Caltrans photo by Scott Lorenzo

In July 2017, Caltrans began delivering tablet computers to landscape field staff to safely and remotely manage the new water-saving smart irrigation network. The steps taken to curtail water use exceeded an ambitious 50 percent reduction target set by Director Malcolm Dougherty.

Strategy to Cut Water Use Pays Off Big

Caltrans Shows 65 Percent Reduction Since 2013 With Smart Tech, Conservation

The five-year drought is over, but water conservation remains a way of life in California and at Caltrans.

The Department is using new technology to balance transportation goals, worker safety and resource conservation as it manages 32,000 acres of roadside vegetation and 29,000 acres of irrigated landscaping along California's vast transportation system.

After a winter of record-setting rainfall, Governor Edmund G. Brown Jr. in April lifted his 2014 state of emergency drought order in all counties except Fresno, Kings, Tulare and Tuolumne.

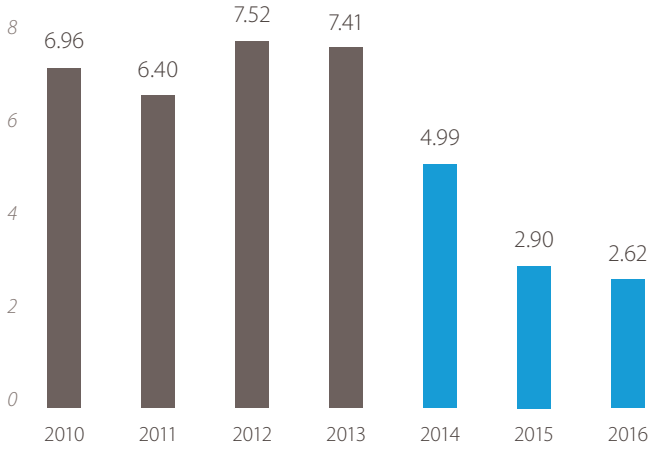
However, the Governor wants Californians to continue conserving water because "the next drought could be around the corner," he cautioned.

During the long drought, Caltrans made great strides in water conservation, saving more than three times Gov. Brown's 20 percent water reduction order in 2014 and topping the even more ambitious 50 percent reduction target set by Caltrans Director Malcolm Dougherty.

In 2013, Caltrans used 7.41 billion gallons of water on its roadside landscape. But by 2016, Caltrans had cut that amount by 65 percent, to 2.62 billion gallons.

Almost 12 billion gallons of water have been saved since 2013 — enough to supply 35,677 Cali-

Caltrans Statewide Water Use *(in Billions of Gallons)*



fornia households for a year. These savings resulted largely from a series of strategic policy changes.

In 2013, Caltrans set a goal to convert all irrigation controllers to "smart" controllers, unless a location is more appropriate for a conventional controller. By July 2017, Caltrans' water-saving smart controller inventory had grown from 2,358 in 2014 to 3,268.

Caltrans updated its Highway Design Manual in 2016 with a goal to irrigate all landscaping, where possible, with recycled water. Caltrans must follow specific state guidelines for non-potable water use as the Department installs miles of piping to route recycled water to highway landscaping.

From March 2014 to June 2017, Caltrans increased recycled water use statewide from 14 to 23 percent by converting 48 irrigation water sources to recycled water, and expanding the reach of five existing mainlines. Each year, Caltrans is now saving 228 million gallons of drinking water, which was previously used to irrigate roadside landscaping that is now thriving on recycled water.

Caltrans' Highway Design Manual updates likely will multiply the water savings in the future, since regional and local agencies generally follow the Department's guidelines when upgrading their local street landscaping infrastructure.

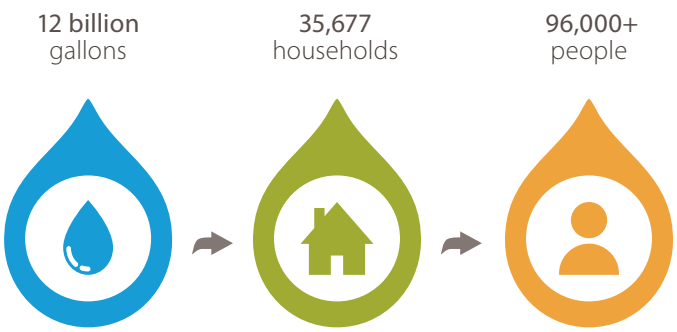
The drought and ensuing order from Caltrans Director Dougherty spurred investments in landscape irrigation, ranging from the installation of 1,439 sensors that measure water flow, to adding nearly 152,000 linear feet of recycled water piping alongside highways. Caltrans also replaced or installed 2,544 smart controllers, on which water schedules can be adjusted to match weather forecasts, leaks and location identified, and problem valves or the entire system shut down.

In addition, Caltrans upgraded 661 communication software components to relay information on troublesome irrigation valves to Caltrans district water managers' mobile devices. Previously, Caltrans employees only knew about water leaks when they saw them. In addition to saving water, smart irrigation systems reduce employee exposure to traffic and trips to the site, which increases worker safety. Caltrans also installed 2,157 anti-theft fence enclosures and valve boxes to protect its smart system investment.

To show employees how to use and repair irrigation systems without the dangers of traffic nearby, Caltrans built a water conservation training center at the District 10 office in Stockton. *(See accompanying story.)* In 2016, Caltrans trained nearly 1,500 employees statewide on how to operate, maintain and repair the new smart irrigation systems.

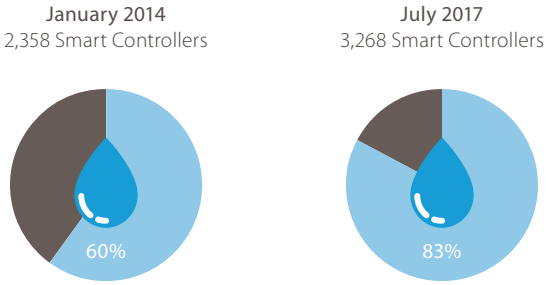
Conservation will continue to be a way of California life as Caltrans strives to meet its ambitious water-saving goals. MM

Caltrans Water Savings from Policy Changes



Almost 12 billion gallons of water have been saved since 2013 — enough to supply 35,677 California households for a year. Households average 2.7 people.

Inventory of Smart Irrigation Controllers



Between January 2014 and July 2017, Caltrans increased its inventory of smart irrigation controllers from 60 percent to 83 percent. Smart controllers have water-saving features, including a weather sensor to adjust sprinklers.

Source: *Elbert Cox, Supervising Landscape Architect; Jack Broadbent, Supervising Landscape Architect; Camilo Arellano Jr., Statewide Water Manager*