Sustainability Roadmap 2018-2019

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

California Highway Patrol

Edmund G. Brown Jr., Governor

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California Highway Patrol
Sustainability Roadmap 2018-2019

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Acronyms

AB	Assembly Bill
BEV	Battery Electric Vehicle
CA	California
CALEPA	California Environmental Protection Agency
CALGREEN	California Green Building Code (Title 24, Part 11)
CHP	Department of California Highway Patrol
CNRA	California Natural Resources Agency
DAC	Disadvantaged Communities
DGS	Department of General Services
DOT	California Department of Transportation
DWR	Department of Water Resources
EMCS	Energy Management Control System
EO	Executive Order
EPP	Environmentally Preferable Purchasing
EUI	Energy Use Intensity (source kBTU/sq. ft.)
EVSE	Electric Vehicle Service Equipment
GHG	Greenhouse Gas Emissions
GS $Mart	Golden State Financial Marketplace
IEQ	Indoor Environmental Quality
ICE	Internal Combustion Engine
IMD	Information Management Division (CHP)
kBTU	Thousand British Thermal Units (unit of energy)
LCCA	Life Cycle Cost Accounting
LED	Light-Emitting Diode
LEED	Leadership in Energy and Environmental Design
LEED-EBOM	Leadership in Energy and Environmental Design for Existing Buildings Operations and Maintenance
MPG	Mileage Per Gallon

OBF	On-Bill Financing
OEHHA	Office of Environmental Health Hazard Assessment
OPC	Ocean Protection Council
PPA	Power Purchase Agreement
PUE	Power Usage Effectiveness
RCP	Representative Concentration Pathway
SABRC	State Agency Buy Recycled Campaign
SAM	State Administrative Manual
SB	Senate Bill
SGMA	Sustainable Groundwater Management Act
SQFT	Square Feet
ZEV	Zero Emission Vehicle
ZNE	Zero Net Energy

EXECUTIVE SUMMARY

The Governor's Office directed the Department of California Highway Patrol (CHP) to prepare a Sustainability Roadmap document to describe the status and steps for achieving the objectives, targets, and requirements of the Governor's Executive Orders (EOs) B-18-12 and B-16-12. This document intends to both outline the applicable requirements of these two EOs and describe what action steps the CHP has taken and will take to achieve compliance.

In 1929, the California Legislature established the CHP. Since then, the CHP has built a history of service and tradition, making the CHP one of the leading law enforcement agencies in the world. At the time of its creation, the Legislature gave the authority and responsibility to enforce traffic laws on county and State highways to the CHP. This authority continues today; however, the duties of the CHP extend far beyond what the Legislature of 1929 ever imagined. The CHP ensures the safe transportation of people and goods across the State highway system and is responsible for protecting over 380,000 lane miles of roadway. The CHP utilizes several types of office space, which include Area and Division offices, headquarters, communications centers, and air operations facilities. The CHP also co-locates six Field offices with the Department of Motor Vehicles and co-locates Traffic Management Centers with the Department of Transportation (DOT). Additionally, the CHP staffs, operates, and with a reimbursable Memorandum of Understanding, maintains the 55 existing DOT-owned commercial vehicle enforcement facilities and scales throughout the State. The CHP is responsible for operating special programs, such as the commercial vehicle inspection program, vehicle theft investigations, multidisciplinary accident investigation teams, salvage vehicle inspections, canine narcotic enforcement, and homeland security. In addition to its enforcement responsibilities, the CHP has taken a leadership role in educating the public concerning driver safety issues. The CHP has received state and national recognition for its innovative public awareness campaigns, which include promoting the use of safety belts, the use of a designated driver, the importance and proper method of securing small children in child safety seats, and the use of motorcycle and bicycle helmets.

Currently, the CHP occupies 1,366,193 square feet (SQFT) of state-owned and 788,104 SQFT of leased facility space for a total of 2,154,297 SQFT statewide, including the headquarters facility, the CHP Academy, eight Field Division offices, 25 Communications/Dispatch Centers, 103 Area offices, 37 resident posts, and eight air operations facilities. As of Fiscal Year (FY) 2016/2017, the CHP employs 10,737 employees, both uniformed and nonuniformed. The CHP faces many challenges as its facility inventory is, on average, over 35 years old, and provides less than half of the needed square footage for proper functionality. One of the challenges for the CHP is many of its offices were built prior to the addition of female officers into the CHP's ranks in 1974. Due to the age and size of the CHP's facilities, many of the offices do not have adequate locker rooms to accommodate and separate male and female officers. Additionally, all the new responsibilities have necessitated the need not only for additional space, but also for areas such as controlled secure storage for evidence, most of which must be climate controlled.

In 2017, the CHP participated in the Direct Install Program funded by Southern California Edison, which assisted in the completion of light-emitting diode (LED) retrofits in ten CHP Area offices. This allowed the CHP to upgrade interior and building-mounted exterior lighting, resulting in a reduction in energy consumption. Currently, the CHP is participating in an energy efficiency program with the Department of General Services (DGS), which will allow energy efficiency upgrades in FY 2017/2018 at the CHP Academy. This will provide significant energy savings and improved operational efficiency for the Academy.

The CHP's Information Management Division (IMD) has made significant progress by completing the installment of the Energy Usage Monitoring software and hardware, which has allowed IMD to make timely and proactive decisions based on the efficiency of the Data Center. Additional installation of power monitoring meters will assist with the discovery of energy waste. The Data Center team has also sent three employees to Data Center Efficiency Training to implement best practices for Data Center management. Additionally, IMD has requested a technical resource to serve as an adviser for industry standards and power efficiency solutions in order to increase the Data Center power efficiency.

The CHP achieved Leadership in Energy and Environmental Design (LEED) Gold and Silver Standards in eight facilities. These offices, located in Sacramento (headquarters), Oceanside, Grass Valley, Oakhurst, Mojave, Stockton, Bakersfield, and Chico, will provide substantial energy savings this year, with energy and cost saving mechanisms, including solar. Despite the many challenges, the CHP is making great strides toward energy reduction in its facilities throughout the State. The CHP's building plans for the next five years mandate all new buildings will be, at a minimum, LEED Silver and Green Code Tier I (Title 24) compliant. The CHP has implemented requirements for low water or no water landscape at all new offices. In support of the drought, the CHP participated in the Governor’s Water Grant, replacing bathroom fixtures that were high flow rate with new low flow rated fixtures.

The majority of the CHP’s vehicle fleet is enforcement vehicles, with special performance requirements necessary for the protection of public safety and welfare. These vehicles are used for routine patrol 24 hours a day, seven days a week, in all climates, topography, undercover investigations, enforcement of commercial vehicle laws and regulations, protection of elected and appointed public officials, and as pursuit capable response vehicles for uniformed command staff. Although the majority of the CHP’s vehicle fleet is exempt from the Governor’s plan to reduce the carbon footprint in California, the CHP continues to work diligently to integrate zero emission vehicles (ZEV) into its fleet. In FY 2015/2016, the CHP integrated four battery electric vehicles into its vehicle fleet. The FY 2018/2019, Light Duty Vehicle purchase plan includes 33 plug-in hybrid electric vehicles.

The CHP installed electric vehicle infrastructure for 680 spaces located at 86 Area offices. This project utilized funding from the NRG Energy Inc. settlement agreement filed by the California Public Utilities Commission with the Federal Energy Regulatory Commission on April 27, 2012. Installation of electric vehicle charging infrastructure will continue at all new CHP buildings.

The CHP remains committed to reducing its carbon footprint and will continue to make every effort possible to meet the State's energy savings goals.

W. A. STANLEY
Acting Commissioner

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

The Governor has issued numerous EOs directing sustainable state operations. The orders relevant to the Governor's Sustainability Roadmap are:

Executive Orders

- EO B-16-12: Directs State agencies to integrate 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 year 2020 to purchase at least 25 percent replacement fleet as ZEVs.

- EO B-18-12: The companion Green Building Action Plan require State agencies to reduce the environmental impacts of State operations by reducing GHG 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 agencies meet these measures.

- EO B-29-15: Directs State agencies to take actions in response to the ongoing drought and to the State of Emergency due to severe drought conditions proclaimed on January 17, 2014. The Governor directed numerous State agencies to develop new programs and

regulations to mitigate the effects of the drought, and required increased enforcement of water waste statewide. Instructions to agencies are to reduce potable urban water use by 25 percent between year 2013 and February 28, 2016.

- EO B-30-15: Declares 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 GHG emission reduction target of 40 percent below 1990 levels by year 2030, and reaffirms California's intent to reduce GHG 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. It also directs State agencies to consider climate change in their planning and investment decisions and employ life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives. State agencies are directed to prioritize investments that build climate preparedness and reduce GHG emissions, prioritize natural infrastructure, and protect the State's most vulnerable populations.

- EO B-37-16: Builds on what were formerly temporary statewide emergency water restrictions in order to establish longer-term water conservation measures, including permanent monthly water use reporting, new permanent water use standards in California communities and bans on clearly wasteful practices such as hosing off sidewalks, driveways, and other hardscapes. The EO focuses on using water more wisely, and eliminating water waste by taking actions to minimize water system leaks. The California Department of Water Resources (DWR) estimates that leaks in water district distribution systems siphon away more than 700,000 acre-feet of water a year in California - enough to supply 1.4 million homes for a year.

2016 Zero Emission Vehicle Action Plan

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

Public Resources Code §25722.8

This statute requires reducing consumption of petroleum products by the State vehicle fleet compared to a 2003 baseline. It mandates a 10 percent reduction or displacement by January 1, 2012, and a 20 percent reduction or displacement by January 1, 2020.

Legislative Direction

Several pieces of legislation were signed in 2015-16 that codified several elements of the EO. These include the following:

- Assembly Bill (AB) 1482 (Gordon, 2015): Requires the California Natural Resources Agency (CNRA) update the State's adaptation strategy, Safeguarding California, every

three years. Directs State agencies to promote climate adaptation in planning decisions and ensure that State investments consider climate change impacts, as well as the use of natural systems and natural infrastructure (Public Resources Code Section 71153).

- AB 4 (Eastin, 1989): The State Agency Buy Recycled Campaign (SABRC) statutes are in Public Contract Code Section 12153-12217. The intent of SABRC is to stimulate markets for materials diverted by California local government and agencies. It requires State agencies to purchase enough recycled content products to meet annual targets, report on purchases of recycled and non-recycled products, and submit plans for meeting the annual goals for purchasing recycled content products.

- AB 32 (Nunez, 2006): The Scoping Plan assumes widespread electrification of the transportation sector as a critical component of every scenario that leads to the mandated 40 percent reduction in GHG by 2030.

- Senate Bill (SB) 246 (Wieckowski, 2015): Established the Integrated Climate Adaptation and Resiliency Program within the Governor's Office of Planning and Research to coordinate regional and local efforts with State climate adaptation strategies to adapt to the impacts of climate change (Public Resources Code Section 71354).

- AB 2800 (Quirk, 2016): Requires State agencies to take the current and future impacts of climate change into planning, designing, building, operating, maintaining, and investing in State infrastructure. The CNRA will establish a Climate-Safe Infrastructure Working Group to determine how to integrate climate change impacts into State infrastructure engineering (Public Resources Code Section 71155).

- Sustainable Groundwater Management Act (SGMA) of 2014: The SGMA directs the DWR to identify groundwater basins and sub-basins in conditions of critical overdraft. Conditions of critical overdraft result from undesirable impacts, which can include seawater intrusion, land subsidence, groundwater depletion, and/or chronic lowering of groundwater levels. As defined in the SGMA, "A basin is subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts." As required in the SGMA, basins designated as high or medium priority and critically overdraft shall be managed under a groundwater sustainability plan or coordinated groundwater sustainability plans by January 31, 2020. All other high and medium priority basins shall be managed under a groundwater sustainability plan by January 31, 2022.

- Strategic Growth Council Resolution on Location Efficiency refers to the GHG emissions arising from the transportation choices of employees and visitors to a building as determined by the Smart Location Calculator. Adopted on December 6, 2016, the resolution directs members of the Strategic Growth Council to achieve a 10 percent

improvement in the Smart Location Score of new leases compared to the average score of leased facilities in 2016.

State Administrative Manual and Management Memos

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

- SAM Chapter 1800: Sustainability
- MM 14-02: Water Efficiency and Conservation
- MM 14-05: Indoor Environmental Quality: New, Renovated, And Existing Buildings
- MM 14-07: Standard Operating Procedures For Energy Management In State Buildings
- MM 14-09: Energy Efficiency in Data Centers and Server Rooms
- MM 15-03: Minimum Fuel Economy Standards Policy
- MM 15-04: Energy Use Reduction for New, Existing, and Leased Buildings
- MM 15-06: State Buildings and Grounds Maintenance and Operation
- MM 15-07: Diesel, Biodiesel, and Renewable Hydrocarbon Diesel Bulk Fuel Purchases
- MM 16-07: Zero-Emission Vehicle Purchasing and Electric Vehicle Service Equipment Infrastructure Requirements

State Resources and Guidance Documents

California has invested significant resources in understanding the risks of climate change to the State and actions available to respond to and reduce these risks. These include the following:

- Safeguarding California: The State's climate adaptation strategy organized by sector. Each sector identifies risks from climate change and actions to reduce those risks.
- Safeguarding California Implementation Action Plans: Directed under EO B-30-15, the Implementation Action Plans outline the steps taken in each sector to reduce risks from climate change.
- Building a Resilient California: Prepared under direction of EO B-30-15, this document provides a framework for State agencies to integrate climate change into planning and investment, including guidance on data selection and analytical approach.

- California's Climate Change Assessments: California has completed three comprehensive assessments of climate change impacts on California. Each assessment has included development of projections of climate impacts on scale that is relevant to State planning (i.e., downscaled climate projections). This data is available through Cal-Adapt, an online data visualization and access tool.

CLIMATE CHANGE ADAPTATION

California is a large state and is home to every type of climate, topography, and population density. The CHP provides statewide law enforcement and emergency response services to California residents, State government, communities, and visitors; this includes counter-terrorism actions and investigations. The CHP has primary traffic law enforcement responsibility on California's 380,000 lane miles of roadway, as well as primary general law enforcement responsibility on all State properties. The mission of the CHP is to provide the highest level of Safety, Service, and Security through protecting life and property, providing superior service to the public and assistance to allied agencies, enhancing public trust through community outreach and partnership, investing in its people, and identifying and responding to evolving law enforcement needs.

The CHP, whose law enforcement responsibilities cover California, will face the effects of climate change first hand. With locations throughout California, changing weather conditions will place immense pressure on the CHP's infrastructure, equipment, personnel, and the ability to maintain operational readiness. In order to balance the pressures of climate change and its mission, the CHP has taken proactive measures to answer the changing nature of the environment.

Climate Change Risks to Facilities

The CHP has seen results of climate change affect its mission and departmental infrastructure. Changes to the environment create natural disasters, from flooding on California roadways to drought affecting rural communities. These catastrophic situations, and many others, have a huge impact on how the CHP accomplishes its public safety mission.

Updates to maintenance procedures, operational parameters, ergonomic planning, and many other considerations are taken into account in regards to climate change. However, certain risk factors will continue to increase due to the changing nature of infrastructure planning, atmospheric conditions, resource availability, and changing demographics.

Moving forward, the CHP looks to its facility, maintenance, and operational planning to meet climate change. Through the CHP Five-Year Infrastructure Plan, the CHP will be building new facilities that meet LEED Silver certification, or higher, and are Green Code Tier I (Title 24) compliant. The CHP seeks to reduce energy use by replacing obsolete equipment and purchasing Green equipment beginning with the Energy Service Contractors (ESCO) project at the CHP Academy. With new databases from allied agencies and federal offices, such as the Urban Heat Island index from the California Environmental Protection Agency, the CHP will use this information in current, and future, facility planning. Along with the data, the CHP seeks to strengthen its role by cooperative work and discussion with state and federal agencies to foster new ideas and methods to reduce the effects of climate change.

Understanding Climate Risk to Existing Facilities

Risk from Increasing Temperatures

Current climate predictions show future temperatures expected to increase, both at the high and low end. As a result, the CHP facilities will experience higher maximum temperatures. This will lead to decreases in structural integrity, overutilization of environmental control equipment, and material deterioration on the CHP's facilities.

Table 1a: Top Five Facilities with Greatest Maximum Temperature

Facility Name	Annual Mean Maximum Temperature (1961 – 1990)	Annual Mean Maximum Temperature (2031 – 2060)	Annual Mean Maximum Temperature (2070-2099)
Needles Area	87.0	92.6	96.5
Winterhaven Area	87.4	92.6	96.5
Blythe Area	87.7	93.1	96.9
Indio Area	88.2	93.1	96.8
El Centro Area	87.7	92.5	96.2

Table 1b: Minimum Temperature for Top Five Facilities

Facility Name	Annual Mean Minimum Temperature (1961 – 1990)	Annual Mean Minimum Temperature (2031 – 2060)	Annual Mean Minimum Temperature (2070-2099)
Needles Area	61.4	66.9	71.5
Winterhaven Area	55.0	60.9	65.5
Blythe Area	56.0	61.8	66.5
Indio Area	57.1	62.1	66.4
El Centro Area	58.6	63.3	67.6

The resulting energy costs increase as the CHP maintains a safe, comfortable working environment for its employees and equipment. Increasing temperatures will require the CHP to

run its environmental control systems longer and at higher rates than previous years, which also affects the budget of the CHP. CHP employees will also have to develop new methods and infrastructure to manage temperature changes, such as new housing facilities for canine units and new standard operating procedures at the Ben Clark Training Center.

This will require researching new technologies and processes on existing infrastructure. The CHP will also evaluate the sustainability of each location, through environmental research and studies. This will necessitate time and resources to ensure that any change on location, or location upgrade, meets the mission of the CHP, and the Governor's Sustainability Goals. Cooperation with other State agencies and departments will be essential, as these changes to the climate will affect all government organizations statewide. By fulfilling its own due diligence and working with other organizations, the CHP will find solutions to remedy these issues.

Table 2: Top Five Facilities that Will Experience the Largest Increase in Extreme Heat Events

Facility Name	Extreme Heat Threshold (EHT)	Average Number of Days Above EHT (1961-1990)	Average Number of Days Above EHT (2031-2060)	Increase in Number of Days Above EHT by Mid-Century	Average Number of Days Above EHT (2070-2099)	Increase in Average Number of Days Above EHT by End of Century
Needles Area	116.2	4.3	31	26.7	60	55.7
Winterhaven Area	111.2	4.2	42	37.8	79	74.8
Blythe Area	115.0	4.2	29	24.8	58	53.8
Indio Area	113.4	4.2	24	19.8	50	45.8
El Centro Area	112.8	4.3	25	20.7	56	51.7

The facilities mentioned above pose the most serious case of risk to occupant health and safety, as well as performance, due to increases in temperatures. Increasing the number of extreme heat days, with longer periods, will place great stress on equipment as it strives to maintain a safe and comfortable working environment. This will lead to high maintenance costs and eventual replacement, which lowers the life cycle of the equipment.

To reduce the impact of changing temperatures on facility performance and to protect occupant health and safety, the CHP looks to building new facilities and moving out of its current outdated facilities. Currently, the CHP has facilities built prior to the understanding of

climate change. These facilities, averaging about 35 years old, will require substantial resources to meet new building standards, Green regulations, and the Governor's Sustainability Goals. By building new facilities that meet LEED certification and Green Code Tier I (Title 24) compliance, the CHP expects to save resources and reduce the risks of extreme heat.

The locations mentioned above also represent the southeast border of the State in regards to the states of Nevada and Arizona, along with the country of Mexico. These locations provide secure and safe coverage of primary roadways such as Interstates 8, 10, 40, and 15. These roadways bring millions of dollars of freight to California, as well as crime. Without key locations near the border and roadways, the CHP will have difficulty securing these routes.

Risks from Changes in Precipitation

Current trends show increases in temperature, along with increased precipitation in some areas, namely northern and coastal areas. With an average mean precipitation of 38.5 inches, these areas can face soil erosion, flooding, heavy fog, and heavy snowfall. These and similar weather conditions increase the maintenance and replacement costs for departmental equipment, vehicles, and facilities. Furthermore, adverse precipitation conditions create obstacles for CHP employees to complete their duties and increase their safety risks.

Table 3: Facilities that Will be Most Impacted by Projected Changes in Precipitation

Facility Name	Annual Mean Maximum Precipitation (1961 – 1990)	Annual Mean Precipitation (2031 – 2060)	Percent Change by Mid-Century	Annual Mean Precipitation (2070 – 2099)	Percent Change by End of Century
Winterhaven Area	4.0	3.0	-25%	3.4	-15%
Garberville Area	57.6	64.8	13%	68.0	18%
Quincy Area	57.5	63.3	10%	68.6	19%
Gold Run Area	62.6	69.2	11%	73.1	17%
Crescent City Area	70.7	75.2	6%	75.8	7%

The facility most affected by the lack of precipitation is the Winterhaven Area. Without adequate precipitation, the surrounding land and environment will be susceptible to flooding, due to lack of saturation of the earth. This would also entail increased use of water sources

outside the Winterhaven Area, as local sources will be unable to supply increased usage. Continual drought conditions will make this location highly erosive as winds will pick up the dried particles of earth and create sandstorms. These particulates will damage exterior surfaces, block airflow to air systems, and have negative effects on employee respiratory systems. Without adequate saturation, this facility will continue to have increased environmental safety risks.

The other listed locations will see the greatest Annual Mean Precipitation of all the facilities of the CHP. These areas will see increased saturation of the land surrounding the facilities. Without adequate drainage systems, increasing precipitation and over saturation will pose dangers to the structural stability of our facilities, as the soil will no longer be stable. Heavy precipitation will also increase CHP operations as our employees respond to accidents, assist stranded motorists, and redirect heavy traffic.

Risks from Rising Sea Levels

Increasing global temperatures are contributing to rising sea levels. Due to storm surges, rising sea levels will cause inundation of coastal areas and increase flooding. The California Ocean Protection Council (OPC) has issued guidance for State agencies on rising sea levels to consider. The Guidance document provides the following estimates of rising sea levels for the California Coast, based on a study by the National Academy of Sciences:

Time Period	North of Cape Mendocino	South of Cape Mendocino
2000 – 2030	-4 to 23 cm (-0.13 to 0.75 ft)	4 to 30 cm (0.13 to 0.98 ft)
2000 – 2050	-3 to 48 cm (-0.1 to 1.57 ft)	12 to 61 cm (0.39 to 2.0 ft)
2000 – 2100	10 to 143 cm (0.3 to 4.69 ft)	42 to 167 cm (1.38 to 5.48 ft)

An accompanying OPC resolution recommends that State agencies and departments base analyses on estimates of rising sea levels in the upper two-thirds of the range.

Table 4: Facilities at Risk From Rising Sea Levels

Facility Name	Area	Sea Level	Sea Level	Sea Level	Sea Level

		Rise 0 m	Rise 0.5 m	Rise 1.0 m	Rise 1.41 m
Marin Area	San Francisco Bay Area	1.01 – 1.50	2.01 – 2.50	2.51 – 3.00	3.01 – 3.50
Redwood City Area	San Francisco Bay Area	1.01 – 1.50	2.01 – 2.50	2.51 – 3.00	3.01 – 3.50
Hayward Area	San Francisco Bay Area	0.00	0.00	0.00	0.51 – 1.00
Humboldt Area	California Coast	0.51 – 1.00	1.01 – 1.50	2.01 – 2.50	2.51 – 3.00
Crescent City Area	California Coast	0.00	0.00	0.00	0.51 – 1.00

The CHP has three facilities located within areas with rising sea levels. According to the Cal-Adapt projections, these areas will have encroachment by seawater, which will result in either increased flooding events or complete immersion underwater.

Currently, the CHP is planning on the relocation of its Marin Area facility. The CHP is currently planning and assessing viable locations for the new facility.

The Hayward, Humboldt, Crescent City, and Redwood City facilities will be vacated pending construction of the new facilities. Currently, the CHP identified the Hayward Area facility as a Capital Outlay project. It is currently in the property replacement acquisition phase. The Crescent City Area facility is under construction and expected to be completed in 2018. The CHP is currently assessing locations for the new Humboldt Area facility. The Redwood City facility will have evaluations and assessments conducted to determine viable locations for the new facility.

Also of concern are highways and main routes affected by rising sea levels. These roads, such as U.S. 101, will become unserviceable due to rain and flooding, thus causing an adverse effect on transportation and the ability of the CHP to complete its mission. Without new, alternate roads to alleviate transportation stress, the CHP will have difficulty in finding new facility locations. As part of its internal assessment of new facility planning, the CHP can incorporate OPC data into future planning.

Natural Infrastructure to Protect Existing Facilities

Executive Order B-30-15 directs State agencies to prioritize the use of natural and green infrastructure solutions. Natural infrastructure is the "preservation or restoration of ecological systems or the utilization of engineered systems that use ecological processes to increase resiliency to climate change, manage other environmental hazards, or both. This may include,

but need not be limited to, flood plain and wetlands restoration or preservation, combining levees with restored natural systems to reduce flood risk, and urban tree planting to mitigate high heat days" (Public Resource Code Section 71154(c)(3)).

The CHP's building plans for the next five years mandate that all new buildings will be, at a minimum, LEED Silver and/or Green Code Tier I (Title 24) compliant. As of 2012, all new CHP facilities have met LEED Silver certification, or higher, and Green Code Tier I (Title 24) compliance. Along with these building standards, the CHP plans to reduce landscape contracts by minimizing water and energy usage at current facilities and in new facilities by preserving the natural infrastructure at each location.

In cooperation with local government and planning commissions, the CHP seeks to work cooperatively with local organizations to maintain the preservation of natural infrastructure. This cooperative effort minimizes the CHP's encroachment on natural landscapes as well as builds positive relations with the community.

The CHP facilities along the State's roadways keep landscaping to minimal areas in order to stress safety and to reduce its footprint at these areas. For example, the DOT Mission Grade Inspection Facilities take up only enough property to meet safety standards for vehicles and employees, while the surrounding area remains natural to the local environment. At the Grass Valley Area facility, the contractor preserved the local fauna surrounding the parking areas, which provided shade to the facility, as well as maintaining the soil to prevent mudslides.

These building and landscape measures will not only preserve ecological systems, but also improve occupational health and increase the life cycle of each facility. These also reduce energy waste and water usage, which preserve local resources and assist with energy conservation. The CHP expects these processes to reduce its overall footprint on the environment and to meet the Governor's Sustainability Goals.

Understanding the Potential Impacts of Facilities on Communities

Vulnerable Populations

Certain populations are more susceptible to the effects of changing climate conditions, and will have less capacity to recover from changing average conditions and more frequent and severe extreme events. A number of factors contribute to vulnerability, often in overlapping and synergistic ways. These can include a number of social and economic factors, and determined by existing environmental, cultural, and institutional arrangements. Vulnerable populations can include, but are not limited to, people living in poverty, people with underlying health conditions, incarnated populations, linguistically or socially isolated individuals, communities with less access to healthcare or educational resources, or communities that have suffered historic exclusion or neglect.

The CHP provides law enforcement services throughout the State, often times operating within, or near, vulnerable populations. The CHP's mission of providing the highest level of Safety,

Service, and Security, helps mitigate the social and economic factors that have negative effects on these populations. These factors include the trafficking of drugs on the State's roadways, apprehending violent motorists, and preventing contraband from entering state borders. Through its operations and programs, the CHP strives to improve commerce, transportation, and health. From providing clear pathways for traffic during natural disasters to educating youth on distracted driving, the CHP presence is one of the foundational blocks of good governance and community trust.

One of the greatest CHP programs relating to this topic is the Amber Alert system, for which the CHP is the primary coordinator. Since 2002, there have been 278 Amber Alerts, resulting in 333 children safely located. As the lead organization for this program, the CHP expanded this program from the initial highway electronic message boards to social media and wireless emergency alerts.

Another important public safety program is the CHP Impact Teen Drivers program. According to the National Safety Council, distracted driving with a cell phone causes an estimated 1.4 million vehicle collisions each year. Automobile collisions are the leading cause of death for American teens, which puts strain on communities already stressed by economic, social, and environmental issues. The CHP witness these events daily in their course of patrolling the State's roadways. To prevent further incidences of distracted driving, the CHP sponsored the Impact Teen Drivers program to educate future drivers early in their driving careers. Through education and training, the CHP strives to prevent the vulnerable youth of our State from serious bodily injury, or death.

The CHP also provides education and training for seniors on safe driving through its Age Well, Drive Smart program. Understanding that seniors, persons over the age of 70 years, are a vulnerable, yet important, part of the community, this program offers outreach and guidance. By educating seniors on safe driving skills, rules of the road, alternatives to driving, and ergonomic considerations, the program hopes to help inform civilians to stay safe on the road.

The actions by CHP employees help build trust in these communities and increase dialogue between the CHP and the public. Building on the success of its programs, the CHP continues to practice good policing, as well as increase community interaction, which has the potential to prevent dangers on the road and the community.

Disadvantaged Communities

California is required to invest resources in disadvantaged communities (DAC). The State identifies DACs using CalEnviroScreen, a tool that ranks census tracts based on a combination of social, economic, and environmental factors. While it does not capture all aspects of climate vulnerability, it is one tool that is available for agencies to use, and does include several relevant characteristics. In many cases, DACs are more likely to suffer damage under changing climate conditions, including extreme events. The CHP's facilities located in these communities can contribute or alleviate the vulnerability of these communities.

Table 5: Facilities Located in Disadvantaged Communities

Facility Name	CalEnviroScreen Score	Is it located in a disadvantaged community? Yes/No
South Los Angeles Area	91-100 %	Yes
South Sacramento Area	91-100 %	Yes
Rancho Cucamonga Area	91-100 %	Yes
San Bernardino Area	91-100 %	Yes
Fresno Area	91-100 %	Yes
Inland Division Headquarters	91-100 %	Yes
Barstow Area	91-100 %	Yes
Los Banos Area	91-100 %	Yes
Logistical Facility (Supply Services)	91-100 %	Yes
Logistical Facility (Fleet Ops)	91-100 %	Yes
Academy	91-100 %	Yes

The CHP has 11 facilities located in DACs according to the Office of Environmental Health Hazard Assessment (OEHHA). Of these 11 facilities, nine locations interact either directly, or indirectly, with the surrounding community. They are centers for daily operations, as well as emergency management. These locations also provide intercommunity relations, such as CHP Day, where the CHP opens its doors to the public. This provides an atmosphere for building rapport with the community and gives local residents an opportunity to express concerns.

Pursuant to the California Natural Resources Agency Safeguarding Implementation Action Plan, these facilities, as well as all CHP facilities, provide services to the Emergency Management Sector Plan and the Transportation Sector Plan. Each location provides work force and equipment to support these plans by securing safe roadways, coordinating emergency response vehicles, and protecting vital infrastructure such as government offices. With climate changes in the State, the need for emergency response is of utmost necessity when natural disasters occur.

Two of these locations are support, Logistical Facilities, whose primary mission is to provide equipment and supply services to employees of the CHP. These locations provide supply points for the CHP as well as maintenance and repair facilities. Without these facilities, the CHP will be unable to supply, repair, or replace equipment during emergencies.

Urban Heat Islands

Urban Heat Islands are areas with localized spikes in temperature, which impact human health, increase pollution, and increase energy demand. Urban Heat Islands occur during the hot summer months in areas with higher percentages of impervious surface and less vegetation. This is likely in areas with large parking lots, dense development, and lower tree density and shading. Urban Heat Islands can be mitigated (i.e., reduced) through tree planting and other greening measures, cool roofs (e.g., lighter roofing materials that reflect light), cooler pavements, and other measures.

Table 6: Facilities Located in Extreme Urban Heat Islands

Facility Name	Located in an Urban Heat Island (Yes/No)
Altadena Area	Yes
Redwood City Area	Yes
Rancho Cucamonga Area	Yes
San Bernardino Area	Yes
Baldwin Park Area	Yes
Riverside Area	Yes
El Cajon Area	Yes
Inland Division Headquarters	Yes
Telecommunication Shop South	Yes

According to the Urban Heat Island Index, produced by the California Environmental Protection Agency (CalEPA), "…large urbanized areas can experience higher temperatures, greater pollution, and more negative health impacts during hot summer months when compared to more rural communities." The absence of natural landscapes, such as trees and rivers, along with urban structures and environment, create the phenomenon of Urban Heat Islands. Heat absorbing asphalt, heat-generating equipment, and other activities in urban areas help accentuate hot days, whereas in rural areas, natural landscapes mitigate the heat from hot days.

The CHP has 95 Area offices located within Urban Heat Islands, with nine in extreme Urban Heat Islands. These Area offices comprise 52 percent of all CHP offices and are mostly located within large cities or towns. Of the 95 Area offices, most will see increases of four to nine degrees, which may not correlate to extreme heat temperatures. However, the facilities in Table 6 pose great concern as not only are they in the extreme Urban Heat Islands; they also rated close to having extreme heat events according to the Cal-Adapt index. These facilities have large parking lots, roof surface area, and surrounded by similar facilities.

Currently, the CHP maintains and renovates its facilities located in Urban Heat Islands. The CHP facility and maintenance staff replace old equipment with new heating and air equipment, which use less electricity and have greater reliability than those it replaced. When possible, the CHP leases facilities built to meet Green Code Tier I (Title 24) compliance. For facilities located in high heat climates, the CHP installed covered vehicle structures to shield the asphalt from the sun.

Based on recently built CHP facilities, the CHP plans to have all new facilities meet LEED Silver and/or Green Code Tier I (Title 24) compliance. One example is with the building of the new facility for the San Bernardino Area office. The CHP plans to relocate to a new location and build a new facility using the latest technological innovations, Green building materials, and energy management systems. This will help mitigate the threat of Urban Heat Islands mentioned by CalEPA.

Understanding Climate Risk to Planned Facilities

Table 7a: Maximum Temperature Risks to Planned Facilities

Facility Name	Annual Mean Maximum Temperature (1961 – 1990)	Annual Mean Maximum Temperature (2031 – 2060)
Crescent City Area	60.9	64.1
Truckee Area	58.9	64.4
Fresno Area	76.5	81.1
San Diego Area	72.4	76.3

Table 7b: Minimum Temperature Risks to Planned Facilities

Facility Name	Annual Mean Minimum Temperature (1961 – 1990)	Annual Mean Minimum Temperature (2031 – 2060)
Crescent City Area	45.4	48.9
Truckee Area	26.5	31.7
Fresno Area	49.7	54.2
San Diego Area	54.2	58.1

Table 7c: Maximum Precipitation Risks to Planned Facilities

Facility Name	Annual Mean Maximum Precipitation (1961 – 1990)	Annual Mean Maximum Precipitation (2031 – 2060)
Crescent City Area	61.8	66.4
Truckee Area	25.8	29.4
Fresno Area	10.9	11.8
San Diego Area	11.3	11.3

Currently, the CHP has four Area offices under construction, with completion dates slated for the end of 2018. Based on the success of previous LEED certified buildings, the CHP followed similar criteria to introduce energy conservation, minimal waste, and resource retention at these facilities. The plan is to build on past successes and make improvements. For example, lessons learned from the Bakersfield and Stockton Area offices, LEED Silver certified, assisted the CHP to produce its first LEED Gold certified facility, the Chico Area Office.

Table 8: Extreme Heat Events and Planned Facilities

Facility Name	Extreme Heat Threshold (EHT)	Average Number of Days Above EHT (1961-1990)	Average Number of Days Above EHT (2031-2060)	Increase in Number of Days Above EHT
Crescent City Area	78.3	4.3	7	2.7
Truckee Area	89.8	4.3	29	24.7
Fresno Area	106.6	4.3	24	19.7
San Diego Area	92.0	4.3	9	4.7

Table 9: Planned Facilities and Disadvantaged Communities and Urban Heat Islands

Facility Name	Located in a Disadvantaged Community (Yes/No)	Located in an Urban Heat Island (Yes/No)
Crescent City Area	No	No
Truckee Area	No	No
Fresno Area	Yes	Yes
San Diego Area	No	Yes

The four Area office's currently under construction will continue to maintain all operations and procedures from its previous location. CHP employees will continue to conduct assessments and surveys within their operational areas, as the need to plan for climate change today is greater than in the past. The CHP is examining the resources provided by the Governor's Sustainability Group and entering this information into future facility planning, along with integrating the information into current facility operations, resource management, and workplace health.

With upgraded facilities, employees spend fewer resources on continuous repairs and maintenance on obsolete equipment, and expands its outreach programs and/or develop new programs to assist surrounding communities. The CHP philosophy of building trust in communities and the nobility of policing has the potential to invest into vulnerable and disadvantaged communities and help alleviate social and cultural issues that maintain the status quo in these communities.

Full Life Cycle Cost Accounting

The CHP employs full life cycle cost accounting (LCCA) in all facilities built after 2012 and in future facilities. Through guidance and recommendations by the California DGS, the CHP cooperatively work with builders and designers to construct facilities that meet energy conservation measures (ECMs). The CHP also ensures that the process meets fiscal accounting as recommended by the California Department of Finance. The LCCA model ensures the CHP invests in facilities that increase energy efficiency, manage cost savings, and reduce operating costs. The CHP facilities built after 2012 meet LCCA standards and will be incorporated in all future CHP constructions.

Integrating Climate Change into Department of California Highway Patrol Planning and Funding Programs

The CHP incorporates climate change into its current and future programs. As part of the CHP's overall mission to meet the Governor's Sustainability Goals, the CHP ensures that its maintenance, building, replacement, and retrofit programs operate within the scope of climate risk, natural infrastructure, and vulnerable/disadvantaged communities.

The CHP Five-Year Infrastructure Plan is the CHP's primary program for integrating climate change into its infrastructure development, resource planning, and daily operations. The goals are to minimize the CHP's footprint on the environment by reducing energy use, conserving water, and integrating new technologies into its planned facilities. Current facilities consist of many buildings built in the mid-20th century, before the ideas and solutions for climate change. The CHP plans to move employees, equipment, and operations from these facilities to new and modern facilities that take advantage of new technologies and innovations to mitigate the effects of climate change on infrastructure.

Table 10: Integration of Climate Change into Department of California Highway Patrol Planning

Plan	Have you integrated climate?	If yes, how has it been integrated?
Five-Year Infrastructure Plan	Yes	Climate change is a portion of the assessment and evaluation process concerning resource management, facility operations, personnel education, and research and development for the CHP.
Energy Service Contractors	Yes	Evaluation and assessment of the CHP's infrastructure produce remedies to facility water and energy usage.
Landscaping Plan	Yes	The CHP reduced the use of water and energy at its facilities by incorporating natural infrastructure and minimizing its landscaping area at its facilities.
Water Grant	Yes	The replacement of high flow rate with low flow rate fixtures will help the CHP conserve water to meet its 2020 goals.

Table 11: Engagement and Planning Processes

Plan	Does this plan consider impacts on vulnerable populations?	Does this plan include coordination with local and regional agencies?	Does this plan prioritize natural and green infrastructure?
Five-Year Infrastructure Plan	Yes	Yes	Yes
Energy Service Contractors	Yes	Yes	Yes
Landscaping Plan	Yes	Yes	Yes
Water Grant	Yes	Yes	Yes

Table 12: Climate Change in Funding Programs

Grant or funding program	Have you integrated climate change into program guidelines?	If no, when will it be integrated?	Does this plan consider impacts on vulnerable populations?	Does this program include coordination with local and regional agencies?
Five-Year Infrastructure Plan	Yes		Yes	Yes
Energy Service Contractors	Yes		Yes	Yes
Landscaping Plan	Yes		Yes	Yes
Water Grant	Yes		Yes	Yes

Measuring and Tracking Progress

The metrics and data provided by the Governor's Sustainability Group and DGS will assist the CHP in tracking and planning for climate change. These metrics provide a model for the CHP to examine future facilities and monitor current facilities. With the ease of accessibility through allied agency websites and through contacts in the State's sustainability field, the CHP plans to use these resources in meeting the Governor's Sustainability Goals and future sustainability developments. These supportive resources encourage the CHP to integrate these metrics, introduced by the State's Sustainability Group, into its current climate change planning and development.

One great metric introduced is the Cal-Adapt database, developed by the University of California, Berkeley, and the California Energy Commission. This metric brought attention to the extreme heat threat to a wide range of its facilities, especially infrastructures located at, or near, the State's borders.

Another metric, the Urban Heat Index, sourced through CalEPA, will assist the CHP with climate change and its equipment maintenance plans. Examining the index of its locations, the CHP can recognize vulnerable infrastructure and set priorities to meet environmental and urban issues. A proactive approach to climate change, vulnerable/disadvantaged communities, facility maintenance, and urban planning will broaden the CHP's vision and scope as it accomplishes the CHP mission.

FLEET VEHICLES

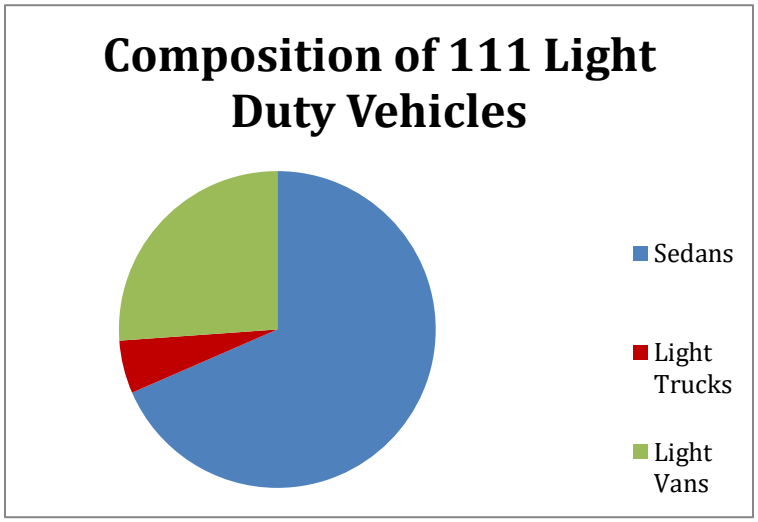
Introduction to the Department of California Highway Patrol Fleet

This ZEV Report and Plan demonstrates to the Governor and the public the progress the CHP has made toward meeting the Governor's Sustainability Goals related to ZEVs. This report identifies successful accomplishments, ongoing efforts, outstanding challenges, and future efforts.

As a statewide law enforcement agency, the CHP maintains a varied fleet of vehicles to ensure its capability to provide uninterrupted service regardless of location and climate. The patrol functions of the CHP necessitate that motor vehicles of various types be specially equipped for law enforcement operations. The CHP has a varied fleet of motor vehicles totaling 4,311 vehicles. Of this total, 2,869 are distinctively marked enforcement vehicles specially equipped for routine law enforcement purposes. Of the remaining 1,442, there are 571 unmarked enforcement vehicles used for law enforcement operations where the identity of the operator or use of the vehicle must remain clandestine; 15 are command post vehicles specially equipped for deployment to large-scale emergencies, and 856 are support vehicles. Enforcement vehicles, both marked and unmarked, are specially equipped with lights, siren, weapons, weapon retention systems, and communications equipment. These vehicles are used for routine patrol 24 hours a day, seven days a week, in all climates, terrain, undercover investigations, enforcement of commercial vehicle laws and regulations, protection of elected and appointed public officials, and as pursuit capable response vehicles for uniformed command staff. These vehicles are exempt public safety vehicles with special performance requirements necessary for the protection of the public safety and welfare, per SAM Section 4121.4, from the annual ZEV purchasing requirements.

The CHP's support vehicle fleet includes 111 light duty vehicles, which are a key component toward meeting the Governor's Sustainability Goals related to ZEVs by providing the most efficient transportation service for nonenforcement duties. Departmental employees use these vehicles for the transport of non-sworn personnel and materials to meetings, training, and other routine state business throughout the state. The CHP has, and will continue to incorporate ZEVs, as a key component and mainstay of the daily operations when feasible, in order to continue to meet the Governor's mandate for sustainability and ZEV Plan.

Graph 1: Composition of the Department of California Highway Patrol Light Duty Fleet



Average Mileage per Gallon (MPG): 35.7 MPG

The MPG increased an average of 6.5 percent each year since FY 2011/2012. Due to retention and maintenance of older vehicles, MPG will decrease over time as the life cycle of each vehicle increases.

The CHP's light duty pool vehicle fleet includes 76 sedans, six light trucks, and 29 light vans. Of the 76 sedans, ten are Plug-in Hybrid Electric Vehicles (PHEV) and four are Battery Electric Vehicles (BEV). Of the 76 sedans, the CHP surveyed two Internal Combustion Engine (ICE) sedans out of the vehicle fleet at the end of FY 2016/2017.

Table 1: Total Purchased Fuel 2017

Purchased Utility	Quantity	Cost ($)
Gasoline	671,582.4 Gallons	$ 1,450,111
Diesel	32,754.6 Gallons	$ 96,691
Renewable Diesel	1,357.3 Gallons	$ 2,520
Total	**705,694.3 Gallons**	**$ 1,549,322**

Incorporating Zero Emission Vehicles into the Department of California Highway Patrol Vehicle Fleet

A widespread shift to ZEV is essential for California to meet its GHG emission goals. State departments are now required to incorporate larger numbers of ZEVs in their vehicle fleets. Starting in FY 2017/2018, the percentage of new light duty vehicles that must be ZEV is 15

percent; increasing by five percent each following year, reaching 25 percent in FY 2019/2020, and 50 percent in FY 2024/2025.

The CHP is working diligently to assist the State with meeting its GHG goals. The CHP uses a portion of its light duty vehicle fleet for the transportation of non-sworn personnel to attend meetings, moving personnel and materials to training sites, conduct applicant investigations, and other routine State business. These light duty vehicles employed for these specific purposes do not require the installation of public safety equipment or communications systems.

Currently, the CHP light duty vehicle fleet includes four BEVs in three different locations. However, due to the maximum travel distant parameters (30 miles), these vehicles are limited in their capacity to reach multiple locations. Furthermore, current BEV configurations limit driving procedures such as vehicle charging between locations, maximum occupancy of vehicles, and performance in rough terrain. For example, current BEV models take up to two hours to maintain enough electrical charge for employees to complete a 30-mile trip. The CHP is optimistic that as the technology and reliability improvements made over time, the CHP will look favorably on BEVs.

Table 2: Vehicles in the Department of California Highway Patrol Vehicle Fleet Currently Eligible for Replacement

	Sub-Compact Sedan	Compact Sedan	Midsize Sedan	Mini Van	Total
# of vehicles eligible for replacement	**0**	**111**	**0**	**0**	**111**

The table on the next page shows the number of ZEVs added to the CHP fleet, including the planned PHEV additions to the CHP fleet in coming years.

Table 3: Zero Emission Vehicle Additions to the Department of California Highway Patrol Vehicle Fleet (By Fiscal Years)

Table Header Format	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22
Battery Electric Vehicle	0	4	0	0	0	27	24	20
Plug-in Hybrid Vehicle	0	0	0	0	33	0	0	0
Fuel Cell Vehicle	0	0	0	0	0	0	0	0
Percent of total purchases	**0 %**	**100 %**	**0 %**	**0 %**	**0 %**	**25 %**	**30 %**	**35 %**
Required ZEV Percentage	**10 %**	**10 %**	**10 %**	**15 %**	**20 %**	**25 %**	**30 %**	**35 %**
Total number of ZEVs in Fleet	**0**	**4**	**4**	**4**	**4**	**31**	**55**	**75**

In FY 2018/2019, the CHP seeks to replenish existing assets, which are eligible for replacement with the PHEV class sedans, pending budgetary resources and approval. The PHEVs are the next best alternative to bridge the gap between the CHP's vehicle operation parameters and GHG goals. The PHEVs reduce the time between charging/refueling, increase occupancy loads by two passengers over the BEV, and maintain acceptable limitations in rough terrain. The CHP will continue to reexamine ever-increasing performance of PHEVs and BEVs in relation to its operational parameters.

Telematics Plan

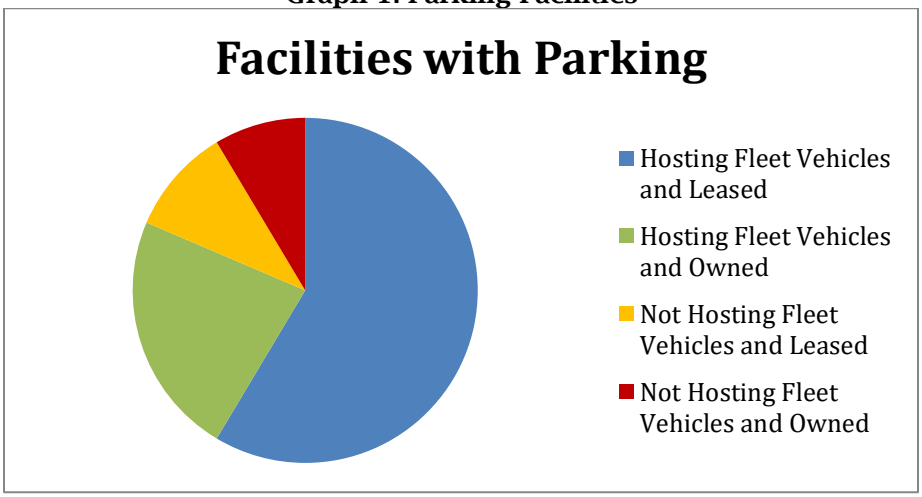
Telematics is a method for monitoring vehicle use. Using the Global Positioning System (GPS) and on-board diagnostics, telematics provides valuable information that often results in fuel savings and improved vehicle utilization. Telematics is especially important for verifying that PHEVs are maximizing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

The CHP will monitor the development of telematics at this time. Questions and concerns exist regarding the cyber-security of telematics in law enforcement vehicles. Representatives of the CHP's IMD and Fleet Operations Section (FOS) participate quarterly in a working group led by the United States Department of Transportation examining these concerns. Should all concerns related to the security of telematics be resolved, the CHP will assess the applicability of the technology.

ZERO EMISSION VEHICLE INFRASTRUCTURE

Introduction to the Department of California Highway Patrol Parking Facilities

Graph 1: Parking Facilities



Given the nature of the CHP's fleet operations and the length of stay for visitors and employees, we have determined that it is appropriate that Level 1 (L1) chargers should make up approximately 10 percent of chargers in employee parking areas and 10 percent of chargers in fleet parking areas, with the remainder being Level 2 (L2) type chargers.

Based on estimates of future ZEV fleet purchases and a count of visitor and workplace parking spaces it has been determined that the CHP will need 15 L2 chargers to adequately serve fleet vehicles and achieve the goals established in the ZEV Action Plan. The CHP determined that L1 and Level 3 (L3) chargers would not serve the future CHP ZEV fleet, due to the temporary design of L1 chargers, and the development of the L3 chargers.

The L1 chargers are plug-in equipment to current AC/DC outlets at facility locations. The device is portable and susceptible to weathering and breakdown after continuous use. The L3 charging station is an independent charging station that is built from the ground up as an independent infrastructure. The L3 will require a complete redesign and reconfiguration of current parking facilities, and will not be compatible with current CHP infrastructure. The L2 charging station is designed to fit current electric and parking infrastructure, without having to implement new electric systems. The L2 chargers have the reliability and durability of a designated charging station, and can fit into current CHP infrastructure without heavy construction or demolition of current parking facilities. The success of the L2 model allowed the CHP to install 680 electric vehicle charging infrastructures at 86 locations. The CHP locations without charging stations are due to lack of infrastructure in the area, along with

inability of local power companies to provide adequate electricity. Currently, the CHP installed 50 electrical charging stations and plans to continue with L2 charger purchases.

Listed below are the facilities with the most urgent need for electric vehicle charging stations:

Table 1: High Priority Electric Vehicle Supply Equipment Projects

Facility Name	Total Parking Spaces	Existing L1 Chargers	Existing L2 Chargers	New L1 Chargers Needed	New L2 Chargers Needed
Headquarters	845	4	0	0	10
Golden Gate Division (1 site)	85	0	1	0	3
Central Division (1 site)	80	0	2	0	2
Border Division (2 sites)	186	0	1	0	3
Coastal Division (2 sites)	83	0	0	0	4
Inland Division (3 sites)	161	0	0	0	3
Total	1,440	4	4	0	25

Outside Funding Sources for Electric Vehicle Infrastructure

The CHP installed electric vehicle charging infrastructure for 680 spaces located at 86 facilities. This project utilized funding from the NRG Energy, Inc. Settlement Agreement filed by the California Public Utilities Commission with the Federal Energy Regulatory Commission on April 27, 2012. Currently, the CHP is planning to install electric vehicle charging infrastructure at all new CHP facilities to accommodate L2 chargers.

Hydrogen Fueling Infrastructure

The CHP currently does not have hydrogen-fueled vehicles in its fleet. At this time, there are no plans to build hydrogen-fueling stations at CHP facilities.

Electric Vehicle Supply Equipment Construction Plan

The CHP is planning to install electric vehicle infrastructure for 10 L2 spaces located at CHP headquarters. This project will utilize funding from FY 2017/2018. Infrastructure for electric vehicle charging is being installed in all new CHP buildings.

Electric Vehicle Supply Equipment Operation

The CHP has designated charging spaces so vehicles can charge while parked. Use of charging spaces will be limited to a maximum of four hours per day. Employees must move vehicles from designated charging spaces upon attaining a full charge or completion of the four-hour maximum, whichever occurs first. Use of charging spaces is based on a first-come, first-served basis and the CHP does not guarantee availability.

Comprehensive Facility Site and Infrastructure Assessments

Site Assessments are performed to establish the cost and feasibility of installing needed electric vehicle charging infrastructure. The CHP completed its initial evaluation of all its facilities and made its initial assessments on the feasibility of installing electric vehicle charging infrastructure. The CHP continues to reevaluate current and future facilities as new technologies emerge on the market and with new infrastructure developments at each facility location. Table 5 lists the CHP's command Areas that have received an initial Site Assessment evaluation. Each command Area includes the Division office, local area commands, and other specialty facilities.

Table 2: Results of Site Assessments

Facility Name/Area Location	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
Logistical Facility (Fleet Ops)	0	1	$ 4,768	0	0
Headquarters	4	0	$ 19,071	0	0
Academy	0	3	$ 13,532	0	0
Northern Division (2 sites)	0	2	$ 8,816	0	0
Valley Division (1 site)	0	1	$ 4,511	0	0
Golden Gate Division (9 sites)	0	10	$ 44,848	0	0
Central Division (8 sites)	0	10	$ 45,409	0	0
Southern Division (6 sites)	0	6	$ 41,294	0	0
Border Division (5 sites)	0	5	$ 22,811	0	0
Coastal Division (3 sites)	0	3	$ 14,038	0	0
Inland Division (5 sites)	0	5	$ 22,794	0	0
Total	4	46	$ 241,892	0	0

ENERGY REPORT

Department of California Highway Patrol Mission and Built Infrastructure

This Energy Report demonstrates to the Governor and the public the progress the CHP has made toward meeting the Governor's Sustainability Goals related to energy. This report identifies successful accomplishments, ongoing efforts, and challenges.

The CHP is responsible for providing a safe and efficient workspace throughout the State. The CHP strives to provide the highest level of efficiency and quality towards meeting the Governor's Sustainability Goals. This will be achieved through its work with CHP commands, allied agencies, and private industry entities. The CHP monitors its energy conservation, resource management, facility operations, and technological developments through weekly reports received from Area commands and reviewing data available via energy star monthly.

The major energy goals of the CHP are:

- Develop the CHP Five-Year infrastructure plan to meet, or exceed, LEED Silver Certification and/or Green Code Tier I (Title 24) compliant.
- Maintain all departmental structures and property and ensure they comply with energy sustainability goals set forth by the Governor.
- Continue to educate and train CHP employees on good stewardship of energy resources.
- Seek and incorporate new technologies that conserve and/or reduce energy usage.
- Develop new operating procedures to garner maximum energy efficiency.

Table 1: Total Purchased Energy 2016

Purchased Utility	Quantity	Cost ($)
Electricity	34,627,264 kWh	$ 3,161,117
Natural Gas	273,705 Therms	$ 181,979
Propane	177,306 Gallons	$ 167,881
Total Cost	---	**$ 3,510,977**

Table 2: Properties with Largest Energy Consumption

Building Name	Floor Area (ft^2)	Source Energy (kBTU)	Source EUI ($kBTU/ft^2$-yr)
Academy	262,756	43,649,266	166
Golden Gate Division Headquarters	23,228	15,227,462	656
Logistical Facility (Fleet Operations)	43,120	11,564,240	268
Indio Area	23,410	6,890,155	294
Fresno Area	15,597	4,827,838	310
Total for Buildings in This Table	**368,111 ft^2**	**82,158,961 kBTU**	**223 ($kBTU/ft^2$-yr)**
Total for All CHP Buildings	**1,366,193 ft^2**	**272,154,335 kBTU**	**199 ($kBTU/ft^2$-yr)**
% of Totals	**27 %**	**30 %**	**1.12 %**

The CHP continues to improve its impact on the environment, while continuing its public safety mission. As the CHP continues moving forward to meet the Governor's Sustainability Goals, certain challenges arise. One concern is the projections for climate change at CHP facilities. Environmental changes will create greater utilization of energy in order to maintain operational safety and efficiency. Rising temperatures will strain CHP resources if the CHP does not apply new technologies, along with updated processes and procedures on how employees shall operate in response to these changes. The CHP is in continuous evaluation and development on how the CHP will function in an ever-changing environment.

In order to remedy the energy issue with its facilities, the CHP initiated the ESCO project at the CHP Academy. Cooperation between the CHP, other State agencies, and Enovity, Inc. helped the CHP to produce a cost and energy savings plan to reduce the use of electricity, water, and natural gas. By redesigning lighting, heating and air systems, water systems, and electrical systems, along with implementing monitoring systems, the CHP expects energy reductions of over 920,000 kilowatts (kWh), resulting in cost reductions of approximately $200,000 per year.

The CHP also seeks to reduce energy costs and increase energy conservation with all new facilities. Since 2012, the CHP has built eight facilities meeting LEED certification; seven with

Silver certifications, and one with Gold certification. Each building met certification requirements in reducing energy usage, energy efficiency management, reducing energy waste, and monitoring energy performance. Recently, the CHP built a new facility in Chico, CA, which attained the CHP's first Gold certification. The CHP sees this accomplishment as its continuing endeavor towards the Governor's Sustainability Goals.

Zero Net Energy

The Governor has set forth the following milestones for State zero net energy (ZNE) buildings:

2020 – 50 percent of new construction and major renovations will be ZNE.

2025 – 100 percent of new construction and major renovations will be ZNE.

2025 – 50 percent of total existing building area will be ZNE.

The CHP is working towards designing new Area offices to be ZNE. Its facilities pose challenges to achieving ZNE as they are in operation 24 hours a day, seven days a week. The facilities are considered Essential Service Facilities, while some contain Communications Centers.

The CHP has currently incorporated the following into the design goals of new Area offices:

- Achieve at least 10 percent reduction in California Code of Regulations (CCR), Title 24, Building Standards Code, baseline usage for Mechanical Systems.
- Overall building electrical system shall exceed Title 24 requirements.
- Achieve LEED Silver or higher.
- Use onsite renewable energy sources when possible.

The CHP has exceeded these requirements and continues to work with DGS and private sector design teams to identify design and technologies the CHP can utilize to reach the ZNE goals set forth by the Governor.

The CHP currently has five Area offices using Photovoltaic systems saving approximately 540,000 kWh of electricity per year.

New Construction Exceeds Title 24 by 15 percent

All new State buildings and major renovations beginning design after July 1, 2012, must exceed the current CCR Title 24 energy requirements by 15 percent or more.

Since July 2012, the CHP has built seven facilities that meet the requirements from CCR, Title 24. Furthermore, these facilities have been certified from LEED, which received Silver, or higher, certifications. The most recent facility, the Chico Area office, received LEED Gold certification, which exceeds the 15 percent requirement mandated by CCR, Title 24.

Table 3: New Construction Exceeding Title 24 by 15 Percent

Buildings Exceeding Title 24 by 15 Percent	Number of Buildings	Floor Area (ft^2)
Completed Since July 2012	7	193,450
Under Design or Construction	10	366,492
Proposed Before 2025	1	23,500

The CHP currently has ten facilities in the design phase or under construction, which will follow previous planning practices. The CHP expects to continue having its facilities LEED certified Silver, or higher.

Reduce Grid-Based Energy Purchased by 20 percent by 2018

Executive Order B-18-12 requires State agencies to reduce grid-based energy purchased by 20 percent by 2018, compared with a 2003 baseline. The CHP will meet the 20 percent reduction requirement by 2018. Through its resource management, energy conservation, and infrastructure measures, the CHP has decreased its energy usage since 2003. With continual cooperation with other State agencies and departments, the CHP will continue to ensure the reduction of its energy consumption. The following methods and programs are being used by to meet this goal.

The CHP requires all departmental employees to follow the policy outlined in Highway Patrol Manual (HPM) 11.1, Administrative Procedures Manual, Chapter 14, Facilities Development, Repairs, and Maintenance. This policy provides an overview of the new facility development process, maintenance, repairs, and energy conservation.

To reduce purchased energy at its facilities, the CHP operates one Data Center over 1,000 SQFT, located at its headquarters in Sacramento. The Data Center resides in a leased facility and is a Tier Three Data Center certified by the Uptime Institute.

The CHP currently uses an older version of the Supervisory Control and Data Acquisition system running Dream Report. This system measures all power coming through the universal power supply and the Data Center uses it to measure power feeding the Data Center. Through a series of calculations, this report generates the Power Usage Effectiveness (PUE) number. Based on current measuring equipment, the Data Center is currently running at a PUE level of 3.04, which is greater than the recommended PUE of 1.5 indicated by MM 14-09. The Data Center's equipment operates at 73 degrees Fahrenheit and the CHP organizes its Data Center with hot and cold aisles. Its network equipment meets Energy Efficient Ethernet 802.3-2012, and the server equipment installed into the Data Center meets 80 PLUS Platinum certification.

The CHP has installed power meters at the Data Center that meet the requirements of the Power Usage Effectiveness Report (TECH 408), revision 08/2014. Specifically, the CHP installed meters to determine the power consumption into the Data Center as well as power distributed to the computer equipment racks. The Data Center utilizes virtualization technology for all but legacy

systems within CHP servers. Non-virtualized server environments consist of legacy applications pending replacement.

The Data Center Support Team evaluated the requirements of the current TECH 408, and they will work with the CHP's budget and accounting sections to meet these requirements. The support team also works in cooperative efforts with the CHP's Facilities Section and the property owner to reevaluate the Data Center's power efficiency. Additionally, the CHP will create a budget proposal for FY 2018/2019 to account for a review of the cooling system design with the goal of adding economizers, review the current rack layout, and install barriers for a full hot or cold isolation.

Furthermore, outside of the Data Center, the CHP made energy reductions throughout its equipment and systems. The CHP ensures that all equipment meet the Energy Star requirement for appliances, computers, and other electrical equipment. About 85 percent of CHP computers go into energy saving mode after 30 minutes of inactivity by using installed Microsoft Windows power scheme for power management on computing devices. Along with its computers, copiers and printers utilize their Energy Saver mode during periods of inactivity. The CHP ensures its hot water systems are not set hotter than 105 degrees Fahrenheit by conducting equipment inspections and by utilizing the equipment replacement plan. The LED replacement project continues to remove incandescent and other high-energy fixtures from all CHP facilities.

The CHP also has Energy Conservation Coordinators at its facilities to inspect heating, ventilation, and air conditioning (HVAC) controls to ensure a ±2 degree fluctuation from the temperature set point. These inspections include checking on system maintenance such as sealed ducts, filters, and motors. With new technologies arriving to the market, the CHP replaces older equipment with new, more energy efficient equipment. This method ensures the CHP remains ahead of its energy reduction goals.

The CHP furthers its dedication to energy conservation by reminding employees of the CHP's energy goals. The last departmental communications network message sent was on June 17, 2016, titled "Electricity Reduction – Heat Wave." The message directed employees to conserve energy by following its recommended proactive measures. These measures included shutting down unused equipment, lowering the hot water temperature, and turning the thermostat up. The message also required employees to keep doors and blinds closed, as well as using one copier instead of multiple copiers in an office.

Department of California Highway Patrol Energy Trends

Table 4: Department of California Highway Patrol Energy Trends

Year	Floor Area (ft^2) W	Total kBTU Consumption X	Department Average EUI
Baseline Year	708,955	207,201,412	292
2012	1,220,525	264,628,988	217
2013	1,751,691	464,402,871	265
2014	1,556,470	346,098,989	222
2015	1,873,255	411,384,978	220
2016	1,903,120	399,442,452	210
2018 Goal	2,154,297	503,697,279	234

The CHP will meet its 20 percent goal in 2018, based on the 2003, Baseline Energy Use Intensity (EUI). Since 2003, the CHP has grown in square footage due to expanding law enforcement areas, even while consolidating its operations. In order for the CHP to correctly account for and set goals based on the standards and mandates of EO B-18-12, the CHP bases its 20 percent goal on the 2003 EUI. This provides a guideline for its growth and use of energy. Setting these limits will assist the CHP in setting a framework and improve its Five-Year Infrastructure Plan.

With the growth of its square footage, the CHP maintains its dedication towards energy conservation in order to maximize its resources. By managing its resources, the CHP invested in new technologies and methods to make the most of its budget and invest in its infrastructure. These measures, such as the CHP Academy ESCO project, will help maintain its older facilities until the CHP can build new facilities. To limit and regulate energy usage, the CHP installed LED lights, new PUE monitors, and other equipment. At new facilities, the CHP installed occupancy sensors, light sensors, multi-stage lighting, intelligent panel boards, and building management systems to ensure proper energy management.

The CHP reduced its energy usage by 37 percent when compared to the 2003 baseline. A majority of the CHP's facilities meets, or exceeded, the 20 percent reduction mandated by EO B-18-12. Energy reduction projects, such as the department wide LED replacement and the CHP Academy ESCO project, continue to provide further insight into new methods and technologies the CHP can take advantage of towards further energy reduction.

Table 5: Energy Reductions Achieved

Purchased Energy Compared to Baseline	Number of Buildings	Floor Area (ft^2)	Current Year Energy Use	Percent of Total Energy
20% Reduction Achieved	109	1,651,727	242,052,347	61%
Less than 20% Reduction	67	243,955	146,202,002	37%
Unspecified Baseline (if any)	7	258,615	6,128,287	2%
Totals	**183**	**2,154,297**	**394,382,636**	**100%**
Department Wide Reduction	**37%**			

Demand Response

Executive Order B-18-12 directs all State agencies and departments to participate in available demand response programs and to obtain financial incentives for reducing peak electrical loads when called upon, to the maximum extent cost-effective. The CHP plans to evaluate demand response with members of the State's sustainability group. The CHP's facilities require 24 hours of operations to fulfill its public safety mandate, which places stresses on itself, as well as the requirements for demand response programs. In order to balance its mission and the facility requirements, the CHP will seek cooperative efforts and research new ideas, which will meet both criteria.

Renewable Energy

New or major renovated State buildings over 10,000 square feet must use clean, on-site power generation, and clean back-up power supplies, if economically feasible. Facilities with available open land must consider large scale distributed generation through various financing methods, including, but not limited to, third party power purchase agreements (PPA).

Although there are no specific kW goals for renewable energy, renewable energy does count towards meeting the ZNE goal for 2025, and a 20 percent grid based energy use reduction by 2018.

The CHP currently has one renewable energy site located at the Oakhurst Area office. As of 2016, the Oakhurst Area office generated 192,188 kWh, resulting in a 1 percent reduction of the CHP's grid based energy.

The CHP is in the evaluation and assessment phase of the Renewable Energy Plan (Solar) at the Academy and Logistical Facility (Fleet Operations). The Sacramento Municipal Utility District (SMUD) evaluated the project through their SMUD Solar Shares Program. Estimated annual power generation will reduce energy usage at these locations by 73 percent, resulting in a 9 percent reduction of the CHP's grid-based energy purchased.

Table 6: On-Site Renewable Energy

Status	Number of Sites	Capacity (kW)	Estimated Annual Power Generation (kWh)
Renewables In Operation or Construction	1	1.5	192,188
Renewables Proposed	**1**	**1.5**	**3,200,000**
Renewable Totals	**2**	**3.0**	**3,392,188**
Department Wide Totals	**1**	**1.5**	**192,188**

Monitoring Based Commissioning

New and existing State buildings must incorporate MBCx to support cost effective and energy efficient building operations, using an Energy Management Control System (EMCS). State agencies managing state-owned buildings must pursue MBCx for all facilities over 5,000 square feet with EUIs exceeding thresholds described in MM 15-04.

The CHP is working to meet MBCx requirements for its facilities. In order to implement MBCx, the CHP incorporated a comprehensive commissioning plan into the design of all new CHP facilities. The EMCS will monitor the commissioned systems, as well as a building management system incorporated into the MBCx.

Table 7: Planned Monitoring Based Commissioning Projects

Building	Location	Floor Area (ft^2)	EMCS Exists? (MBCx Capable, MBCx Difficult, No EMCS)	MBCx Projected To Start	Projected Cost ($)
Crescent City Area	Crescent City	23,219	MBCx Capable	2018	N/A
Truckee Area	Truckee	26,000	MBCx Capable	2018	N/A
Fresno Area	Fresno	39,360	MBCx Capable	2018	N/A
San Diego Area	San Diego	45,888	MBCx Capable	2018	N/A
Totals		**134,467**			**N/A**

Financing

The CHP has secured multiple methods of funding for its sustainability projects and programs. Since the advance of the Governor's Sustainability Goals, the CHP took advantage of available funding programs to improve its energy conservation. In 2017, the CHP initiated the ESCO project at the Academy to renovate its energy systems in order to reduce energy consumption. The ESCO project provides funding to the CHP, allowing renovations that will save over $170,000 in energy costs, reduce annual energy use by almost 1 million kWh, and save over 4,000 Therms of Natural Gas over the next five to 10 years. Another funding project is a PPA with SMUD. The SMUD Solar Shares project will build a renewable energy source at the Academy and the adjacent Logistical Facility (Fleet Operations). This project will be a cooperative between the CHP, DGS, and SMUD to install a renewable energy site that will save about 3,200,000 kWh of electricity at these locations.

The CHP continues to work with State agencies and departments, along with private companies, to find all available financing and project delivery mechanisms to help it exceed its sustainability goals. The CHP will incorporate as much State revolving loan funds, utility On-Bill Financing (OBF), PPAs, Golden State Financial Marketplace (GS $Mart), ESCOs, and other available programs as possible.

WATER EFFICIENCY AND CONSERVATION REPORT

This Water Efficiency and Conservation Report demonstrate to the Governor and the public the progress the CHP has made toward meeting the Governor's goals. This report identifies successful accomplishments, ongoing efforts, and outstanding challenges.

Introduction

California experiences the most extreme variability in yearly precipitation in the nation. In 2015, California had a record low statewide mountain snowpack of 5 percent of average, while 2012 to 2014 were the four driest consecutive years of statewide precipitation in historical record. The 2017 water year (October 1, 2016 to September 30, 2017) is surpassing the wettest year of record (1982 to 1983) in the Sacramento River and San Joaquin River watersheds and close to becoming the wettest year in the Tulare Basin (1968 to 1969). These potential swings in precipitation from one year to the next show why California must prepare for either flood or drought in any year. Therefore, using water wisely is critical.

The Governor's EO and SAM sections help demonstrate the connection between water and energy use (the water-energy nexus), water and climate change, and water and landscaping. Furthermore, the impact of water use by State agencies goes beyond the scope of these EOs, SAM sections, and DGS MMs as these documents do not address such related issues as water runoff from landscaping and various work processes and the potential for water pollution or the benefits of water infiltration, soil health, and nutrient recycling. However, by using holistic water planning, a well-crafted water plan can not only meet all State requirements, but also add considerable value and benefits to the CHP and surrounding communities.

Department of California Highway Patrol Mission and Built Infrastructure

This Water Efficiency and Conservation Report will demonstrate the improvements made by the CHP toward meeting the Governor's Sustainability Goals related to water conservation. This report identifies successful accomplishments, ongoing efforts, and outstanding challenges.

Currently, the CHP occupies 1,366,193 SQFT of state-owned and 788,104 SQFT of leased facility space for a total of 2,154,297 SQFT statewide, including the headquarters facility; the CHP Academy; eight Field Division offices; 25 Communication/Dispatchers Centers, 103 Area offices; 37 resident posts, and eight air operations facilities. As of Fiscal Year (FY) 2016/2017, the CHP employs 10,737 employees, both uniformed and non-uniformed. The CHP faces many challenges as its facility inventory is, on average, over 35 years old, and provides less than half of the needed square footage for proper functionality. One of the challenges for the CHP is many of its offices were built prior to the addition of female officers into the CHP's ranks in 1974. Due to the age and size of the CHP's facilities, many of the offices do not have adequate locker rooms to accommodate their officers. Additionally, all the new responsibilities have

necessitated the need not only for additional space, but also for areas such as controlled secure storage for evidence, most of which must be climate controlled. Water resources are a necessity for these facilities, as it not only is an integral part of equipment operations, but it provides sustainment to CHP employees. Taking into account new technological developments and conservation ideas, the CHP seeks to incorporate these into its current facilities, as well as current and future facility constructions. The goal of the CHP is not only to meet the mandates from the Governor, but also to maintain good stewardship over its water resources.

The major water conservation goals of the CHP are to:

- Develop the CHP Five-Year infrastructure plan to meet, or exceed, LEED Silver and/or Green Code Tier I (Title 24) compliant.
- Maintain all departmental structures and property and ensure they comply with water conservation goals set forth by the Governor.
- Continue to educate and train CHP employees on good stewardship of water resources.
- Seek and incorporate new technologies that conserve and/or reduce water usage.
- Develop new operating procedures to garner maximum water conservation.

Table 1: Total Purchased Water 2016

Purchased Water	Quantity	Cost ($/Year)
Potable	76,021,200 Gallons	$ 392,128
Recycled Water	0 Gallons	$ 0
Total	**76,021,200 Gallons**	**$ 392,128**

Table 2: Properties with Largest Water Use Per Capita

Building Name	Area (ft^2)	Total Gallons	Total Irrigation in Gallons (if known)	Gallons per Capita
Central Division Headquarters	11,560	1,195,200	N/A	25
Golden Gate Division	23,228	1,436,500	N/A	290

Building Name	Area (ft^2)	Total Gallons	Total Irrigation in Gallons (if known)	Gallons per Capita
Headquarters				
Riverside Area	4,080	1,142,700	N/A	27
East Los Angeles Area	27,640	1,105,500	N/A	82
Academy	262,756	43,304,000	N/A	177
Total for Buildings in This Table	**329,264 ft^2**	**48,183,900**	**N/A**	**121**
Total for All Department Buildings	**1,366,193 ft^2**	**78,909,100**	**N/A**	**21**
% of Totals	**24 %**	**61 %**		

Table 2a: Properties with Largest Landscape Area

Building Name	Area (ft^2)
Headquarters	286,903
Academy	262,756
Motor Carrier Safety Unit	100,000
Logistical Facility (Supply Services)	46,136
Logistical Facility (Fleet Operations)	43,120
Total for Buildings in This Table	**738,915 ft^2**
Total for All Department Buildings	**1,366,193 ft^2**
% of Totals	**54 %**

The CHP continues to implement its Governor's Water Grant throughout its facilities. The facilities mentioned in Table 2 are currently replacing and upgrading its water faucets, sanitary plumbing, and other water fixtures to reduce the use of water. The scheduling of these projects takes into account the balance of project completion and the security and safety of these facilities. Upon completion, these projects will help these facilities lower their consumption of water.

The facilities with the largest landscape area remain below water consumption rates, except for the Academy. This facility will see a reduced water use upon the completion of the CHP Academy ESCO project and the Governor's Water Grant. The Academy will continue to evaluate other water savings measures with the Governor's Sustainability Group and seek programs that will benefit its water goals.

Table 3: Department of California Highway Patrol Water Use Trends

Year	Total Occupancy per Year	Total Amount Used (Gallons per Year)	Per Capita Gallons per Person per Day
Baseline Year 2010	11,029	118,934,000	30
Baseline Year 2013	10,325	135,967,600	36
2016	10,088	78,909,100	21
2020 Goal	10,862	95,147,200	24

Table 4: Total Water Reductions Achieved

Total Water Use Compared to Baseline	Total Amount Used (Gallons per Year)	Annual Gallons per Capita
20% Reduction Achieved	78,909,100	21
Less than 20% Reduction Achieved		
25% Reduction Achieved		
Less than 25% Reduction Achieved		
Totals	78,909,100	21
Department Wide Reduction	40,024,900	8

In 2016, the CHP exceeded its water use goal compared to its 2010 and 2013 baseline years. The CHP cut the use of water by 70 percent in 2016 and the facilities will continue to reduce the use of water.

Currently, the CHP has water projects that are ongoing, along with planned projects. The Governor's Water Grant continues to reduce water usage at its facilities by replacing hundreds of bathroom fixtures, which were high flow rate with new, low flow rate fixtures. The estimated water savings from this project is about 4,882,431 gallons (gal) of water.

The ESCO project at the Academy is a planned project that will help reduce water by replacing old, inefficient equipment. The plan is to install with new equipment with solar thermal heating technology. This system will save the Academy about 104,000 gal of water, as well as saving over 4,000 Therms of Natural Gas.

The CHP landscaping plan is to promote xeriscaping, a landscaping principle which reduces or eliminates the need for supplemental water from irrigation. At all new facilities, the CHP implemented xeriscaping techniques and processes in conjunction with its LEED certification. The CHP xeriscaping includes cooperating with local landscapers, environmental analysts, and local governments to find the optimum natural infrastructure and fauna for each location. This promotes reducing water usage, as well as alleviating the CHP footprint on natural landscapes.

Monitoring, Reporting, and Compliance

The CHP monitors its water usage through the Energy Star database, which tracks the use and purchase of water at its facilities. The data provides the metrics used by employees to report the CHP's progress towards sustainability and conservation. Energy Star also provides the CHP with metrics to project water reductions in the near future, make purchase comparisons between facilities, and identify infrastructure vulnerabilities. For example, the CHP can calculate the per capita use in high heat threat areas and plan for contingencies to prevent water shortage. Energy Star is the primary metric to provide a baseline for its strategic planning, as well as reporting to the Governor's Sustainability Group.

GREEN OPERATIONS

Greenhouse Gas Emissions

State agencies are directed to take actions to reduce entity-wide greenhouse gas emissions by at least 10 percent by 2015, and 20 percent by 2020, as measured against a 2010 baseline. The CHP met the 2015 GHG Emissions standard at 10.6 percent. The CHP GHG emissions decreased to 15.2 percent at the end of 2016. Current projections show the CHP will continue to decrease its GHG emissions to meet 2020 goals. The CHP continues to examine its energy sources and seeks to balance its consumption of energy in relation to its primary energy goals.

Natural gas usage has continued to decrease from the initial high usage in 2014. Since 2010, the CHP decreased natural gas usage by 3 percent. Although increases occurred in 2011 to 2014, the CHP reorganized its resource management and studied its use of natural gas. With new technologies incorporated into infrastructure development, there are plans to incorporate new equipment and systems into its facilities. The CHP continues to maintain minimum usage of natural gas, along with keeping energy conservation in mind.

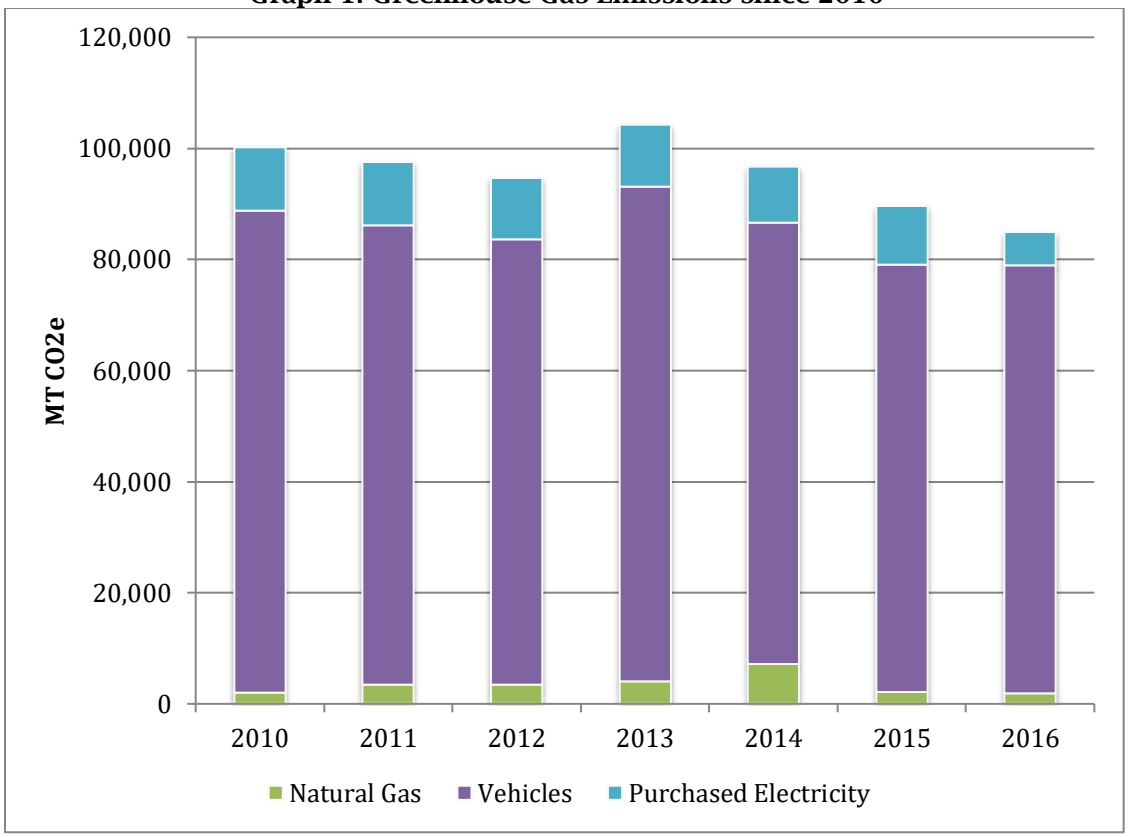
The use of fossil fuels has decreased since 2010. Although the primary use of fossil fuels is for the CHP's enforcement vehicles, the CHP seeks to replace an aging vehicle fleet with new, modern vehicles that are more energy efficient, yet maintain the performance and safety features that contribute to the continued success of the CHP. Part of this initiative is the plan to replace its Light Duty Pool Vehicles with PHEV. As new, emerging vehicle technologies continue to improve and expand, the CHP will continue to evaluate vehicle replacement within its vehicle fleet.

Table 1: Greenhouse Gas Emissions since 2010

	2010	2011	2012	2013	2014	2015	2016	Percent Change since Baseline
Natural gas	1,962	3,488	3,509	4,055	7,137	2,119	1,903	-3%
Vehicles	86,806	82,618	80,098	89,099	79,471	76,955	77,046	-11%
Purchased Electricity	11,472	11,472	11,097	11,093	10,141	10,525	6,057	-47%
Total	**100,240**	**97,578**	**94,704**	**104,247**	**96,749**	**89,599**	**85,006**	**-15%**

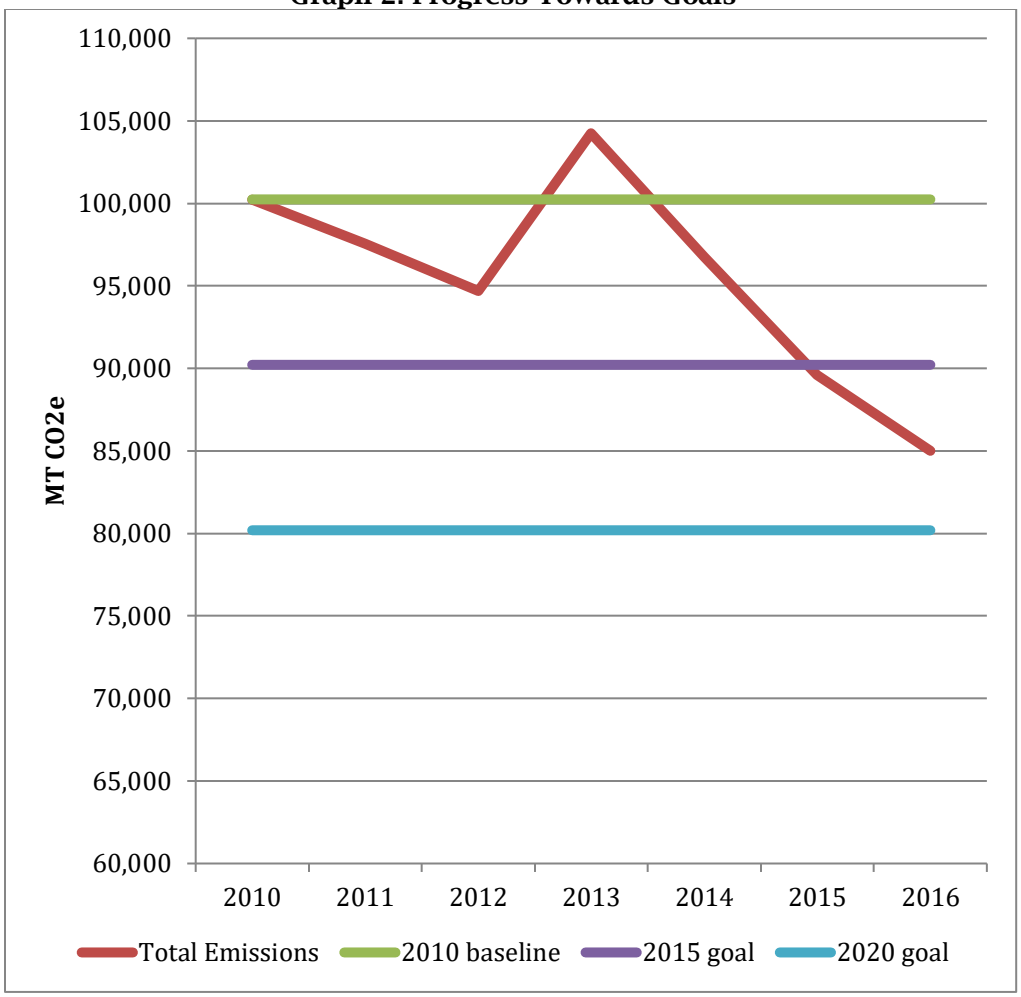
The greatest decrease for the CHP's GHG emissions is purchased electricity, which has decreased 47 percent from its 2010 measure. As the overall largest example of energy conservation, the CHP continues to expand its internal programs and seek new solutions to its purchased electricity use. One of the energy conservation measures implemented by the CHP is educating its employees of not only the cost savings of using less electricity at its facilities, but the responsibility of its employees as stewards of the State. In addition, the facilities and maintenance sections of the CHP proactively installed LED bulbs, contracted for low maintenance landscaping, replacement of aging equipment, and reorganization of its Data Centers. At its largest facilities, the CHP is renovating and replacing older infrastructures with new, lower energy equipment and systems, such as the ESCO project at the Academy and building new facilities that are LEED certified. Together with education and planning, the CHP will meet the Governor's Sustainability Goals and its duty as stewards of the State's resources.

Graph 1: Greenhouse Gas Emissions since 2010



The current trend continues to have the CHP decrease its GHG emissions over time. The CHP expects to meet the Governor's Sustainability Goals of reducing GHG emissions by 20 percent in 2020.

Graph 2: Progress Towards Goals



Building Design and Construction

Executive Order B-18-12 requires all new buildings, major renovation projects, and build-to-suit leases over 10,000 SQFT to obtain LEED Silver certification or higher. All new buildings under 10,000 SQFT shall meet applicable Green Code Tier I (Title 24) measures. New buildings and major renovations greater than 5,000 SQFT shall incorporate building commissioning (MBCx) after construction.

Currently, the CHP has eight facilities meeting LEED certification; seven with Silver certifications, and one with Gold certification. The CHP assessed initial developments during its early construction projects and attempted to improve upon lessons learned from previous built facilities. Over time, these lessons provided the guidelines and goals that led to the CHP's most recently built facility in Chico. The Chico Area office achieved Gold certification due to cooperative efforts between the CHP and the various vendors involved with the construction of

the facility. The CHP plans to continue to improve on this success for current and future constructions. As of present, the CHP has ten facilities under construction or in the middle of development.

Table 2: New Construction since July 1, 2012

Project Name	LEED Level Achieved	Commissioning Performed (Yes/No)
Chico Area	Gold	Yes
Headquarters	Silver	Yes
Bakersfield Area	Silver	Yes
Stockton Area	Silver	Yes
Oceanside Area	Silver	Yes
Grass Valley Area	Silver	Yes
Mojave Area	Silver	Yes
Oakhurst Area	Silver	Yes

Leadership in Energy and Environmental Design for Existing Buildings Operations and Maintenance

All State buildings over 50,000 SQFT were required to complete LEED for Existing Buildings Operations and Maintenance (LEED-EBOM) certification by December 31, 2015, and meet an Energy Star rating of 75 to the maximum extent cost effective. Currently, there are coordinative efforts between the CHP and property owners to meet LEED-EBOM requirements for the CHP's leased buildings. The CHP seeks collaborative measures that both property owners and the CHP can incorporate to work towards meeting LEED-EBOM standards.

Indoor Environmental Quality

The CHP implemented the measures mandated by California Green Building Standards Code (CALGREEN), Part 11, in regards to indoor environmental quality. As part of the CHP's Five-Year Infrastructure Plan, the CHP instituted water efficiency and conservation procedures, equipment, and landscaping. The CHP also implemented new processes and upgrades relating to air quality, consumable purchasing, resource management, and infrastructure life cycle. These proactive measures not only meet sustainability mandates, but they also provide greater occupational health for employees.

The CHP is currently building new facilities to replace older facilities to meet CALGREEN, Part 11, standards. These older facilities reached the end of their life cycles and they require more resources than necessary to remain in operation. New CHP facilities built in accordance with LEED Silver certification and Green Code Tier I (Title 24) will comply with CALGREEN, Part 11. These facilities will also provide extended CHP operations as they will have a longer infrastructure life cycle and they have the durability to manage climate change.

The CHP implemented policies and mandates for its employees to ensure its indoor environmental quality meets CALGREEN, Part 11, standards. Quarterly and annual safety inspections are conducted as part of the CHP Occupational Safety Program, Facility and Maintenance Inspection, Administration and Office Management, and Property Inspection. These inspections include measures that pertain to Indoor Environmental Quality standards.

For example, the CHP Facility and Maintenance Inspection looks at repairs and modifications made, or pending, at each CHP command Area. The inspection examines HVAC systems, water boilers, air ventilation, water fixtures, and other facility equipment. These inspections provide alerts to new issues, as well as feedback on previous equipment issues. This inspection allows the CHP to remain proactive in its approach to facility maintenance.

Environmentally Preferable Purchasing

State agencies are required to purchase and use EPP that have a reduced effect on human health and the environment when compared with competing goods that serve the same purpose. The CHP is required to purchase EPP as mandated by its internal policies. One of these policies is to purchase products that meet the State Agency Buy Recycled Campaign Program (SABRC) requirements. The CHP uses Recycled Content Products (RCP), and track and report annual purchases of goods containing recycled material. The CHP makes a minimum of 50 percent of purchases in 11 of the 12 groups.

Table 3: State Agency Buy Recycled Campaign Program Requirements

Product Category	Minimum % Required
Paper Products	50 %
Plastic Products	
Compost	
Glass	
Lubricating Oils	
Paint	
Solvents	
Steel	
Tires	
Tire-Derived Products	
Antifreeze	
Printing and Writing Paper	25 %

For the final group of products, the CHP is required to purchase 25 percent of printing and writing paper that meet the requirements of an RCP. The environmental impact of the goods bought is often larger than the impact of departmental operations. The CHP is committed to reducing the environmental impact of goods and services we purchase.

The CHP tracks and measures its SABRC purchases with the SABRC system provided by the California's Department of Resources Recycling and Recovery (CalRecycle) which is stored in a data base and provided to the CHP to track.

Table 4: State Agency Buy Recycled Campaign 2016 Performance

Product Category	SABRC Reportable Dollars	SABRC Compliant Dollars	% SABRC Compliant
Antifreeze	956.00	956.00	100 %
Compost and Mulch	25,138.42	0.00	0 %
Glass Products	12,066.00	6,909.30	57.26 %
Lubricating Oils	58,701.54	5,238.00	8.92 %
Paint	2,352.00	0.00	0 %
Paper Products	1,818,118.00	1,576,447.17	86.71 %
Plastic Products	729,753.48	636,669.66	87.24 %
Printing and Writing Paper	373,064.00	137,873.72	36.96 %
Metal Products	1,124,270.68	745,929.61	66.35 %
Tire Derived Products	56.42	56.42	100 %
Tires	274,975.23	3,169.32	1.15 %

Location Efficiency

Location efficiency refers to the effect of a facility's location on travel behavior and the environmental, health, and community impacts of that travel behavior including emissions from vehicles. Locating CHP facilities in efficient locations reduces air emissions from state employees and users of the facilities, contributes to the revitalization of California's downtowns and town centers, helps the CHP compete for a future workforce that prefers walkable, bikeable, and transit-accessible worksites, and aligns CHP operations with California's planning priorities.

The CHP's goal is having the average location efficiency score for all new leases to be 10 percent higher than the average on January 1, 2017. The CHP accomplished this through its vanpool/carpool program, transit passes for public transportation, and bicycle program. These programs help employees reduce their carbon emissions from driving personal vehicles and help alleviate traffic congestion on the state's roadways. Employees also help increase energy conservation as they reduce the use of fossil fuels.

These programs and facilities not only reduce the use of energy, but also improve the health and wellness of employees.

Table 5: Smart Location Score for New Leases

Facility name	Smart Location Calculator Score
McClellan Air Operations	49
Chico Area	40
Average	**45**
Baseline	**45**
% change from Baseline	**49**

The new leases for the CHP, since January 1, 2017, are for McClellan Air Operations and Chico Area facilities. Both facilities scored higher, or near, the CHP average due to their locations. The McClellan Air Operation facility has access to public transportation, roads, bicycle lanes, and walking paths. These arrangements increase the likelihood for CHP employees to reduce air emissions by carpooling, taking public transportation, or riding bicycles to work. The CHP recently commissioned the Chico Area facility, which is in a newly developed area of the community. Once development is complete and the community infrastructure is in place, the projection will see the Smart Location score rise.

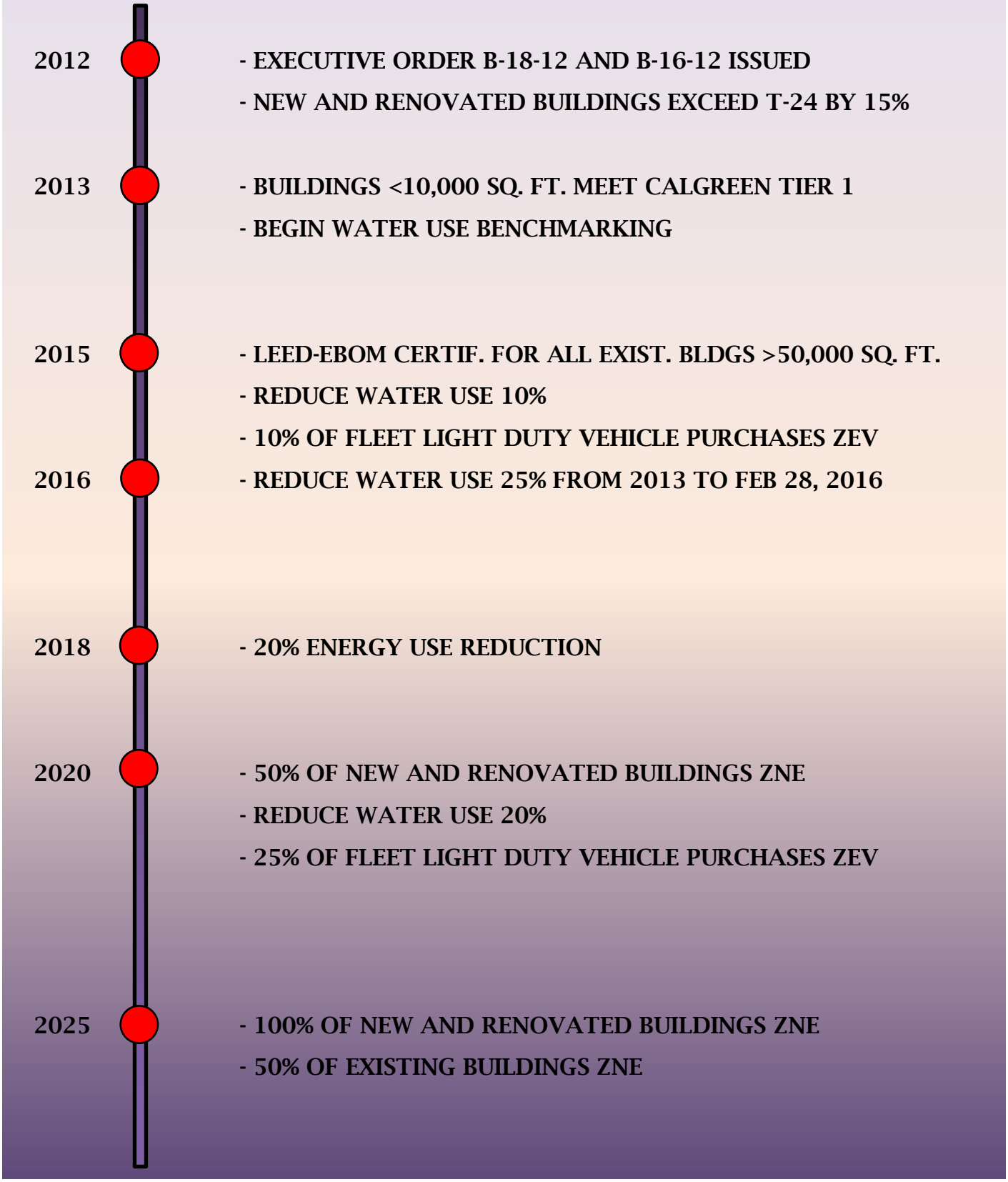
Table 6: Lowest Smart Location Score Leases

Facility name	Smart Location Calculator Score
Cottonwood Inspection Facility	12
Keene Platform Scale	21
Desert Hills Inspection Facility	22
Mountain Pass Platform Scale	23
Livermore Platform Scale	23

The CHP facilities with the lowest Smart Location scores reside in remote locations in California, along major highways. These facilities conduct vehicle inspections, which require

long lengths of roadway needed for large vehicles to move off the highways and slow to a complete stop in order for inspections by CHP and DOT employees. This type of inspection operation requires surrounding areas to be clear to meet minimal federal, state, and local agency codes and regulations. These regulations limit bike paths, walkways, and transit systems near or at these facilities for safety reasons. Safety barriers, warning placards, and roadway markings built at these facilities also limit human traffic in order for employees to conduct inspections without interruption and obstacles. Employees can only reach these facilities by vehicle travel, since the only accessible entry is from the highway system.

SUSTAINABILITY MILESTONES AND TIMELINE



DEPARTMENT STAKEHOLDERS

Understanding Climate Risk at Existing Facilities	
Bob Jones	CHP, Chief, Administrative Services Division - Provides leadership for Facilities Section, Fiscal Management, Fleet Operations, and Business Services.
Ken Roberts	CHP, Captain, Facilities Section - Responsible for the development of new and/or replacement facilities, facility alterations, facility repairs, unforeseen repairs, additional space requests, and general facility maintenance at all CHP offices. Accountable for preparing the annual Five-Year Infrastructure Plan, identifying facility needs of the CHP, the Green Energy Program, and the Fuel Tank Program.

Understanding Climate Risk at Planned Facilities	
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Integrating Climate Change into Department Planning and Funding Programs	
Bob Jones	CHP, Chief, Administrative Services Division - Provides leadership for Facilities Section, Fiscal Management, Fleet Operations, and Business Services.
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Rebecca Metz	CHP, Commander, Fiscal Management Section - Responsible for all phases of the CHP accounting system, budgets, grants, invoice payments, deposits, travel claims, billings and reimbursable services, payroll and financial records.

Measuring and Tracking Progress	
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Incorporating ZEVs Into the Department Fleet	
Bob Jones	CHP, Chief, Administrative Services Division - Provides leadership for

	Facilities Section, Fiscal Management, Fleet Operations, and Business Services.
Jeff Loftin	CHP, Captain, Fleet Operations Section - Responsible for vehicle purchases, equipping vehicles, monitors in-service performance of vehicles, and strips and sells vehicles.

Telematics	
Bob Jones	CHP, Chief, Administrative Services Division - Provides leadership for Facilities Section, Fiscal Management, Fleet Operations, and Business Services.
Jeff Loftin	CHP, Captain, Fleet Operations Section - Responsible for vehicle purchases, equipping vehicles, monitors in-service performance of vehicles, and strips and sells vehicles.
Scott Howland	CHP, Chief, Information Management Division - Responsible for long-range information systems planning, transportation management center coordination, communications centers, and technology review.

Public Safety Exemption	
Bob Jones	CHP, Chief, Administrative Services Division - Provides leadership for Facilities Section, Fiscal Management, Fleet Operations, and Business Services.
Jeff Loftin	CHP, Captain, Fleet Operations Section - Responsible for vehicle purchases, equipping vehicles, monitors in-service performance of vehicles, and strips and sells vehicles.

Outside Funding Sources for ZEV Infrastructure	
Bob Jones	CHP, Chief, Administrative Services Division - Provides leadership for Facilities Section, Fiscal Management, Fleet Operations, and Business Services.
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Hydrogen Fueling Infrastructure	
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EVSE Construction Plan	
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EVSE Operation	
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Zero Net Energy (ZNE)	
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New Construction Exceeds Title 24 by 15%	
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Reduce Grid-Based Energy Purchased by 20% by 2018	
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Demand Response	
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Renewable Energy	
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Monitoring Based Commissioning (MBCx)	
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Financing	
Bob Jones	CHP, Chief, Administrative Services Division - Provides leadership for Facilities Section, Fiscal Management, Fleet Operations, and Business Services.
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Indoor Water Efficiency Projects In Progress First Initiative	
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Boilers and Cooling Systems Projects In Progress	
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Landscaping Hardware Water Efficiency Projects In Progress	
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Living Landscaping Water Efficiency Projects In Progress	
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Buildings with Urban Water Shortage Contingency Plans In Progress	
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