of the TMS program also helped zero in on ways to improve performance and identify problem areas that previously held up progress. A performance audit of the TMS program by

[Caltrans' Independent Office of Audits and Investigations](#) was conducted in the 2017-2018 fiscal year, and found that highway infrastructure components had not been accurately counted or catalogued at a district level. Without a reliable description of those TMS assets, auditors said, establishing an SB 1 performance baseline or future goals would be difficult.

TMS program managers implemented audit recommendations to update the number, type and condition of components in the TMS inventory and keep those counts current. Those improvements have been implemented, auditors noted earlier this year. Further work to provide more definitive guidance on project scope and treatment requirements to meet performance objectives is underway, which will improve the accuracy and integrity of the TMS asset management program — ensuring that SB 1 asset management goals and performance targets are met.



Under the squares cut into the pavement are ramp metering sensors called loop detectors that measure traffic density to control the number of vehicles merging onto the main freeway. The roadway infrastructure system managed by Caltrans.

Source: *Monica Kress, Deputy Chief (Mobility), Division of Traffic Operations; Stan Slavin, Transportation Management Systems Performance Strategy Manager, Division of Traffic Operations; Patrick Leung, Acting Chief, Office of Transportation Management Systems, Division of Traffic Operations; John L. Castro, Chief, Traffic Signals & Ramp Metering Branch, Division of Traffic Operations; Jas Bhullar, Chief, Office of Traffic Systems Maintenance, Division of Maintenance; Caltrans 2019 State Highway System Management Plan; Caltrans Independent Office of Audits and Investigations*

- › [Director's Message](#)
- › [Shining a Light on Culvert Conditions](#)
- › 'Signals, Signs and Sensors' High on Fix-It List
- › [New Life for Old Stretch of 99](#)
- › [Mileposts](#)
- › [After the Devastation, a Safer Highway System](#)
- › [Search for Cost Savings Pays Off](#)
- › [Taking a Turn Toward Active Transportation](#)
- › [Construction Turns to Tablets for Efficiency](#)
- › [Plan Identifies Highway System Needs, Fixes](#)
- › [New Inspector General Keeps Watch](#)

Statewide Campaigns

- › [ADA Access](#)
- › [Adopt-A-Highway](#)
- › [Amber Alert](#)
- › [Be Work Zone Alert](#)
- › [Cal OES: Power Outage and Fire Recovery Resources](#)
- › [California Climate Investments](#)
- › [California Connected](#)
- › [California Transportation Plan 2050](#)

▶ [CAL FIRE](#)

▶ [Clean California](#)

▶ [Energy Upgrade](#)

▶ [Go Safely California](#)

▶ [HeatReadyCA.com](#)

▶ [Move Over Law](#)

▶ [REAL ID](#)

▶ [Save Our Water](#)

▶ [Stormwater Education Campaign](#)

▶ [Tenant and Landlord Resources](#)

▶ [Unclaimed Property](#)

[Back to Top](#)

[Accessibility](#)

[Privacy Policy](#)

[Conditions of Use](#)

[Register to Vote](#)

[!\[\]\(63c637fab7465f6861f4cd6c5336ca32_img.jpg\) Facebook](#) [!\[\]\(d3c2edceb4ecf74680f16a44c9c035f7_img.jpg\) Twitter](#)

Copyright © 2024 State of California

[Home](#) [Programs](#) [Public Affairs](#) [Mile Marker](#)[Mile Marker: A Caltrans Performance Report, Winter 2019-2020](#)[New Life for Old Stretch of 99](#)

New Life for Old Stretch of 99

Realignment of Busy Corridor Through Central Fresno
Transformed Entire Area



The realignment and reconstruction of a two-mile section of State Route 99 through the Ashlan Avenue interchange, was recently completed after about three years of construction. The project provided improved traffic flow and access on the heavily-traveled corridor.

Although it was moved to the west just 80 feet — a stone's throw — realigning a two-mile stretch of State Route 99 in central Fresno was a massive undertaking that wound up being the largest state highway project ever in the region.

The 99 Realignment project was wrapped up in late 2018, with a formal ribbon-cutting dedicating the new highway section from Ashlan to Clinton avenues held in February 2019. Construction got underway in December 2015 after three years of planning and design spearheaded by Caltrans regional District 6.

The rerouting of SR 99 was done to accommodate the alignment of the California High-Speed Rail line through Fresno. Much of the work on the high-speed rail network intended to first serve the Central Valley has been centered in the Fresno area.

SR 99 is one of the state's heavily traveled, and commercially important, corridors. The section of highway between Clinton and Ashlan avenues, the project area, accommodates an average of 114,000 vehicles a day, with trucks making up 17 percent of that traffic, according to 2019 Caltrans traffic counts.

The new section of highway replaced the original portion of SR 99 that hadn't seen major improvements for at least 50 years.

The finished project delivers a vastly

Project Spotlight



improved traveling experience on the highway known to many simply as “99.” Drivers now ride atop a smooth, long-life pavement in all three lanes in each direction. The 99 Realignment eliminated a cramped, outdated design, including three nonstandard partial interchanges built in an earlier era, and now features the latest advances in safety and traffic operations. It also eased gridlock along the highly congested east-west corridors at Clinton and Ashlan avenues.

The impact of the \$290 million realignment reached far beyond the highway. An innovative design and procurement process allowed for a smaller route footprint with minimized impacts to the business community, and greatly enhanced the appeal of the area. The project improved the local circulation and accessibility for adjacent property owners, and injected a new vitality into surrounding neighborhoods and local businesses.

Inclusion of new landscaping, wider walking paths and bike paths in the project area also help make for a more livable urban core.

But before a new section of SR 99 and the high-speed rail network could be built, the Caltrans-led team faced a series of logistical hurdles. Apart from the obvious traffic issues, the Ashlan to Clinton segment of 99 passes through a major urban location, surrounded by dozens of businesses that would be impacted by the realignment, and thousands of nearby residents who crossed the highway overpasses.

A revamped road-rail corridor also presented major engineering issues, accompanied by the question of how to best schedule the work and traffic mitigations to keep the project on schedule. Relocation of major utility connections were required. And multiple stakeholders were involved, each of whom had to be consulted and involved in the decision-making process.

Perhaps the most formidable challenge came with the reconstruction of the Clinton Avenue interchange.

Initial scheduling showed a lengthy construction timeline of 18 to 24 months to transform the interchange due to a phased construction approach, utility relocations, and right of way acquisitions. Given those constraints, it became clear the realignment of SR 99 and the Clinton interchange reconstruction needed to occur simultaneously if delivery of the project was to occur within a more ambitious schedule.

The Caltrans team and project partners sorted through the options and chose a bold but potentially unpopular approach — closing the busy Clinton overcrossing altogether. The move would shave the overcrossing

construction time to seven months by giving crews unfettered 24-hour/seven-day-a-week access to the site, but close off a key interchange and cut off east-west access over the highway for residents and businesses.

The closure proposal also relied on an extensive detour plan and outreach campaign, and buy-in from a diverse range of stakeholders that included the city of Fresno, Union Pacific Railroad, multiple utility companies, schools and businesses. To keep from cutting off the community, a dedicated bus service to carry people across the Clinton overpass seven days a week also was launched.

The plan went into effect in April 2017. Executed by Granite Construction — the prime contractor brought on board early in the project — the overcrossing work was completed within the promised seven-month timetable.

The 99 Realignment team also had to work with numerous businesses that would be affected along the project's two-mile path. The acquisition process involved 42 business properties, and the negotiations were often arduous and required creative solutions. In the case of the Fresno Rescue Mission, and the former Hacienda Hotel, a historic Fresno landmark, plan redesigns were made that enabled both to continue operations and allow highway construction to proceed, without incurring extra costs.

The realignment project was financed through the California High-Speed Rail Authority. Through careful budgeting, time and materials savings, and early involvement of Granite Construction in the planning process, the project is expected to be within its \$290 million budget.

Altogether, about 700 Caltrans staff members helped lay the groundwork for the project prior to construction, which began after completion of an environmental review in 2013. The realignment also proved to be a boon for the regional economy, employing more than 1,750 persons during the construction phase. About 75 percent of those workers came from the Central Valley.

The project team also developed a small business and subcontracting plan that ultimately contracted with 56 small businesses, accounting for 31.5 percent of the work that met the hiring requirements for National Targeted and Disadvantaged Workers as called for in the High-Speed Rail Authority build contract.

The SR 99 realignment is part of the overall improvement that has taken place on the busy highway in the last decade. Much of SR 99 through the Central Valley has been upgraded to three lanes in each direction, creating safer and smoother conditions for travelers.



The new Clinton Avenue interchange takes shape during construction in Fresno. The seven months, thanks to a decision by Caltrans and its partners to close the overcross construction that saved time and money.

Source: *Garth Fernandez, Caltrans Senior Transportation Engineer, Realign 99 Project Manager.*

Sustainable Practices Minimize Project's Environmental Impact

On the 99 Realignment project, every effort was made to use sustainable practices to conserve resources and preserve the environment in keeping with Caltrans' Strategic Management Plan goals of sustainability and efficiency.

Among the



The Realign 99 project along the Central Valley's main artery through Fresno recycled construction materials and limited vehicle emissions.

construction materials savings:

- 75,000 tons of existing asphalt surfacing were recycled into hot mix asphalt or roadway bases.
- 45,000 cubic yards of existing concrete were recycled into roadway base.
- 500 tons of steel were recycled for commercial reuse.
- The project also utilized selected on-site materials and performed on-site material blending when necessary to create structure backfill material, meeting the contract quality requirements. This approach

reduced the use of virgin aggregates, and lowered tailpipe emissions by limiting project trucking requirements.

As part of sustainable landscaping practices, the rebuilt two-mile stretch features drought-tolerant plants and will be able to use recycled water from the city of Fresno when it becomes available.

A commitment was made as well to air quality standards during construction. A voluntary emissions reduction agreement was made between the High-Speed Rail Authority and the San Joaquin Valley Air Pollution Control District to use the cleanest, most reasonably available off-road equipment and on-road equipment consisting of an average fleet mix of equipment of model year 2010 or newer, to the extent reasonably practical.

- › [Director's Message](#)
- › [Shining a Light on Culvert Conditions](#)
- › ['Signals, Signs and Sensors' High on Fix-It List](#)
- › [New Life for Old Stretch of 99](#)
- › [Mileposts](#)
- › [After the Devastation, a Safer Highway System](#)
- › [Search for Cost Savings Pays Off](#)
- › [Taking a Turn Toward Active Transportation](#)
- › [Construction Turns to Tablets for Efficiency](#)
- › [Plan Identifies Highway System Needs, Fixes](#)
- › [New Inspector General Keeps Watch](#)

Statewide Campaigns

- › [ADA Access](#)
- › [Adopt-A-Highway](#)
- › [Amber Alert](#)
- › [Be Work Zone Alert](#)
- › [CAL FIRE](#)
- › [Cal OES: Power Outage and Fire Recovery Resources](#)
- › [California Climate Investments](#)
- › [California Connected](#)
- › [California Transportation Plan 2050](#)

- ▶ [Clean California](#)
- ▶ [Energy Upgrade](#)
- ▶ [Go Safely California](#)
- ▶ [HeatReadyCA.com](#)
- ▶ [Move Over Law](#)

- ▶ [REAL ID](#)
- ▶ [Save Our Water](#)
- ▶ [Stormwater Education Campaign](#)
- ▶ [Tenant and Landlord Resources](#)
- ▶ [Unclaimed Property](#)

[Back to Top](#)

[Accessibility](#)

[Privacy Policy](#)

[Conditions of Use](#)

[Register to Vote](#)

[f Facebook](#) [🐦 Twitter](#)

Copyright © 2024 State of California

[Home](#) [Programs](#) [Public Affairs](#) [Mile Marker](#)[Mile Marker: A Caltrans Performance Report, Winter 2019-2020](#)[Mileposts](#)

Mileposts

New leaders tapped by governor take helm at Caltrans



Left: Toks Omishakin, Caltrans Director **Right:** James Davis, Caltrans Chief Deputy Director

Caltrans has a new director, drawn from the executive ranks of the Tennessee state

transportation department, and his chief deputy is a longtime Caltrans engineer who has held multiple leadership roles in the Department.

Toks Omishakin, 43, was appointed by Gov. Gavin Newsom in September to fill Caltrans' highest post. Omishakin was sworn in as director in late October.

James Davis, 54, was chosen by Newsom to serve in the Department's No. 2 position. Davis previously served as special advisor to the director under Laurie Berman, who retired in June, and Acting Director Bob Franzoia, who took over after Berman's departure.

Omishakin comes to Caltrans following eight years with the Tennessee Department of Transportation, where he established environmental, multimodal and planning policies.

As Deputy Commissioner for Environment and Planning, Omishakin was responsible for an administrative and project budget of more than \$300 million annually, and he led the activities of the divisions of Environmental Services, Long-Range Planning, and Multimodal Transportation Resources within the Tennessee DOT.

Prior to that, he served as Director of Healthy Living Initiatives in the Nashville Mayor's Office. Omishakin is a member of the American Association of State Highway and Transportation Officials (AASHTO), where he has served as the organization's Vice Chairman of Active Transportation Council since 2017. He also is Chair of AASHTO's Multimodal Task Force.

Omishakin holds a Ph.D. in engineering management from the University of Tennessee, Knoxville; and a master's degree in urban and regional planning from Jackson State University.

Davis served as Caltrans' Senate Bill 1 program manager from 2018 to 2019, Bay Area district director in 2018, division chief of project management from 2013 to 2018, division chief of transportation planning from 2016 to 2017, division chief and deputy division chief of engineering services from 2004 to 2013, and multiple transportation engineering positions from 1988 to 2004.

Reports map climate change threat to SoCal highways

Caltrans has released three [Climate Change Vulnerability Assessments](#) that focus on the risks posed to the transportation system by wildfires, extreme temperatures and precipitation, sea-level rise and coastal-bluff erosion in Southern California.

The reports cover Imperial, Los Angeles, Riverside, San Bernardino, San Diego and Ventura counties, and include an interactive mapping application that shows where and how climate change is expected to have an impact.

These new vulnerability assessments will help guide Department planning and investment strategies that lessen the impacts of climate change, and save money.

Caltrans is sharing the reports' data with local, regional, state and federal agencies. Together, the partners will work toward establishing a more resilient transportation system and responding to the need for actions to adapt to the changing climate.

In recent years, Southern California has been beset by destructive and deadly wildfires, record heat waves, and more frequent mudslides. These general climate trends are expected to continue in California and the rest of the West.

Caltrans previously released climate reports for the regions it serves in the San Francisco Bay Area, Central Valley, and northern portion of the state. Six more reports are in development. Upon completion of all 12 assessments, Caltrans will develop adaptation reports for each region that outline how climate change will be fully integrated into future transportation planning decisions.

- [Director's Message](#)
- [Shining a Light on Culvert Conditions](#)
- ['Signals, Signs and Sensors' High on Fix-It List](#)
- [New Life for Old Stretch of 99](#)
- [Mileposts](#)
- [After the Devastation, a Safer Highway System](#)
- [Search for Cost Savings Pays Off](#)
- [Taking a Turn Toward Active Transportation](#)
- [Construction Turns to Tablets for Efficiency](#)
- [Plan Identifies Highway System Needs, Fixes](#)
- [New Inspector General Keeps Watch](#)

Statewide Campaigns

- ▶ [ADA Access](#)
- ▶ [Adopt-A-Highway](#)
- ▶ [Amber Alert](#)
- ▶ [Be Work Zone Alert](#)
- ▶ [CAL FIRE](#)
- ▶ [Clean California](#)
- ▶ [Energy Upgrade](#)
- ▶ [Go Safely California](#)
- ▶ [HeatReadyCA.com](#)
- ▶ [Move Over Law](#)
- ▶ [Cal OES: Power Outage and Fire Recovery Resources](#)
- ▶ [California Climate Investments](#)
- ▶ [California Connected](#)
- ▶ [California Transportation Plan 2050](#)
- ▶ [REAL ID](#)
- ▶ [Save Our Water](#)
- ▶ [Stormwater Education Campaign](#)
- ▶ [Tenant and Landlord Resources](#)
- ▶ [Unclaimed Property](#)

[Back to Top](#)

[Accessibility](#)

[Privacy Policy](#)

[Conditions of Use](#)

[Register to Vote](#)

[!\[\]\(006190f2bbfbd38324559ea514e41ca7_img.jpg\) Facebook](#) [!\[\]\(9eb4fb100a7ec3474b26b02b26dfda33_img.jpg\) Twitter](#)

Copyright © 2024 State of California

[Home](#) [Programs](#) [Public Affairs](#) [Mile Marker](#)[Mile Marker: A Caltrans Performance Report, Winter 2019-2020](#)[After the Devastation, a Safer Highway System](#)

After the Devastation, a Safer Highway System

Loma Prieta, Other Quakes Give Caltrans Valuable Lessons in Seismic Engineering



The Oct. 17, 1989, Loma Prieta earthquake, though originating from the Santa Cruz M more than 40 miles north of its epicenter. A 50-foot portion of the San Francisco-Oakl one motorist's death.

Thirty years ago, the Loma Prieta earthquake killed 63 people in the Bay Area and presented Caltrans with one of its biggest challenges: how to ensure the safety of people traveling on the thousands of bridges within the State Highway System, especially in quake-prone regions.

Forty-two of the deaths attributed to the quake that struck on Oct. 17, 1989, occurred on the Cypress Street Viaduct in Oakland. The double-deck bridge structure, which opened to traffic in 1957 as part of the Nimitz Freeway (Interstate 880), "pancaked" along a 0.7-mile stretch of the upper deck between 16th Street and the MacArthur Maze. Caltrans maintenance crews, engineers, surveyors and support staff worked around the clock for weeks to shore up the structure and perform rescue, recovery and demolition duties.

The 6.9-magnitude temblor centered in the Santa Cruz Mountains also caused the partial collapse of the upper-deck, 50-foot portion of the eastern span of the San Francisco-Oakland Bay Bridge, which opened in 1936. A passenger traveling on the damaged bridge after the earthquake was killed. A month to the day after the disaster, Caltrans had completed permanent repairs and the Bay Bridge was reopened.

About 60 miles south of the bridge, close to the epicenter, rockslides and heavily damaged pavement forced the closure of State Route 17 between Santa Cruz and Los Gatos for several weeks.

Loma Prieta, which happened at 5:04 p.m. on a Tuesday, was the largest Bay Area earthquake since 1906. As devastating as it was, the quake would have killed more travelers on the two damaged bridges had it not been for the fact that the Oakland Athletics and San Francisco Giants were 30 minutes from starting Game 3 of the World Series. Many people who routinely commuted on those bridges had left work early to watch the game.

Caltrans was initially the target of blame for catastrophic failure of the Cypress structure. One reporter even asked the Department's state bridge engineer at the time, James E. Roberts, what it felt like to have blood on his hands. Such emotional allegations subsided, however, as certain facts became more widely known: The two-tier roadway was constructed before seismic engineering was a major component of bridge design, the viaduct was built upon unstable soil, and time simply ran out on plans to strengthen its entire 1.6-mile stretch of elevated highway.

The
Lead-
up
and
the



A 0.7-mile stretch of the double-deck Cypress Street Viaduct, part of Interstate 880, “pancaked” and was responsible for 42 deaths.

Aftermath

Two earlier ground-shaking events in Southern California prior to Loma Prieta — the 6.5-magnitude San Fernando earthquake in 1971 and the 5.9-magnitude Whittier Narrows earthquake in 1987 — spurred Caltrans to change its seismic-related procedures. After the San Fernando Valley quake, the Department sent teams of engineers to study damage and make note of lessons learned.

As a result, retrofit requirements were changed. Columns were made more shear-resistant and able to withstand deformation, and modified to resist being pulled out of the foundation. In addition, the widths of hinges and expansion joints on the structures were widened. After Whittier, Caltrans updated its retrofit program to begin the practice of wrapping existing bridge columns in steel or fiber-reinforced polymer casings.

The Cypress Street Viaduct was on the list of bridges to be retrofit.

After Loma Prieta, then-Gov. George Deukmejian created a Board of Inquiry that concluded Caltrans needed to accelerate and expand its retrofiting efforts. Over the next four years, the Department made 1,039 bridges more earthquake-resistant at a cost of \$1.08 billion.

Then on Jan. 17, 1994, the Southern California region was struck by a massive earthquake. The 6.7-magnitude Northridge quake killed 57 people and caused an estimated \$50 billion in damage.

But, like Loma Prieta, things could have been much worse. The Northridge quake struck at 4:31 a.m. on a holiday, when few people were on the roads. Although a California Highway Patrol officer died when his motorcycle

plunged off a fallen bridge in Sylmar, no fatalities occurred when portions of the Santa Monica Freeway (part of Interstate 10) collapsed.

Those structural failures aside, later it was determined that all 60 bridges in the Los Angeles metro area that Caltrans had retrofitted since Loma Prieta made it through the Northridge quake in good shape.

After Northridge, in what is referred to as Phase 2 of the statewide retrofit program, Caltrans made seismic-safety upgrades on 1,155 more bridges at a total cost of \$1.35 billion.

Starting in 1997, Caltrans began systematically retrofitting or replacing the nine state-owned toll bridges — the Antioch Bridge, Benicia-Martinez Bridge, Carquinez Bridge, Dumbarton Bridge, Richmond-San Rafael Bridge, San Diego-Coronado Bridge, San Francisco-Oakland Bay Bridge, San Mateo-Hayward Bridge and the Vincent Thomas Bridge — at an approximate cost of \$9 billion.

Caltrans also plays an important role in a separate retrofit program in which local agencies are responsible for assessing the need for seismic retrofit work on non-state, publicly owned bridges. Caltrans must approve the scope of retrofit work and provide funding. As of July, a total of 1,181 bridges under the local agency program have undergone about \$1.4 billion in retrofits. Fourteen bridges are still being upgraded and 47 are in design, representing a \$400 million investment.

Today, continuing inspections are a critical part of the process. Periodic rescreening of state bridges is conducted to assess the structures for seismic vulnerabilities using the most current seismic criteria. The most recent rescreening was completed in 2019.

Bridge Engineers Make Adjustments

Prior to Loma Prieta, the primary seismic measurement that bridge designers considered was force. For instance, if you put a truck on the bridge, what is the force that the bridge must resist?

The ground movement that twisted and broke the Cypress structure, however, exposed a major drawback with force-based design: Making a bridge “stronger” has the unfortunate effect of intensifying seismic forces when a span is exposed to ground-shaking. For example, if a bridge’s columns are strengthened by making the column bigger or by adding more main reinforcement, larger seismic forces will be transferred to other parts of the bridge that might fail instead. Something has to give, in other words.

This realization prompted Caltrans to replace a force-based design with deformation-based design. Also referred to as displacement-based design, the columns are designed to act as fuses, to limit the force (but allow larger displacements) during earthquakes.

The Northridge earthquake brought another significant change in bridge design and retrofitting. One lesson learned from the collapse of the Newhall Overpass at the interchange of Interstate 5 and State Route 14 was that during a strong earthquake, short columns cannot displace as much seismic force as adjacent taller columns and can fail.

From there, achieving a balance of stiffness became a guiding principle for bridge designers. One of the strategies to make short columns as earthquake-resistant as their taller neighbors in what bridge engineers call “isolation casings.” This technique for balancing shorter columns is to place them in a pipe under the ground, making them in effect taller. The pipe would be wide enough to allow movement of the column placed inside.

Another balancing technique (usually for new bridges) when the columns are of different heights, is to vary their diameters. In this way, a tall column could be modified to have the same flexibility as a neighboring shorter column. The idea behind both of these techniques is to achieve balance.

The western portion (where Interstate 680 traffic heads south) of the Benicia-Martinez Bridge in the Bay Area illustrates how deformation and balance are factored into retrofitting of an existing large span. Each of its massive piers that rise from the water is topped with an isolation device: a 13-foot-wide “dish” in which a metal ball supports the bridge deck and can slide around on the dish should shaking occur. That allows different parts of the structure to move without damaging the vulnerable piers below the isolator dish.



Caltrans crews worked around the clock to repair the Bay Bridge. The vital commuter corridor was reopened one month after the quake.

Finding a Realistic Path Forward

Because it is impossible to say when the next big earthquake will occur, how strong it will be or where its

effects will most be felt, Caltrans can make no guarantees about how the state's bridges will perform. There is perhaps no such thing as an earthquake-proof bridge. Caltrans' budget is never going to be large enough to cover every contingency.

In acknowledgement of that fact, Caltrans bridge engineers take a “probabilistic” approach to seismic safety.

Systemwide, they have adopted the philosophy that the structures that are built and retrofitted will survive a once-in-a-thousand-year earthquake. Similar to how governmental officials and water engineers talk about 100-year and 200-year floods, bridge engineers calculate in terms of 100-year, 500-year, 1,000-year and 2,500-year earthquake events.

Caltrans has concluded that in the case of a 1,000-year earthquake, a modern bridge will sustain damage, but the probability of collapse is very small. However, if the same bridge is subjected to a massive 2,500-year event, significant damage will occur, and the probability of collapse increases.

The 1,000-year bridge, like any insurance policy that becomes more expensive as the risks are reduced, is now the standard what Caltrans now can afford in earthquake-prone areas. Because funding is finite and many parts of the state are less susceptible to large earthquakes events, Caltrans prioritizes where it conducts seismic retrofitting. The Los Angeles and San Francisco areas obviously receive a lot of attention, but so do San Bernardino and Eureka, to name two smaller at-risk regions.

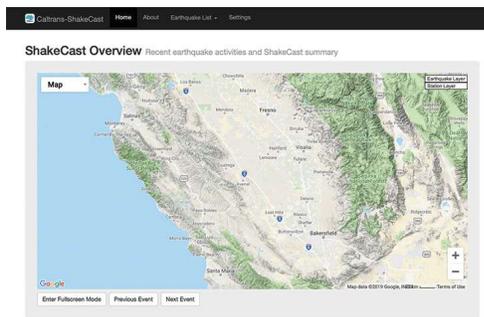
Although the public tends to measure earthquake strength based on the Richter scale — their magnitude — Caltrans bridge engineers focus on the earthquakes' effects upon bridges. Strong shaking, soil liquefaction, fault

offset, and other hazards are part of engineers' risk assessments.

Another test of the quake-resistant highway system came July 4-5 when two major earthquakes — 6.4 and 7.1 on the Richter scale — struck the Southern California desert area of Ridgecrest. Thankfully, the impact on the regional road network was relatively limited. Portions of State Route 178 sustained roadway damage that was quickly fixed, and a series of rockslides caused by the quakes were cleared away, but there was no discernible damage to any of the roughly 30 bridges that were subsequently inspected.

It's inevitable that damaging earthquakes will strike California in the future. Caltrans is using the knowledge gathered from past events to make its bridges and highways safer for the traveling public today and far into the future.

Sources: *Mark Mahan, Office Chief, Caltrans' Earthquake Engineering Analysis and Research, and Senior Bridge Engineer Mark Yashinsky.*



Screenshot of the ShakeCast Overview Map

ShakeCast Speeds Up Quake Response

One tool available to emergency responders in the immediate aftermath of an earthquake is Caltrans' ShakeCast, a website that shares information such as the exact epicenter location, magnitude, depth and origin time of temblors detected within California.

As explained on the site, ShakeCast "automatically retrieves shaking intensity data and performs analyses using structural models of Caltrans bridges and buildings.

"By focusing inspection efforts on the most damage-susceptible facilities in the most severely shaken areas, ShakeCast can drastically reduce Caltrans' response time in the aftermath of a major earthquake."

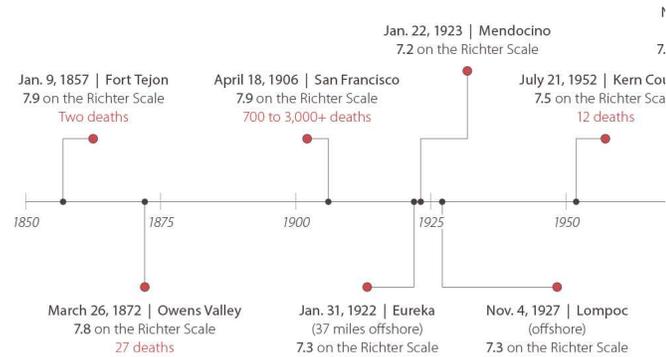
ShakeCast data is gathered by more than 1,900 seismic sensors throughout the state. The open-source web application was developed by the U.S. Geological Survey in 2003, and customized in cooperation with Caltrans' Division of Research, Innovation and System Information to offer a specialized service that focuses on Caltrans bridges and buildings.

The site's interactive map, which has a full-screen option, is zoomable and allows visitors to click on symbols that represent epicenters, bridges and buildings to retrieve more information.

Those interested can receive notifications of earthquakes in California that register at least 4.0 on the Richter scale.

10 Strongest Earthquakes in California's History

Following are the 10 strongest earthquakes (in terms of magnitude) in California's history, as recently was reported by The Sacramento Bee. Others of note: Ridgecrest, Loma Prieta, Northridge, San Fernando.



Timeline graphic of California's 10 strongest earthquakes

Quake Readiness

How confident is Caltrans that its bridges are ready to meet the challenges of tomorrow's big earthquakes? The Department's veteran bridge engineers offered their thoughts.



Mark Mahan



Erol Kaslan

Mark Mahan, Office Chief, Office of Earthquake Engineering Analysis and Research: "There is no such thing as taking the risk to zero. There is always a risk. But it should be minimized as much as



Brian Maroney

possible. We are on that path. Before 1989, earthquake engineering knowledge was limited. Bridges carrying the truck loads were especially vulnerable to extreme earthquake damage. Improvements in seismic sciences since 1989 have empowered engineers to design resilient new bridges and retrofit the older ones."

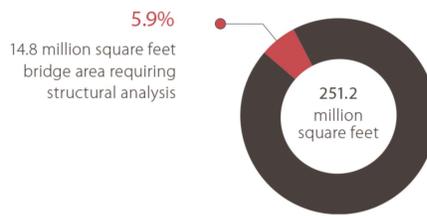
Erol Kaslan, Chief of Structure Investigations, North: "I think Caltrans as an organization has come a long way since Loma Prieta. We have our Office of Emergency Management. Each district now has their sub-office of managing those kind of things. There are protocols, there are things that are in place right now. We run random drills from time to time. So as an organization, we're much, much better at being able to respond to these. But we can do more, including dedicated earthquake training."

Brian Maroney, Toll Bridge Seismic Retrofit Chief Bridge Engineer: "There's still going to be surprises. The reality is there will be earthquakes in the future in California. ... But we are going to perform, as a state, a lot better because of the investment that elected officials and the good taxpayers of California paid into. We have reduced risk, really tremendously, up and down the state."

Ongoing Effort to Examine, Strengthen Bridges

Caltrans

BRIDGE DECK AREA — SEISMIC VULNERABILITY



5.9% of all bridge deck area shows seismic vulnerability

continually performs research and analysis to identify new information that will help fortify bridges, and protect travelers, when earthquakes strike.

Bridges are assessed for seismic vulnerability based on screenings performed by Caltrans' Offices of Earthquake Engineering and Geotechnical Services. A detailed ranking and a priority list is then created, subject to further structural analysis to validate.

The assessments are based on anticipated ground motions and seismic movement generated by earthquakes of a certain strength. For bridges with foundations in or near a waterway, the potential for soil liquefaction is also evaluated.

The Caltrans Asset Management group condenses the detailed seismic rankings and tallies the amount of total bridge deck area (in square feet) requiring further structural analysis.

Of Caltrans' total bridge deck area of 251.2 million square feet statewide, about 14.8 million square feet may have some degree of seismic vulnerability.

Those bridges deemed potentially vulnerable are then prioritized for additional analysis to determine if seismic retrofitting is needed. All State Highway System bridges are included in this inventory, except Bay Area Toll Authority, Golden Gate Transportation District bridges, and bridges built and maintained under public-private partnerships.

In its 2019 State Highway Management Plan, Caltrans has set a goal to bring 70 percent all bridges in need of seismic strengthening (as measured by square feet) to a good condition rating by 2029. Caltrans estimates it will take \$777 million in the next 10 years to improve almost five million square feet of bridge deck area.

Source: 2019 State Highway System Management Plan

- > [Director's Message](#)
- > [Shining a Light on Culvert Conditions](#)
- > ['Signals, Signs and Sensors' High on Fix-It List](#)
- > [New Life for Old Stretch of 99](#)
- > [Mileposts](#)
- > After the Devastation, a Safer Highway System
- > [Search for Cost Savings Pays Off](#)

- › [Taking a Turn Toward Active Transportation](#)
- › [Construction Turns to Tablets for Efficiency](#)
- › [Plan Identifies Highway System Needs, Fixes](#)
- › [New Inspector General Keeps Watch](#)

Statewide Campaigns

- › [ADA Access](#)
- › [Adopt-A-Highway](#)
- › [Amber Alert](#)
- › [Be Work Zone Alert](#)
- › [CAL FIRE](#)
- › [Cal OES: Power Outage and Fire Recovery Resources](#)
- › [California Climate Investments](#)
- › [California Connected](#)
- › [California Transportation Plan 2050](#)
- › [Clean California](#)
- › [Energy Upgrade](#)
- › [Go Safely California](#)
- › [HeatReadyCA.com](#)
- › [Move Over Law](#)
- › [REAL ID](#)
- › [Save Our Water](#)
- › [Stormwater Education Campaign](#)
- › [Tenant and Landlord Resources](#)
- › [Unclaimed Property](#)

[Back to Top](#)

[Accessibility](#)

[Privacy Policy](#)

[Conditions of Use](#)

[Register to Vote](#)

[f Facebook](#) [🐦 Twitter](#)

Copyright © 2024 State of California

[Home](#) [Programs](#) [Public Affairs](#) [Mile Marker](#)[Mile Marker: A Caltrans Performance Report, Winter 2019-2020](#)[Search for Cost Savings Pays Off](#)

Search for Cost Savings Pays Off

\$233 Million in Efficiencies, More than Double Target, Achieved in 2018-19



Caltrans Maintenance crew members Richard Carmona, left, and Stanley Scrivner III work on a road rehabilitation project on State Route 132 in Modesto. Money that Caltrans saves in the SB 1 project is being reinvested in road rehabilitations like this.

Improvements that Caltrans made in its operations and project delivery process in the 2018-19 fiscal year has produced nearly double the savings as the previous year, according to an Annual Efficiencies Report prepared as a requirement of Senate Bill 1, the landmark transportation funding law.

The report, submitted to the Legislature, identified \$233 million in cost savings in the fiscal year that ended June 30, 2019.

SB 1, the Road Repair and Accountability Act of 2017, requires that Caltrans identify at least \$100 million annually in cost avoidance measures or process improvements. The Department exceeded that target in the first year of reporting by finding \$123 million in savings, an amount that is being reinvested back into additional road maintenance and rehabilitation projects.

Caltrans said it found more ways to save money in 2018-19 that helped boost the amount of total savings. The Department also built on efficiency moves taken in the previous fiscal year.

All of the system improvements were grouped into “efficiency categories” based on type of cost avoidance/reduction measure. They are:

Innovative Tools • \$108.9 million savings

- **Acceleration of work, \$64 million.** Because of increased funding from SB 1, Caltrans moved up the construction schedules of projects and



New-generation road striping tape is laid down along a highway.

avoided cost escalation, which was pegged at 4.25 percent in 2018.

- **Road striping contracts, \$30.4 million.** A change was made in the way these contracts are awarded to contractors to reduce the number of project days, lowering costs. Also, contractor crews were able to complete work at a faster pace due to increased working hours and flexible lane closures.
- **Construction Manager/General Contractor program, \$14.4 million.** Rather than hiring a contractor just prior to construction, this process brings one in during the design stage to work collaboratively with Caltrans on eliminating potential pitfalls, manage costs and improving quality. After several years of successful trials, recent legislation now allows Caltrans to use this process on an unlimited number of projects. Savings were realized with two major projects in FY 2018-19 — the San Mateo Highway 101 phase 1, and Interstate 5-North Coast Corridor phase 4.
- **Advance Mitigation credits, \$123,000.** Through this program, Caltrans purchases land for habitat conservation to offset the impacts of transportation projects. In 2018, mitigation “credits” for a project in San Luis Obispo County was bundled and purchased early in the process, avoiding escalating land costs.

Process Improvements • \$98.1 million savings

- **Value Analysis studies, \$49 million.** For certain projects, Caltrans is assigning teams of subject matter experts early in the development process to analyze function, benefits and cost. In 2018-19, eight major projects around the state were assessed using the Value Analysis method, yielding \$49.3 million in avoided costs. All projects exceeding \$25 million in cost are now required to undergo Value Analysis studies.
- **Streamlining environmental review process, \$41.5 million.** Caltrans was the first transportation agency in the nation to reach an agreement with the Federal Highway Administration to conduct National Environmental Policy Act (NEPA) reviews of projects involving shared funding. By taking responsibility for such reviews, Caltrans can expedite the preparation of environmental documents and begin project construction earlier. No environmental protection standards are compromised during the process. Caltrans conducted 189 NEPA reviews in 2018-19.

- **Value engineering change proposals, \$4.4 million.** Contractors who find ways to add value or lower costs on projects can petition Caltrans, which reviews the proposal and decides whether to issue a change order. There was a total of 26 value engineering change proposals accepted in the last fiscal year.
- **Lean 6 Sigma program, \$3.1 million.** The program relies on internal process improvements to identify and eliminate waste or inefficiencies in operations. More efficient ways of doing business have been found in the areas of outdoor advertising agreements, encroachment permits, new product evaluations, contract preparations, fleet acquisition, building project design, asphalt testing, traffic collision report processing, construction support costs, internal investigations and disciplinary actions, and the local assistance invoice process.

New Technology • \$26.1 million savings

- **High-reflective material for road striping, \$16.5 million.** Within the last several years, Caltrans has begun laying down six-inch-wide road striping using a new generation of materials. The thermoplastic and tape materials last up to six years, compared with painted stripes that have a life of about one year. The new striping also is embedded with tiny glass beads that reflect light. About 16,000 miles of state highway lanes have been restriped so far, slightly under one-third of the lane miles in the State Highway System.
- **Highway lighting LED retrofit, \$5.7 million annually.** Caltrans, which maintains about 80,000 pole-mounted streetlights statewide, has converted about 90 percent of those fixtures to light-emitting diode (LED) lighting. Energy costs have been cut 50 to 60 percent, and LED lights generally last at least 15 years, compared with four years for earlier-generation lighting. Caltrans estimates about a \$1.7 million annual savings in labor costs because of less frequent maintenance and light replacement.
- **Global positioning satellite device use in fleet, \$2.2 million.** Use of GPS devices in Caltrans' light-duty fleet of passenger cars and trucks, which began in 2013, has led to more efficient fleet management.
- **Mobile field devices, \$1.5 million.** Caltrans construction staff began using tablets on job sites in the last fiscal year. (See story, page 28.)
- **High-performance reflective signs, \$226,000.** New reflective sheeting is now being used to make overhead and roadside signs being installed in place of older-generation displays. Because the new signs are easier to see, less lighting is required, resulting in lower energy costs. It may take up to decade to replace all of Caltrans' estimated 20,000 overhead signs.

Source: *SB 1 Annual Efficiencies Report 2018-19*

- [Director's Message](#)
- [Shining a Light on Culvert Conditions](#)
- ['Signals, Signs and Sensors' High on Fix-It List](#)
- [New Life for Old Stretch of 99](#)
- [Mileposts](#)
- [After the Devastation, a Safer Highway System](#)
- [Search for Cost Savings Pays Off](#)
- [Taking a Turn Toward Active Transportation](#)
- [Construction Turns to Tablets for Efficiency](#)
- [Plan Identifies Highway System Needs, Fixes](#)

Statewide Campaigns

- ▶ [ADA Access](#)
- ▶ [Adopt-A-Highway](#)
- ▶ [Amber Alert](#)
- ▶ [Be Work Zone Alert](#)
- ▶ [CAL FIRE](#)
- ▶ [Clean California](#)
- ▶ [Energy Upgrade](#)
- ▶ [Go Safely California](#)
- ▶ [HeatReadyCA.com](#)
- ▶ [Move Over Law](#)
- ▶ [Cal OES: Power Outage and Fire Recovery Resources](#)
- ▶ [California Climate Investments](#)
- ▶ [California Connected](#)
- ▶ [California Transportation Plan 2050](#)
- ▶ [REAL ID](#)
- ▶ [Save Our Water](#)
- ▶ [Stormwater Education Campaign](#)
- ▶ [Tenant and Landlord Resources](#)
- ▶ [Unclaimed Property](#)

[Back to Top](#)

[Accessibility](#)

[Privacy Policy](#)

[Conditions of Use](#)

[Register to Vote](#)

[f Facebook](#) [Twitter](#)

Copyright © 2024 State of California

[Home](#) [Programs](#) [Public Affairs](#) [Mile Marker](#)[Mile Marker: A Caltrans Performance Report, Winter 2019-2020](#)[Taking a Turn Toward Active Transportation](#)

Taking a Turn Toward Active Transportation

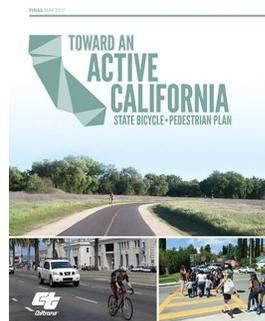
More Projects Around State Encourage Bicycling, Walking as a Means of Travel



State Route 116 in Sebastopol, in Sonoma County, recently underwent a partial “road bicycle lanes and other pedestrian-friendly and aesthetically pleasing features. The project expands bike and pedestrian travel networks.

Caltrans is committed to bike- and pedestrian-friendly transportation options and is working to strengthen and expand the network of routes, trails and facilities around the state. These “active transportation” projects to get people out of their cars help improve air quality, reduce congestion, promote healthy lifestyles, and provide travel alternatives for residents of disadvantaged communities.

Through the Active Transportation Program (ATP) created by legislation in 2013, more than \$1 billion in state and local funds has been invested in the past five years to encourage modes of travel other than motorized vehicle. More than \$200 million of that amount was generated by the Road Repair and Accountability Act of 2017 (Senate Bill 1) expressly for pedestrian and bicycle projects throughout California.



Released in 2017, this Caltrans report lays out goals and an action plan to increase walking and bicycle use in the state. It calls on Caltrans and its partners to develop alternate

The development of active transportation projects in local communities is expected to grow in the next decade as SB 1

travel networks and align them with other multimodal transportation systems.

provides a larger, stable revenue source. SB 1 is projected to provide an additional \$1 billion to the ATP through 2027 to build or improve existing bike paths, crosswalks and sidewalks. Caltrans' Division of Local Assistance assists and oversees the delivery of local projects that receive ATP funds through the landmark transportation law and other sources.

Local agencies vie for ATP funds through a competitive process to promote non-auto transportation choices in their jurisdictions. Caltrans also can compete for funds through the ATP process to expand bike riding and walking options along the state highways. The California Transportation Commission sets the guidelines for each ATP funding cycle, selects the projects, and commits money to complete the work.

Caltrans districts and local agencies will be able to apply for ATP's Cycle 5 funding, with the call for applications expected to be released this spring by the California Transportation Commission (CTC). About \$445 million is projected to be available for local projects proposed through fiscal years 2021-2025. ATP funding comes from the federal government, SB 1 and the State Highway Account.

More than 800 ATP projects funded

Since its inception, the ATP program has funded more than 800 projects in rural and urban areas across the state. Many of these projects were developed with active transportation elements to protect students who walk and bike to school.

In addition to applying for ATP funds, Caltrans also uses the State Highway Operation and Protection Program (SHOPP) to add active transportation facilities as part of its overall road maintenance and rehabilitation work on the State Highway System. The SHOPP is a four-year master plan that lists Caltrans' priority repair projects, and is updated every other year.

The most recent 2018 SHOPP plan reflects Caltrans' support of active transportation goals. Of the almost \$18 billion in projects scheduled through fiscal year 2021-22, Caltrans plans to construct more than 180,000 linear feet of sidewalks and crosswalks, 2,200 pedestrian safety features such as refuge islands, 640 linear miles of bicycle lanes and lane improvements, 130 linear miles of shoulder improvements, and 280 public transit features that provide better access to bus stops and rail stations.

Revenues from SB 1 is making more money available for upcoming projects, including active transportation, in the 2018 SHOPP. An additional \$6.4 billion in projects of all types was programmed, or committed, over the plan's four-year cycle.

An update to the SHOPP in 2020 should allow Caltrans to add even more meaningful active transportation improvements.

In each of the Department's 12 regional districts, Caltrans Active Transportation Plans are being developed with local partner agencies and community-based organizations to identify cycling, pedestrian and transit improvements needed within each region's boundaries. The number, and condition, of existing bicycle and pedestrian facilities along the State Highway System is now being collected as a part of that process.

Once the inventory is complete, Caltrans districts will work with local partners to identify high-priority gaps in the system and opportunities to upgrade existing facilities and determine the cost of needed improvements. In addition to building a comfortable and convenient system for people to walk and bicycle, the districts must initiate projects that enhance safety, be long-lasting, and serve communities that have been bypassed, divided or negatively impacted by previous transportation investments.



Cyclists in Sebastapol now have their own demarcated lanes instead of being forced to share space with dangerous traffic.

Considering all road users

The goal of increasing walking and bicycling in California was formalized at Caltrans in 2008 with the adoption of a Complete Streets Policy. The Complete Streets internal directive widened the Department's transportation focus to accommodate the movement of people walking or cycling to their destinations.

Under Caltrans Complete Streets Policy, designated state highways such as main streets in smaller communities or arterial streets in suburban or urban communities are considered for design makeovers when other repaving, maintenance, or bridge work is planned that will create safe environments for all road users, including bicyclists, pedestrians, transit vehicles, truckers and motorists. The kind of changes that go into creating a "complete street" depends on context, community preferences, identified safety concerns, and the types of road users and their needs.

In May 2017, the Department released the state's first pedestrian and bicycle plan, 'Toward an Active California.' Its vision statement is, "By 2040, people in California of all ages, abilities and incomes can safely, conveniently, and comfortably walk and bicycle for their transportation needs."

Caltrans reaffirmed its commitment to a sustainable transportation system in its 2015-2020 Strategic Management Plan, calling for an increase statewide in non-motorized travel. Although the rates of bicycling and walking in

California are not meeting those targets, according to recent surveys, Caltrans is dedicated to creating more new and safe alternative modes of travel. More on that topic in a future *Mile Marker* issue.

Sources: *Caltrans Sustainability Program, Caltrans Division of Local Assistance, Caltrans 2019 State Highway System Management Plan, "Toward an Active California" State Bicycle and Pedestrian Plan, California Transportation Commission.*

Green Travel Projects Take Root in Caltrans Districts

Here is a sampling of projects and initiatives in Caltrans regional districts throughout the state that promote walking and cycling. Caltrans' role in these and other similar projects involves either planning, consultation with local agencies, funding, coordination and oversight of projects.



In the town of Orick, green road shoulder markings were laid down.

District 1

Caltrans District 1 in June 2018 installed green shoulder markings to encourage bicycle use and protect riders in the

community of Orick, in Humboldt County. That project was initiated as part of an earlier report that Caltrans helped fund on improving the town's sense of place as a gateway to the redwoods.

District 2

District 2 is coordinating with the city of Redding to deliver a project that will close Riverside Drive to through traffic. The project will provide continuous bike lanes along the roadway, connecting the existing paved River Trail system to downtown, neighborhoods, schools, businesses and various services, and close gaps in sidewalks for those walking and biking. Additional coordination is being made with the city to permit a two-way cycle track on State Route 273 that connects the Riverside Drive project to a second effort that Redding is moving forward with that will offer affordable housing and a marketplace in the downtown promenade area, which is becoming a destination place for active transportation enthusiasts.

District 3

In a project that finished in February 2018, District 3 oversaw widening of both shoulders on Butte House Road in Yuba City to accommodate an eight-foot, Class II (defined by a painted stripe) bike lane between Royo Ranchero Drive and Madison Road. The project included all associated striping and signage improvements. This project also closed a gap between existing bicycle facilities, and there has been an observable increase in bicycling along the revamped stretch.

District 4

In District 4 last fall, Caltrans completed repaving work on two one-way portions of State Route 116 in Sebastopol. The Department worked with the city to implement a partial “road diet” that features new bike lanes designated by green conflict zone markings and a striped buffer. Some residents were initially hesitant about the repainted lanes, but have come to learn that solid green paths are bike-only, and fragmented green lanes mean vehicles can cross over them.

District 5

What began as a straightforward resurfacing project in District 5 flowered into something much more last summer in Los Alamos. Due to community involvement, Class II (painted stripe) bikeways, bike lane buffers and enhanced-visibility crosswalks were incorporated into the project, as were curb ramps upgraded to meet American With Disabilities Act requirements. The project encompassed about a half-mile of State Route 135 (which connects to Highway 101).

District 6

A project that will add eight miles of bicycle lanes, provide enhanced crosswalk visibility, and make accessibility and school safety route improvements is in the design phase for SR 184 near the city of Bakersfield. In Woodlake, Tulare County, construction of a new roundabout was wrapped up about a year ago. The roundabout features bike lanes, wide decorative sidewalks, street “furniture,” landscaping and decorative lighting, where SRs 245 and 216 intersect.

District 7

In the District 7 college town of Claremont a few blocks north of Old Route 66, Caltrans last summer finished a green bicycle lane project on the southbound side of North Towne Avenue as it crosses over Interstate 210. The project was funded by a local agency, and Caltrans issued an encroachment permit. The project was paid for through a Safe Routes to School grant.

District 8

On a festive day in August 2018, District 8 helped plan and



District 8 staff helped stage a Complete Streets event in Upland.

participated in a Complete Streets demonstration event along Upland’s Euclid Avenue, which as State Route 83 is maintained by Caltrans. A Class IV cycle track (a bike lane separated by a physical barrier), curb extensions (shortening pedestrian crossing distance) and parklets (enhanced sidewalk seating areas in place of a parking space) were temporarily placed on the streets to promote a permanent street-safety makeover. More than 1,200 people attended the event in Upland.

District 9

In cooperation with the town of Mammoth Lakes, District 9 developed, funded and constructed a retaining wall, curb, gutter, lighting and sidewalk on a portion of State Route 203 (Main Street) between the Old Mammoth area and the “Mammoth Village” — a heavily visited center for the town, the eastern Sierra and Mammoth Mountain Ski Area. Prior to the project, finished in fall 2018, pedestrians walked on the busy road’s shoulder, and for much of the year had to navigate their way through snowpiles.

District 10

Projects that added or improved pedestrian/bicyclist facilities, or Complete Streets features, were started or completed in 2019 on sections of State Route 12 in the Sacramento-San Joaquin Delta, SRs 16, 49, 88 and 104 in the Sierra Nevada foothills, SR 99 overpasses in Lodi and Ripon, and the SR 120/108 junction east of Oakdale, a main turnoff for Yosemite National Park.

District 11

With the opening of the I-5 Gilman Bridge in February, District 11 reached a major milestone for the Interstate 5 Build North Coast Corridor Program (Build NCC). In partnership with the University of California, San Diego, Caltrans built a bridge over the freeway that connects the east and west campuses. It gives students, faculty and visitors easier access to the university and the surrounding community. In addition, there is no longer a need to use city streets or the highway to get to any point once on campus. The bridge includes a protected left turn pocket, bike lanes and sidewalks. The Build NCC is part of a 40-year, \$6 billion multi-agency project that balances transportation improvements with environmental enhancement programs to ensure better mobility and more transportation choices in the San Diego area.

District 12

In Orange County, work is now underway on restriping Culver Drive at the Interstate 405 overcrossing to create a new Class II bicycle lane. The project began last April, and is scheduled to wrap up in January 2020. A more extensive restriping effort along State Route 1, the Pacific Coast Highway, is now in the planning stages, a 15-mile stretch starting on Dover Drive and finishing at the Los Angeles County line.

- [Director's Message](#)
- [Shining a Light on Culvert Conditions](#)
- [‘Signals, Signs and Sensors’ High on Fix-It List](#)
- [New Life for Old Stretch of 99](#)
- [Mileposts](#)
- [After the Devastation, a Safer Highway System](#)
- [Search for Cost Savings Pays Off](#)
- [Taking a Turn Toward Active Transportation](#)
- [Construction Turns to Tablets for Efficiency](#)
- [Plan Identifies Highway System Needs, Fixes](#)
- [New Inspector General Keeps Watch](#)

Statewide Campaigns

- ▶ [ADA Access](#)
- ▶ [Adopt-A-Highway](#)
- ▶ [Amber Alert](#)
- ▶ [Be Work Zone Alert](#)
- ▶ [CAL FIRE](#)
- ▶ [Clean California](#)
- ▶ [Energy Upgrade](#)
- ▶ [Go Safely California](#)
- ▶ [HeatReadyCA.com](#)
- ▶ [Move Over Law](#)
- ▶ [Cal OES: Power Outage and Fire Recovery Resources](#)
- ▶ [California Climate Investments](#)
- ▶ [California Connected](#)
- ▶ [California Transportation Plan 2050](#)
- ▶ [REAL ID](#)
- ▶ [Save Our Water](#)
- ▶ [Stormwater Education Campaign](#)
- ▶ [Tenant and Landlord Resources](#)
- ▶ [Unclaimed Property](#)

[Back to Top](#)

[Accessibility](#)

[Privacy Policy](#)

[Conditions of Use](#)

[Register to Vote](#)

[!\[\]\(f97bbb84d3e14c71f5666b6875b81b2f_img.jpg\) Facebook](#) [!\[\]\(253c2e2b09b663087336f31efdca4bbd_img.jpg\) Twitter](#)

Copyright © 2024 State of California

[Home](#) [Programs](#) [Public Affairs](#) [Mile Marker](#)[Mile Marker: A Caltrans Performance Report, Winter 2019-2020](#)[Construction Turns to Tablets for Efficiency](#)

Construction Turns to Tablets for Efficiency

Devices Replacing Traditional Paper Plans on Job Sites, Save Money and Time



Ariel Mendoza, a Caltrans transportation engineer who works out of Lodi, checks project tablet at a job site this summer. About 1,000 field tablets have been distributed to engineers to access schedules, save money and enhance safety.

Concrete, steel and asphalt endure as irreplaceable components of road and bridge projects, but paper — used for plans, specifications, procedural manuals, forms and the like — is being phased out in Caltrans' Division of Construction.

Caltrans distributed about 1,000 tablets to its field engineers in 2017-18, which means about half of the total field workforce is equipped with that form of digital technology. Staff in the field use the tablets to access contract documents and Caltrans manuals, enter information, conduct research, and email interested parties. The devices cut costs, save time and, because they can reduce the need for trips between the office and work sites, lower environmental impact and state vehicles' exposure to vehicular accidents.

A recent survey noted that each tablet used by the Division of Construction resulted in an average reduction of 4.4 trips per week between the field office and job site. That translates to an annual travel savings of \$2.1 million. Another \$350,000 is saved annually by each tablet user printing an average of 7,100 fewer pages. Subtract the devices' \$1,100-per-unit purchase and servicing expenses, and the annual savings of having 1,000 tablets in the field adds up to nearly \$1.5 million.

Once the division provides all 2,000 of its field engineers with tablets, the annual savings could rise to \$3 million. As users become more proficient using tablets to gather and access information in the field, those savings

might increase even more.

Field tablet users who can call up documents remotely and enter data at the job site — in other words, perform more of their duties at the source than they could before — are making better use of their time than by physically having to retrieve documents, retype data or fill out forms in their office. A project's plans, manuals on how to perform the work, and contract specifications are examples of pertinent information that can be preloaded on a mobile device.

Field engineers who work on a tablet can answer contractors' questions quickly, at the job site, rather than going through a prolonged, fragmented exchange. That capability helps projects run smoothly, helping keep work on schedule and under budget.

Tablets also cut down on stacks of paperwork. Every four years, Caltrans updates and prints thousands of copies of its multivolume contract standard specifications. Revisions to these publications are made twice a year, adding to their bulk, making it more difficult to navigate and even more inconvenient to lug around or grab copies off the shelf. Field engineers often must look in multiple places to find the latest information, which eats up time and can ratchet up annoyance.

The final print version of these specifications was released in 2018. Digital versions have taken their place and will now be issued annually, perhaps as often as every six months. Digital revisions to the specifications can now be immediately incorporated in the appropriate sections.

Print reductions also are envisioned for projects' sets of plans, which now can consist of up to 2,000 sheets of drawings on 11-by-17-inch paper. Tablets' zoom function can make drawing details easy to read — no dime-store readers or magnifying glasses required.

While the benefits of accessing contract documents in a digital format on tablets has shown immediate results, fully incorporating these devices as a digital platform in our work environment has proved challenging. Caltrans' information technology (IT) team has been instrumental in working closely with the Division of Construction to provide support, address technical challenges, and expand the functionality of these mobile workforce tools.

Loading information (including photographs) onto tablets at a job site is straightforward and a definite step toward greater efficiency. However, should a tablet break or be misplaced, any new or stored data would be at risk unless it has been transmitted to a central repository. The IT team is looking into cloud storage and is zeroing in on a solution.

To access the internet, enable email, and report time, some field tablets have been loaded with a cellular card to allow for direct connectivity. (Decisions about whether tablets have cellular capabilities are made at the regional or district level.) The costs involved with connecting in such a way are minimal compared with the cost of employees going back and forth to the office, or trying to figure out the technology to connect via a cell phone.

According to the survey released earlier this year, about one-third of the field tablets had a cellular plan subscription, another third employed tethering to a cell phone, and the rest relied on the office WiFi to connect to the internet.

The survey also polled participants on how quickly they are adapting to the technology. Nearly half said that after three months of experience, they had attained a comfort level with the tablets and felt capable of training colleagues on their use.

Local user groups have proved to be a solid resource, with District 8 and the Central Regions' groups being good examples. Caltrans headquarters offers an electronic forum where staff members ask questions — not just about the tablets, but any construction issue. A link is provided on the desktop of the tablets, as is a link to get downloads of manuals.

Source: *John Hancock, Office Chief for Performance and Innovation, Caltrans Division of Construction*

Pilot Program's Clear Success Paved Way for Big Commitment

In a pilot program conducted in 2015 and 2016, the Division of Construction deployed field tablets on eight project contracts of varying types and complexity. The costs of the projects ranged from \$800,000 to \$632 million.

The pilot program was deemed such a success in terms of work-pace efficiency that the purchase and deployment of 1,000 more tablets soon followed.

The pilot also addressed how tablets might reduce Caltrans' environmental footprint. It was judged that universal use of the devices could reduce annual greenhouse gas production by more than 2.9 million pounds (related to vehicle use and paper production), eliminate 1.2 million gallons of waste water (paper production), and reduce paper usage by approximately 12.6 million sheets.

The changeover to tablets in the field supports Caltrans' goals of sustainability and system efficiency as part of its 2015-2020 Strategic Management Plan.

- › [Director's Message](#)
- › [Shining a Light on Culvert Conditions](#)
- › ['Signals, Signs and Sensors' High on Fix-It List](#)
- › [New Life for Old Stretch of 99](#)
- › [Mileposts](#)
- › [After the Devastation, a Safer Highway System](#)
- › [Search for Cost Savings Pays Off](#)
- › [Taking a Turn Toward Active Transportation](#)
- › [Construction Turns to Tablets for Efficiency](#)
- › [Plan Identifies Highway System Needs, Fixes](#)
- › [New Inspector General Keeps Watch](#)

Statewide Campaigns

- › [ADA Access](#)
- › [Adopt-A-Highway](#)
- › [Amber Alert](#)
- › [Cal OES: Power Outage and Fire Recovery Resources](#)
- › [California Climate Investments](#)
- › [California Connected](#)

▶ [Be Work Zone Alert](#)

▶ [CAL FIRE](#)

▶ [Clean California](#)

▶ [Energy Upgrade](#)

▶ [Go Safely California](#)

▶ [HeatReadyCA.com](#)

▶ [Move Over Law](#)

▶ [California Transportation Plan 2050](#)

▶ [REAL ID](#)

▶ [Save Our Water](#)

▶ [Stormwater Education Campaign](#)

▶ [Tenant and Landlord Resources](#)

▶ [Unclaimed Property](#)

[Back to Top](#)

[Accessibility](#)

[Privacy Policy](#)

[Conditions of Use](#)

[Register to Vote](#)

[f Facebook](#) [Twitter](#)

Copyright © 2024 State of California

[Home](#) [Programs](#) [Public Affairs](#) [Mile Marker](#)[Mile Marker: A Caltrans Performance Report, Winter 2019-2020](#)[Plan Identifies Highway System Needs, Fixes](#)

Plan Identifies Highway System Needs, Fixes

Caltrans Should Spend \$54.2 Billion Over Next Decade to Reach SB 1 Goals



Improving components that keep the state highway network moving, and creating new revenue sources for motorized vehicles, should be Caltrans' focus with the revenues it receives through the new State Highway System Management Plan.

Caltrans' latest State Highway System Management Plan lays the groundwork for continuing improvements to California's transportation network, which is already in a better place than when the report was last released in 2017.

The 2019 management plan delivers an up-to-date evaluation on the many physical parts that make up the state highway network, and estimates how much money and work will be needed to meet performance improvement targets set for those assets through 2029.

The difference between 2017 and this year, of course, has been the passage of the Road Repair and Accountability Act of 2017 (Senate Bill 1). The landmark transportation funding law is projected to raise \$54 billion in fuel taxes and vehicle license fees through 2027, an amount split between the state and local agencies.

The 2019 management plan is the first to reflect the early accomplishments for the additional SB 1 funds, and gives greater detail on the improvements needed ahead to comply with the new law.

The plan proposes investing \$54.2 billion through 2029 on the maintenance and rehabilitation work needed to satisfy SB 1 performance baselines for critical asset categories, to improve overall highway conditions, and offset the inevitable wear and tear on components. With the help of SB 1 revenues,

Caltrans expects to fix or replace more than 17,000 lane miles of pavement, 500 bridges, 55,000 culverts and 7,700 transportation management system units by 2027.

Major capital projects take precedence

The investment plan calls for spending most of the projected revenues, \$47.1 billion, on major capital projects through the State Highway Operation and Protection Plan (SHOPP). The SHOPP, comprised of various revenue sources in addition to SB 1, is the primary state transportation fund used to upgrade highway safety, rehabilitate or replace physical assets, improve the operation of highways, improve system resiliency, and mitigate transportation-related environmental impacts.

Based on a needs assessment, the plan identifies pavement rehabilitation and repair (\$18 billion), safety-related measures (\$5.9 billion), bridge condition improvements (\$3.7 billion), drainage (\$2.4 billion), and upgrades to transportation management systems (\$2.2 billion) as areas deserving the most SHOPP funding in the next 10 years. Outside of safety — which is always the Department's highest priority — the remaining four core categories of highway infrastructure are subject to SB 1 performance goals that should be met or surpassed if funding recommendations are followed, the plan says.

The remainder of the non-SHOPP revenues, expected to be \$7.1 billion, would finance maintenance activities through 2029. Those programs focus on preventive steps to extend the life of pavement, bridges and tunnels, drainage networks, and transportation management systems.

The 2019 highway management plan reflects the needs of all travelers by including the first estimates of bicycle, pedestrian and transit investments.

The plan notes Caltrans' continuing implementation of the Complete Streets model of more pedestrian- and bicycle-friendly highway design (see story, page 24), environmental stewardship programs that promote fish passage and wildlife crossings, proactive climate change adaptation for vulnerable parts of the transportation system, and freight mobility efforts that are environmentally responsible.

A plan tied to performance

The 2017 management plan represented a significant departure in Caltrans' planning process in managing the state transportation system. Instead of using a program-by-program approach, the Department adopted a system-wide method tied to performance targets and broader goals laid out in Caltrans' 2015-2020 Strategic Management Plan.

It also adopted the national performance metrics of a good-fair-poor rating system to evaluate highway assets, and called for a shift of some decision-making powers from Caltrans headquarters to regional districts better suited to address local issues and constituent needs.

The 2019 management plan carries forward and expands on those major changes. It updates the inventory of state highway assets and rates their condition on the good-fair-poor scale. From those conclusions, a needs assessment ultimately assigns each asset category a performance target necessary to reach "state of good repair" objectives.

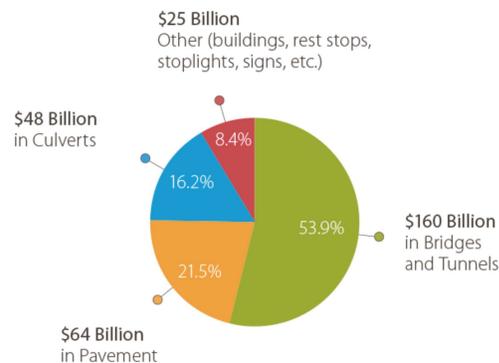
The plan then describes the steps and the money needed to put the required improvements in place by 2029. It also emphasizes how planners must factor in the life cycle of the physical materials before making decisions, and

consider the risks to the Department and transportation network as a result of those choices.

Although SB 1 revenues have only been flowing for a short time, they're already strengthening the foundation of the State Highway System, particularly pavement condition. Since late 2017, Caltrans has paved almost 1,500 lane miles within the State Highway System, repaired or replaced 115 bridges, and completed more than 100 construction projects. Hundreds more repair and rehabilitation projects are in the construction pipeline, and numerous project timelines have been accelerated to quicken the pace of improvements and reduce costs.

Prior to the passage of SB 1, available transportation funding for the SHS met about 25 percent of the identified annual need. With the additional revenues, annual funding relative to need has more than doubled to 56 percent.

Value of Core Assets on the State Highway System



Investments in the SHS over time have created a highway network with an estimated replacement cost of \$297 billion. A breakdown of major system component replacement value is shown in the chart above.

Increased revenues still fall short of total fix

However, the management plan notes that even with the increased revenues from SB 1, it's not feasible to fund every identified need on the State Highway System. The reality is that it would take an estimated \$90.4 billion to complete all needed work on the state transportation network in the next decade.

With an expected total of \$54.2 billion to work with, Caltrans, and the California Transportation Commission, must act with constraint in their spending choices. The management plan recommends a path that prioritizes spending on projects and programs subject to SB 1 performance objectives — pavement, bridges and tunnels, drainages and traffic management systems — and to selectively fund less critical highway assets.

Source: 2019 State Highway Management Plan; Michael B. Johnson, Manager, Caltrans Asset Management

- > [Director's Message](#)
- > [Shining a Light on Culvert Conditions](#)
- > ['Signals, Signs and Sensors' High on Fix-It List](#)

- › [New Life for Old Stretch of 99](#)
- › [Mileposts](#)
- › [After the Devastation, a Safer Highway System](#)
- › [Search for Cost Savings Pays Off](#)
- › [Taking a Turn Toward Active Transportation](#)
- › [Construction Turns to Tablets for Efficiency](#)
- › [Plan Identifies Highway System Needs, Fixes](#)
- › [New Inspector General Keeps Watch](#)

Statewide Campaigns

- › [ADA Access](#)
- › [Adopt-A-Highway](#)
- › [Amber Alert](#)
- › [Be Work Zone Alert](#)
- › [CAL FIRE](#)
- › [Cal OES: Power Outage and Fire Recovery Resources](#)
- › [California Climate Investments](#)
- › [California Connected](#)
- › [California Transportation Plan 2050](#)
- › [Clean California](#)
- › [Energy Upgrade](#)
- › [Go Safely California](#)
- › [HeatReadyCA.com](#)
- › [Move Over Law](#)
- › [REAL ID](#)
- › [Save Our Water](#)
- › [Stormwater Education Campaign](#)
- › [Tenant and Landlord Resources](#)
- › [Unclaimed Property](#)

[Back to Top](#)

[Accessibility](#)

[Privacy Policy](#)

[Conditions of Use](#)

[Register to Vote](#)

[f Facebook](#) [Twitter](#)

Copyright © 2024 State of California

[Home](#) [Programs](#) [Public Affairs](#) [Mile Marker](#)[Mile Marker: A Caltrans Performance Report, Winter 2019-2020](#)[New Inspector General Keeps Watch](#)

New Inspector General Keeps Watch

Oversight Office Audits Costs, Effectiveness of SB 1, Other Programs

There's a new leader at Caltrans'



As Inspector General, Rhonda Craft and her staff scrutinize transportation spending by Caltrans and local agencies.

Independent Office of Audits and Investigations that works to ensure that state transportation funds are being spent on their intended purpose.

Rhonda L. Craft was appointed by Gov. Gavin Newsom to serve a six-year term as Caltrans' Inspector General. The position was created as part of the Road Repair and Accountability Act of 2017 (Senate Bill 1), which required the appointment of an independent administrator to monitor fuel and driver licensing revenues raised by the transportation funding law.

Caltrans' existing Office of Audits and Investigations was brought under the authority of the Inspector General once SB 1 became law. In addition to SB 1 overview, the office performs a scheduled range of audits and investigations through the fiscal year, focusing on selected Caltrans operations and contracts as well as scrutinizing the work of local agencies that receive state and federal transportation funds from the Department.

Craft was most recently director of the state Office of Traffic Safety and the Governor's Representative for Highway Safety, responsible for developing programs to reduce the number of persons injured or killed in traffic crashes in California. She also served in executive positions at the California Department of Motor Vehicles during a 30-year-plus career with the State.

Six months into the job, Craft said she's building on the foundation of good work and organizational structure left by her predecessor, Eraina Ortega, the office's first Inspector General who was appointed by Newsom to become the chief of CalHR.

As Inspector General, Craft oversees a 92-person office made up of auditors, special investigators, and support staff.

Audits and reviews are performed according to state or federal mandates, to satisfy reporting requirements, or if conditions exist that officials believe warrant an examination of a program's efficiency.

Craft's staff has wrapped up its activities for the recently concluded 2018-2019 fiscal year. The recommendations and findings can be viewed in the annual summary posted on the Inspector General's Caltrans web pages.

A total of 70 comprehensive audits were performed through the end of June 2019. Of those, 28 were conducted of local agencies that received state transportation funds, 20 were construction audits of specific projects, 16 involved use of Proposition 1B funds (approved in 2006 for various transportation projects), and six audits looked into Caltrans internal programs.

The office also conducted 351 reviews of architectural and engineering contracts with consultants during the last fiscal year, and 97 reviews of local agency contracts.

That oversight helps save taxpayer funds. The construction audits resulted in \$3 million in avoided costs, which were identified by auditors prior to the execution of the contract with consultants. The 16 Proposition 1B audits of local agency spending on those projects turned up \$7.5 million in disallowed or questioned costs, of the \$415 million total allocated from bond measure proceeds.

Investigations also were conducted on Caltrans' internal operations when incidents of misconduct were reported. Of the 104 allegations reviewed, 15 formal investigations were launched and 11 cases confirmed, resulting in disciplinary action.

The office also maintains an ethics hotline where Caltrans employees can anonymously report unethical or questionable behavior. In FY 2018-19, 152 reports were called in or reported on the office's website.

Source: *Rhonda L. Craft, Inspector General, Independent Office of Audits and Investigations*

- > [Director's Message](#)
- > [Shining a Light on Culvert Conditions](#)
- > ['Signals, Signs and Sensors' High on Fix-It List](#)
- > [New Life for Old Stretch of 99](#)
- > [Mileposts](#)
- > [After the Devastation, a Safer Highway System](#)
- > [Search for Cost Savings Pays Off](#)
- > [Taking a Turn Toward Active Transportation](#)
- > [Construction Turns to Tablets for Efficiency](#)
- > [Plan Identifies Highway System Needs, Fixes](#)
- > New Inspector General Keeps Watch

Statewide Campaigns

- ▶ [ADA Access](#)
- ▶ [Adopt-A-Highway](#)
- ▶ [Amber Alert](#)
- ▶ [Be Work Zone Alert](#)
- ▶ [CAL FIRE](#)
- ▶ [Clean California](#)
- ▶ [Energy Upgrade](#)
- ▶ [Go Safely California](#)
- ▶ [HeatReadyCA.com](#)
- ▶ [Move Over Law](#)
- ▶ [Cal OES: Power Outage and Fire Recovery Resources](#)
- ▶ [California Climate Investments](#)
- ▶ [California Connected](#)
- ▶ [California Transportation Plan 2050](#)
- ▶ [REAL ID](#)
- ▶ [Save Our Water](#)
- ▶ [Stormwater Education Campaign](#)
- ▶ [Tenant and Landlord Resources](#)
- ▶ [Unclaimed Property](#)

[Back to Top](#)

[Accessibility](#)

[Privacy Policy](#)

[Conditions of Use](#)

[Register to Vote](#)

[!\[\]\(0d02338139225ba9482f9993590abfbe_img.jpg\) Facebook](#) [!\[\]\(ddc19e464dd6e85cc2966163ff87891a_img.jpg\) Twitter](#)

Copyright © 2024 State of California