



THE MILE MARKER

A CALTRANS PERFORMANCE REPORT

AUGUST 2014 | VOL. 1 | ISS. 11

In This Issue

Mile Markers ♦ ***New Mission, Vision, Goals*** ♦ ***Designing Safety***

Managing Mega Projects ♦ ***Conserving California's Water***

Pitkins Curve ♦ ***Zero-Emission Fleet*** ♦ ***Lessons Learned and More!***

Table of Contents

Mile Markers3
New Mission, Vision, Goals5
Project Spotlight:
Pitkins Curve25

Worker Safety Improving7
Designing for Safety9
Airport Safety
Inspections Increase24

Water 13
LED Fixtures 15
Zero-Emission Fleet29
Equipment Uptime
Increases32

California Household
Travel Survey 17
Annual Bicycle-Friendly
Statistics Survey21
Caltrans Endorses
NACTO Guidelines22
Improving Operations
with Vehicle Detectors23
Keeping Goods Moving35
The Caldecott Tunnel39
Intercity Passenger Rail45
Transit Ridership Up48

Project Delivery43

Caltrans Fiscal Resources22

Managing Mega Projects 11
Highway 1 Chip Seal37

SPOTLIGHT

SAFETY

STEWARDSHIP/SUSTAINABILITY

MOBILITY

DELIVERY

FINANCIAL

LESSONS LEARNED



MESSAGE FROM THE CALTRANS DIRECTOR

Thank you for reading the second issue of *The Mile Marker: A Caltrans Performance Report*. We are improving the ways we do business at Caltrans, and the *Mile Marker* is one of them. We are striving to provide policymakers and the public with greater transparency and accounting of the department’s performance. Since we published the last issue, we’ve developed an updated mission and vision. Our old mission statement, “Caltrans improves mobility across California” was concise, but it did not reflect our diverse transportation expertise and breadth of responsibility. Our new mission statement better describes our activities and our purpose. It clearly articulates why we exist, to “provide a safe, sustainable, integrated and efficient transportation system to enhance California’s economy and livability.” In this issue, you will find data and stories on how we are performing in areas that will help us achieve our mission. We are also adopting revised goals, which you will see on page 36. Our new goals will drive much of the content in the *Mile Marker’s* future issues, and they will help us better achieve our new mission and vision. These goals focus on the safety and health of Californians, sustainability, stewardship, system performance, and organizational excellence.



On the cover: The new rock shed on State Route 1 in Monterey County helps protect motorists and maintenance workers from falling rocks. The rock shed is the only roadway structure of its kind in the nation.

This page: The award-winning new Pitkins Curve Bridge and Rain Rocks rock shed on State Route 1 help keep this vital stretch of highway open during landslides and rockfalls.

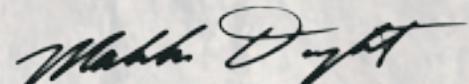
To view the interactive, electronic version of the *Mile Marker*, visit www.dot.ca.gov.

As we work to become a more modern transportation department, transparency and accountability will be part of our foundation. We want to increase the public's trust in the Department and engage the public and our transportation partners in how we can improve. We also want to continue to provide a world-class transportation system for travelers and goods in California, which we can only achieve through partnerships with other agencies at all levels, from federal, state, tribal, and local governments to grassroots organizations. Transparency and collaboration with our partners will help us achieve our new mission.

Caltrans isn't just responsible for the state highway system. We are providing leadership on a comprehensive California transportation system—one that provides our state's residents and visitors with an integrated system connecting regions and communities and moving people and goods as efficiently as possible. This multimodal system will meet the mobility needs of all Californians in a sustainable way.

California is changing, and Caltrans is working to enhance the economy and livability in the state by making smart transportation improvements and investments. We want to make sure we are not only being transparent and communicating our performance in a way that everyone can understand, but we also want to make sure we are sharing our performance in areas that matter to our readers. I encourage you to take a few minutes to respond to our short reader survey. The survey is available at https://www.surveymonkey.com/s/Mile_Marker.

The *Mile Marker* is still in its infancy, and as Caltrans advances, you may also notice changes in the report. What will not change, however, is our commitment to our employees and stakeholders: to provide a transparent and accurate accounting of our performance and do it in a way that the public can understand. Thank you and enjoy the latest issue of *The Mile Marker: A Caltrans Performance Report*.


Malcolm Dougherty

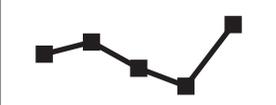


Please take the *Mile Marker* reader survey by scanning the QR code or visiting https://www.surveymonkey.com/s/Mile_Marker.



CALTRANS MILE MARKERS



Performance Measure	Previous Period	Current Period	Goal	Goal Met	Five-Year Trend (Unless otherwise noted)	Desired Trend
SAFETY						
Number of fatal accidents in 2011, on the California state highway system, for every 100 million vehicle miles traveled.	0.64	0.66	1.0 or less	✓		↓
Number of work-related injuries and illnesses per 200,000 employee hours.	7.20	6.75	5.58	—		↓
MOBILITY						
Total train and bus revenue for Amtrak California for federal fiscal year 2013.	\$134.8M	\$137.3M	\$140.6M	—		↑
Amtrak California ridership (in millions) for federal fiscal year 2013.	5.5	5.6	6.1	—		↑
STEWARDSHIP/SUSTAINABILITY						
Percentage of Caltrans' total annual state expenditure that went to small businesses.	21.6	28.24	25	✓		↑
Percentage of Caltrans' total annual state expenditure that went to disabled veteran business enterprises.	1.96	3.79	5	—		↑
Percentage of Caltrans' total annual flexible pavement placed, which consists of rubberized hot-mix asphalt and uses recycled tires.	35.9	29.2	25	✓		↑
Percentage of alternative fuels used in the Caltrans fleet.	29	27.8 thru 5/31/14	30	—		↑

The Mile Marker Purpose Statement

The purpose of the *Mile Marker* is to provide a transparent, plain-language accounting of Caltrans' performance.

Mile Markers Legend

 Goal Met  Goal Not Met
 Data that is gray had no change since last report.

Performance Measure	Previous Period	Current Period	Goal	Goal Met	Five-Year Trend (Unless otherwise noted)	Desired Trend
DELIVERY						
Percentage of planned projects delivered on schedule and ready for construction in fiscal year 2013–14.	98	98	100			
Percentage of project awards not exceeding more than 10 percent of the estimate in fiscal year 2013–14.	82	87	100			
Percentage of planned project approval/environmental documents delivered in fiscal year 2013–14.	88	88	90			
MAINTENANCE						
The fiscal year 2013–14 overall maintenance roadway service score, on a scale of 0–100, with 100 being the best.	87	85	87			
Percentage of state highway system pavement that is healthy. Caltrans' goal is expected to be reached by 2023.	84	84	90			
Overall condition of California's bridges on a scale of 0–100, with 100 being the best.	95.6	96.3	94			
Percentage of Caltrans' vehicle detectors that are "good" or functioning properly.	64.5	66.6	90.0			
Level-of-service score for highway litter and debris collected statewide for fiscal year 2013–14.	85	84	80			
Percentage of Caltrans' fleet that is in ready-to-use condition.	69	83	90			

Driving Change to Modernize Caltrans

In Caltrans' early days, our main role was to build highways, but times have changed, and so have our state's transportation needs. Transportation is evolving, and we need to evolve with it. We took time to look closely at our department. We asked others to do the same, and those reviews helped us realize that we needed a new mission, vision, and goals so we can become an even better transportation department for California's people and environment.

"Asking others to publicly critique one's own operations certainly takes guts."

~ Assembly Transportation Committee Chair
Bonnie Lowenthal, March 5, 2014, California State
Assembly Transportation Committee Hearing

A Call for Modernization

To further the in-depth review of our operations, the California State Transportation Agency commissioned the [State Smart Transportation Initiative](#) to provide an external assessment of our practices. SSTI, housed at the University of Wisconsin, promotes transportation practices that advance environmental sustainability and equitable economic development, while maintaining high standards of governmental efficiency and transparency. SSTI released their report in late January. It included the results from more than 100 interviews with people inside and outside of Caltrans, and it identified many ways to modernize our department. The SSTI report was critical of Caltrans in some areas, but it also validated changes we had already started in our 2012 Program Review.

New Mission,

A Critical Look from Inside

Caltrans employees must make good business decisions and be good stewards of taxpayers' dollars. We must also foster a culture of professionalism and ethics throughout our ranks, and we must embrace change and sustainability. We are committed to transparency and improving the way we do business. In early 2012, we undertook the [Caltrans Program Review](#). The review was a critical internal look at how we do business. We also asked our external transportation partners to critique us. Through the review, we found ways to be more effective and efficient. Some of the changes that came from the Program Review include:

- Developing the Caltrans *Mile Marker* to improve communication and transparency on departmental performance in achieving key goals.
- Creating the Office of Enterprise Risk Management to help managers identify potential issues and possible solutions to become more effective and efficient.

We are integrating the recommendations from the final Program Review and the SSTI reports into a single effort to modernize Caltrans. We've made some changes, but others, such as developing sustainable funding mechanisms, will take more time. As we improve, transparency and accountability will be cornerstones of our operations, and we will appropriately measure our performance and share it with the public, legislators, and the media.

New Mission, New Vision

The Caltrans Executive Board, which includes the Caltrans Director, Chief Deputy Director, Deputy Directors, and District Directors, worked with the California State Transportation Agency and used employee input to craft our new mission and vision statements that better describe our activities and our purpose. While our old mission statement, "Caltrans improves mobility" was concise, it did not truly reflect all of Caltrans' diverse transportation expertise. Our new mission statement says what

we do, why we exist, and exactly what kind of transportation system we will deliver to the people of California: We “provide a safe, sustainable, integrated and efficient transportation system to enhance California’s economy and livability.”

Similarly, our new vision statement says what we want to become and that we want to be seen as “a performance-driven, transparent and accountable organization that values its people, resources and partners, and meets new challenges through leadership, innovation and teamwork,” and our values: integrity, commitment, teamwork, and innovation support our mission and vision.

(continued on page 36)



Mission

Provide a safe, sustainable, integrated and efficient transportation system to enhance California’s economy and livability

Vision

A performance-driven, transparent and accountable organization that values its people, resources and partners, and meets new challenges through leadership, innovation and teamwork

Revised April 2011

Vision, Goals

Meeting new challenges through leadership, innovation, and teamwork is part of Caltrans' new vision.



Worker Safety Improving

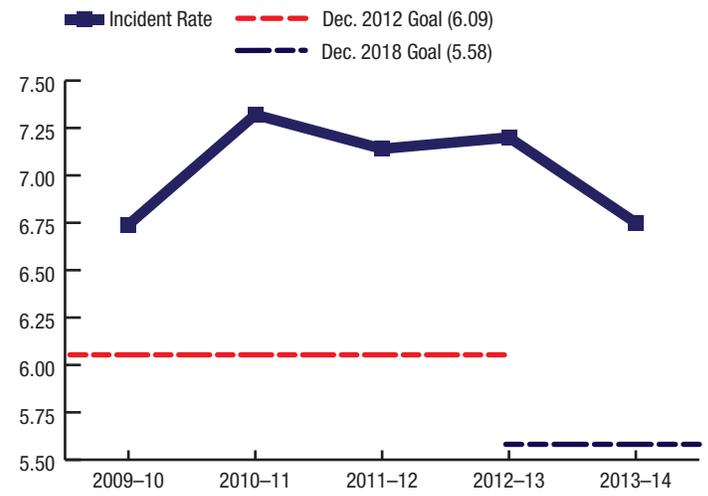
Worker Illnesses and Injuries Drop

Caltrans measures work-related illnesses and injuries using the worker incident rate, a formula that measures the number of injuries for every 200,000 hours worked. A worker incident is any work-related injury or illness that requires medical attention. Work-related injuries and illnesses affect employee morale and may cost the public through increased workers' compensation insurance premiums and lost production.

Our worker incident rate dropped from 7.20 in 2013 to 6.75 in the second quarter of 2014. There has been a steady downward trend in the worker incident rate in recent years, and we have set a new goal of reducing the worker incident rate to 5.58 by 2018.

At Caltrans, we are always looking for ways to increase the focus on worker safety. In addition to our regular activities that emphasize safety, each spring our employees participate in National Work Zone Awareness Week and the Caltrans Workers

Worker Incident Rate



Source: Office of Health and Safety

Memorial. The memorial pays tribute to Caltrans workers who lost their lives building, maintaining, and operating California's world-class transportation system. The memorial is a reminder that safety is a year-round priority, and nothing is more important than the safety of our workers and the public.

Left to right, Kevin Lindsey, Alex Valdez, and Rick Chavez of the Caltrans Honor Guard place a memorial cone at the 2014 Workers Memorial, which honors the department's workers who lost their lives on the job.



Preventable Motor Vehicle Incidents Decline

In addition to measuring worker illnesses and injuries, we track the number of motor vehicle incidents, which are collisions that a Caltrans employee could have avoided. They can range from a scrape on a Caltrans vehicle to a fatality. Motor vehicle incidents not only endanger lives, but they can also be costly. Costs incurred in these vehicle incidents are not reimbursable and come directly from Caltrans' budget. Reducing preventable motor vehicle incidents means fewer resources are used for vehicle repairs.

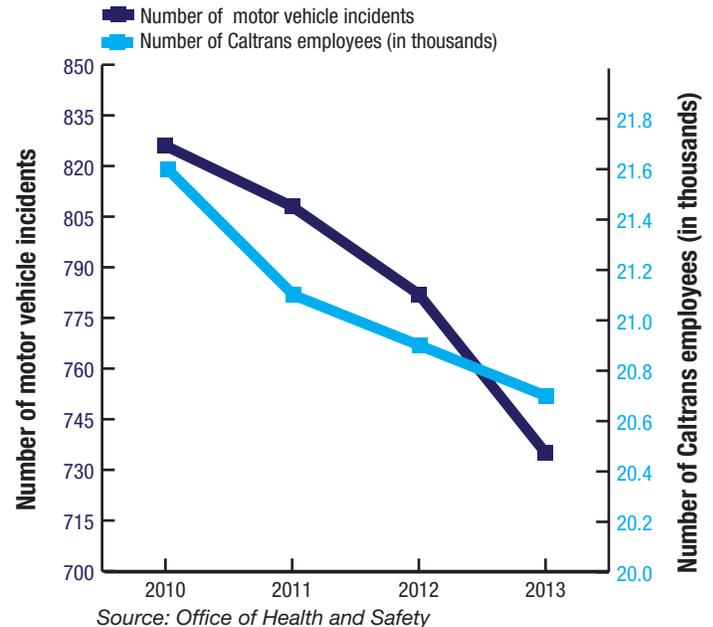
Our goal is to improve employee safety by reducing these incidents. In calendar year 2013, preventable motor vehicle incidents decreased 6 percent from the previous year, dropping from 782 to 735 incidents.

We have reduced the number of vehicles in our fleet, which may contribute to the decrease in preventable motor vehicle incidents. We've also increased the safety training available to our employees, and the required defensive driver training has been updated. Caltrans has also put added emphasis on safety in our Motorized Equipment Training Academy training courses.

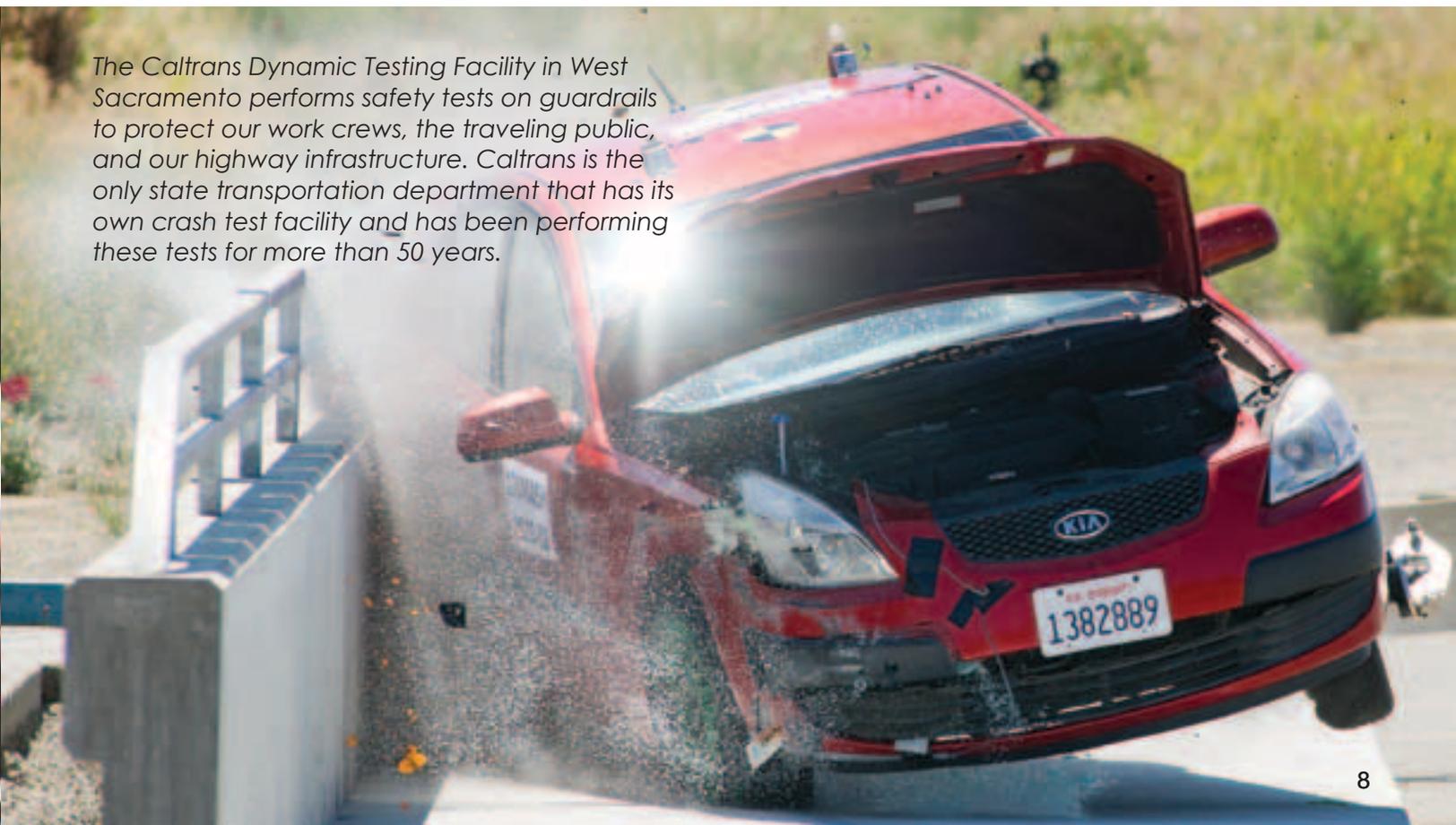
Contributor: Wayne Wolfe, Office of Health and Safety

The safety of the public and our employees will always be our No. 1 priority.

Preventable Motor Vehicle Incidents



The Caltrans Dynamic Testing Facility in West Sacramento performs safety tests on guardrails to protect our work crews, the traveling public, and our highway infrastructure. Caltrans is the only state transportation department that has its own crash test facility and has been performing these tests for more than 50 years.



Designing for Safety

Working to Protect our Employees

Any time someone stands on a highway, alongside vehicles traveling at 55 miles per hour or more, they risk injury or death.

Caltrans is designing and building highways with safety features to protect our employees from the hazards they face every day they go to work. Since an employee's risk increases with time exposed to traffic without protection, we are designing highways with protective features or with features that require less maintenance by our workers. Sometimes this means we are widening freeway shoulders, upgrading guardrails to concrete barriers, improving lighting, or moving employee parking, signs, or electrical boxes farther from traffic.

Providing safe worker access and reducing the need for recurrent activities reduces the amount of time employees are exposed to traffic. These improvements reduce worker exposure and make the highways more sustainable by eliminating or minimizing needed maintenance activities and costs.

Caltrans measures the number of locations where we make worker safety improvements through our State Highway Operations and Protection Plan (SHOPP) Roadside Safety Improvement Program. The program provides off-pavement access areas that can be used by highway workers for landscape and electrical maintenance, litter pickup crews, the motoring public for emergencies, and the California Highway Patrol for traffic control. Our goal is to have zero work-zone-related fatalities and to reduce work-related injuries.

Although we routinely address safety needs on many highway improvement projects as a standard business practice, Caltrans is increasing its focus on reducing worker exposure risk through a dedicated program to address worker exposure. Over the three fiscal years spanning 2013–14 through 2015–16, we will be improving worker safety at more than 1,600 locations. Caltrans district staff determine where safety improvements are needed based on highway worker proximity to traffic or repeated errant vehicles in a certain location where employees work. Improvements will include creating safe access to work areas with gates, vehicle trails, or vehicle pullouts. We are also relocating signs, and when possible, either moving highway elements such as signals and irrigation system components closer together or to protected locations, and we are increasing the pavement areas near highway exits so our workers spend less time exposed to traffic during weed-control work. For our chain control areas, we are improving signage and lighting and increasing the pavement areas for our workers. We are upgrading our barriers from metal to concrete where appropriate and including barrier end treatments that crumple to reduce motorist injury upon impact. These upgrades will be measured by location in varying units, such as square feet or linear feet, to count as one location. In addition,

Caltrans Safety Locations

(Fiscal years 2010–2015)

Fiscal Year	Number of Locations with Safety Improvements
2010–11	33*
2011–12	31*
2012–13	32*
2013–14	142
2014–15	893 (planned)
2015–16	574 (planned)
Total Improvements	1,609

*Before funds were increased for the Roadside Safety Improvement Program.
 (Note: The program was previously funded at \$2.9 million, but it was increased to \$90 million last year.)
 Source: Division of Design



we are including these and other safety features when we design new projects.

The Roadside Safety Improvements Program is slated to receive an average of \$90 million a year through the next 10-year SHOPP cycle. This will help us meet our goals by continuing to fund the protection of highway workers by placing barriers between the workers and traffic, moving highway features farther from traffic, and by providing safe access to work sites.

New Safety Campaign Features Caltrans Kids

Highway construction is one of the most dangerous jobs in the nation. Since the 1920s, 183 Caltrans employees have been killed on the job—and the risk of death is seven times higher for highway workers than for workers in other industries, according to the latest data from the California Department of Industrial Relations. On average, 1,000 Caltrans vehicles are struck each year—more than three each day.

In June of this year, and in partnership with the California Highway Patrol and the California Office of Traffic Safety, we began asking drivers to “Be Work Zone Alert” and help save lives on California’s roads. The new campaign features public service announcements and nearly 60 billboards across

California where the children of highway workers remind drivers to stay alert in California work zones. Through an in-house casting call to our field maintenance employees, we are able to feature five families. The campaign is funded with highway maintenance funds and a grant from the California Office of Traffic Safety through the National Highway Traffic Safety Administration.

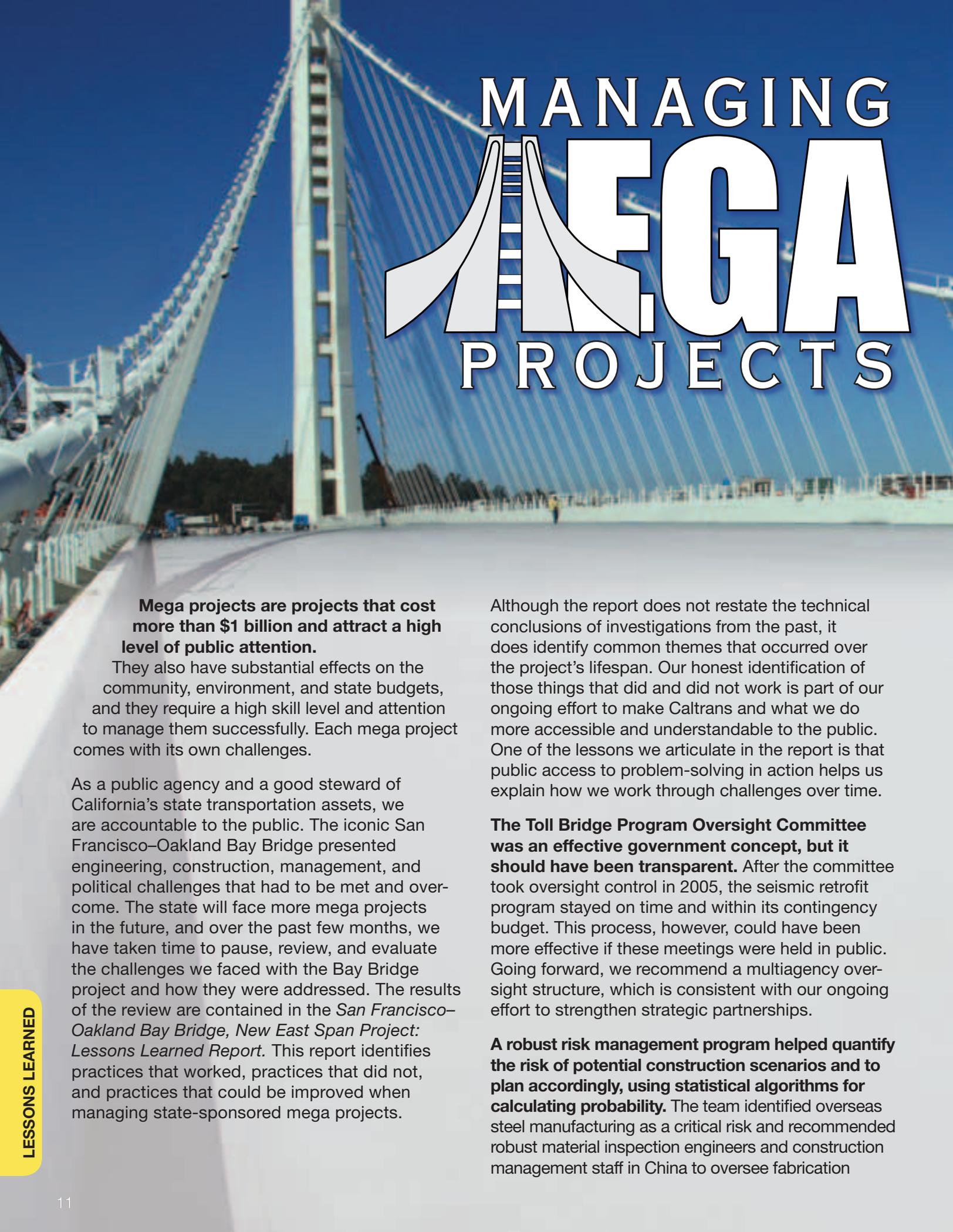
This public awareness campaign reminds everyone that highway workers have families and loved ones who are counting on motorists to “[Be Work Zone Alert](#)” and help save lives. The children of our workers are proud of their parents and are asking all drivers to help keep workers safe by staying alert in highway work zones.

Past public awareness campaigns, such as “[Click It or Ticket](#)” and “[Slow for the Cone Zone](#),” have helped improve public safety by reducing collisions, injuries, and fatalities on California’s highways. In 2010, highway work zone injuries were reduced by 33 percent from 2007 levels. Nevertheless, work zone collisions still burdened the state with approximately \$185 million in economic costs as well as the tragic loss of human life.

Safety is our No. 1 priority, and we will continue to do all that we can to protect our workers—all of them—so that at the end of their workdays they can go home to the people who love them.

*Contributors: Dawn Grinstain and Keith Robinson,
Division of Design*





MANAGING MEGA PROJECTS

Mega projects are projects that cost more than \$1 billion and attract a high level of public attention.

They also have substantial effects on the community, environment, and state budgets, and they require a high skill level and attention to manage them successfully. Each mega project comes with its own challenges.

As a public agency and a good steward of California's state transportation assets, we are accountable to the public. The iconic San Francisco–Oakland Bay Bridge presented engineering, construction, management, and political challenges that had to be met and overcome. The state will face more mega projects in the future, and over the past few months, we have taken time to pause, review, and evaluate the challenges we faced with the Bay Bridge project and how they were addressed. The results of the review are contained in the *San Francisco–Oakland Bay Bridge, New East Span Project: Lessons Learned Report*. This report identifies practices that worked, practices that did not, and practices that could be improved when managing state-sponsored mega projects.

Although the report does not restate the technical conclusions of investigations from the past, it does identify common themes that occurred over the project's lifespan. Our honest identification of those things that did and did not work is part of our ongoing effort to make Caltrans and what we do more accessible and understandable to the public. One of the lessons we articulate in the report is that public access to problem-solving in action helps us explain how we work through challenges over time.

The Toll Bridge Program Oversight Committee was an effective government concept, but it should have been transparent. After the committee took oversight control in 2005, the seismic retrofit program stayed on time and within its contingency budget. This process, however, could have been more effective if these meetings were held in public. Going forward, we recommend a multiagency oversight structure, which is consistent with our ongoing effort to strengthen strategic partnerships.

A robust risk management program helped quantify the risk of potential construction scenarios and to plan accordingly, using statistical algorithms for calculating probability. The team identified overseas steel manufacturing as a critical risk and recommended robust material inspection engineers and construction management staff in China to oversee fabrication

LESSONS LEARNED: SAN FRANCISCO—OAKLAND BAY BRIDGE



quality. This risk management was useful, but the project did not get the full benefits it would have from implementing the risk management program fully from the outset rather than at the start of construction. We recommend using a risk manager for future projects.

Bringing in outside experts for technical advice was valuable for ensuring quality throughout construction. The Materials Engineering and Testing Services provided quality assurance services, the Seismic Safety Peer Review Panel—an independent body of world-renowned engineering experts—provided technical guidance, and an external Quality Assurance and Quality Control panel helped evaluate steel and overseas welding fabrication. We strongly recommend that all mega projects engage world-renowned industry experts to provide technical consultation during construction.

Mega projects produce potentially overwhelming volumes of project documentation and records that would benefit from dedicated records management, and retention personnel and tools. Developing databases to track voluminous records can be quite difficult in the midst of construction. We recommend that at the beginning of a project, Caltrans establish a

formalized records management process and staff capable of managing and retaining library-style volumes of construction records throughout the project.

Consideration should be given to the contextual relationships that exist when building large infrastructure projects. California is a diverse place, and no one project is right for all communities. The state originally proposed a Spartan concrete viaduct, but that design was unacceptable to the local community, which sought a lifeline structure that related to the identity of the region it would serve. Caltrans is currently going through a period of self-analysis and is working to substantially improve our organization and our responsiveness to local community needs.

The report shows that even something that started as a challenge taught us how to better manage future mega projects, such as the planned California high-speed rail. You can read the entire report *San Francisco–Oakland Bay Bridge, New East Span Project: Lessons Learned Report* and list of recommendations [[here](#)].

Caltrans Works to Conserve State's Most Precious Resource:

Water

Water. It's vital for each of us to exist, and in California it's rapidly diminishing.

Caltrans understands the importance of conserving our most precious resource, and we are taking aggressive steps to promote sustainable practices and do our part to save our state's water.

For many areas of California, 2013 was the driest year in the state's recorded history, and in January 2014, Governor Edmund G. Brown, Jr. declared a drought state of emergency directing state officials to take action to conserve water. Governor Brown also called on all Californians to reduce their water use by 20 percent. Caltrans has been a leader in water conservation since the drought of 1976-77, and we are working to conserve more water and cut our irrigation by 50 percent statewide.

Caltrans owns and manages more than 30,000 acres of irrigated landscape. About 75 percent of the water Caltrans uses goes to irrigating highway plants. These plants do more than make our roads look nice. They also help reduce erosion and graffiti, help filter pollutants such as heavy metals from rain runoff, and absorb pollutants from the air.

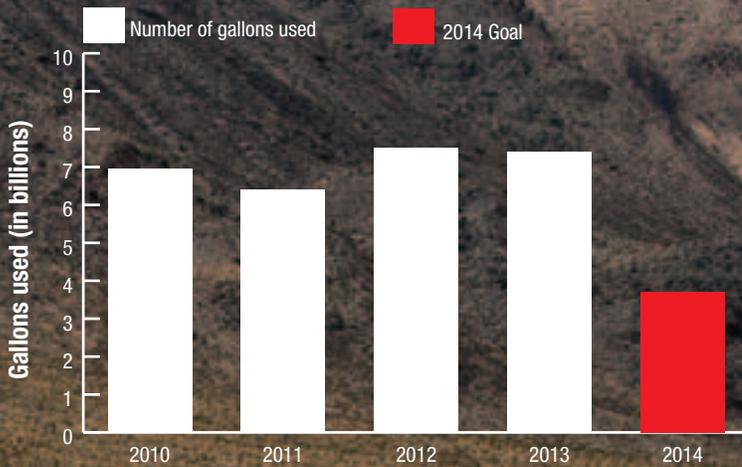
What We Are Doing

We are making dramatic changes in our irrigation activities, construction practices, and facilities and equipment management to further reduce water use while sustaining the health of roadside plants. To reach our increased water-reduction target, we are:

- No longer watering, or significantly curtailing watering, highway planting in areas of the state suffering the most severe drought effects.
- Accelerating the installation of smart irrigation controllers. Smart irrigation technologies can reduce water use by as much as 50 percent. They automatically turn off when it rains and when it is forecast to rain, apply water only when plants need it, and they shut off and notify the water manager when the system breaks.
- Placing more efficient plumbing fixtures in our buildings.
- Eliminating watering lawns at rest areas and office buildings. In the limited circumstances when we do water these lawns, we are using only onsite, recycled water that would otherwise be wasted or well water that is not planned for human consumption.

Racetrack Playa is an ancient dry lakebed located in Death Valley National Park and famous for its moving rocks that inscribe long tracks in their wake across the smooth, dry valley floor without human or animal intervention.

Total Statewide Landscape Water Use



All state departments in California are using 2010 as the base year to evaluate conservation efforts.

Caltrans District 12 Shows Savings

Caltrans' 2014 water conservation efforts are already showing savings in Orange County, via a pilot project that updated the landscape irrigation controllers allowing even closer monitoring of use. From January through April, water reduction efforts resulted in a savings of 53 million gallons, or 81 percent less than 2013 use over the same period. These are the kind of results we'll need state-wide to help meet the Governor's order for water conservation.

Statewide, Caltrans works with more than 7,500 water agencies. It's not your average water bill we deal with on a monthly basis, but that doesn't change the fact that we have to be innovative, creative, and aggressive with how we use this vital resource.

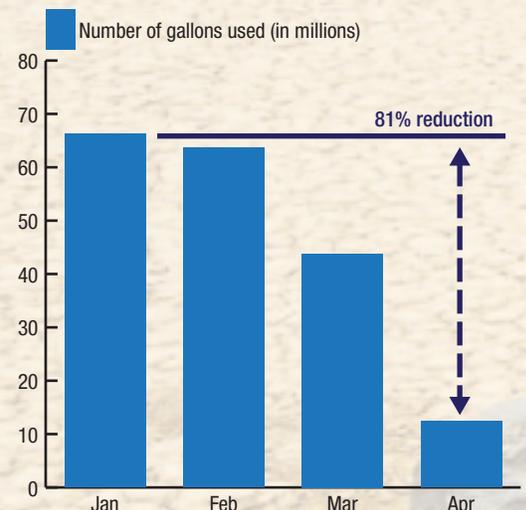
- Partnering with local water purveyors to increase the use of recycled water wherever possible.
- No longer washing state vehicles, except when necessary for safety.
- Delaying nonessential landscape projects in severely drought-affected areas until the next rainy season.
- Using dust suppressants instead of water to suppress dust at our construction sites.

Caltrans supports the www.saveourh2o.org campaign. We have used California's electronic highway message signs to raise awareness of the severe drought and encourage Californians to conserve water. The signs were activated when there were no critical emergency or traffic safety messages or Amber Alerts, and we plan to activate them throughout the drought as needed.

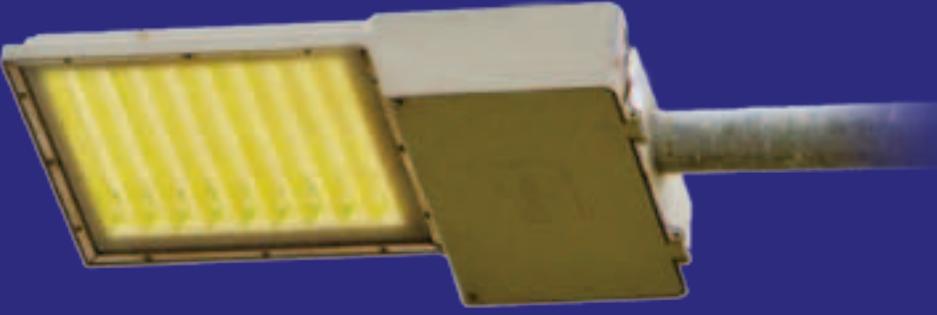
This is just a small list of what Caltrans is doing to save California's precious water. The future of the drought is uncertain, but we will continue to do our part toward sustainable water practices.

Contributors: Keith Robinson, Division of Design and Ken Murray, Division of Maintenance

Orange County Water Reduction* (January–April 2014)



* In Orange County, Caltrans conducted a pilot project that updated the landscape sprinkler controllers. The new controllers provide water use data, so we are more confident in the reduction of water use.



LED Fixtures Cheaper, Safer, and Sustainable

At Caltrans, we are retrofitting our roadway lighting inventory with LED fixtures. High-pressure sodium fixtures have been the mainstay for Caltrans roadway lighting for 30 years, but they are being surpassed by LED as the state-of-the-art lighting technology. LED fixtures are helping us to reduce our maintenance efforts on lighting systems, improve safety for our employees and the public, and reduce our energy needs.

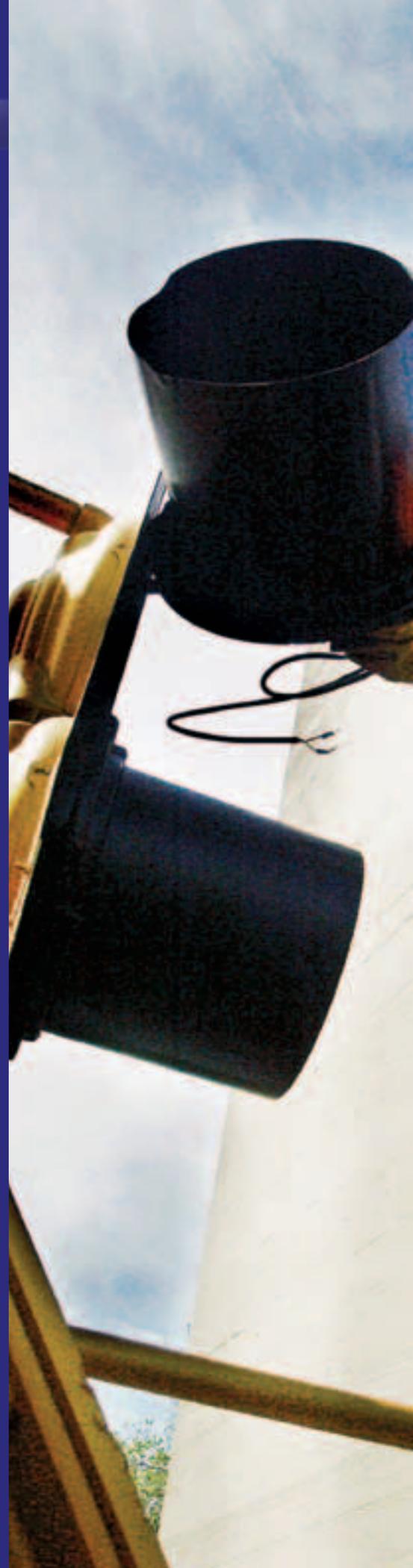
Highway Lighting Comes with Costs

Caltrans installs lighting on roadways to allow motorists to avoid other vehicles and obstacles in the roadway. Maintaining and operating these systems costs more than \$20 million annually and requires routine maintenance that often places workers at risk and interferes with traffic flow.

Benefits of LED Fixtures

LED fixtures are more robust and reliable, and that leads to a safer roadway system for motorists. LED roadway fixtures are designed to operate for a minimum of 15 years with little to no maintenance, while our current high-pressure sodium fixtures need to be relamped every four to five years. Reducing the need for maintenance on highway lighting means fewer lane closures are necessary. This translates to fewer motorists' delays, and it reduces our electricians' exposure to the hazards of working near live traffic. Our electricians in these positions can now focus their efforts on other high-priority work, such as maintaining ramp meters, freeway vehicle detection systems, and electronic highway message signs.

LED fixtures are a significant energy saver. LED fixtures reduce lighting energy needs by up to 50 percent. This savings results in a financial benefit to the citizens of California, as well as contributing to Caltrans' effort to reduce our greenhouse gas effects on the environment. Caltrans has a goal to reduce the department's



A Caltrans maintenance worker installs an LED fixture on Sacramento's Tower Bridge.



carbon dioxide equivalent, a measure used to compare emissions from various greenhouse gases based upon their global warming potential. We estimate that our fully retrofitted lighting inventory will reduce up to 20,000 tons of carbon dioxide equivalent per year. Our current retrofit effort will save enough energy to power more than 2,400 homes, and the annual greenhouse gas reduction is equivalent to taking more than 2,800 cars off the roads.

These savings, for both maintenance and energy, are part of the effort to reduce costs and ensure a sustainable highway system.

Caltrans LED Inventory, Savings, and Greenhouse Gas Reduction

	Up to 2012	2013	2014 (estimate)	2015 (estimate)	2016 (estimate)
Annual installed (or planned)	1,491	7,252	23,000	26,000	6,500+
Cumulative installations	1,491	8,743	31,743	57,743	64,243+
Annual energy savings (in kilowatt hours)	916,965	5,376,945	19,521,945	35,511,945	39,509,445+
Annual greenhouse gas reduction (in tons of carbon dioxide equivalent)	346	2,027	7,360	13,388	14,895+

Source: Division of Maintenance

Lighting the Future

We began our energy saving measures on roadways 10 years ago by converting more than 240,000 traffic signal lamps to LED technology. The first phase of this effort is focused on standard street lights, or “cobrahead” style fixtures. There are more than 64,000 of these types of fixtures on the state’s highways.

We started our LED retrofit in 2009, with installations on bridges and interchanges in the San Francisco Bay Area. In 2012, we purchased 50,000 fixtures, and we will be installing these fixtures over several years. Additional purchases are planned for fiscal year 2014–15, and we should complete the first part of the retrofit by fiscal year 2015–16.

While the cobrahead retrofit is being completed, we are writing specifications to convert the other types of lighting (such as tunnel lighting, sign lighting, and underpass lighting) to LED technology. This could add another 25,000 fixtures. We expect LED technology to be the lighting technology of choice for the foreseeable future.

Contributor: Gonzalo Gomez, Division of Maintenance

California Household Travel Survey: More Californians are Walking, Biking, and Riding Transit

Planning for transportation projects almost requires a crystal ball. It is difficult to plan the maintenance of and improvements to existing bridges, roads, and railroads without knowing what the future holds. To make projections about the future, we can study today's travel trends to forecast what we will need into the future. That's where the [California Household Travel Survey](#)

comes in—the largest and most complex review of its kind. The survey's results show that almost twice as many Californians are walking, biking, or using public transportation than they were in 2000. Such a massive shift in how people travel requires a renewed emphasis on improving the quality of these transportation options.



The Survey

The California Household Travel Survey provides detailed information about the characteristics and travel behavior of households statewide. Caltrans has conducted the California Household Travel Survey about every 10 years since 1991. The most recent survey began January 2012 and ended February 2013. The survey is a partnership between Caltrans, several California state agencies, and regional planning agencies statewide. The study was jointly funded by Caltrans, the Strategic Growth Council, the California Energy Commission, the San Joaquin Valley Air Pollution Control District, and seven regional planning agencies. Pooling state and local funds resulted in one comprehensive statewide database that each agency can use for various purposes.

How the Data was Collected

Survey participants received diaries to record where and when they traveled and how they got to and from their destinations on one random day. To ensure the data represents the entire state population, each household was asked a series of detailed demographic and socioeconomic questions, such as age, gender, income level, travel characteristics, and access to transportation. We can use this information to make good decisions about transportation investments that will make California a better place to live and work.

How the Data is Used

Caltrans and regional transportation planning agencies use the survey data as part of the development process to build models that predict travel demand. Transportation planners use models to estimate future travel demand based on future population and employment estimates. Planners then evaluate whether the existing transportation system can handle that future travel demand. If not, they can test various transportation policies and strategies to determine the best way to meet the state's, as well as each region's, future transportation needs.

Every metropolitan region in California has a modeling process. This process helps planners determine which roads and interchanges may need improvement or where more transit, biking, or walking options are likely needed. These identified improvements eventually become part of planning

documents such as a regional transportation plan. The travel projections are also used by air quality, energy, and transportation agencies to estimate the amount of exhaust emissions generated from travel and test the effect of different strategies and policies on pollution levels and energy consumption.

Household Size	Number of Households Reporting	Total
1-person	10,379	24.5%
2-persons	12,744	30.0%
3-persons	6,939	16.4%
4 or more persons	12,368	29.1%
Total	42,431	100.0%

Number of Vehicles per Household	Frequency	Total
No vehicle	3,402	8.0%
1	13,886	32.7%
2	15,788	37.2%
3 or more	9,355	22.0%
Total	42,431	99.9%

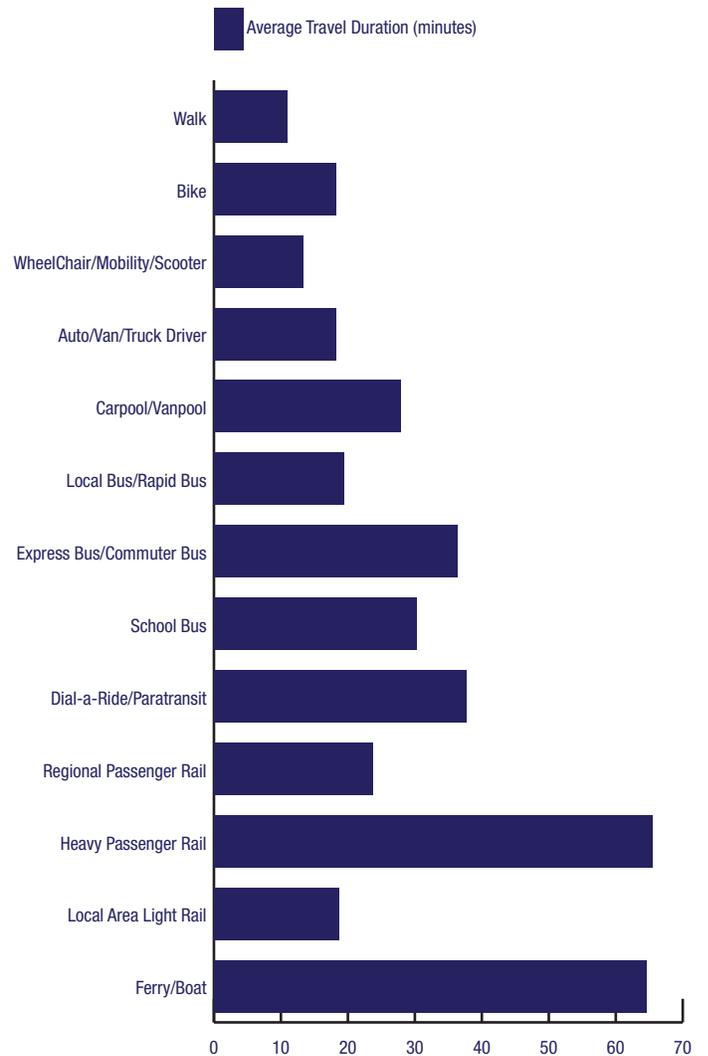
Mode	2010–2012 Mode Share	2000 Mode Share
Auto/van/truck driver	49.3%	60.2%
Auto/van/truck passenger	25.9%	25.8%
Walk	16.6%	8.4%
Public transportation	4.4%	2.2%
Bicycle	1.5%	0.8%
Private transportation	0.6%	
School bus	0.6%	
Carpool/vanpool	0.6%	
All other	0.5%	0.7%

Key Trip Statistics	
Average household trips per day	9.2
Average person trips per day	3.6
Percentage of zero trips per household	14
Percentage of auto trips	76.9
Percentage of transit trips	4
Average trip duration (minutes)	17.7
Average work trip duration (minutes)	21.3
Average school trip duration (minutes)	14.6
Average travel distance (route distance in miles)	6.8

Source: 2010–2012 California Household Travel Survey



Travel Time by Mode (in minutes)

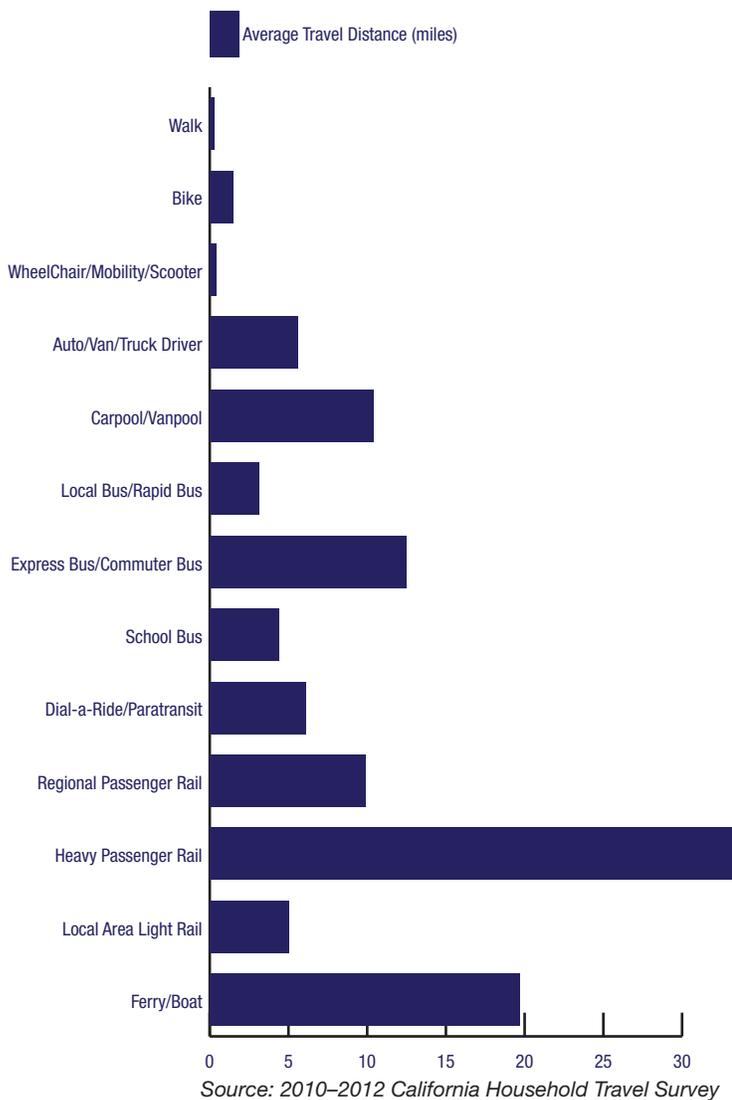


Source: 2010–2012 California Household Travel Survey

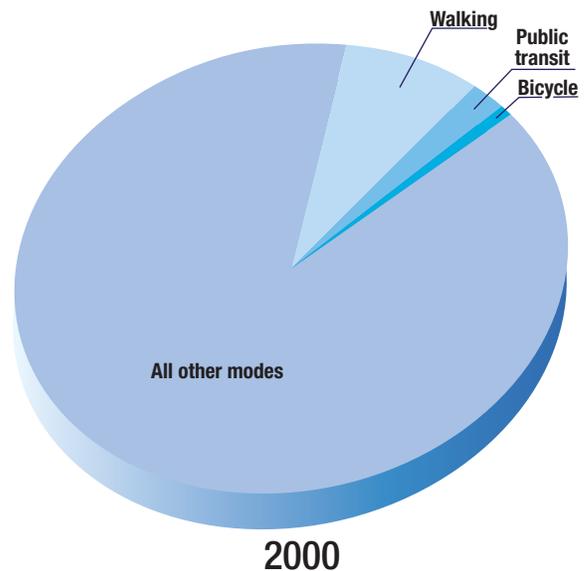
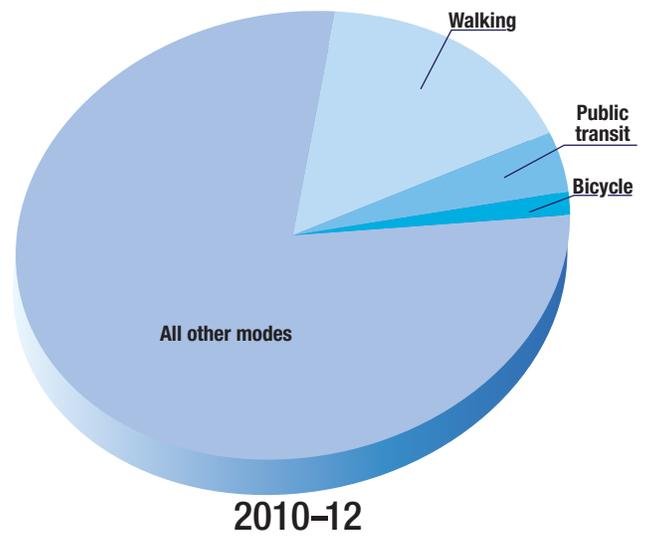
The Findings

The 2012 study provides a snapshot of travel behavior of approximately 109,000 people from more than 42,000 households in California’s 58 counties. Although the true benefit of the survey is the development of models to project future travel, the survey itself revealed interesting changes in travel behavior. Nearly 23 percent of household trips were taken by walking, biking, and public transportation. In 2000, that share was only 11 percent. This increase includes a dramatic increase in walking trips, which nearly doubled from 8.4 percent to 16.6 percent of trips. The average number of trips for a household was 9.2, while the average number of trips per person was 3.6.

Travel Distance by Mode (in miles)



Trips by Walking, Biking, and Public Transit have Doubled Since 2000



Source: 2010–2012 California Household Travel Survey

Importance of the Survey

In 2013, California enacted the state’s Active Transportation Program, which consolidates existing federal and state transportation programs, including the Transportation Alternatives Program, Bicycle Transportation Account, and State Safe Routes to School, into a single program focused on making California a national leader in active transportation. More Californians are choosing active transportation that has health benefits and cuts greenhouse gases, and this shift in choices requires planning for expanded or

new facilities. Projects such as bicycle and pedestrian paths support sustainable communities and healthier, low-carbon travel choices. This is important in achieving the mobility, safety, and sustainability goals for California’s transportation system, and the California Household Travel Survey is helping us plan for that future.

Contributors: Chad Baker and Soheila Khoii, Division of Transportation Planning



California Moves from 19th to 9th in the Annual Bicycle-Friendly State Survey

California moved up from 19th to 9th in the nation in the *League of American Bicyclists'* annual bicycle-friendly survey. How did we accomplish this great achievement? To begin with, in fall 2013, Governor Jerry Brown Jr. signed legislation (Senate Bill 99) creating the *Active Transportation Program*. This law combined several nonmotorized programs into one bicycle and pedestrian fund that provides about \$125 million per year in federal and state funding for bicycle and pedestrian projects.

Caltrans is conducting a \$360 million call for projects under the Active Transportation Program for program years 2014–15 and 2015–16. We have received 770 program applications, seeking more than \$1 billion for bicycle and pedestrian projects throughout the state. Other changes that influenced our rating in the League's survey were the statewide enactment of the Complete Streets Program and passage of California's Three Feet for Safety Act (*Assembly Bill 1371*). This law requires vehicles passing a bicycle to maintain a three-foot buffer for safe passage.

Passage of the Active Transportation Program and the subsequent call for projects has raised the profile of nonmotorized transportation in California like never before. Caltrans' new mission to "provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability," reinforces the importance of bicycle and pedestrian transportation as part of the overall transportation system. Investments in bicycle and pedestrian facilities increase system efficiencies while lowering greenhouse gas emissions, as required under *Assembly Bill 32* and *Senate Bill 375*.

For California to continue improving its bicycle-friendly rating, some areas require improvement. We need to conduct bicycle counts, collect bicycle crash data, and develop performance measures for bicycle facilities. While this is an emerging subject nationally, it is important that Caltrans assume the same leadership role with bicycle data as it has with other transportation data and information.



To view Caltrans Director Malcolm Dougherty's video, scan the QR code or see the Mile Marker online at www.dot.ca.gov.

Effective data collection will lead to better planning and integrating bicycle and pedestrian facilities into the transportation system.

Other League-recommended improvements for California include:

- Adopting a state bicycle plan.
- Adopting a state policy requiring bicycle parking at all state buildings, parks, and facilities.
- Adopting a vulnerable road-users law that increases penalties for motorists who injure or kill a bicyclist or pedestrian.
- Adopting a mode-share goal for biking that encourages integrating bicycle transportation needs.

California residents are changing how they travel, with more people choosing active transportation over driving. We still have work to do, but by working with our local and regional partners, we will continue to advance toward a sustainable transportation system for everyone.

Contributor: Paul Moore, Division of Local Assistance

Caltrans Endorses NACTO Guidelines

California's transportation system must be multimodal and support bicycles and pedestrians as well as automobiles, and Caltrans supports the construction of more multimodal local streets and roads to make our communities more livable, sustainable, and safe. This year, we endorsed the use of National Association of City Transportation Officials' [guidelines](#) that include innovations such as buffered bike lanes and improved pedestrian walkways. California is the third state in the nation to endorse these new design concepts as a resource.

Endorsing the use of these guidelines is an important part of modernizing our approach to improving transportation for all Californians and is part of an ongoing effort to provide Californians with more transportation choices.



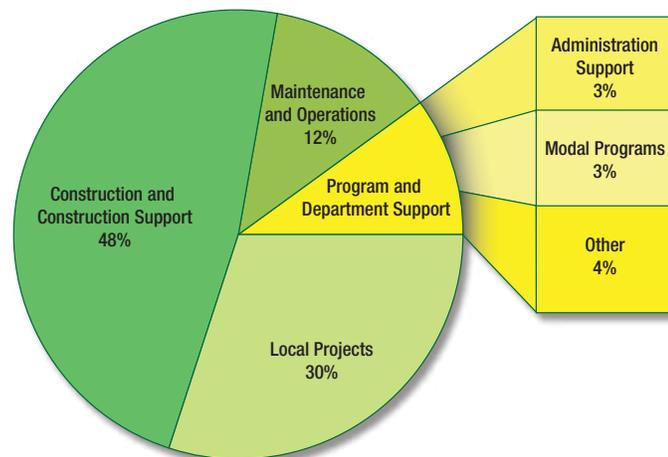
CALTRANS FI\$CAL RESOURCES

Caltrans' budget for fiscal year 2013–14 was approximately \$11.5 billion, excluding work performed for others. The largest sources of funding for transportation projects are excise taxes paid on fuel consumption, federal funds also derived from fuel taxes, and weight fees on trucks.

Transportation spending is focused on construction, primarily rehabilitation of state transportation facilities, local projects (design and construction of locally owned transportation facilities), and maintenance and operation of the state highway system. Together, these three categories made up about 90 percent of the 2013–14 budget for Caltrans. Support for these programs and for department operations make up the remaining portion of the budget. The department employs approximately 19,500 staff, which has decreased by 16 percent since fiscal year 2007–08.

For the 2013–14 fiscal year, actual expenditures were approximately 88 percent of the budget, with the largest savings in construction and local projects. Caltrans continues to see significant savings on transportation projects due to healthy competition among contractors. Bid savings on projects awarded by Caltrans averaged nearly 9 percent for the 2013–14 fiscal year. Savings from projects are made available for new projects that will further improve transportation across the state.

Caltrans 2013–14 Budget

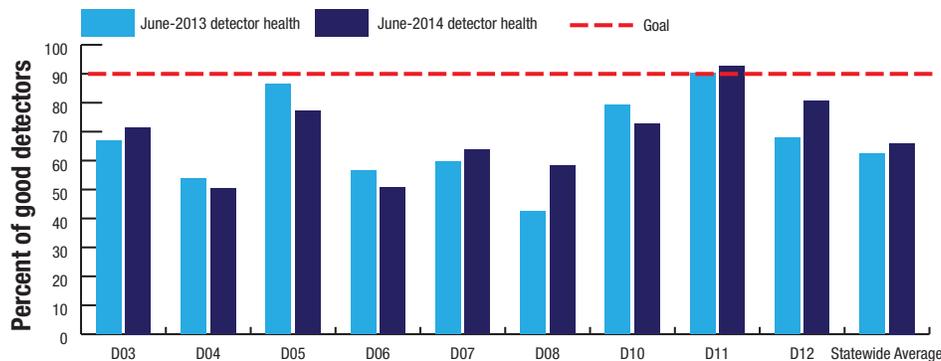


Caltrans 2013-14 Budget versus Actual

Program	Budget	Actual
Construction and construction support	\$5,481,245	\$4,904,652
Local projects	\$3,484,988	\$2,775,275
Maintenance and operations	\$1,360,103	\$1,355,696
Administration support	\$400,622	\$392,573
Modal programs	\$303,805	\$269,649
Other	\$454,119	\$422,995
Total	\$11,484,882	\$10,120,840

Contributing Divisions: Accounting and Budgets

Improving Operations with Vehicle Detectors



Source: Division of Traffic Operations

Efficiently moving from point A to B affects the state’s economic and daily livelihood. We depend on California’s transportation system to drive to work, get agricultural and manufactured products to market, and get to recreational activities we enjoy. The efficient and safe operation of California’s roadways depends on maintaining and investing in traffic management systems. The thousands of vehicle detectors imbedded in urban freeways are a critical component of our traffic management system. Healthy detectors are essential to keeping California’s transportation network efficient.

Determining travel time—and ways to maintain and improve consistency in those travel times—relies on dependable data. It involves monitoring use, creating methods to control and optimize capacity, and avoiding congestion. Vehicle detection sensors help us do that. They also help us control signalized intersections and ramp metering lights. Real-time detection is also necessary for collision response and automated traveler information systems, such as the popular electronic highway message signs. Caltrans operates transportation management centers throughout the state. These centers rely on operable detectors and help us monitor highway conditions within a region. We also use sensor data to monitor travel performance and make informed decisions on how to invest limited system operations dollars.

The detectors collect traffic volume and speed data and send the information to the management centers every 30 seconds. This allows us to

monitor and evaluate the highway system in real time. Not only do they provide real-time conditions, but the data also helps with long-term planning and traffic management.

Properly functioning or “healthy” detectors help us efficiently manage our highway system, and the fewer healthy detectors we have, the more challenging it is to keep the traffic moving smoothly. Our current statewide goal is to have 90 percent of our detectors healthy. To date, 66.5 percent of our detectors are healthy. This is a slight increase from the 64.6 that was reported in the *January 2014* issue of the *Mile Marker*.

We are short of our goal to have 90 percent or more of our vehicle detectors functioning properly, and it will be unlikely we will achieve our goal with our current funding levels. Some detectors have been damaged due to copper wire theft, and many have reached the end of their life cycle. Replacing and upgrading elements to maintain the health of the transportation management systems improves the effectiveness, efficiency, and safety of California’s roadways. To continue to maintain or improve the number of healthy vehicle detectors on the most congested areas of California’s highway system, we need to continue to invest in our traffic management systems, but funds are limited, so we have to prioritize our projects and continue searching for a sustainable funding source.

Contributors: Kris Kuhl and Jane Berner,
Division of Traffic Operations

Airport Safety Inspections Increase

This aerial view shows Humboldt County's Shelter Cove Airport in Whitethorn, California.

Aviation Safety Inspections

Type	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Average
Airport (AP)	190	166	164	170	203	182	178.6
Heliport (HP)	109	86	90	90	114	127	97.8
Total AP and HP	299	252	254	260	317	309	276.4
FAA form 5010	163	136	147	152	172	155	154

Source: Division of Aeronautics

Aviation is an important part of California's transportation system and economy. Caltrans' goal in aviation is to foster and promote a safe, efficient, dependable, and environmentally-compatible air transportation system.

One of our roles in achieving that goal is to conduct annual permit compliance and safety inspections of the state's 245 public-use airports and 160 hospital heliports. California's 245 airports play an important role in emergency response because these airports are potential staging areas in major catastrophic events such as floods or earthquakes, as well as providing aerial support for fire-suppression activities. Under a contract with the Federal Aviation Administration, we also inspect and update Airport Master Records (FAA Form 5010) for specified public-use airports. The 5010 Airport Master Record contains aeronautical data published for public use, describing the physical and operational characteristics of civil public-use and private-use airports and military and other federal agency airports in the National Airspace System. Inspections were down in fiscal years 2009-10 through 2011-12 because of staff vacancies and the time required to fully train new aviation safety officers.

In addition to conducting safety inspections, Caltrans makes recommendations regarding safety

and noise at proposed K-12 school, community college, and state building sites within two miles of an airport runway, and we authorize helicopter landing sites at or near schools. We also administer state airport noise regulations and land use planning laws that foster compatible land use around airports. Caltrans integrates our aviation system into broader transportation system planning on a regional, statewide, and national basis, and we provide grants and loans to airports for safety, maintenance, and capital improvement projects.

Contributor: Jeff Brown, Division of Aeronautics

Caltrans Aviation by the Numbers

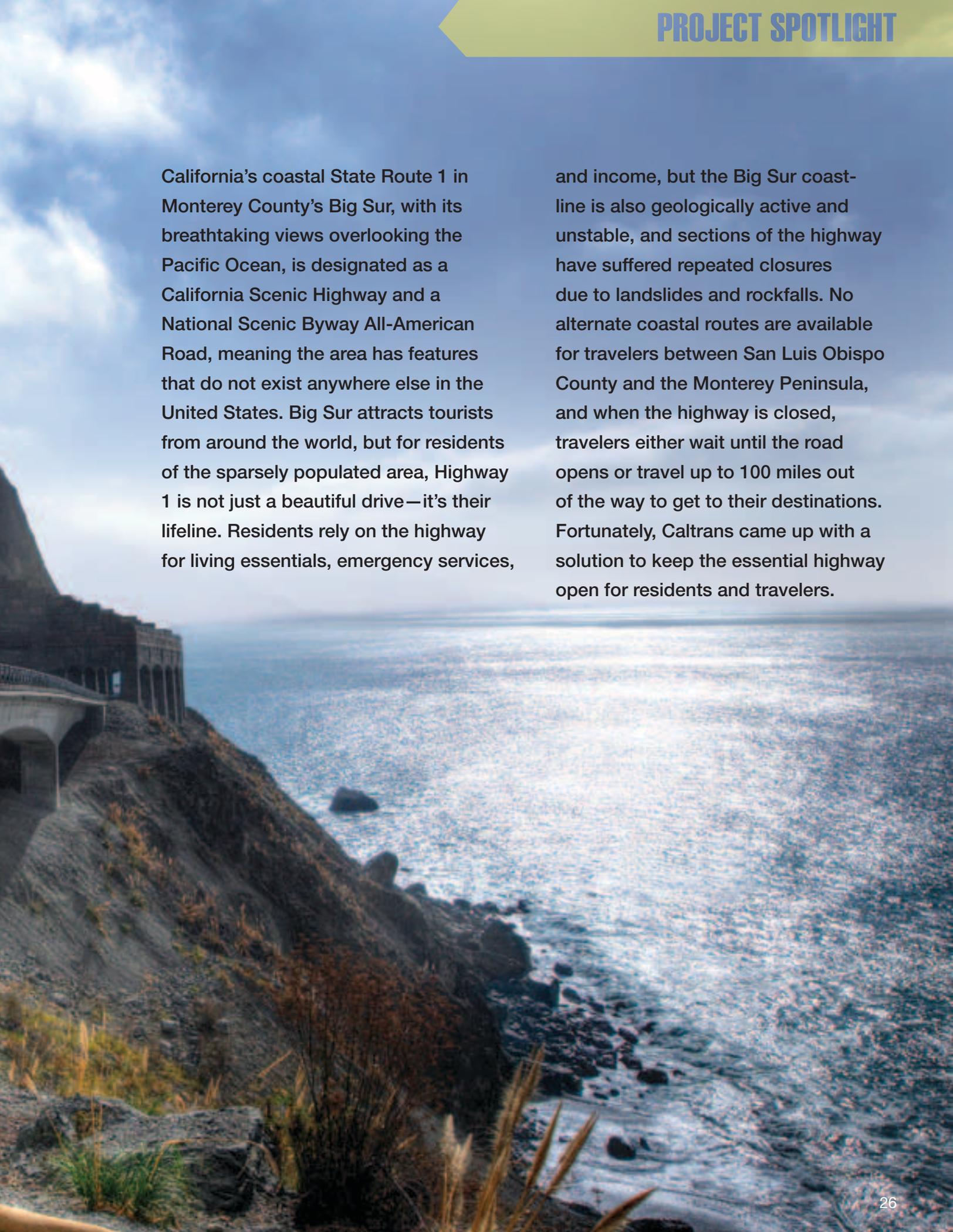
Public-use airports	245
Hospital heliports	160
State aviation safety officers	6
State-owned aircraft	2
State airport grants awarded for state fiscal year 2012-13	\$1.9 million
Federal aviation grants awarded to California airports for federal fiscal year 2013	\$254.1 million
Total California Aeronautics Account revenue for fiscal year 2012-13	\$5.2 million

Source: Division of Aeronautics Aviation in California Fact Sheet (April 2014).

Pitkins Curve

Rockin' & Rollin' an
ALL-AMERICAN ROAD



A scenic view of a coastal highway bridge overlooking the ocean. The bridge is a concrete structure with multiple arches, built on a steep, rocky cliffside. The ocean is a deep blue, with white-capped waves crashing against the shore. The sky is a clear, bright blue. The overall scene is a beautiful coastal landscape.

California's coastal State Route 1 in Monterey County's Big Sur, with its breathtaking views overlooking the Pacific Ocean, is designated as a California Scenic Highway and a National Scenic Byway All-American Road, meaning the area has features that do not exist anywhere else in the United States. Big Sur attracts tourists from around the world, but for residents of the sparsely populated area, Highway 1 is not just a beautiful drive—it's their lifeline. Residents rely on the highway for living essentials, emergency services,

and income, but the Big Sur coastline is also geologically active and unstable, and sections of the highway have suffered repeated closures due to landslides and rockfalls. No alternate coastal routes are available for travelers between San Luis Obispo County and the Monterey Peninsula, and when the highway is closed, travelers either wait until the road opens or travel up to 100 miles out of the way to get to their destinations. Fortunately, Caltrans came up with a solution to keep the essential highway open for residents and travelers.

Highway 1 Pitkins Curve and Rain Rocks

The Big Sur stretch of Highway 1 traverses the steepest coastal slope in the contiguous United States and is one of the toughest highway maintenance challenges on California's central coast. The short distance north of Limekiln Creek and south of Lucia on State Route 1 has two areas of significant roadway instability: "Pitkins Curve" and "Rain Rocks." Over the years, extensive landslides and rockfalls repeatedly reduced or severed travel on the highway, sometimes for months at a time, and profoundly affected local and regional economies.

From the time Highway 1 was completed in 1937, slopes above and below it have been in a constant state of erosion. The 1998 El Niño storms caused the most damage in the Big Sur Coast highway's

history. At Pitkins Curve, highway restoration cost \$1 million and disrupted traffic for five months. Rocks also fell at Rain Rocks, and Caltrans covered the slope with a wire mesh rock net to ensure safety for travelers and highway workers. Installing the net cost \$1 million and disrupted traffic for 20 days.

In 2000, a massive landslide below the highway at Pitkins Curve took out both lanes and required 7,000 truckloads of debris to be hauled away, costing \$3.4 million and limiting travel for 60 days. Again, in 2001, a landslide above Pitkins Curve and intensified rockfall at Rain Rocks disrupted traffic for two months, requiring crews to haul away 1,400 truckloads of material at a cost of \$1.5 million. Each year after, about 700 truckloads of material were transported from the site. Geologists and geotechnical engineers studied the slopes at Pitkins Curve and Rain Rocks and concluded that the hillsides would continue sliding.



Keeping an All-American Road Open

After slides or rockfalls at Pitkins Curve/Rain Rocks, Caltrans needed to make emergency repairs to reopen the highway as quickly as possible, but those repairs gave us limited options and placed workers at risk. Highway workers often work under hazardous conditions while maintaining the area, and scaling cliffs to knock down precariously situated boulders put them in the most active rockfall areas.

Clearing the road after landslides and rockfalls also had elevated costs and jeopardized environmental resources. Among the most difficult and expensive activities at Pitkins Curve/Rain Rocks was handling the large volume of rocks and soil generated by the landslides and subsequent repairs. In times past, soil was pushed into the sea, but since 1992, with the designation of the Monterey Bay National Marine Sanctuary, the practice was avoided due to potential effects to the marine environment. Soil is now trucked to inland locations 10 or more miles away. Stockpile sites are limited and diminishing, and as soil is transported farther from where it was generated, the associated monetary and environmental costs increase. Pitkins Curve/Rain Rocks averaged more than \$1 million a year in maintenance, whereas other unstable Big Sur highway locations requiring regular maintenance average about \$10,000 to \$20,000 per year.

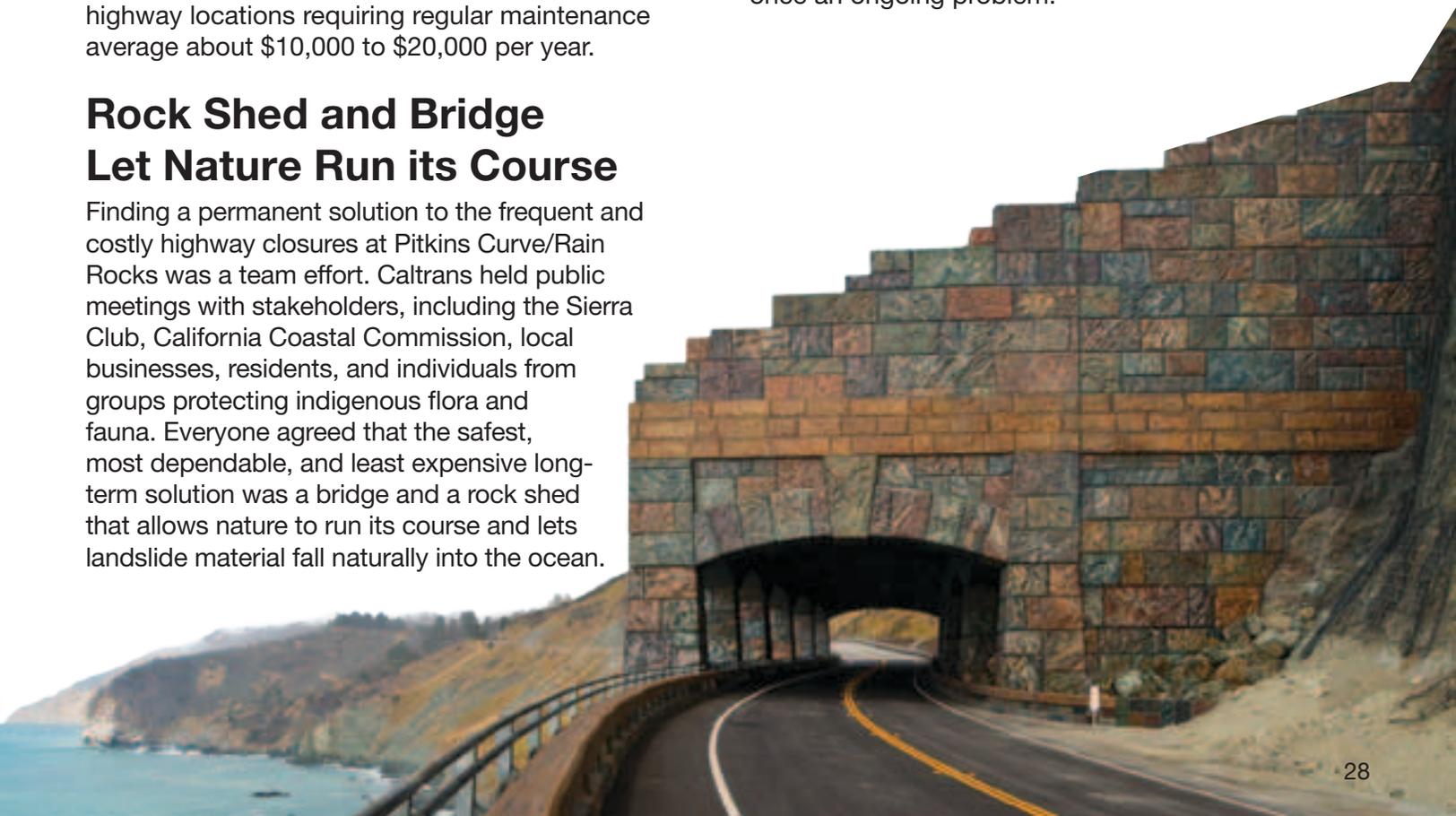
Rock Shed and Bridge Let Nature Run its Course

Finding a permanent solution to the frequent and costly highway closures at Pitkins Curve/Rain Rocks was a team effort. Caltrans held public meetings with stakeholders, including the Sierra Club, California Coastal Commission, local businesses, residents, and individuals from groups protecting indigenous flora and fauna. Everyone agreed that the safest, most dependable, and least expensive long-term solution was a bridge and a rock shed that allows nature to run its course and lets landslide material fall naturally into the ocean.

The Rain Rocks shed is the only roadway structure of its kind in the nation. It has a faux keystone finish, aqueduct-like arches, and a slanted roof that allows rocks to tumble into the ocean without affecting the highway or drivers. The Pitkins Curve Bridge spans over part of the ocean, allows rocks to fall under the bridge and into the water, and offers breathtaking views by bringing drivers closer to the water.

The new rock shed and bridge won the 2013 California Transportation Foundation's "Structure Project of the Year" award. The project took four years to build, cost \$39 million, and increased safety by greatly reducing motorists' and workers' encounters with landslides and falling rocks by deflecting large, sometimes car-size boulders from the highway. The life span of the bridge and rock shed is conservatively estimated at 50 years. Over that period, the total cost of maintaining the highway with the new bridge and rock shed is estimated to be \$1.7 million, whereas we estimate that it would cost about \$112 million over the next 50 years to maintain the highway without the new structures.

The new bridge and shed allow nature to keep the rocks rolling, but instead of wreaking havoc on the lives of the people who depend on this stretch of highway, the new structures offer a unique and sustainable solution to what was once an ongoing problem.



Cleaning the Air with a Zero-Emission Fleet



California's transportation sector contributes nearly 40 percent of the state's greenhouse gas emissions. To help clean California's air, Governor Brown signed [Executive Order B-16-2012](#) in 2012 setting a statewide goal to reduce, by 2050, greenhouse gas emissions from the transportation sector to an amount that is 80 percent less than the state's 1990 levels. It also requires state agencies to increase their zero-emission vehicles through normal fleet replacement, with at least 10 percent of annual light-

duty fleet vehicle purchases being zero-emission vehicles by 2015 and at least 25 percent being zero-emission by 2020. Zero-emission vehicles in California will protect the environment, stimulate economic growth, and improve the quality of life in the state. Incorporating zero-emission vehicles into the Caltrans fleet will help us achieve our goal of meeting the executive order requirements while also providing a safe, sustainable, integrated, and efficient transportation system to enhance California's economy and livability.

Zero-Emission Vehicle Point System

Vehicle Type	Minimum Range	Maximum Range	Credit Ratio
Battery electric vehicle			1:1
Low-range plug-in hybrid vehicle	10	19	5:1
Mid-range plug-in hybrid vehicle	20	34	3:1
Long-range plug-in hybrid vehicle	35	49	2:1
Extra-long-range plug-in hybrid vehicle	50	n/a	1:1

Source: Division of Equipment

Meeting the Zero-Emission Requirement

For each electric vehicle Caltrans purchases, we earn credit toward fulfilling our 10 percent zero-emission vehicle requirement. Battery electric vehicles earn one full credit each because they are pure zero-emission vehicles and use no gasoline. The Nissan LEAF, with a range of about 80 miles, and the Toyota Rav4, with an estimated range of 100 miles, are examples of battery electric vehicles.

Because plug-in hybrid electric vehicles use gasoline, they are considered transitional zero-emission vehicles and earn partial credit based on their certified battery-only driving range. The Chevrolet Volt has an electric range of 35 to 49 miles and is considered a long-range, plug-in hybrid electric vehicle. This gives it a credit ratio of 2:1, or a half credit for each Volt we purchase.

California's Department of General Services defines zero-emission vehicles as pure zero-emission vehicles such as battery electric vehicles and hydrogen fuel cell vehicles. This means that to meet the executive order requirement by 2015, if Caltrans purchases 100 light-duty vehicles, 10 of them must be zero-emission vehicles, five of which must be battery electric or fuel cell vehicles.

Electric Vehicles

Not all electric vehicles are the same. A number of zero-emission electric vehicles are on the market and can be grouped into three main categories: hybrid electric vehicles, long-range electric vehicles, and battery electric vehicles.

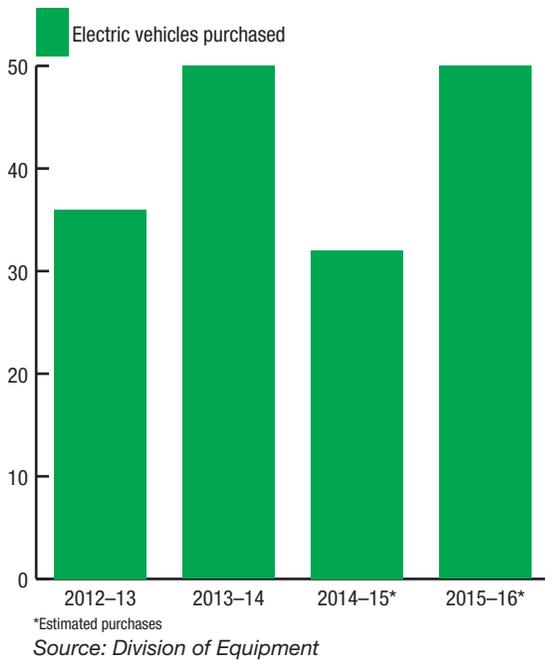
Hybrid electric vehicles use either an electric motor or gas engine to move the wheels, but they use only electricity generated within the vehicle. These vehicles convert the energy used when braking into electricity to charge the battery. When the battery becomes drained, the gasoline engine turns on, allowing the vehicle to keep moving. The Toyota Prius is a hybrid electric vehicle, but hybrids also have a plug-in version that can use a power outlet to recharge the battery, or they can generate electricity on the go with the gasoline engine.

Extended-range electric vehicles have an internal gas engine to power an electric generator that charges the battery. Unlike hybrid vehicles, only the electric motor powers the wheels, and the gas engine only charges the battery. The Chevrolet Volt is an extended-range vehicle that can recharge by plugging into a power source.

Battery electric vehicles, such as the Nissan LEAF, are all-electric vehicles with no internal gas engine and must plug into an electric power source to recharge the batteries.



Caltrans' Zero-Emission Vehicle Fleet



In 2013, through normal fleet replacement, we purchased our first plug-in electric vehicles: one Nissan LEAF battery electric vehicle and 35 Chevrolet Volt plug-in hybrid electric vehicles. These purchases earned Caltrans 18.5 zero-emission vehicle credits, one for the Nissan Leaf and 17.5 for the Chevrolet Volts. In 2014, we will purchase approximately 80 electric vehicles, meeting the requirement that at least 10 percent of our light-duty fleet purchases be zero-emission vehicles.

We constantly seek opportunities to increase our zero-emission vehicles that can perform the work required, but much of our fieldwork requires pickup trucks. Unfortunately, no battery electric pickup trucks are currently on the market. We are purchasing 50 Toyota RAV4 battery electric vehicles to meet the electric vehicle requirement, and are planning to incorporate aftermarket hybrid pickup trucks into our fleet until a more viable option is available.

We are hopeful that innovations in the zero-emission vehicle industry will increase electric vehicle feasibility and allow us to continue to meet or exceed the executive order requirements now and into the future—but these innovations come at a price. Aftermarket hybrid pickups cost about \$85,000 each compared with an average of \$30,000 for a conventional pickup. These steep prices and our existing new equipment budget limit our ability to fully meet existing fleet needs

with zero-emission vehicles. Caltrans, as with all state entities, must weigh the pros and cons when deciding how to spend public dollars, and we strive to make the best decisions with the resources and information available to us.



Electric Vehicle Fueling

Electric vehicles show great promise in helping reduce California's greenhouse gas emissions, but the lack of charging stations is proving to be a formidable hurdle. To support and promote the use of zero-emission electric fleet vehicles, we are installing electric vehicle charging stations at Caltrans facilities throughout the state. We have installed, or are in the process of installing, charging stations at our 12 district offices and various equipment shops, maintenance stations, and construction sites. This will give us approximately 50 charging stations statewide and will further increase the feasibility of using zero-emission electric fleet vehicles.

Our stations, combined with investments by other public and private entities, are helping to provide the infrastructure necessary to support Governor Brown's zero-emission vehicle goals and to create a viable market for zero-emission vehicles. For example, the North County Transit District installed seven electric vehicle charging stations at their Oceanside Transit Center, the largest such station in North San Diego County. By helping electric vehicle drivers and potential fleet operators gain confidence in the technology and alleviate any range anxiety with the installation of the necessary infrastructure, we can continue to help reduce California's greenhouse gas emissions while supporting a strong, sustainable industry that can provide quality jobs in our communities.

Contributors: Lisa Kunzman and Jeremy Matsuo, Division of Equipment

Equipment Uptime Increases

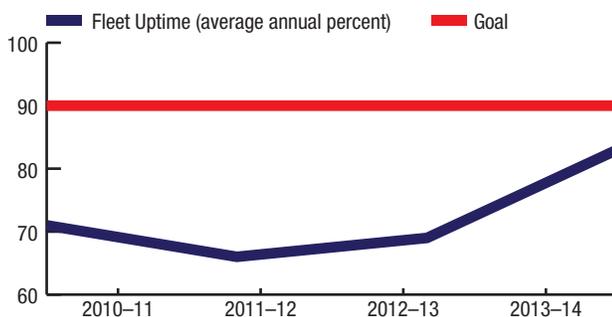
Caltrans owns and maintains more than 12,000 pieces of equipment that we use to build and maintain California's bridges and roads. Our complex and varied fleet includes trucks, light vehicles, giant snow blowers, loaders, dump trucks, and two ferries. Our loaders and dump trucks help us fill pot holes, and our giant snow blowers allow us to keep highways open in the winter. In the case of our ferries, the equipment is the roadway. The Real McCoy II and the J-Mack ferries provide service to residents of Ryer Island and Grand Island in the Sacramento–San Joaquin Delta. If these ferries are not running, the “road” closes. To keep California's people and goods moving, equipment must be ready to use when we need it. We call this “uptime.”

Our Goal is to Have Equipment Available when Needed

Caltrans' active fleet has a total capital value of more than \$763 million, and our vehicles are used by many of our divisions, including Traffic Operations, Equipment, Maintenance, and Construction. Our goal is to have equipment available to users when they need it. This is a huge undertaking considering the number, complexity, and variety of our equipment fleet. To measure how well we are meeting our goal,

Caltrans owns and maintains more than 12,000 pieces of equipment that we use to build and maintain California's bridges and roads.

Percentage of Equipment Available for Use



Source: Division of Equipment

equipment that is operational and ready for use is measured in overall average fleet uptime. In the 2010–11 fiscal year uptime was 71 percent, with a goal to maintain a 90 percent or better uptime average. The uptime average for the 2013–14 fiscal year was 83 percent, with progressive strategies to raise the average even higher in the near future.

Staff at the Caltrans Equipment Division Headquarters Shop in Sacramento purchase, fabricate, maintain, and repair the department's fleet of more than 12,000 pieces of equipment.





A Leaner More Efficient Equipment Division

Caltrans made significant improvements to fleet uptime by making our Equipment Division a leaner, more efficient operation. One significant change was to shift the focus of part of the Sacramento Headquarters Shop from production and assembly to repair and overhaul of major equipment such as snow blowers. This has allowed equipment repair shops across the state to concentrate on quicker repairs and service.

Our proactive approach to solicit suggestions and ideas from all levels of the organization has helped us eliminate redundancy and improve processes for leaner operations. Since September 2013, more than 100 suggestions have been made and half of those have already been implemented. We are fully committed to continuous improvement, and we involve the entire workforce so we can reduce wasteful practices and achieve our goal to increase vehicle uptime and customer satisfaction.

Modernizing the tools at our 12 main equipment shops statewide has increased staff efficiency in repairing and maintaining equipment and vehicles with computers and up-to-date diagnostic and repair tools.

We are finding innovative ways to work leaner and provide better service in all our equipment shops by reducing redundant inspections and taking advantage of extended service intervals available with newer vehicles to reduce downtime.

The next major advancement in effectively managing the Caltrans fleet is the plan to add GPS to 7,700 light-duty vehicles, off-road equipment, and selected other equipment statewide. We are scheduled to finish installing these units by the end of 2014.

In preparation for this advancement, we conducted a two-year pilot study that began July 2012, during which 200 light-duty vehicles were equipped

with GPS. The highly successful pilot had several beneficial outcomes. The study showed that GPS-equipped state-owned fleet vehicles are safer and have reduced maintenance costs. These vehicles do not require biennial smog checks, since the systems wirelessly monitor engine diagnostic information and send alerts to the appropriate equipment shop when the GPS senses potential engine problems. We can view engine status and emissions data for each vehicle in the fleet, so we can instantly identify vehicles that are out of compliance and immediately make the necessary repairs. GPS devices can track vehicle travel and storage locations and generate detailed reports about all aspects of the vehicle's use. Employees will no longer manually record information on GPS-equipped vehicles, because the system does it automatically, which will improve accuracy.

Left: Caltrans mechanic Ernie Lopez provides critical maintenance and repairs to Caltrans equipment so it is operational when employees need it.

Below: Caltrans' new state-of-the-art computer-operated laser cutter cuts metal at the speed of light.

Fleet Asset Management

We've put greater emphasis on true fleet asset management—replacing the right equipment and vehicles at the right time. A refreshed fleet with newer equipment not only reduces the number of repairs, it also allows us to take advantage of newer technologies such as GPS. A new approach of involving equipment users in replacement decisions from the initial design through the building and purchasing process helps get the most effective equipment to the user.

Reduced downtime of Caltrans equipment ultimately benefits the motoring public. Increased availability of critical equipment, such as snow and slide removal equipment in mountain areas, traffic management vehicles in metropolitan areas, and road-patching equipment provides safer, smoother, and open roads.

By balancing the business needs for the Caltrans fleet with the needs of our employees who use our equipment, we are able to provide the right tools to do the job at the right time. The contemporary fleet business practices developed today will help Caltrans sustain and improve California's highways well into the future while being good stewards of the state's resources.

*Contributors: Rob Anderson and Jim Lawrence,
Division of Equipment*



Keeping Goods *Moving*

Caltrans has been working with more than 60 agencies, freight industry representatives, Native American tribal governments, and advocacy groups to develop a [California Freight Mobility Plan](#) by the end of 2014. The plan will detail how we can better move goods through and within California to strengthen the economy, while also supporting the health of our environment and communities. The California Air Resources Board is also developing a [Sustainable Freight Initiative](#), and we are working closely with them to ensure we coordinate the state's freight efforts.

The federally recommended and state-required California Freight Mobility Plan is especially important because the Golden State is a national and global trade leader. About 40 percent of our country's internationally traded consumer products—the stuff we buy at the store—are transported through California's 12 seaports. This enormous amount of trade is supported by our state's diverse economy, a highly skilled and educated workforce, and more than a century of proactive private and public investment in transportation and cargo-handling infrastructure. The plan will address all the ways freight is moved: seaports, railroads, air cargo, and trucking.

As we look toward the future, and the impending opening of the expanded Panama Canal, our challenge is to balance the need to effectively get goods where they need to go, while protecting the environment and those living in communities along heavy trade corridors from diesel emissions and other pollutants. California has already reduced freight's negative effects on the environment through better engines, cleaner fuels,

cleaner ports and rail yards, infrastructure changes, and improved operations, but we're not done. We can further improve rail-to-port connections to ensure efficient low-carbon impacts by bringing more rail into the ports to reduce short-haul truck trips.

Another challenge is that before goods are distributed throughout the country, they often stop at warehouses near the ports or in the Inland Empire to be repackaged into 53-foot-long trucks and smaller shipments to transport to individual stores. Those repackaging centers employ thousands of workers. With increased competition from ports in other states, California would lose hundreds of thousands of jobs if these packaging centers move elsewhere.

We cannot afford to allow our freight system to fall apart. As an example, if trucks stop running today, fresh produce will all be gone from grocery stores in three days, and all store shelves will be empty in seven days.

If we want to maintain and improve California's status as the eighth-largest economy in the world, we must create a multimodal freight plan that helps to modernize freight movement while sustaining jobs and the environment. To do this, we will need reliable and substantial freight transportation funding, because while California's 2006 transportation bond included \$2 billion for projects under the Trade Corridors Improvement Fund, that money has been fully expended on high-priority freight movement projects. Yet, there are even more worthy projects to help us stay globally competitive that need funds and many others that will also improve the health of communities near freight networks. So, we are coordinating across the state to develop new funding partnerships among private and public organizations to find new and sustained freight funding.

As we plan into the future for a sustainable freight movement system, we have to embrace two key challenges. First, we need to shift more freight to rail, and then we need to have cleaner vehicles, which in the longer term have to be either zero-emission or near-zero-emission vehicles. California's freight industry has led the way as the cleanest in the country and will rise to the challenge of attaining this sustainability goal.

*Contributors: Bruce De Terra,
Division of Transportation Planning*



New Goals to Achieve our Mission and Vision

We will continue to improve how we do business so we can give Californians the most efficient transportation system possible, and our new goals will help us achieve that.

- **Safety and Health:** Provide a safe transportation system for workers and users, and promote health through active transportation and reduced pollution in communities.
- **Stewardship and Efficiency:** Money counts. Responsibly manage California's transportation-related assets.
- **Sustainability, Livability, and Economy:** Make long-lasting, smart mobility decisions that improve the environment, support a vibrant economy, and build communities, not sprawl.
- **System Performance:** Use leadership, collaboration, and strategic partnerships to develop an integrated transportation system that provides reliable and accessible mobility for travelers.
- **Organizational Excellence:** Be a national leader in delivering quality service through excellent employee performance, public communication, and accountability.

Caltrans has identified five goal teams to lead our change by developing performance measures and strategies to achieve our goals.

What this Means for Californians

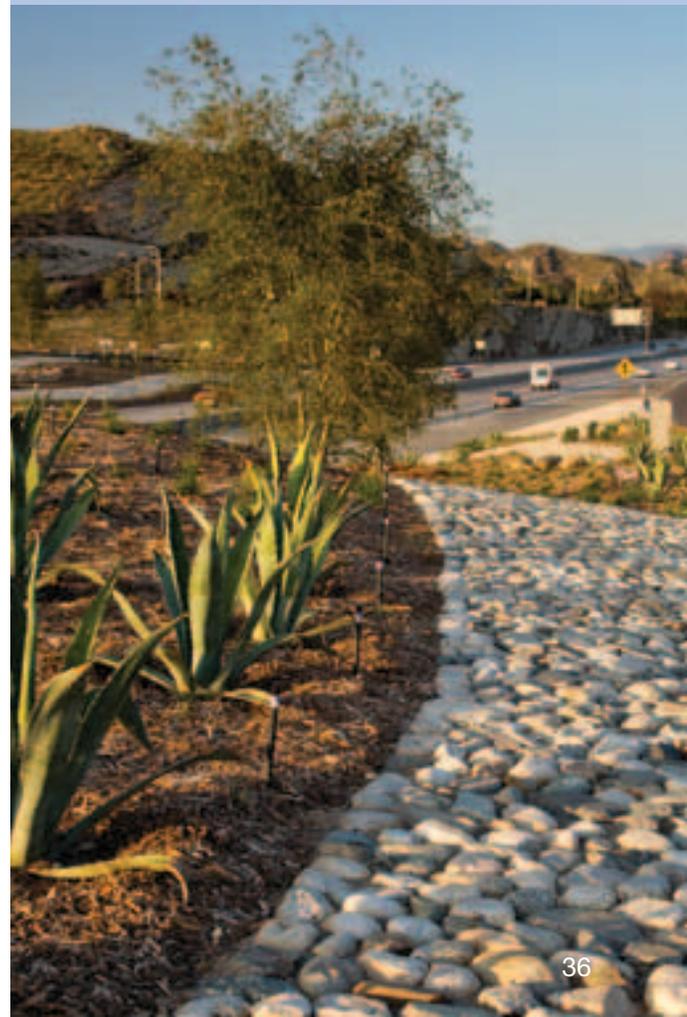
For many years, the transportation system has consisted of the state highway system and local and regional transportation systems. Our new mission means that we are shifting our focus from those separate systems to a cohesive *California* transportation system that integrates the state and local systems. By working closely with local agencies and tribal governments, we will give Californians more efficient travel options to improve their quality of life, while continuing to make safety our No. 1 priority.

It's a continuous process that will take time, but by focusing on our new mission and staying true to our values, we will become the Caltrans we envision: a performance-driven, transparent, and accountable organization that values its people, resources, and partners, and meets new challenges through leadership, innovation, and teamwork.

Caltrans Provides Oversight on Local Landscape Project

The city of Santa Clarita worked with Caltrans to create a welcoming area at the Sand Canyon and State Route 14 on-ramp, where about 114,000 motorists pass daily.

The city designed landscaping for 3.4 acres within Caltrans' right-of-way. The design highlights the area's unusual rock formations and outcroppings. The design also incorporated oaks and other drought-tolerant plants compatible with the arid region between the San Gabriel Mountains and the Santa Susana Mountains. The city of Santa Clarita completed the project in February for \$1.2 million, and Caltrans had oversight of the project. The city will be responsible for the project's ongoing landscape maintenance, which is often the case when a city initiates and builds a project.



Highway 1 Chip Seal Partnership Resolves Friction



When Caltrans repaired a section of State Route 1 in San Luis Obispo County in late 2012, we had no idea the repaired highway would cause friction, in more ways than one, with several bicycle advocacy groups that ride along the Pacific coastline. This “rough road,” however, led to a new partnership and turned out to be an opportunity to improve our practices so we can better serve all users of the roadway.

In fall 2012, Caltrans placed a modified binder chip seal on Highway 1 in San Luis Obispo County, a two-lane highway extending along the Pacific coastline from the town of Cambria to the Monterey County line. A chip seal, also referred to as a seal coat, is a preventive maintenance strategy in which a layer of bonded aggregate—essentially small pieces of gravel—are affixed to the top of an existing asphalt road. This resurfacing technique can save taxpayers considerable money by postponing the need to replace an aging road. Chip seal provides a wear surface that protects the underlying pavement from deterioration, in much the same way that painting a house protects the siding. Caltrans anticipated the chip seal would provide another five to 10 years of wear surface for this portion of Highway 1 and would greatly reduce maintenance needs over that time. From Caltrans’ perspective, this project was a success:

- a smoother road and a protected road surface that would need less upkeep.

Smooth for Drivers, but not for Cyclists

The chip seal, while effective for vehicle use, resulted in an extremely rough ride for cyclists. This was of particular concern because this section of highway is one of the most cycled roads in North America. Bicyclists come to the Pacific Coast to enjoy the scenery and pedal the 1,852 miles along the beautiful coastline from Canada down to Imperial Beach, California.

A grassroots effort by the cycling community demanded a fix and grew to include county supervisors, state officials, and national cycling groups. Their proposal was to have the 23-mile stretch of roadway repaved with conventional asphalt concrete pavement, but with a price tag exceeding \$7 million, the funds were not available within the existing maintenance budget. Furthermore, even if we tried to make improvements, current Caltrans chip seal specifications do not have a quantifiable indicator to effectively evaluate any improvement to the road’s roughness. In March 2013, we used heavy rollers to smooth out the surface, but that resulted in minimal improvement.

Unique Partnership Finds Solution

Caltrans agreed to work with the bicycle community and researchers to find a way to evaluate and potentially resolve the roughness issue on Highway 1. We partnered with the University of California Pavement Research Center at UC Davis to conduct a two-phase study. The first phase evaluated different pavement surfaces using both specialized equipment and individual bicycle riders' perceptions. The second phase looked internally at our practices and specifications and proposed improvements we could make that would benefit both cyclists and roadway maintenance.

We evaluated different applications around San Luis Obispo County roadways and then applied five different remedial pavement treatments to test sections on Highway 198 in Monterey County. Local cyclists volunteered to ride each test section and complete an evaluation sheet prepared by the Pavement Research Center. The cyclist test complemented tests being done with specialized equipment, including a laser texture scanner and inertial profiler, which measure pavement ride quality.

Bicyclists gave several of the test treatment segments the thumbs up as acceptable surface improvements. Ultimately, the sand seal application was chosen—a sprayed application of asphalt emulsion followed by a cover of clean sand. Not only did the new surface create a less bumpy ride for bicyclists, it was done at a cost of \$1.5 million—much less than the \$7 million it would have cost to repave the highway.

Smooth Ride Brings Happy Ending

Caltrans finished the sand seal in 2013, and shortly after, the local bicycle community sent a letter of thanks expressing their appreciation for Caltrans' willingness to listen to cyclists concerns and to evaluate and fix the problem. Since the project's completion, several large organized bike rides, including the Amgen Tour of California, have traveled this section of Highway 1 without concerns.

Through our unique partnership, Caltrans was able to respond to bicyclists' concerns and effectively and economically provide a pavement surface that met the needs of everyone who uses this stretch of scenic highway. Caltrans and the University of California Pavement Research Center will perform a long-term study to evaluate our current chip seal specifications. Potential improvements may add smoothing techniques and modify the asphalt binder layer and rock sizes along bicycle routes. Our objective is a long-term Caltrans policy to improve the bicycling experience while maintaining the benefits of the chip seal strategy. We will continue community outreach to find a timely and cost-effective solution that meets the shared needs of California's taxpayers, motorists, and cyclists.

The Pavement Research Center's final report, "[Surface Treatment Macrotexture and Bicycle Ride Quality](http://www.its.ucdavis.edu/research/publications/publication-detail/?pub_id=2121)" is available at http://www.its.ucdavis.edu/research/publications/publication-detail/?pub_id=2121.

Contributor: Kelly McClain, Caltrans District 5

Fiscal year	Maintenance Contract Dollars Awarded	Pavement Maintenance Contracts Awarded	Maintenance Contract Dollars Spent on Chip Seals
2010–11	\$332 million	3,231	\$24 million
2011–12	\$274 million	2,449	\$14 million
2012–13	\$202 million	2,051	\$14 million

Chip seals are a preventive maintenance strategy to keep good pavement in good condition. Caltrans usually uses chip seals on rural, two-lane roads with less than 30,000 vehicles a day. Depending on the environment, traffic,

and number of semitrucks, the chip seal can last between five and 10 years. At \$55,000 per lane mile, the cost of using chip seal is low, versus about \$842,000 per lane mile for a rehabilitation project.

Travel Time Reliability Case Study: The Caldecott Tunnel

At Caltrans, we want to help reduce greenhouse gas emissions, and we want you to be able to reach your destination on time. Travel time reliability allows us to measure the benefits of projects such as the Caldecott Tunnel's new fourth bore, in the San Francisco Bay Area. The new bore has improved travel time reliability for drivers in the area.

A Reliable Commute

We have been measuring congestion on our state highway system, but now we are starting to analyze travel time reliability. Travel time reliability is not just the amount of congestion—it's how consistent congestion is each day. Travel reliability is often as

important as reducing congestion. Reliability allows travelers to accurately predict how long it will take them to reach their destinations.

Consider the following example: Every weekday you drive 10 miles to work. You leave at the same time and take the same route. In free-flow traffic, your journey takes 15 minutes, but when you travel to work in the morning, you typically get caught in some traffic congestion and your journey takes 20 minutes. Sometimes you get stuck in bad congestion, and that same drive takes 30 minutes. Since you never know when congestion will be bad, you give yourself 30 minutes to get to work so you aren't late.

When Caltrans works to improve travel time reliability, we are trying to make it so that the 30-minute trip doesn't happen. Rather, the trip should always take 20 minutes in the morning. That means you'll find some congestion, but it will be consistent each day. It means you can spend an extra 10 minutes at home with your kids, eating breakfast, or even sleeping in a little longer—and still get to work on time.

How We Measure Travel Time Reliability

We are beginning to assess travel time reliability and evaluate if our projects and activities improve reliability. A common way we measure travel time reliability is to compare the 95th percentile travel time to the 50th percentile, or median, travel time. Simply put, if we evaluate your morning commute for 100 consecutive weekdays, we have 100 different travel times to analyze. We put those travel times in order from shortest to longest. The 50th longest trip is the median—half the trips were shorter and half were longer. The 95th longest, meaning 95 trips were

shorter and only five were longer, is then compared to the 50th. If the trip is reliable, the 95th longest trip and the 50th longest trip are similar. If it is unreliable, there is a substantial difference between the two.

New Bore Makes Travel Time More Reliable

In November 2013, Caltrans completed the fourth bore of the Caldecott Tunnel on State Route 24 in the Oakland Hills. Each tunnel bore has two traffic lanes, for a total of eight lanes. When the tunnel had only three bores, or six lanes total, four lanes were used in the morning for the peak travel direction (westbound), and two lanes for the off-peak direction (eastbound). In the afternoon, one of the bores switched direction to alleviate rush-hour traffic. When only two lanes were open for the off-peak direction, drivers often experienced delayed traffic and incidents because traffic had to merge from four lanes to two to get through the tunnel. The new fourth bore improved travel time reliability in the off-peak travel direction, as well as made safety and emergency response improvements.



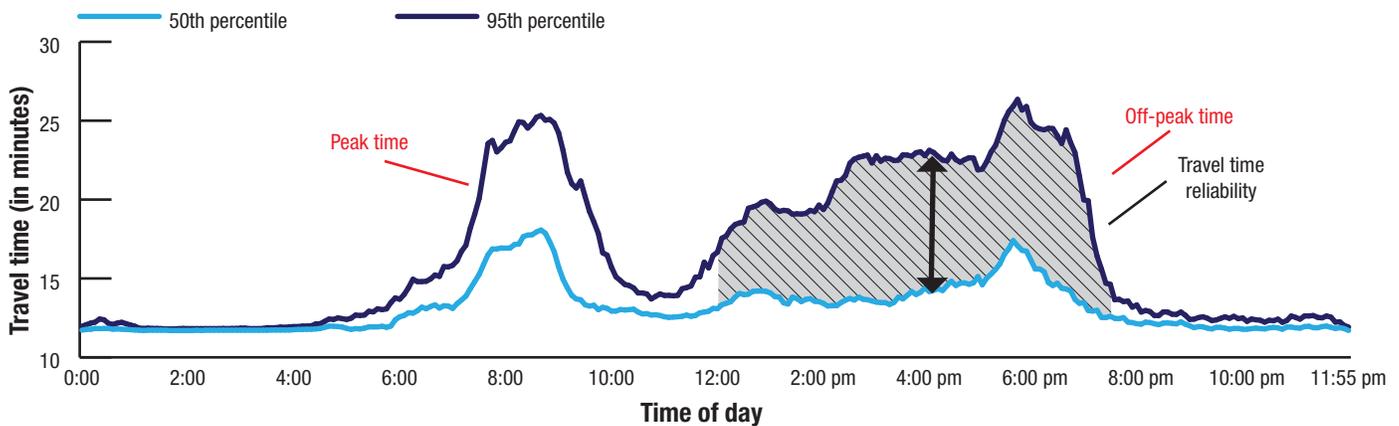
Caldecott Tunnel: Before and After

Caltrans uses vehicle detectors and the Performance Measurement System to analyze travel time reliability. The system stores and processes all of the vehicle detector data. We compared five months' worth of weekday travel times before construction started on the fourth bore (December 2009–April 2010) to weekday travel times after it was finished (December 2013–April 2014). We analyzed the stretch of State

Route 24 from its junction with Interstate 580 near Oakland to its junction with Interstate 680 near Walnut Creek.

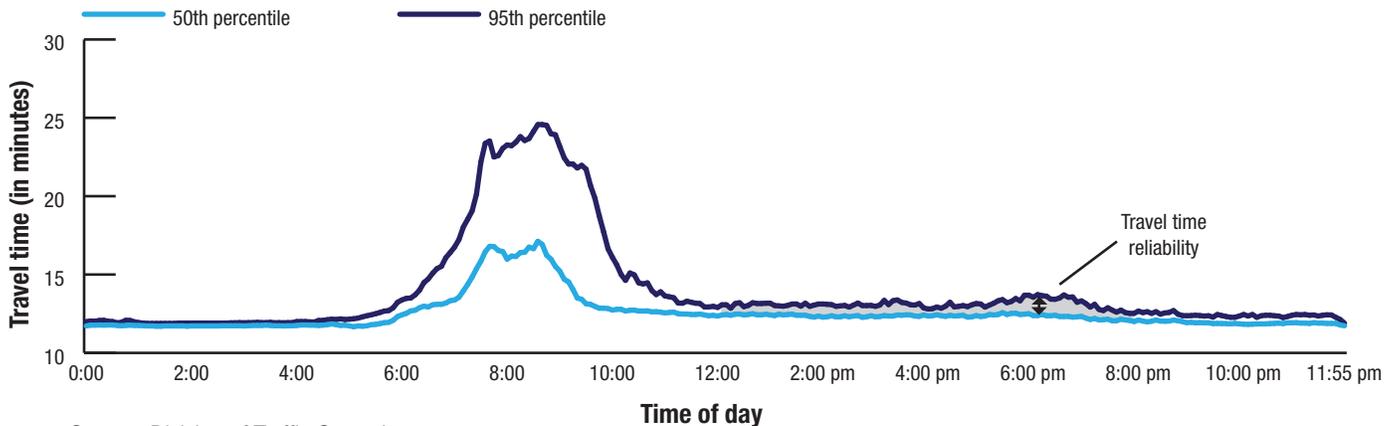
Before construction, the corridor's westbound direction was highly unreliable in the afternoon off-peak period. After construction, travel-time reliability improved significantly.

Westbound State Route 24 Before Construction: December 2009–April 2010



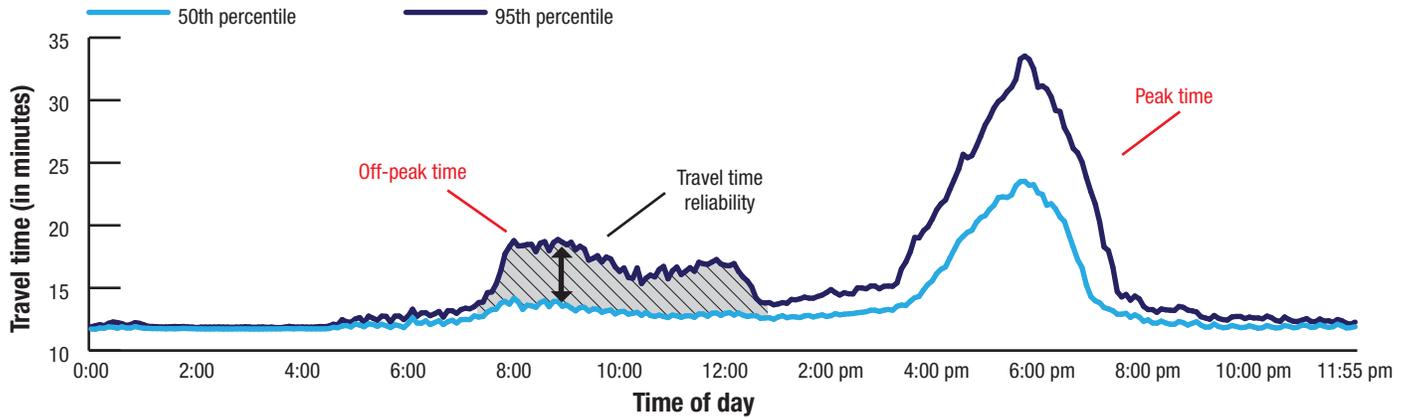
Important Point: The closer the travel times are for the 95th percentile trip and the 50th percentile trip, the greater the travel time reliability.

Westbound State Route 24 After Construction: December 2013–April 2014

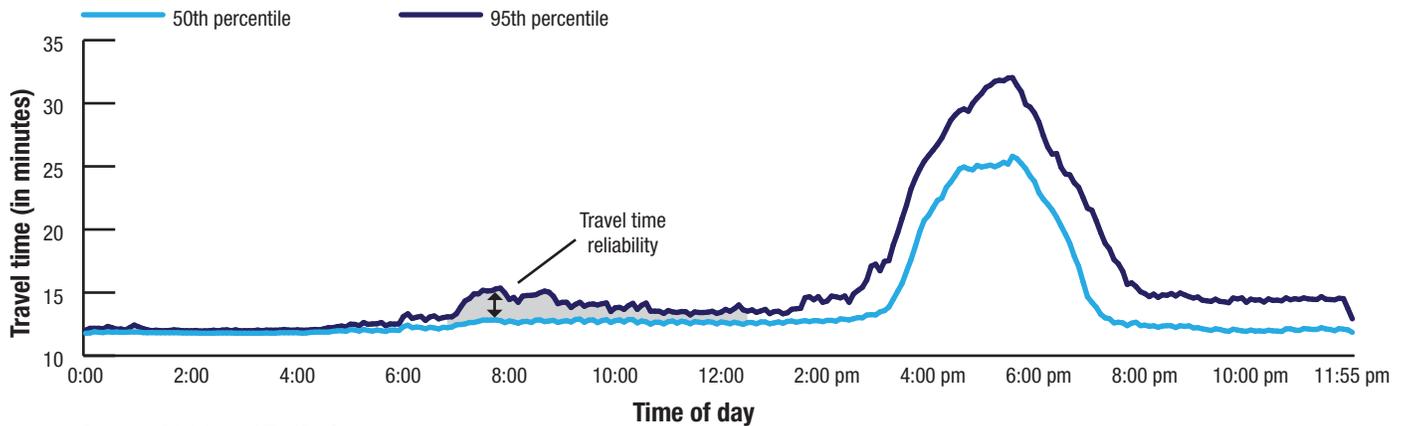


Source: Division of Traffic Operations

Eastbound State Route 24 Before Construction: December 2009–April 2010



Eastbound State Route 24 After Construction: December 2013–April 2014



Source: Division of Traffic Operations

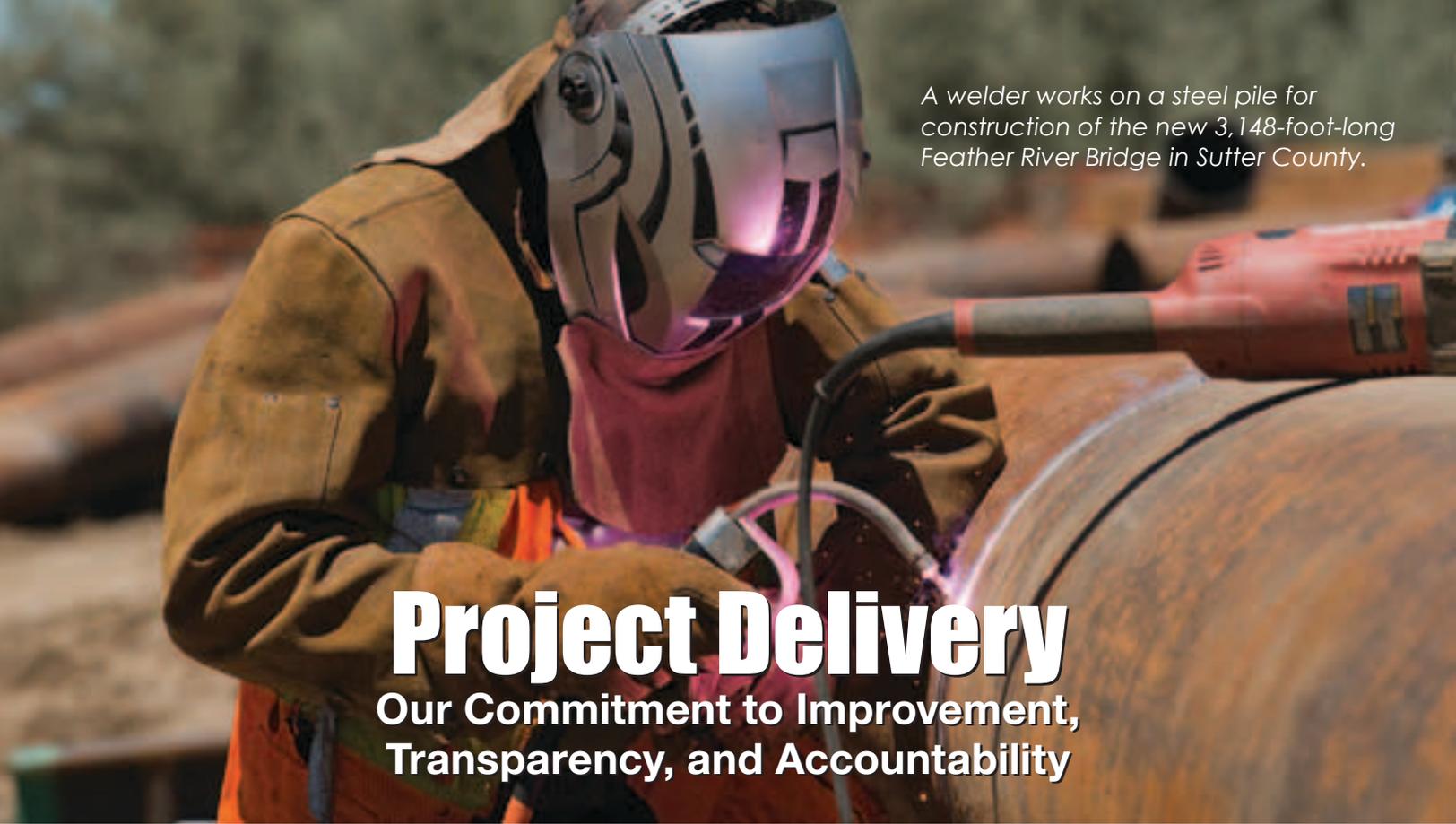
Before the new bore was constructed, the corridor's eastbound direction was somewhat unreliable in the morning off-peak period. Similar to the westbound direction, congestion has been almost entirely eliminated in the off-peak period since the project was finished.

Travel time reliability is one way we can measure the benefits of improvement projects such as the

Caldecott Tunnel Fourth Bore. Understanding reliability allows us to know if we are efficiently managing traffic or if we need to use additional measures such as ramp metering to regulate traffic flows onto the highway system, freeway service patrols to clear incidents, or electronic highway signs to notify travelers of conditions.

Contributor: Jane Berner, Division of Traffic Operations





A welder works on a steel pile for construction of the new 3,148-foot-long Feather River Bridge in Sutter County.

Project Delivery

Our Commitment to Improvement, Transparency, and Accountability

Caltrans' vision is to become a performance-driven, transparent, and accountable organization that values its people, resources, and partners and meets new challenges through leadership, innovation, and teamwork. Across the department, we are working to achieve our vision, and this includes our Capital Outlay Support Program. Over the last several years, we have made several improvements to increase the transparency and accountability of the program.

We implemented new performance measures and report these and actual project cost information in regular reports to the legislature and the California Transportation Commission. Our new project resourcing and schedule management tool—PRSM—enhances our project management capabilities. As part of our commitment to transparency and as part of the annual budget request, we increased the amount of project data we provide to the legislature. We also recently agreed to make additional improvements in the Governor's January Budget as part of the Zero-Based Budget Program review conducted in collaboration with the Department of Finance and the Legislative Analyst's Office. Our performance-driven management structure through the Contract for Delivery focuses our teams on performance, and over the years, our delivery has improved from a low of 80 percent to nearly a consistent rate of 99 percent.

Our Contract to Deliver

Each year since fiscal year 2005–06, the Caltrans Director has signed a Contract for Delivery with each of our 12 district directors committing to deliver projects on schedule and ready for construction. The Contract for Delivery includes a list of major state highway projects for which Caltrans will complete project plans and specifications and secure rights-of-way and permits in that fiscal year, allowing us to advertise and award construction contracts and begin construction. The Contract for Delivery does not include minor, locally delivered, or emergency projects. Through the Contract for Delivery, we have committed to deliver specific projects, which has improved our performance and increased our transparency and accountability, but we have also heard from our partners that we are not taking enough risks and are too conservative. We are responding to this criticism by taking more intelligent and agreed-upon risks to deliver projects faster. This will not always result in meeting our delivery goal of 100 percent, and we are okay with that, as long it achieves faster project delivery.

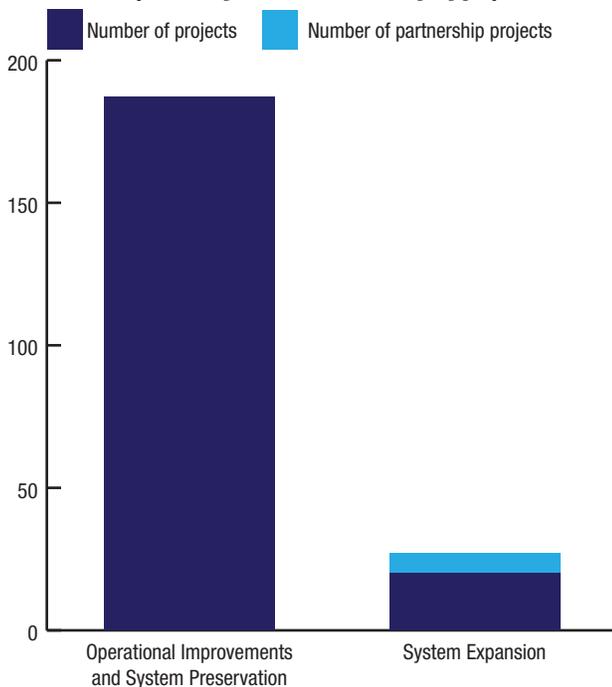
In fiscal year 2013–14, we committed to deliver 219 projects valued at \$2.5 billion, of which we delivered 214, or 98 percent, with an estimated value of \$2.1 billion. One of the projects not delivered required a challenging Coastal Commission permit. We could have decided

to delay this project into the future to ensure successful delivery, but the Caltrans Director and District Director agreed to take a risk and push the team to work collaboratively with the Coastal Commission to secure the permit and deliver the project. Although we did not deliver this project last fiscal year, we did secure the permit two weeks after the close of the fiscal year. This huge success will result in building a much-needed project faster for the traveling public. We accomplished this by taking intelligent and agreed-upon risks.

Of the 214 projects we delivered, 187 were operational improvement or system preservation

projects. Operational improvements help the existing highway system function more efficiently without expanding the highway system, and system preservation projects (such as bridge rehabilitation and pavement rehabilitation) help the existing highway system last longer and decrease annual maintenance costs. Twenty of our projects were system expansion projects to add capacity to the highway system by adding lanes or constructing new highways, and seven were partnership projects. Partnership projects are funded 100 percent by local agencies and can be operational improvement or system expansion projects.

Number of Projects Delivered (Fiscal year 2013–14 by type)



Contract to Deliver Performance

In addition to preparing project plans and specifications, Caltrans achieves other major project milestones throughout the year. This is important because most major projects take several years to complete. If a project misses an interim milestone, the project most likely will not be completed on schedule in a future year. The project approval and environmental document milestone is achieved when the preferred alternative is selected and the environmental document is approved. The right-of-way certification milestone is achieved when all property, railroad, and utility constraints are cleared, and the construction contract acceptance milestone is achieved when construction is completed. In fiscal year 2013–14, we delivered 181, or 88 percent, of 205 planned environmental documents. Of our right-of-way certifications, we delivered 214 of 222 planned, or 96 percent, and for our planned construction contract acceptance we achieved 142 of 150, or 95 percent.

Contributors: Elizabeth Doohar, James Davis, and Rich Williams

Major Milestone Delivery (Fiscal year 2013–14)

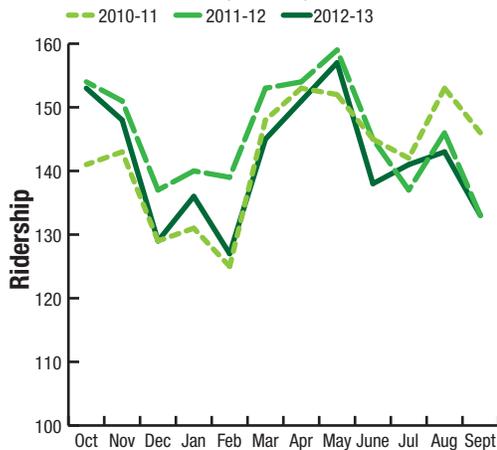


Intercity Passenger Rail: A Sustainable Option

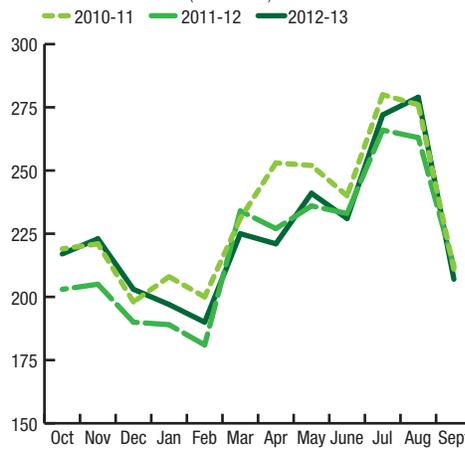
Caltrans' mission is to provide a safe, sustainable, integrated, and efficient transportation system to enhance California's economy and livability. One way we can do that is by offering people in California more than just highways to get to their destination. Intercity passenger rail is one of those options, and Caltrans funds three of the five busiest intercity passenger rail routes in the nation: the Pacific Surfliner Route (ranked second), the Capitol Corridor (ranked third),

and the San Joaquin Route (ranked fifth). Caltrans manages both the Pacific Surfliner and the San Joaquin routes under the Amtrak California banner, and the Capitol Corridor Joint Powers Authority manages the Capitol Corridor. Our objective is to increase intercity rail ridership on these state-supported routes, which is consistent with Caltrans' mission.

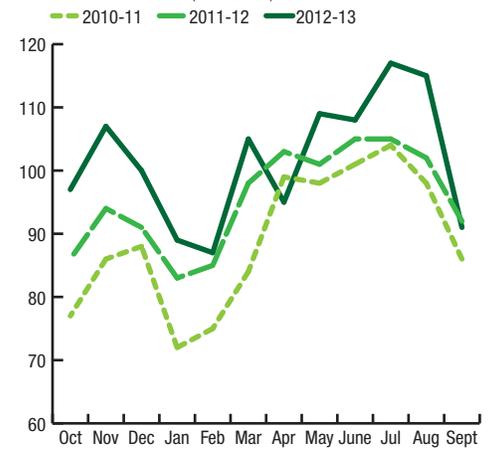
**Capitol Corridor Ridership
FFY 2010-11 thru 2012-13**
(In thousands)



**Pacific Surfliner Ridership
FFY 2010-11 thru 2012-13**
(In thousands)



**San Joaquin Ridership
FFY 2010-11 thru 2012-13**
(In thousands)



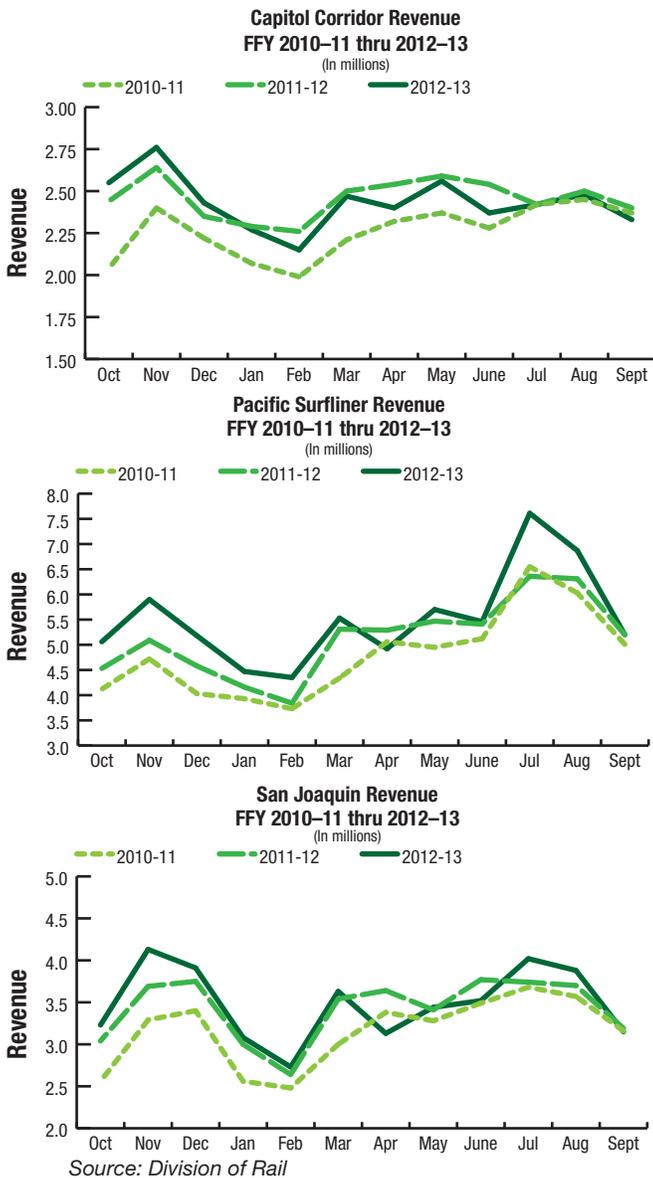
Source: Division of Rail and Mass Transportation



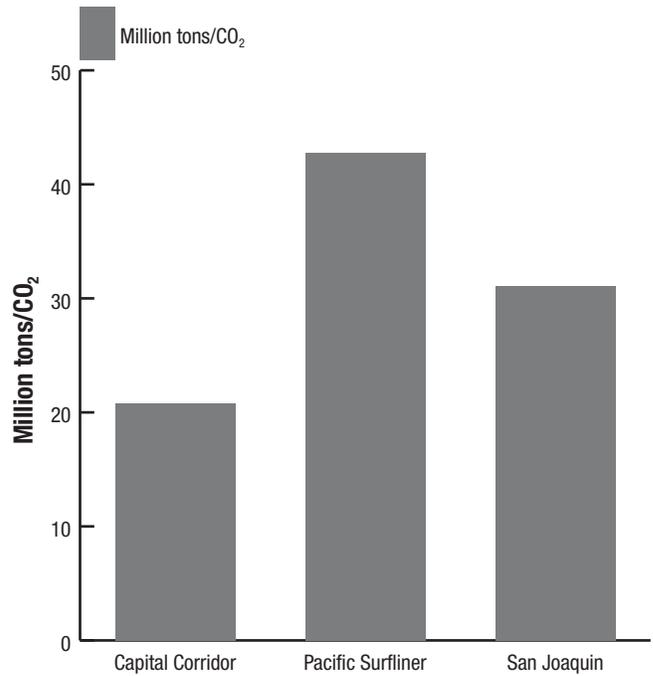
Route	Capitol Corridor	Pacific Surfliner	San Joaquin
Route mileage	169	354	364
Number of daily round trips	23	18	6
Number of stations	16	28	18
Ridership	1.7 million	2.7 million	1.2 million
Passenger miles	112.2 million	232.3 million	171.1 million
Average trip length	66 miles	86 miles	140 miles

Caltrans' Division of Rail and Mass Transportation is a leader in sustainable intercity transportation solutions. We are committed to making intercity passenger rail a more competitive travel option. We are working to engage partners and stakeholders in strategies that will modernize and grow the existing services, while better integrating intercity rail services with local and regional transit services. This integrated rail and transit system will ultimately serve to complement the high-speed rail system.

In federal fiscal year 2013, train, bus, and other revenue totaled \$137.3 million, a 3.9 percent increase from the previous fiscal year, while operating expenses were \$237.3 million, an increase of only 0.3 percent from the previous federal fiscal year. State support of the three routes totaled \$90.3 million.



Tons of CO₂ Removed by Train Travel Versus Car (2013 calendar year)



Data calculated by using U.S. EPA estimates from U.S. EPA "Optional Emissions from Commuting, Business Travel and Product Transport" (May 2008).

According to the U.S. Environmental Protection Agency, per passenger mile, rail generates approximately half the carbon dioxide emissions of an automobile. Caltrans is investing in greener and more energy-efficient capital improvements and rail equipment to further its objectives for sustainability, modernization, and integration. We recently entered into a joint multistate procurement contract, through which California will purchase 42 passenger rail cars and six locomotives, with an option to purchase 11 additional passenger cars. This will help Caltrans meet additional ridership demand.

All the new rail equipment meets "Buy America" requirements, using all American parts and labor. The passenger railcars are being built in Rochelle, Illinois, and the new locomotives are being built in Sacramento, California. The new locomotives will be powered by a 4,400-horsepower diesel-electric engine that meets all U.S. Environmental Protection Agency Tier IV emission standards. When built, these environmentally friendly locomotives will be the cleanest in the country, resulting in a greenhouse gas emissions reduction of approximately 85 percent compared to locomotives in the existing fleet. The first of the new locomotives is scheduled for delivery in late 2015, and the first of the new rail cars is scheduled for delivery in fall 2017.

Contributor: Bruce Roberts, Division of Rail and Mass Transportation



Transit Ridership Up↑



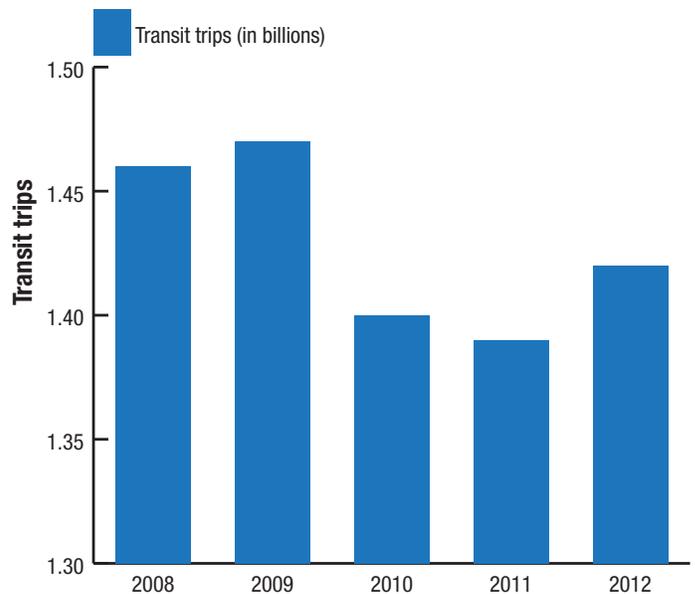
How do you get to your destination?

Many Californians drive, but more people are seeking travel options like walking, bicycling, and taking public transportation. Public transportation is experiencing a boom. Transit trips taken in California in 2012 increased by more than 32 million from 1.39 billion in 2011. In 2013, the American Public Transit Association reported transit ridership in the United States was the highest it had been in 57 years. That same year, according to APTA, some of the public transit agencies reporting record ridership systemwide or on specific lines were located in Los Angeles, Oakland, Riverside, and San Carlos. Even though transit ridership is up, California continues to have some of the nation's most congested highways. Can you imagine the transportation system without public transit? Single-occupant vehicle trips and congestion would be even worse. Public transportation helps reduce congestion and improve traffic flow, which helps the environment by reducing vehicle emissions. Equally important is that transit offers choices for travel.

Ridership is back on the rise, with 1.42 billion transit passenger trips taken in California in 2012.

The Great Recession and fluctuating gas prices have likely contributed to the ebbs and flows of California's transit ridership, with ridership spiking during the peak of the recession, then dropping and climbing back up as California's gas prices rise.

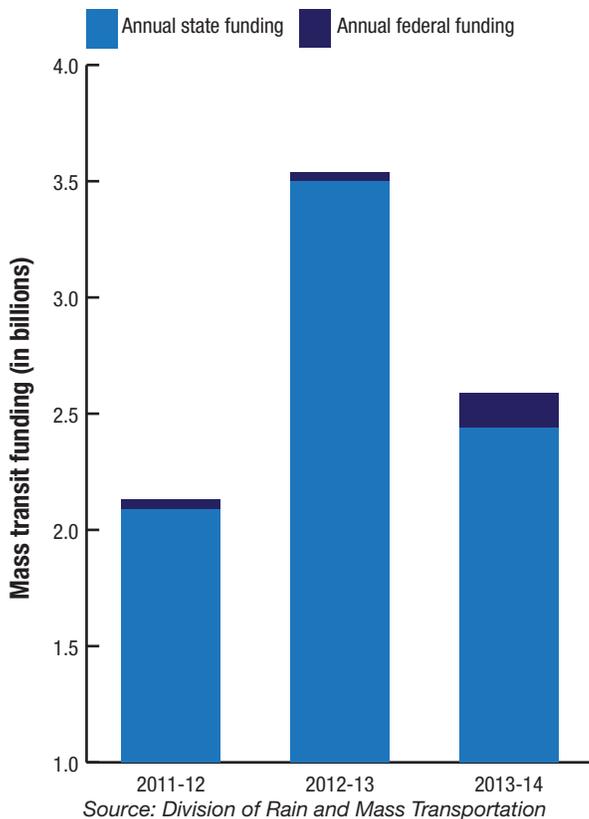
Transit Trips in California (2008–2012)



Caltrans' Role in Transit Funding

An increase in transit ridership equals a proportionate need to fund service expansion and operations. Much like money used for highways, government funds help plan, design, build, operate, and maintain the transit facilities, vehicles, and equipment that are necessary for an integrated, 21st-century, multimodal transportation system. That means funding subsidies are needed for transit, and that's one area where Caltrans has consistently delivered. Every year, we help ease the delivery of funding that our small urban and rural partners use for transit. Our part in public transportation is critical to local transit services that rely on these subsidies. Our federal partner, the Federal Transit Administration, also works directly with large urban areas to deliver even more.

Public Transit Funding (federal and state sources)



At Caltrans, our Division of Rail and Mass Transportation is responsible for managing state and federal public transportation funding programs that help deliver capital improvements and operating assistance to public transit agencies. Transit services, which are available in all of California's 58 counties and most of its 482 municipalities, include fixed transit routes, rural and intercity transit, commuter and urban



rail, waterborne ferries, and accessible services for the elderly and disabled. We also provide technical assistance to partner agencies, and we help develop plans to support transit, which fosters continuous improvements to California's overall transportation system. The division has two main transit program offices: the State Transit Programs office and the Federal Transit Programs office. Between these two offices, the total projected funds annually distributed to local agencies for years 2013 through 2017 range between \$2.14 billion and \$2.82 billion.

At Caltrans, our mission is to "provide a safe, sustainable, integrated and efficient transportation system." That's why we are developing strategies to integrate *smart mobility* principles, concepts, and performance measures that respond to state mandates aimed at improving California's social equity, economy, and environment. Success will hinge on our ability to work strategically with hundreds of local transportation agencies. We will continue to make sure Californians can get to their destinations—no matter how they choose or are able to travel.

Contributor: Brian Travis, Division of Rail and Mass Transportation

Caltrans Districts

Edmund G. Brown Jr.
Governor
State of California

Brian P. Kelly
Secretary
California State
Transportation Agency

Malcolm Dougherty
Director
California Department of
Transportation (Caltrans)

Tamie McGowen
Assistant Deputy Director
Caltrans Public Affairs

Matt Rocco
Office Chief
Caltrans Public Affairs

Office of Strategic Management

All photography provided
by Caltrans photographers

Ed Andersen

William Hall

John Huseby

Steven Hellon

Scott Lorenzo

All video provided by or edited
by Caltrans videographer

Jim O'Brien

Writing Staff

Angela Tillotson

Erin Gallup

Vanessa Wiseman

Jason Probst

Data Analysis & Graphic Design
Ty Johnson



For more information on Caltrans, please visit the following links:

QuickMap
quickmap.dot.ca.gov/

Program Review
www.dot.ca.gov/docs/Program_Review_Final_Report_Jan_2014.pdf

Division of Maintenance
www.dot.ca.gov/hq/maint/

Caltrans Social Media
www.dot.ca.gov/socialmedia/

Mission, Vision, Goals
www.dot.ca.gov/hq/paffairs/about/mission.htm

Smart Mobility Framework
<http://www.dot.ca.gov/hq/tpp/offices/ocp/smf.html>

California Household Travel Survey
www.dot.ca.gov/hq/tsip/otfa/tab/chts_travelsurvey.html

Reports to the California Legislature
www.dot.ca.gov/reports-legislature.htm

Freight Mobility Plan
dot.ca.gov/hq/tpp/offices/ogm/cfmp.html

Bay Bridge reports
www.dot.ca.gov/baybridge/seismic_retrofit_program_reports/

Aviation Fact Sheet
www.dot.ca.gov/hq/planning/aeronaut/documents/AeroFactSheet.pdf



Caltrans

California Department of Transportation

