

Sustainability Roadmap 2018-2019: Zero Emission Vehicles

Progress Report and Plan for Meeting
the Governor's Sustainability Goals
for California State Agencies

California Conservation Corps

Edmund G. Brown Jr., Governor

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California Conservation Corps Sustainability Roadmap 2018-2019: Zero Emission Vehicles

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Acronyms

EO	Executive Order
EVSE	Electric Vehicle Supply Equipment (charging equipment)
GHGe	Greenhouse Gas Emissions
MM	Management Memo
SAM	State Administrative Manual
ZEV	Zero Emission Vehicle

EXECUTIVE SUMMARY

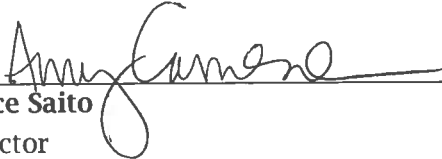
The California Conservation Corps (CCC) is comprised of young adults, ages 18 to 25 (and veterans to age 29), who work on conservation projects on public lands in cities and rural areas. Projects range from restoring fish and wildlife habitat, to installing energy and water-efficient improvements, building trails, and improving forest health. As one of the state's emergency work forces, the CCC responds to fires, floods, pest infestations, earthquakes and oil spills.

The CCC currently owns and leases 26 facilities in urban and rural areas - statewide, including eight residential facilities, 18 non-residential facilities comprising approximately 590,000 square feet of building space. The CCC has about 1,434 full-time corpsmembers, of which approximately 584 are housed in residential centers. A typical residential facility includes dormitories, administration, educational, recreational, warehouse, dining, and kitchen space and house 80 to 100 corpsmembers. Residential facilities operate 24 hours a day, seven days a week. The non-residential facility includes educational and administrative space which serves from 30 to 60 corpsmembers and operates five days a week.

The CCC has made significant first steps in meeting the goals of Executive Order B-18-12 by participating in the Governor's Office, Sustainable Building Work Group, and timely reporting base year and ongoing monitoring of energy, gas water and greenhouse gas (GHG) emissions as required. Our Tahoe and Camarillo residential centers are 'LEED Silver Certified' facilities. In April 2018 the CCC will open its newest 'LEED Silver Certified' Delta residential center in Stockton. Camarillo and Delta are included in the DGS' program for Zero Net Energy (ZNE). Energy audits will be conducted at all CCC facilities within the next two years. In addition, we anticipate receiving DGS reports on ZNE options for remaining residential centers to meet the "green" goals planned at the CCC by next fiscal year.

While the majority of the department's fleet is heavy duty and outfitted for transporting crews, tools and materials to remote project sites, there are opportunities to utilize ZEVs on the administrative side of our program. The CCC made its first purchase of a hybrid vehicle in Fiscal Year 14/15, then five ZEVs were purchased in 15/16, followed by two more hybrids in 16/17. Our current five-year plan includes adding five more ZEVs to our fleet. The only state owned property for the department include Placer, Tahoe, Camarillo and our new Delta Center that is due for completion in April 2018. Plans include adding two level 2 EVSEs at Placer Center. The new Delta will have two level 2 EVSEs. This leaves Camarillo and Tahoe Centers as priorities in adding two each level 2 EVSEs at each site. We are currently evaluating the need to add corpsmember parking into the calculation in determining the number of EVSE to install at our state owned properties.

There has been an upward trend from 2013 to 2015 in fuel use. However in comparing fuel use from 2015 to 2016, we observed a noticeable decrease which we attribute in part to our growing ZEV and Hybrid fleet. The CCC will continue to seek out every opportunity to conserve resources, reduce the use of fossil fuels, increase environmentally friendly vehicles and decrease our GHG production.



Bruce Saito
Director

SUSTAINABILITY GOALS

The Governor has directed California State Agencies to demonstrate sustainable operations and to lead the way by implementing sustainability policies set by the state. Sustainability includes the following general initiatives:

- Greenhouse Gas Emissions Reductions
- Building Energy Efficiency and Conservation
- Indoor Environmental Quality (IEQ)
- Water Efficiency and Conservation
- Monitoring Based Building Commissioning (MBCx)
- Environmentally Preferable Purchasing (EPP)
- Financing for Sustainability
- Zero Emission Vehicle (ZEV) Fleet Purchases
- Electric Vehicle Charging Infrastructure
- Monitoring and Executive Oversight

The Governor has issued numerous executive orders directing sustainable state operations. The orders relevant to zero emission vehicles are:

Executive Order B-18-12

EO B-18-12 and the companion *Green Building Action Plan* require state agencies to reduce the environmental impacts of state operations by reducing greenhouse gas emissions, managing energy and water use, improving indoor air quality, generating onsite renewable energy when feasible, implementing environmentally preferable purchasing, and developing the infrastructure for electric vehicle charging stations at state facilities. The Green Building Action Plan also established two oversight groups, the staff level Sustainability Working Group and the executive level Sustainability Task Force, to ensure these measures are met.

Executive Order B-16-12

EO B-16-12 directs state agencies to integrate zero emission vehicles (ZEVs) into the state vehicle fleet. It also directs state agencies to develop the infrastructure to support increased public and private sector use of ZEVs. Specifically, it directs state agencies replacing fleet vehicles to replace at least ten percent with ZEVs, and by 2020 to purchase at least 25 percent replacement fleet as ZEVs.

Executive Order B-30-15

EO B-30-15 declared climate change to be a threat to the well-being, public health, natural resources, economy, and environment of California. It established a new interim statewide greenhouse gas emission reduction target of 40 percent below 1990 levels by 2030, and reaffirms California's intent to reduce greenhouse gas emissions by 80 percent below 1990

levels by 2050. To support these goals, this order requires numerous state agencies to develop plans and programs to reduce emissions.

2016 Zero Emission Vehicle Action Plan

The plan establishes a goal to provide electric vehicle charging to 5 percent of state owned parking spaces by 2022. It also advances the ZEV procurement target to 50 percent of light duty vehicles by 2025.

AB 32 Scoping Plan

The scoping plan assumes widespread electrification of the transportation sector as a critical component of every scenario that leads to the mandated 40 percent below 1990 GHG levels by 2030 and 80 percent below by 2050.

Public Resources Code §25722.8

Statute requires reducing consumption of petroleum products by the state fleet compared to a 2003 baseline, by mandating a 10 percent reduction or displacement by January 1, 2012 and a 20 percent reduction or displacement by January 1, 2020.

State Administrative Manual & Management Memos

The following sections of the State Administrative Manual (SAM), and associated Management Memos (MM), currently impose sustainability requirements on the department under the Governor's executive authority:

- MM 15-03: Minimum Fuel Economy Standards Policy
- MM 15-07: Diesel, Biodiesel, and Renewable Hydrocarbon Diesel Bulk Fuel Purchases
- MM 16-07: Zero-Emission Vehicle Purchasing and EVSE Infrastructure Requirements

FLEET VEHICLES

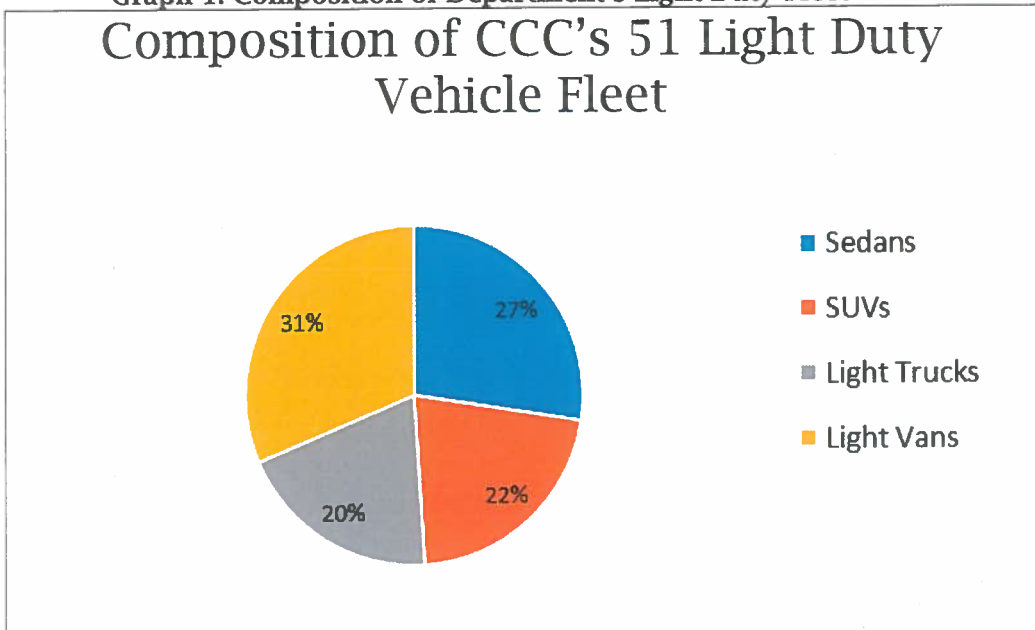
Department Mission and Fleet

This ZEV Report and Plan demonstrates to the Governor and the public the progress the Department has made toward meeting the Governor's sustainability goals related to Zero Emission Vehicles. This report identifies successful accomplishments, ongoing efforts, outstanding challenges and future efforts.

The California Conservation Corps is a youth work program in maintaining and enhancing the state's natural resources. This requires a large mobile work force distributed throughout the state, utilizing a fleet of heavy duty vehicles in order to carry out the department's mission. The CCC currently maintains eight residential centers and 18 non-residential satellites. These centers and satellites are situated state-wide from Yreka to San Diego in urban, suburban and rural settings. With an average "crew" size of 15 corpsmembers, a center can house four to five crews, while a satellite is a base for one to three crews. The CCC's project sites vary and include coastal, desert, central valley, riverine, deltas, sierras and high country but are primarily in rural and remote locations. It is common for crews to travel several hours a day to and from project work sites. Access to such sites may begin on highways and paved roads but also include gravel and dirt roads. While on travel status, crews spend about 40 percent of the time on paved road and 60 percent on unpaved roads. While on paved surfaces, 30 percent of the time is city driving while the balance is highway driving. Project travel and work is performed regardless of the weather conditions - snow, rain, wind and sun.

The vehicle needs of a typical crew are (1) Crew Carrying Vehicle (CCV) and (1) Project Support Vehicle towing an enclosed trailer or a chipper trailer. The CCV is a Ford F-550 with seating for six in the cab. It is outfitted with a crew carrying box with seating for nine. The Project Support Vehicle consists of a ¾-ton Dodge Ram pick-up with a cab capable of seating three or six. The pick-up and/or trailer also hauls the project's hand tools, power tools, fuels, food and water. Some project work requirements include camping ("Spiking" or "Spike") one or more nights at the work site (or "Grade"). Another facet of our program is emergency response to natural or man-made disasters including floods, fires, earthquakes and oil spills. Due to the nature of the CCC's program needs and the current technological limitations of alternative fuel vehicles, the use of fossil fueled vehicles will continue into the foreseeable future.

Graph 1: Composition of Department's Light Duty Fleet



In 2016, the department purchased 346,878 gallon of fossil fuel for fleet. In the prior year 2015, the department purchased 350,939 gallons of fossil fuel. As compared to prior year, the department realized a one percent decrease in fleet fossil fuel consumption, equivalent to a savings of 4,061 gallons thus far.

Table 1: Total Purchased Fuel for 2016

Purchased Utility	Quantity	Cost (\$)
Gasoline	336,980 Gallons	\$1,109,940
Diesel	9,898 Gallons	\$32,168
Renewable Diesel	0 Gallons	\$0
TOTAL GGE	346,878 Gallons	\$1,142,108

Incorporating ZEVs into the State Fleet

A widespread shift to Zero Emission Vehicles is essential for California to meet its Green House Gas (GHG) emission goals. State departments are now required to incorporate a larger number of ZEVs in their vehicle fleets. Starting in FY 17/18 the percentage of new light duty vehicles that must be Zero Emission Vehicles should increase by five percent each year, reaching 25 percent in FY 19/20 and 50 percent in FY 24/25.

The ZEV technologies include hydrogen fuel cell electric vehicles and plug-in electric vehicles, which includes plug-in hybrid electric vehicles.

Since ZEVs are not suitable for project field work there are opportunities for ZEVs on the support side of our program - administrative and facilities. Each center and satellite has a complement of light duty vehicles, including SUVs, mini vans and sedans in support of the administrative and facility functions. These vehicles are used for various needs such as short trips into town for corpsmember errands, mail runs, doctor appointments, hardware store

trips, volunteer work and recreational events. These short trips are primarily on paved surface streets of both city and highway driving and are generally ten to 30 minutes in travel time. The current CCC fleet consist of 356 vehicles, which includes five ZEVs. Seven ZEVs are pending current year purchase.

CCC vehicles are identified for replacement based on thresholds outlined in the State Administrative Manual, recently updated on November 1, 2017. Replacement thresholds are determined by vehicle type, mileage and age, whichever comes first. Currently ZEVs are available on statewide commodity contracts in the sub-compact, compact, mid-size sedans and mini-vans vehicle classes. There are currently 19 vehicles in our fleet that are currently eligible for replacement in vehicle classes for which ZEVs are available on contract.

Table 2: Vehicles in Department Fleet Currently Eligible for Replacement

	SUV	Compact Sedan	Midsized Sedan	Mini Van	Total
# of vehicles eligible for replacement	8	4	1	6	19

The table below shows the estimated number of ZEVs that have been or are anticipated to be added to the department fleet in coming years.

Table 3: ZEV Additions to the Department Fleet

Table Header Format	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22
Battery Electric Vehicle	0	5	0	4	1	2	1	1
Plug-in Hybrid Vehicle	0	0	0	3	0	0	0	0
Hybrid Vehicle	0	0	2	6	0	0	0	0
Percent of total purchases	0%	23%	6%	20%	20%	25%	30%	35%
Required ZEV Percentage	10%	10%	10%	15%	20%	25%	30%	35%
Total number of ZEVs in Fleet	0	5	5	12	13	15	16	17

Telematics Plan

Telematics is a method for monitoring vehicle use. Using GPS and on-board diagnostics, telematics provides valuable information that often results in fuel savings and improved vehicle utilization. Telematics is especially important for verifying that Plug-in Hybrid Vehicles are maximizing the use of electric fuel rather than gasoline. The rule requiring 50 percent of ZEVs purchased to be battery electric vehicles (BEVs) is not in place for fleets making use of telematics for all ZEVs.

Our department is not currently planning to use telematics. There is an issue with some union groups regarding GPS monitoring and tracking that need to be reviewed prior to employing telematics into our program.

Public Safety Exemption

The CCC does not employ sworn peace officers and therefore we do not have a Public Safety Exemptions.

ZEV INFRASTRUCTURE

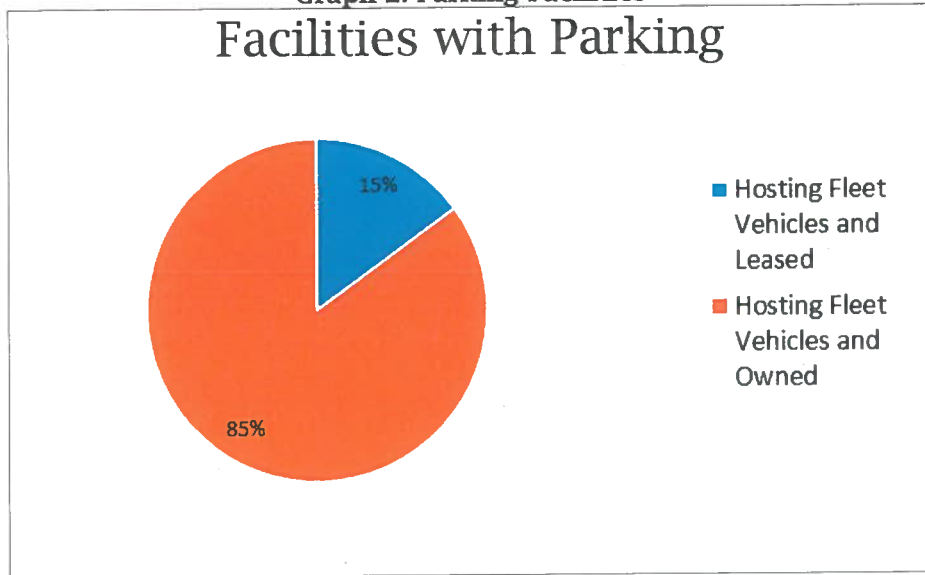
Introduction to the Department of California Conservation Corps Parking Facilities

To support our ZEV fleet, all future CCC capital outlay projects for residential and most non-residential buildings will include Electric Vehicle Supply Equipment (EVSE) for PEV charging per California Green Building Standards Code (Title 24, Part 11 Green Building Standards Code). As noted, effective January 2017, the number of parking spaces that must be PEV-capable increased to 6 percent for most non-residential buildings.

The interesting aspect of CCC facilities is the wide variety of facility types and forms of occupancy. Of the 26 facility locations statewide, only three (12 percent) are state owned, Placer, Tahoe and Camarillo. The remainder are leased, both for short and long term leases, from federal, state, local and private owners. The CCC relies upon DGS, the state's leasing officer, to negotiate EVSE installation at our leased facilities. During collaborative meetings between the CCC and DGS, prior to new, or lease renewal, program items needing to be incorporated into the lease agreements are discussed and formalized.

Our new Delta Residential Center, due to be completed in early 2018, is state owned. With the exception of the state owned properties, including Greenwood Center (a long term lease), most leased facilities lack onsite parking for all fleet, visitor, staff and corpsmembers combined. Many parking areas are not paved or defined and include dirt or graveled surfaces. Due to lack of onsite parking, staff and corpsmember must find street parking or take public transportation. Parking priority is for fleet, visitor, and staff, followed by corpsmembers. Regarding parking segregation, fleet parking is commonly secured parking. Staff and visitor parking is separated from corpsmember parking. Of the corpsmembers population, only 30 to 40 percent bring vehicles to the residential centers. For satellite centers corpsmembers either drive, dropped off or utilize public transportation depending on location.

Graph 2: Parking Facilities



Given the nature of the department’s fleet operations, the length of stay for visitors and employees, we have initially determined that it is appropriate that level 2 chargers should make up approximately 25 percent of the chargers in employee parking areas and 75 percent of chargers in fleet parking areas, with the remainder being level 1. The CCC is reviewing the issue of whether or not to include corpmember parking in the calculation of EVSE allocation and if it is a responsible investment in state resources.

Based on estimates of future ZEV fleet purchases and a count of visitor and workplace parking spaces it has been determined that the Department will need three L1 and five L2 chargers by June 2018 to adequately serve fleet vehicles and achieve the goals established in the ZEV Action Plan.

The facilities with the most urgent need for EV charging are listed below.

Table 4: High Priority EVSE Projects

Facility Name	Total Parking Spaces	Existing L1 Chargers	Existing L2 Chargers	New L1 Chargers Needed	New L2 Chargers Needed
Camarillo	77	0	0	2	2
Tahoe	54	0	0	1	3
Total	131	0	0	3	5

Outside Funding Sources for EV Infrastructure

In 2015-16, the CCC received its first five plug-in ZEVs (with 12 more planned in the next five years). To date we have since added staff for the department’s sustainability efforts and we are at the early stages of learning about governmental, utility, private, or non-profit EVSE funding and installation efforts. Since ZEVs are competing with CCC project needs for funding, the CCC

will rely heavily, if not exclusively, on outside funding programs provided by DGS, utility providers and others.

Hydrogen Fueling Infrastructure

The CCC does not have fleet plans that incorporate hydrogen fueled vehicles or refueling stations.

Comprehensive Facility Site and Infrastructure Assessments

Site Assessments are performed to establish the cost and feasibility of installing needed EV infrastructure. The table below lists the facilities that have been evaluated with Site Assessments.

Table 5: Results of Site Assessments

Facility Name	L1 Chargers with Current Electrical System	L2 Chargers with Current Electrical System	Total cost for Project using Current Electrical System	L1 Chargers with Electrical System Upgrades	L2 Chargers with Electrical System Upgrades
Camarillo	None	None	TBD	None	None
Tahoe	None	None	TBD	None	None
Total					

With limited funds and resources, the CCC has no plans for formal site assessments on existing facilities. However, all future capital outlay projects will be assessed through the concept, design and development phases of those projects, with cost of sustainability and adaptation built into the cost of new capital projects. As leased facilities come up for renewal, the CCC will collaborate with DGS to incorporate EV infrastructure needs, if possible.

EVSE Construction Plan

The CCC intends to install (2) level 2 EVSE at its three existing state owned centers, Placer, Tahoe and Camarillo. Placer’s (2) EVSE are included in a capital outlay project consisting of new dorms, a multi-purpose building, kitchen, and parking lot, which is in the working drawing phase with a project completion scheduled for early 2020. The CCC also has Delta Center in Stockton under construction, due to be completed in early 2018. This residential center will include two level 2 EVSE in the parking lot.

The existing five plug-in ZEVs (level 1 charging) do not require a special charging station. For the next 12 ZEVs, purchased in the next five years, it is anticipated that they will require level 2 charging stations. We anticipate activating level 2 EVSE for the existing and future ZEV fleet at Placer, Tahoe, Camarillo and soon to be Delta Centers. At this early stage of our efforts we have reached out and engaged in discussions with DGS regarding assistance in site evaluations,

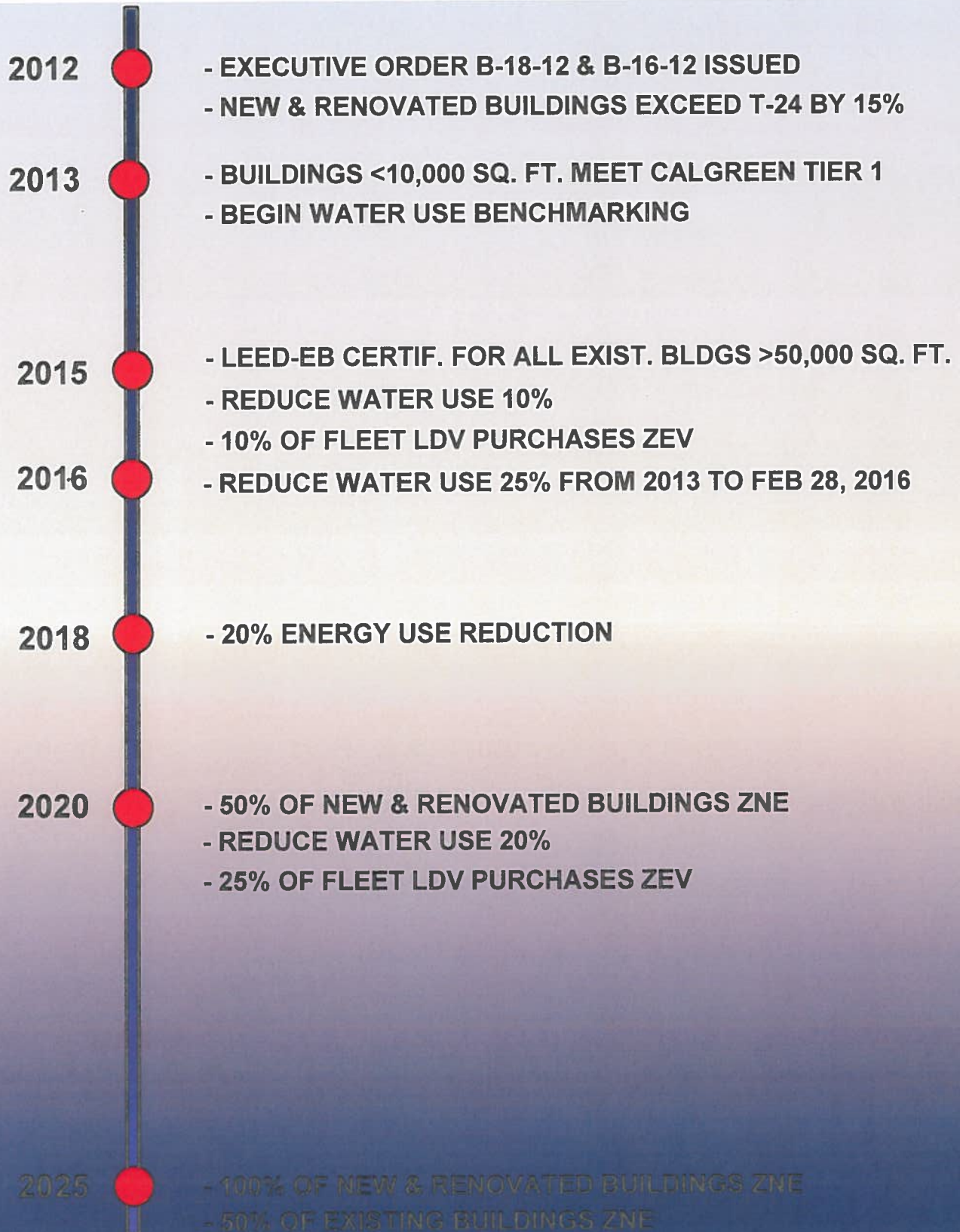
design and construction as an option. For comparison, the department may elect to perform or contract to an outside provider.

The vast majority of the CCC's locations are leased, some from federal, state and local government but mostly from the private sector. The CCC and DGS meet to confirm CCC program requirements prior to lease negotiations. The DGS then incorporates program requirements such as EVSE installation at CCC leased facilities into the lease documents.

EVSE Operation

Onsite staff will manage the day-to-day use of the charging stations in accordance to, yet to be developed, CCC policy. The CCC policy will address use for state fleet vehicles, and may address use for personal employee vehicles. Every effort will be made to equitably accommodate ZEV charging station users. The CCC has the option of engaging a service provider for managing the payment collection, usage reporting and maintenance of the chargers. The other option, pending approval for hiring a maintenance mechanic, is to provide the same service using in-house staff. Statewide EVSE oversight will be a task implemented by the Administrative Division, Sustainability Program, located at CCC's headquarters in Sacramento.

SUSTAINABILITY MILESTONES & TIMELINE



DEPARTMENT STAKEHOLDERS

Incorporating ZEVs Into the Department Fleet	
Dawne Bortolazzo	Deputy Director, Administrative Division
Michael Haupt	Business Services Manager
Steven Fultz	Departmental Construction and Maintenance Supervisor, Facilities Unit

Telematics	
N/A	

Public Safety Exemption	
N/A	

Outside Funding Sources for ZEV Infrastructure	
Bill McNamara	Director, Energy Program Development
Chris Rochte	Regional Deputy, Energy Region
Michael Haupt	Business Services Manager

Hydrogen Fueling Infrastructure	
N/A	

Comprehensive Facility Site and Infrastructure Assessments	
Chris Rochte	Regional Deputy, Energy Region
Steven Fultz	Departmental Construction and Maintenance Supervisor, Facilities Unit

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