



Along what had been State Route 275, now known as the Tower Bridge Gateway controlled by the city of West Sacramento, the conversion to arterial street included pedestrian-friendly features. Such planning is now standard for most Caltrans projects as part of a sustainability strategy.

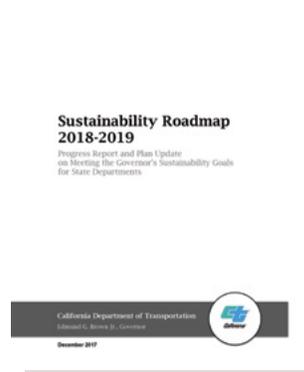
Caltrans' Mantra: Do More, Use Less

Sustainability Roadmap Cites Progress in Managing Resources

Caltrans' Sustainability Program, established in 2014, has already helped the Department take major steps to reduce its impact on the environment by building on long-established practices including environmental compliance and use of recycled materials. Caltrans has already met water and energy conservation targets for 2020 in its facilities and on landscaped acreage, is completing comprehensive climate change assessments for each of the 12 districts, and has launched an ambitious program to rein in the greenhouse gas emissions it produces.

These efforts align with the Department's three sustainability priorities: champion active transportation that encourages travel other than by vehicle; promote clean fuels, vehicles and materials; and prepare for climate change and extreme weather.

The Caltrans Sustainability Roadmap 2018-2019 focuses on Caltrans' efforts to embrace sustainable practices in its operations, and outlines courses of action to comply with executive orders by then-Gov. Edmund G. Brown Jr. and state legislation.



Nearly 40 percent of all greenhouse gas emissions in California come from vehicle emissions, not including emissions from construction materials and Caltrans facilities. Caltrans Director Laurie Berman, noting this, said the Department has a responsibility to continue reducing its carbon footprint

and adopt sustainable practices as stewards of the vast State Highway System.

In addition to the Sustainability Roadmap, which focuses on Caltrans operations, the Department's 2015-2020 Strategic Management Plan includes sustainability targets.

Caltrans oversees the construction and maintenance of about 50,000 lane-miles of pavement, 13,000-plus bridges, more than 200,000 culverts and almost 19,000 transportation management system (TMS) units. To keep

the integrated system safe and efficient for travelers, Caltrans has more than 20,000 full-time, permanent employees, and operates out of more than 500 facilities.

The Sustainability Roadmap highlights five target areas that all State agencies are addressing.

Climate Change Adaptation

This roadmap section identifies Caltrans' most vulnerable building facilities, investigates the vulnerability of the State Highway System to the likely impacts of climate change, and offers initial recommendations to protect vulnerable facilities, with a focus on buildings.

In the coming century, Caltrans facilities in certain locations are projected to experience:

- *Higher maximum and minimum temperatures, and more extreme heat events.* Maintenance facilities and equipment shops in inland Southern California face this prospect in particular, which has implications for staff safety and building integrity. The report offers mitigation strategies for at-risk facilities, and notes those practices are already in use at some locations. In addition, climate extremes in the next century are poised to threaten roadway surfaces, right-of-way vegetation and landscaping, and increase fire threats — and must be factored into policy decisions.
- *Changing precipitation patterns.* In the next century, climate change models forecast that as temperatures warm, snow levels will rise and more of the state's precipitation will fall as rain. If that occurs, Caltrans

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office buildings and maintenance facilities are more likely to sustain damage, as will roadways and other highway infrastructure.

- *Significant sea level rise.* Depending on the rise in global temperatures, Caltrans' coastal facilities in the Bay Area and portions of the coast are most at risk from seawater inundation.

These anticipated weather-related risks to the State Highway System are described in the regional vulnerability assessments that are being coordinated by Caltrans' Climate Change branch. Caltrans, through partnerships, is developing adaptation planning strategies to preserve facilities and transportation corridors.

Energy

Conservation efforts have cut the amount of power purchased, and the cost, since the governor's edict in 2012 that state agencies reduce energy purchases. Caltrans' energy use in 2016 declined 28 percent compared with the 2003 baseline year, exceeding the 20 percent target and saving the Department an estimated \$23 million.

Caltrans' estimated energy bill in 2016 was \$46.9 million for 335.3 million kBTUs (a measure of energy) used. Caltrans' 12 office buildings around the state were the largest power consumers, using almost half of the Department's total energy purchased in 2016. Maintenance stations, 369 in total and representing 70 percent of all Caltrans facilities, were the second-highest power user, followed by the Department's five transportation management centers (TMC), the nerve centers for highway operations in different parts of the state.

Individually, the five properties showing the highest energy use in 2016 were, in order, the District 7 (Los Angeles area) office, District 4 (San Francisco Bay Area) office, District 8 (San Bernardino) office, Los Angeles TMC, and Caltrans headquarters office in Sacramento.

The roadmap noted that Department office buildings offer the greatest potential for energy savings, and



Caltrans has made significant strides in cutting its overall power bills, due in part to facilities like this solar power station near Sacramento.

conservation efforts are underway through a variety of programs such as conversion to LED lighting and measures to lower individual usage. Solar power systems have been installed at some facilities, and 41 buildings with a record of high energy consumption are identified as candidates for solar panel installation. The Department also is enrolled in programs offered by regional energy providers to reduce power demands during emergency energy events in exchange for lower rates.

Going forward, Caltrans also is committed to meeting the governor's zero net energy (ZNE) goals requiring that a percentage of state buildings produce as much energy as consumed. Caltrans has finished construction on one of the state's first pilot ZNE projects, the San Francisco-Oakland Bay Bridge warehouse.

Water Efficiency and Conservation

Despite wildly fluctuating conditions — from punishing drought to one of the wettest years on record — Caltrans managed to exceed water conservation goals set by the governor. The Department reduced overall water use by 66 percent from 2010 to 2016 through a variety of measures, from savings in highway irrigation to water-efficient practices for buildings and surrounding vegetation. Highway irrigation represents about 70 percent of all of Caltrans' water consumption.

Caltrans' effort to limit water use on its irrigated acreage was accomplished despite a 77 percent increase in amount of landscaped acres under its control since 1990.

Steps taken to save water include new or modernized irrigation equipment, increased use of recycled or nonpotable water, more efficient practices such as harvested runoff, use of compost and more selective plantings, and better monitoring and usage tracking. Those conservation measures are ongoing.

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Green Operations

Since the governor's 2012 order requiring state agencies to reduce their greenhouse gas emissions, Caltrans has sharply cut the amount of harmful gases associated with its activities (excluding the use of the State Highway System). Caltrans showed a 40 percent drop in greenhouse gas levels generated in 2016 from the baseline year of 2010, according to the roadmap, far exceeding the state target ordering a 10 percent reduction by 2015 and a 20 percent cut by 2020.

Steps taken to create a greener Caltrans include LED light replacement in buildings, HVAC upgrades and energy-efficient measures, solar power generation, an emphasis on renewable power or cleaner fuel purchases, and buying more zero-emission vehicles.

The Department also is following the Leadership in Energy and Environmental Design (LEED) rating system and California Green Building Standards Code when constructing, renovating or maintaining its buildings. Indoor air quality standards also must be met at the time of new construction or alteration to gain LEED certification or meet CALGreen mandates.

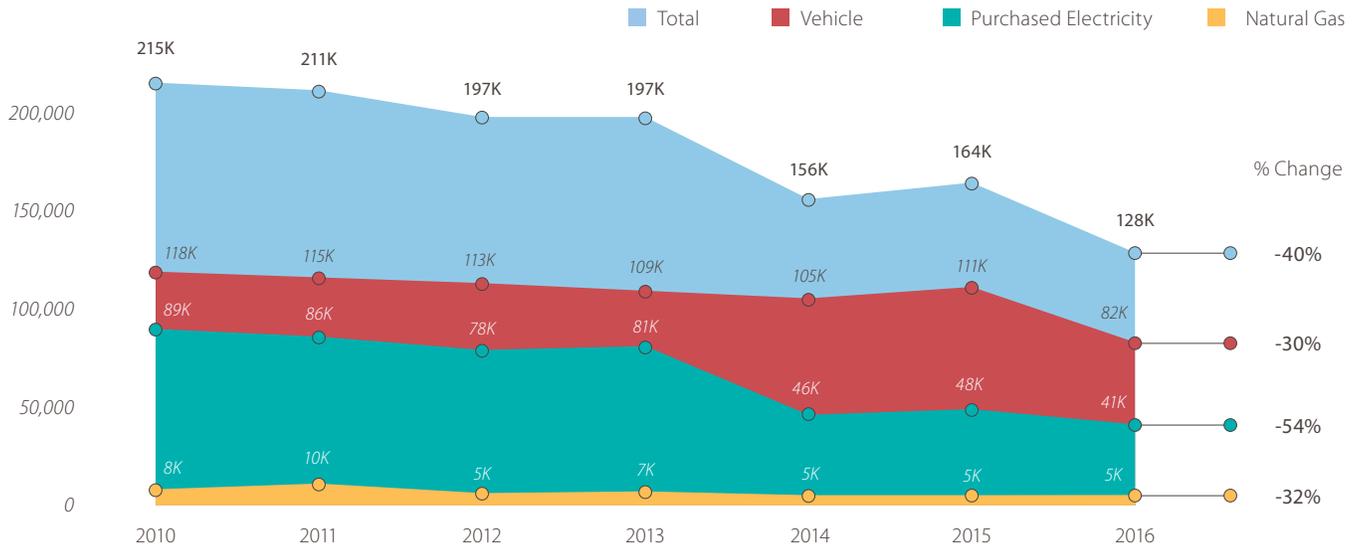
Purchasing is another area where Caltrans, and other state agencies, have to meet green standards. Caltrans has committed to buy environmentally responsible products, including recycled ones such as antifreeze, paint and tires for its maintenance facility needs, and to reduce waste sent to landfills.



At Caltrans regional District 10 in Stockton, water-saving techniques and maintenance are taught at a state-of-the-art landscape center.

Caltrans Greenhouse Gas Emissions

In metric tons CO₂e



Zero-Emission Vehicles (ZEVs)

Caltrans has been buying more ZEVs as part of the push to modernize agency fleets across the state and meet greenhouse gas reduction targets. ZEVs consist of all-electric vehicles, plug-in hybrids and hydrogen fuel cell cars.

The Department is on track to have 261 ZEVs in its light-duty fleet by the end of the 2018-19 fiscal year, and its fleet purchases met the State target of 20 percent. State agencies, including Caltrans, are required to raise the percentage of ZEVs in their light-duty fleet by 5 percent a year starting in fiscal year 2017-18 and continuing through 2024-25, reaching 50 percent.

Caltrans' light-duty fleet consisted of more than 3,600 vehicles that include passenger vehicles, light-duty pickup trucks, and four-wheel-drive vehicles for use in the field. Those vehicles eligible for replacement for age or mileage reasons will be replaced by ZEVs when possible, although the report notes that these vehicles cost significantly more and only limited models are currently offered.

In pushing for a changeover of the fleet, Caltrans also has begun to develop a statewide ZEV fueling network to supply its own vehicles and public charging stations based on the governor's 2016 ZEV Action Plan. Caltrans has more than 100 electric vehicle charging stations at its facilities, but will need to install about 1,200 more in the next five years to support the growing need for workplace and public charging.

The Sustainability Roadmap also plots a course

of action for Caltrans' internal units to implement or advance green operations practices, and assigns deadlines to fulfill those commitments. State law, or executive orders, requires Caltrans and other state agencies to cut water and energy use, build or adapt existing facilities to ZNE standards, and grow their fleets of ZEVs through 2025.

Source: Caltrans Sustainability Roadmap 2018-2019



A Chevy Volt electric car that's part of Caltrans' growing fleet of zero-emission vehicles powers up at a Department charging station.