# Sustainability Roadmap: Water Efficiency and Conservation

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

**Department of Motor Vehicles**

Edmund G. Brown Jr. Governor

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# Department of Motor Vehicles

# Sustainability Road Map: Water Efficiency and Conservation

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# Acronyms

| | |
|---|---|
| **BMP** | Best Management Practices |
| **CALGREEN** | California Green Building Code (Title 24, Part 11) |
| **CUP** | Central Utility Plant |
| **DGS** | Department of General Services |
| **EO** | Executive Order |
| **DWR** | Department of Water Resources |
| **ESPM** | Energy Star Portfolio Manager |
| **GHGe** | Greenhouse Gas Emissions |
| **GSP** | Groundwater Sustainability Plan |
| **HQ** | DMV Headquarters |
| **HVAC** | Heating Ventilation and Air Conditioning |
| **LCM** | The Landscape Coefficient |
| **LEED** | Leadership in Energy and Environmental Design |
| **MM** | Management Memo |
| **MAWA** | Maximum Applied Water Allowance |
| **MWELO** | Model Water Efficient Landscape Ordinance |
| **SAM** | State Administrative Manual |
| **SGA** | Sustainable Groundwater Agency |
| **SGMA** | Sustainable Groundwater Management Act |
| **WMC** | Water Management Coordinator |
| **WUCOLS** | Water Use Classifications of Landscape Species |

# Glossary

Backflow - is the undesirable reversal of the flow of water or mixtures of water and other undesirable substances from any source (such as used water, industrial fluids, gasses, or any substance other than the intended potable water) into the distribution pipes of the potable water system.

Back flow prevention device – a device that prevents contaminants from entering the potable water system in the event of backpressure or back siphonage.

Blowdown - is the periodic or continuous removal of water from a boiler to remove accumulated dissolved solids and/or sludge. Proper control of blowdown is critical to boiler operation. Insufficient blowdown may lead to deposits or carryover. Excessive blowdown wastes water, energy, and chemicals.

Compost – Compost is the product resulting from the controlled biological decomposition of organic material from a feedstock into a stable, humus-like product that has many environmental benefits. Composting is a natural process that is managed to optimize the conditions for decomposing microbes to thrive. This generally involves providing air and moisture, and achieving sufficient temperatures to ensure weed seeds, invasive pests, and pathogens are destroyed. A wide range of material (feedstock) may be composted, such as yard trimmings, wood chips, vegetable scraps, paper products, manures and bio solids. Compost may be applied to the top of the soil or incorporated into the soil (tilling).

Critical overdraft - a condition in which significantly more water has been taken out of a groundwater basin than has been put in, either by natural recharge or by recharging basins. Critical overdraft leads to various undesirable conditions such as ground subsidence and saltwater intrusion.

Ecosystem services - are the direct and indirect contributions of ecosystems to human well-being. They support directly or indirectly our survival and quality of life. Ecosystem services can be categorized in four main types:

- Provisioning services are the products obtained from ecosystems such as food, fresh water, wood, fiber, genetic resources and medicines.

- Regulating services are the benefits obtained from the regulation of ecosystem processes such as climate regulation, natural hazard regulation, water purification and waste management, pollination or pest control.

- Habitat services provide living places for all species and maintain the viability of gene-pools.

- Cultural services include non-material benefits such as spiritual enrichment, intellectual development, recreation and aesthetic values.

Grasscycling -refers to an aerobic (requires air) method of handling grass clippings by leaving them on the lawn when mowing. Because grass consists largely of water (80% or more), contains little lignin and has high nitrogen content, grass clippings easily break down during an aerobic process. Grasscycling returns the decomposed clippings to the soil within one to two weeks acting primarily as a fertilizer supplement and, to a much smaller degree, mulch. Grasscycling can provide 15 to 20% or more of a lawn's yearly nitrogen requirements

Hydrozone – is a portion of a landscaped area having plants with similar water needs that are served by one irrigation valve or set of valves with the same schedule.

Landscape Coefficient Method (LCM) describes a method of estimating irrigation needs of landscape plantings in California. It is intended as a guide for landscape professionals.

Landscape water budget - is the calculated irrigation requirement of a landscape based on landscape area, local climate factors, specific plant requirements and the irrigation system performance.

Model Water Efficient Landscape Ordinance (MWELO) - The Water Conservation in Landscaping Act was signed into law on September 29, 1990. The premise was that landscape design, installation, and maintenance can and should be water efficient. Some of the provisions specified in the statute included plant selection and groupings of plants based on water needs and climatic, geological or topographical conditions, efficient irrigation systems, practices that foster long term water conservation and routine repair and maintenance of irrigation systems. DWR adopted the Model Ordinance in June of 1992. One element of the Model Ordinance was a landscape water budget. In the water budget approach, a Maximum Applied Water Allowance (MAWA) was established based on the landscape area and the climate where the landscape is located. The latest update to MWELO was in 2015. MWELO applies to all state agencies' landscaping.

Mulch – Mulch is a layer of material applied on top of soil. Examples of material that can be used as mulch include wood chips, grass clippings, leaves, straw, cardboard, newspaper, rocks, and even shredded tires. Benefits of applying mulch include reducing erosion and weeds and increasing water retention and soil vitality. Whenever possible, look for mulch that has been through a sanitization process to kill weed seeds and pests.

Trickle flow – A device that allows users to reduce flow to a trickle while using soap and shampoo. When the device is switched off, the flow is reinstated with the temperature and pressure resumes to previous settings.

Sprinkler system backflow prevention devices – are devices to prevent contaminants from entering water supplies. These devices connect to the sprinkler system and are an important safety feature. They are required by the California Plumbing Code.

Submeter- a metering device installed to measure water use in a specific area or for a specific purpose. Also known as dedicated meters, landscape sub meters are effective for separating landscape water use from interior water use, evaluating the landscape water budget and for leak detection within the irrigation system.

Water Budget - A landscape water budget is the calculated irrigation requirement of a landscape based on landscape area, local climate factors, specific plant requirements and the irrigation system performance.

Water-energy nexus - Water and energy are often managed separately despite the important links between the two. Twelve percent of California's energy use is related to water use with nearly 10 percent being used at the end water use. Water is used in the production of nearly every major energy source. Likewise, energy is used in multiple ways and at multiple steps in water delivery and treatment systems as well as wastewater collection and treatment.

Water Shortage Contingency Plans - each urban water purveyor serving more than 3,000 connections or 3,000 acre-feet of water annually must have an Urban Water Shortage Contingency Plan (Water Shortage Plan) which details how a community would react to a reduction in water supply of up to 50% for droughts lasting up to three years.

# EXECUTIVE SUMMARY

## DEPARTMENT OF MOTOR VEHICLES (DMV)

### Mission

DMV proudly serves the public by licensing drivers, registering vehicles, securing identities, and regulating the motor vehicle industry.

### Vision

A trusted leader in delivering innovative DMV services.

### DMV Building Portfolio - Overview

The majority of DMV's customer services and programs are administered at field offices located throughout the state. The building portfolio consists of both state-owned and leased facilities. The most familiar of these is the traditional public field office, which comprises approximately 51% of the department's portfolio based on square footage. Another 14% is divided among Industry Business Centers, Call Centers, Commercial Driver License, Driver Safety, Investigations, Occupational Licensing, and Training offices. Often these separate programs are co-located in the same facility as a public field office. The balance of DMV's portfolio includes headquarters, warehouse/storage, and support facilities.

Nearly 50% of the department's facilities are state-owned by DMV, the California Highway Patrol (CHP), or the Department of General Services (DGS), and 62% of the state-owned facilities were built during, or prior, to 1980. With a state-owned portfolio that averages approximately 40 years in age, these aged buildings are in need of replacement or reconfiguration to meet the department's ongoing and diverse programmatic needs and to address code deficiencies.

Below is a chart showing an inventory of buildings and sites by ownership that DMV occupies.

| *DMV INVENTORY BY OWNERSHIP* | | |
|---|---|---|
| **Building/Site Ownership** | **Number of Buildings/Sites** | **Square Footage** |
| **DMV Owned** | 100 | 1,565,444 |
| **DMV Leased** | 139 | 1,210,707 |
| **CHP Owned** | 6 | 10,770 |
| **DGS Owned** | 4 | 17,716 |
| **Totals** | **249** | **2,804,673** |

### DMV Water Conservation Challenges and Efforts Underway

Ongoing facility operations and new capital outlay projects are DMV's best opportunities to achieve water conservation in field office locations. New DMV field office projects are designed to modern building codes and meet statewide water conservation policy directives. DMV had six

authorized field office replacement projects that were funded between CY 1997-2017, and six new projects are currently in various stages of site acquisition, design and construction.

DMV has 89 state-owned field offices that on average were built more than 40 years ago, and sixteen of them are over 50-years-old. These buildings suffer from physical and functional deficiencies; and, many have original mechanical and plumbing systems with components that cannot be easily replaced or updated and may require complete system replacement.

DMV has been successful in reducing its water use over the past several years, primarily by reducing landscape watering. Strategies have included reduced watering days, adjustments to watering times, and installation of improved landscape watering infrastructure. At the DMV Concord field office, local government has made recycled water available and DMV has tied into the city's infrastructure for its landscape watering, thereby reducing the use of potable water for irrigation.

Additional equipment and chemical treatments have been added to DMV's headquarters Central Utility Plant, to reduce the use of makeup water for the cooling towers by approximately 1,000,000 gallons/year.

DMV has installed low flow fixtures and sink aerators in field offices where feasible; existing pipe slopes in a number of field offices will not successfully accommodate the lower flow lavatories and commodes. DMV Headquarters East Building utilizes waterless urinals for additional water conservation.

New capital outlay projects completed during the drought were devoid of plantings, but low flow irrigation infrastructure and controls were installed in some locations in anticipation of post-drought landscape plantings. Working with DGS, who maintains the DMV headquarters campus, the department continues to seek opportunities to improve the landscape irrigation system at its largest site.

DMV employs Best Management Practices (BMPs), including irrigation inspection and repair, boiler tune ups, inspection and repair of HVAC systems, use of rainwater capture systems, selection of native plants and drought tolerant plant and tracking monthly water use as other methods of improving the department's water conservation practices.

**Jean Shiomoto**
**Director**

# SUSTAINABILITY GOALS

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

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

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

## Executive Order B-18-12

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

Executive Order B-18-12 requires State agencies to reduce agency-wide water use 10% by 2015 and 20% by 2020 as measured against a 2010 baseline. The 2015 and 2020 targets reinforce the SB X7-7 requirement that State agencies reduce water use at facilities they operate to support local water suppliers in meeting their targets.

On February 28, 2013, the California Department of Water Resources issued its Water Use Reduction Guidelines and Criteria, pursuant to Executive Order B-18-12. Each applicable agency was required to take actions to reduce water use in facilities and landscapes that are operated by the state, including facilities owned, funded or leased. State operated facilities are defined as facilities where the agency has direct control of the buildings' function, maintenance and repair. For leased facilities, the Green Building Action Plan directed at that time that new and renegotiated leases include provisions for water conservation, reporting water use and installation of sub-meters to the extent possible and economically feasible.

All the following sections in this water plan and the accompanying worksheet only repeat the initial criteria and guidelines issued at that time. Only the MWELO requirements have been updated since that time. Additionally, other Executive Orders have followed, strengthening and elaborating on the issues contained in EO B-18-12.

EO B-18-12 requires that beginning January 2013, agencies shall regularly report current water use into the water-tracking database. Since January 2014, annual water use reports have documented progress towards the 2015 and 2020 targets using the ESPM http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager_benchmarking to track energy and water use and to submit annual reports to DGS. (Sustainability Manager, Department of General Services, 707 Third Street, 8th Floor, West Sacramento, CA 95798-9052). Additionally, for facilities with landscape areas over 20,000 sq. ft. the landscape water use must be tracked with a water budget program.

## Executive Order B-29-15 – Rescinded by EO B-40-17

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. Agencies were instructed to reduce potable urban water use by 25% between 2013 and February 28, 2016.

## Executive Order B-30-15

EO B-30-15 declared climate change to be a threat to the well-being, public health, natural resources, economy, and environment of California. It established a new interim statewide greenhouse gas emission reduction target of 40 percent below 1990 levels by 2030, and reaffirms California's intent to reduce greenhouse gas emissions by 80 percent below 1990 levels by 2050. To support these goals, this order requires numerous state agencies to develop plans and programs to reduce emissions.

## Other Relevant Executive Orders...

## Executive Order B-37-16

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. 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.

The EO further strengthens local drought resilience and looks to improve agricultural water use efficiency and drought planning. State agencies are to cooperate with urban water management plans, which include plans for droughts lasting for at least five years by assuring that the water efficiency, and conservation plan has drought contingency actions.

## Executive Order B-40-17

The executive order ended the drought state of emergency in all California counties except Fresno, Kings, Tulare, and Tuolumne, where emergency drinking water projects will continue to help address diminished groundwater supplies. It rescinded EO B-26-14, B-28-14, B-29-15 and B-36-15. It maintains water reporting requirements and prohibitions on wasteful practices. The order was built on actions taken in Executive Order B-37-16, which remains in effect. In a related action, state agencies, including DWR, released a plan to continue making water conservation a way of life.

## State Administrative Manual & Management Memos

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

### SAM Sections

- Landscaping practices 1821.5
- Drought moratorium 1821.4

### Relevant Management Memos

- MM 15-06 State Buildings And Grounds Maintenance And Operation
- MM 15-04: Energy Use Reduction for New, Existing, and Leased Buildings
- MM 14-02 Water Efficiency and Conservation
- MM 14-07: Standard Operating Procedures For Energy Management In State Buildings
- MM 14-09: Energy Efficiency in Data Centers and Server Rooms

### Relevant Legislation

Sustainable Groundwater Management Act of 2014 - The Sustainable Groundwater Management Act (SGMA) directs the Department of Water Resources (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 over drafted 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.

# WATER EFFICIENCY AND CONSERVATION REPORT

This Water Efficiency and Conservation Report demonstrates to the Governor and the public the progress the Department 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 record low statewide mountain snowpack of only 5 percent of average while 2012-14 were the four driest consecutive years of statewide precipitation in the historical record. Now, the 2017 water year (October 1, 2016-September 30, 2017) is surpassing the wettest year of record (1982-83) in the Sacramento River and San Joaquin River watersheds and close to becoming the wettest year in the Tulare Basin (set in 1968-69). These potential wide swings in precipitation from one year to the next show why California must be prepared for either flood or drought in any year.

Therefore, using water wisely is critical. The E.O.s and SAM sections listed in the previous section help demonstrate the connection between water and energy use, (the water-energy nexus), water and climate change, and water and landscaping. Further, the impact of water uses by state agencies goes beyond the scope of these E.O.s and SAM sections and DGS management memos 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 organization and surrounding communities.

## Department Mission and Built Infrastructure

The DMV is a recognized leader among state agencies for energy and resource conservation strategies to meet objectives stated in the Governor's Executive Orders (EO) B-18-12 and B-16-12, and B-30-15. This progress plan describes current steps DMV is taking to achieve those objectives, targets, and requirements, as they apply to ongoing energy conservation measures in use at DMV facilities statewide.

### Mission

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### DMV Building Portfolio - Overview

The majority of DMV's customer services and programs are administered at field offices located throughout the state. The building portfolio consists of both state-owned and leased facilities.

The most familiar of these is the traditional public field office, which comprises approximately 51% of the department's portfolio based on square footage. Another 14% is divided among Industry Business Centers, Call Centers, Commercial Driver License, Driver Safety, Investigations, Occupational Licensing, and Training offices. Often these separate programs are co-located in the same facility as a public field office. The balance of DMV's portfolio includes headquarters, warehouse/storage, and support facilities.

Nearly 50% of the department's facilities are state-owned by DMV, the California Highway Patrol (CHP), or the Department of General Services (DGS), and 62% of the state-owned facilities were built during, or prior, to 1980. With a state-owned portfolio that averages approximately 40 years in age, these aged buildings are in need of replacement or reconfiguration to meet the department's ongoing and diverse programmatic needs and to address code deficiencies.

Below is a chart showing an inventory of buildings and sites by ownership that DMV occupies.

| *DMV INVENTORY BY OWNERSHIP* | | |
|---|---|---|
| **Building/Site Ownership** | **Number of Buildings/Sites** | **Square Footage** |
| **DMV Owned** | 100 | 1,565,444 |
| **DMV Leased** | 139 | 1,210,707 |
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| **Totals** | **249** | **2,804,673** |

**Table 1: Total Purchased Water**

| Purchased Water | Quantity | Cost ($/yr.) |
|---|---|---|
| Potable | 37,064,800 | $ 347,974 |
| Recycled Water | 53,000 | $ 3,975 |
| Gallons | 37,117,800 | $ 351,949 |

**Table 2: Properties with Largest Water Use Per Capita**

| | Area ($ft^2$) | Total Gallons | Total Irrigation in Gallons (if known) | Gallons per Capita |
|---|---|---|---|---|
| DMV Campus HQ East/West Buildings | 371,709 | 1,276,240 | N/A | 3 |
| DMV Campus HQ West Building | 198,884 | 1,131,760 | N/A | 6 |
| Arleta | 10,172 | 308,900 | N/A | 30 |
| Seaside | 10,847 | 213,200 | N/A | 20 |
| Sacramento Broadway FO | 30,692 | 170,600 | N/A | 6 |
| Total for Buildings in This Table | 622,304 $ft^2$ | 3,100,700 | | 5 |
| Total for All Department Buildings | 1,565,444 $ft^2$ | 37,064,800 | | 24 |
| % of Totals | 40 % | 4% | | 21% |

**Table 3a: Properties with Largest Landscape Area**

| Building Name | Area (Acres) |
|---|---|
| Sacramento Headquarters East Building | 15.24 |
| Sacramento Headquarters West Building | 6.29 |
| Fullerton Field Office | 4.50 |
| Carmichael Field Office | 4.26 |
| Montebello Field Office | 3.70 |
| Total for Buildings in This Table | 33.99 |
| Total for All Department Owned Buildings | 247.36 |
| % of Totals | 13 % |

Consistent with various EO's, and water conservation mandates, the DMV implemented multiple water conservation measures throughout its building portfolio, including:

- The Contra Costa County Sanitation District - reclaimed water infrastructure connection project at the Concord Field office; uses recycled water for landscape irrigation.
- DMV and DGS implemented a project at DMV's Central Utility Plant (CUP) in 2016 where pumps were installed to provide additional chemical treatment in the cooling towers, allowing more dissolved solids in to be held in suspension. This reduces the interval for bleed off and saves approximately 1,000,000 gallons of water annually.
- The "Use Water Wisely" campaign. Posting of signage reminding staff and DMV visitors to conserve water in every facet of their lives.
- Continued water conservation construction specifications requiring:
    - Low consumption faucets, toilets
    - Waterless urinals
    - Instant heat (low consumption) water heaters
    - Drought tolerant landscaping
    - Rain water collection

Although the Governor lifted the statewide drought emergency, DMV continues to restrict irrigation at all its statewide facilities to minimum levels to preserve plant resources.

Due to the age and poor condition of the landscape infrastructure at many DMV facilities, significant repairs or replacements are needed. Many of these systems were not used during the drought and have suffered from months, possibly years, of non-use. Significant irrigation improvement projects are anticipated through renovation and new capital outlay field office replacement plans. Smaller repair and improvement undertakings will be accomplished within the context of DMV's 5-year scheduled maintenance and repair plan.

**Table 3: Department Wide Water Use Trends**

| Year | Total Occupancy /year | Total Amount Used (Gallons/year) | Per capita Gallons per person per day |
|---|---|---|---|
| **Baseline Year 2010** | 8,948 | 72,230,600 | 22 |
| **Baseline Year 2013** | 9,055 | 56,250,134 | 20 |
| 2016 | 8930 | 37,064,800 | 12 |
| **2020 Goal** | N/A | 42,487,600* | 13 |

*DMV has already exceeded the 20% reduction goal from the 2010 baseline and the 25% reduction goal target for 2020 based on the 2013 baseline.

**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 | 37,064,800 | 4,380 |
| Less than 20% Reduction | N/A | N/A |
| 25% Reduction Achieved | 37,064,800 | 4380 |
| Less than 25% Reduction Achieved | N/A | N/A |
| Totals | -49% | 4,380 |
| Department-Wide Reduction | -49% | -45% |

DMV has continually specified water conservation technology for all DMV owned and leased space designs for more than a decade. For new field office construction projects, buildings are designed to CALGREEN code and incorporate various water conservation.

In 2014, the DMV became one of the first state departments to integrate reclaimed water infrastructure, implementing this strategy at the Concord field office by means of a connection into local government's recycle water system. The project was completed in 2016 and water conservation data is being collected for the 2017 reporting period. Historically, the DMV has always sought to reduce consumption of all resources. DMV is compliant with government mandates to quantify consumption, and is ahead in meeting and exceeding the goals established by the EO's.

For the past several years, due to water conservation and drought concerns, DMV has prohibited new plantings, refrained from water existing turf and other plants, and suspended window washing. Therefore, DMV does not have specific water conservation projects to report in Tables 5-8, other than water savings from LEED rated projects (state owned and leased) completed during that time period, as well as the aforementioned cooling tower project for the HQ campus. DMV foresees new opportunities to implement water conversation projects in the near term with new construction projects at locations such as Inglewood, Delano, Santa Maria, San Diego, and Reedley; all of these projects are authorized and in the design phase.

**Table 5: Summary of Indoor Water Efficiency Projects Completed or In Progress**

| Year Started | Water Saved (Gallons/yr.) | Cost Savings per Year |
|---|---|---|
| 2012 | 34,575 | (+$66,157) |
| 2013 | 45,066 | (+$5,969) |
| 2014 | 12,306 | -$20,328 |
| 2015 | 10,745 | -$30,264 |
| 2016 | 7,012 | (+$55,561) |

**Table 6: Summary of Boilers and Cooling Systems Projects Completed or In Progress**

| Year Funded | Water Saved (Gallons/yr.) | Number of Systems with Water Efficiency Projects | Percent of Department Heating and Cooling systems |
|---|---|---|---|
| 2012 | 34,575 | 6 | 6% |
| 2013 | 45,066 | 1 | 1% |
| 2014 | 12,306 | 1 | 1% |
| 2015 | 10,745 | 3 | 3% |
| 2016 | 7,012 | 1 | 1% |
| 2016* | 1,000,000* | 1 | 36.4% of portfolio s.f. |

*Cooling tower project to reduce makeup water use. HQ campus is 36.4% of s.f.

**Table 4: Summary of Landscaping Hardware Water Efficiency Projects Completed or In Progress**

| Year Funded | Water Saved (Gallons/yr.) | Estimated Annual Cost Savings | Total Number of Projects per Year |
|---|---|---|---|
| 2012 | 34,575 | 35,575 | 6 |
| 2013 | 45,066 | 45,066 | 1 |
| 2014 | 12,306 | 12,306 | 1 |
| 2015 | 10,745 | 10,745 | 3 |
| 2016 | 7,012 | 7,012 | 1 |

**Table 8: Summary of Living Landscaping Water Efficiency Projects Completed or In Progress**

| Year Funded | Water Saved (Gallons/yr.) | Landscape Area MWELO (ft2) | Climate Appropriate Landscape Area (ft2) |
|---|---|---|---|
| 2012 | 34,575 | 1,163,157 | 290,789 |
| 2013 | 45,066 | 1,163,157 | 290,789 |
| 2014 | 12,306 | 1,163,157 | 290,789 |
| 2015 | 10,745 | 1,163,157 | 290,789 |
| 2016 | 7,012 | 1,163,157 | 290,789 |

## Water Shortage Contingency Plans and Critical Groundwater Basins

Urban water suppliers are required to maintain Water Shortage Contingency Plans that are customized to local conditions. These plans include a staged response to water shortages and droughts lasting up to three years. When implementing the stages of the Water Shortage Contingency Plan, the water supplier will require increasingly stringent reductions in water use.

State agencies are to be aware of their water suppliers' Water Shortage Contingency Plan and the potential impact each stage may have on their water use. State agencies are to have their own contingency plans in place for their building and landscaping water use in order to respond to any stage implemented by the water supplier.

The Sustainable Groundwater Management Act (SGMA) established a new structure for managing California's groundwater resources at a local level by local agencies. SGMA requires, by June 30, 2017, the formation of locally controlled groundwater sustainability agencies (GSAs) in the State's high- and medium-priority groundwater basins and subbasins (basins). A GSA is responsible for developing and implementing a groundwater sustainability plan (GSP) to meet the sustainability goal of the basin to ensure that it is operated within its sustainable yield, without causing undesirable results. For those facilities located in critical groundwater basins, state agencies are to work with the local GSA plan.

**Table 9: Number of Buildings with Urban Water Shortage Contingency Plans and in Critical Groundwater Basins**

| Number of Buildings with urban water shortage contingency plans. | Number of buildings in critical groundwater basins | Total Amount of water used by buildings in critical groundwater basins (Gallons) |
|---|---|---|
| N/A | 8 State Owned | 5,508,384 |

DMV operates eight state-owned facilities in areas having critically over-drafted groundwater basins. The majority of DMV's water usage at its field offices is for landscape watering, however, other water uses include restrooms, drinking fountains, and employee breakroom kitchens. DMV has implemented water saving measures through sink aerators, low flush restroom fixtures, and reduced landscape watering. During California's recent drought, landscaping areas without significant plant and tree resources were not irrigated and grass, annuals, and other lesser-valued plant resources were allowed to die in order to save water. With the end of the drought, DMV has returned to a more frequent, but still limited, watering program to maintain the remaining living plants with the least amount of water possible.

DMV has one large central heating and cooling plant at its Sacramento headquarters campus and implemented a water conservation project in 2016 to reduce the use of the cooling tower makeup water by approximately 1,000,000 gallons per year. The balance of DMV offices are small and generally do not have boiler plants or cooling towers.

As new DMV projects are designed and constructed to CALGREEN Code, DMV will be seeking opportunities for high efficiency landscape watering systems and the use of drought tolerant plantings to reduce water use. Low flow fixtures and other water conservation devices will be included in new projects; and on-site water retention systems, the use of local government recycled water for irrigation and other water conservation measures will be investigated on a project level basis.

DMV has three authorized capital outlay projects underway (Delano, Reedley and Oxnard), as well as the current Fresno field office, in critically over-drafted groundwater basins. The Fresno field office was completed in 2014 and has water conservation features and no new plantings

due to the multi-year drought. While no urban water shortage contingency plans have been created by DMV on a facility level basis, should severe water shortage dictate future conservation measures, DMV would follow whatever conservation measures are directed by the Administration.

## Building Inventories Summary

DMV performed preliminary field reviews of low flow fixtures and aerators in a number of state-owned field offices, which range in age from 3 years to 57 years old and have an average age of 38 years. The reviews showed most DMV-owned buildings already had aerators and low flow fixtures installed, and those locations that did not, lacked the necessary plumbing infrastructure (ex. pipe slope) to facilitate the successful operation of low flow fixtures.

A full inventory of public and employee restroom fixtures, lavatory fixtures, and breakroom fixtures could not be accomplished within existing staff resources and would not have yielded many opportunities, based on the initial field reviews. Since a full inventory could not be performed in FY 16/17, Table 10 has not been populated.

As indicated, DMV has sought opportunities to install water conservation measures in its existing portfolio of state-owned buildings and new DMV projects will incorporate the latest water saving measures and be constructed to CALGREEN code.

**Table 10: Summary of Building Inventory Needs**

| Number of toilets to be replaced with 1.25 gallon per flush | Number of urinals to be replaced | Number of faucet aerators to be replaced | Number of showerheads to be replaced @ 2.0 gpm and trickle flow control | Number of clothes washers to be replaced with Energy Star washers | Number of garbage disposals to be replaced. | Number of pre-rinse valves to be purchased and replaced |
|---|---|---|---|---|---|---|
| N/A | N/A | N/A | N/A | N/A | N/A | N/A |

## Heating and Cooling Systems Inventories Summary

With the exception of the DMV headquarters campus CUP, most of DMV's state-owned offices do not utilize boilers; they use central HVAC (multi-zone) or package units. DMV and DGS implemented a project at DMV's CUP in 2016 to save approximately 1,000,000 gallons of makeup water a year. New pumps were also installed to provide additional chemical treatment for the cooling towers and allow the DGS stationary engineers who operate the plant to hold more dissolved solids in suspension, increasing the interval period for water bleed off and reducing the use of makeup water. Because field offices are small and do not have central plants and large boilers, this strategy was only implemented at the headquarters CUP.

DMV performs annual inspections of the state-owned field offices and tracks the age, condition and life cycle expectancy of HVAC equipment as part of the 5-Year Maintenance Plan. The annual surveys inform DMV's priorities and strategy for HVAC repairs and system replacements. Systems that are old and have a high frequency of repairs or failures are

identified for replacement within the 5-year planning horizon. New units are more efficient than the existing systems, which are approximately 25-50 years old. DMV is using Section 6.10 funding from the 2016-17 budget to design and construct up to 13 identified HVAC systems in DMV field offices that were deemed critical, likely to experience ongoing failures, and where replacement parts have been difficult to procure due to the age of the existing equipment. These new HVAC projects are being designed to current code and will be more efficient than the existing equipment. A list of locations where DGS is designing and implementing HVAC projects on behalf of DMV follows below:

- Carmichael
- Costa Mesa
- Culver City
- Davis
- Hanford
- Long Beach
- Norco
- Pleasanton
- Redlands
- Santa Rosa
- Santa Teresa
- Van Nuys
- Whittier

**Table 11: Summary of Boilers and Cooling Systems Inventory**

| Amount of Water Used for make up (Gallons) | Number of flash tanks to purchase and install | Number of meters to purchase and install | Amount currently reused? (Gallons) | Remaining additional water suitable for other purposes such as irrigation (Gallons) |
|---|---|---|---|---|
| No data | Not populated | Not populated | Not populated | Not populated |

## Irrigation Hardware Inventories Summary

Landscaping typically uses 50 percent or more of an agency's total water use. While landscaping serves critical functions, the accompanying irrigation hardware, if not properly installed and maintained, can contribute to water waste. By reviewing and inventorying all irrigation hardware, it is possible to achieve significant water savings.

DMV has 89 field offices ranging in age from 3 years to 57 years old and the irrigation infrastructure varies throughout the State. Even the newer buildings do not have the modern infrastructure and technology suggested by DGS' Office of Sustainability for maximizing

irrigation efficiency. DMV's headquarters campus landscaping and irrigation is overseen by DGS and together the departments have pursued opportunities to upgrade the irrigation system as funding has allowed.

DMV is currently unable to survey all of the field office irrigation hardware; however, DMV has shown the ability to conserve water within the operation of its existing irrigation systems. DMV regularly adjusts timers to maximize water efficiency. DMV's overall water use (irrigation and domestic) is approximately 0.38% of state agency/department water use statewide while DMV's building portfolio constitutes only 0.64% of the statewide portfolio (based on total gross square feet).

**Table 12: Summary of Irrigation Hardware Inventory**

| Number of separate meters or sub-meters to purchase and install. | Number of irrigation controllers required with weather or soil moisture adjustment and flow sensing capabilities to purchase and install. | Number of backflow prevention devices to purchase and install. | Number of flow sensors to be purchased and installed | Number of automatic rain shut-off devices needed | Number of new pressure regulators to purchase and install. | Number of new hydrozones needed. | Number of new valves to purchase and install. | Number of filter assemblies to purchase and install. | Amount of drip irrigation to purchase and install (area covered) | Number of booster pumps to purchase and install | Number of rotary nozzles or other high efficiency nozzles to purchase and install |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Table 12 Not populated - data unavailable | | | | | | | | | | | |

## Living Landscape Inventory

Far from being just an aesthetic or ornamental feature, landscaping plays a critical role around public buildings and facilities. From providing safety and security, to reducing local heat islands, suppressing dust, reducing water runoff, maintaining soil health, aiding in water filtration and nutrient recycling, landscaping around public buildings is essential. Further, landscaping in public places frequently surrounds historic places and public memorials as well as provides pleasant public gathering spaces. The health and proper maintenance of these landscapes is vital to the physical wellbeing of California's people as well as to its social, cultural, political and historical life.

Additionally, the many vital ecosystem functions carried out by living public landscaping are critical in helping California meet its goals for greenhouse gas reduction, climate adaptation, and water and energy efficiency and water conservation. Urban forests are vital to improve site conditions for occupants and visitors to buildings and the surrounding community.

Table 13: Summary of Living Landscape Inventory

| Landscape >500Sq. ft.) | Turf (Sq. ft.) | Number of historical sites Or memorials | MWELO landscape area (Sq.ft.) | Climate appropriate landscape area (Sq.ft.) |
|---|---|---|---|---|
| Not populated | Not populated | Not Applicable | Not populated | Not populated |

DMV has not performed a Living Landscape Inventory of its 100 state-owned facilities and sites located throughout California; therefore, Table 13 cannot be populated with data. As indicated earlier in this report, the vast majority of DMV's buildings are field offices, typically smaller in size (under 15,000 g.s.f.), with extensive surface parking for customers and employees, and having minimal landscaped areas.

As part of new capital outlay replacement and major renovation projects, DMV will work with DGS and project architects and engineers to evaluate opportunities for urban forests, while also meeting other required code items and policy directives, such as ZNE and on site power generation. DMV must also carefully consider how shade trees and urban foresting affects site power generation (solar arrays), ongoing operational costs, potential damage to DMV's parking lots, safety and security, and possible liability from tree or limb falls.

## Large landscape water use

Large landscape water use often represents a significant percentage of a facility's water use and significant water savings can often be achieved through better irrigation scheduling or inexpensive improvements in irrigation hardware. As part of the Water Use Guidelines and Criteria, the water use for landscape areas over 20,000 sq. ft. shall be tracked through a water budget program.

The department has minimal landscaping at field office locations; there are no large contiguous landscaped areas that necessitate a landscape water budget management plan. The largest DMV site is the headquarters campus where the landscaping is overseen by DGS. Table 14 below is not populated as DMV has no qualifying sites that are not already overseen by DGS who is responsible for water budgeting.

Table 14. Summary of Large Landscape Inventory and Water Budget

| Number of Facility Sites/Locations with > 20,000 sq.ft. of Landscaping | Total Landscape Area per facility | Total Water Budget per facility | Total EPA WaterSense or Irrigation Association Certified Staff |
|---|---|---|---|
| N/A | N/A | N/A | N/A |

# BMPs

Building Best Management Practices (BMPs) are ongoing actions that establish and maintain building water use efficiency. State agencies are required by DGS Management Memo 14-02 to implement the building BMPs outlined below.

## Building Water Management BMPS

### General Water Management

DMV's Facility Operations Branch reports monthly water use into the Energy Star Portfolio Manager database. Any data that suggests a higher than expected water use at an individual DMV facility triggers onsite investigation to determine if a problem exists. Most recently, DMV discovered high water use data for the Arleta Field Office, which prompted an on-site investigation; a broken pipe was found and immediately repaired.

### Leak Detection and Repair

DMV has Regional Construction Maintenance Supervisors and Stationary Engineering staff who routinely visit DMV's field offices for repair and maintenance projects. During their visits, they perform visual leak detection surveys on internal fixtures and field reviews of the landscape irrigation infrastructure. They have and continue to identify opportunities for more low flow fixtures, where the plumbing infrastructure allows successful operation.

The Facilities Operations Branch sends out water conservation reminders to DMV facilities, informing employees statewide of ways to save water while at work, including the use of DMV's breakrooms and restrooms. DMV has no laundry facilities and no showers in its field offices, so no operational guidance was provided for these types of facility systems.

## Building Heating and Cooling Systems BMPs

As indicated previously, the DMV Central Utility Plant at the Sacramento headquarters campus is operated and maintained by DGS/FMD staff who follow Best Management Practices including, but not limited to:

- Routine inspections and maintenance checking steam traps and steam lines for leaks.
- Repairing leaks and replace faulty steam traps as soon as problems are identified.
- Boiler tuning though an authorized service provider.
- Insulating steam and condensate return piping, and central storage tanks.
- A water treatment specialist is under contract to prevent system scale and corrosion and to optimize cycles of concentration. Water treatment programs include regularly scheduled checks of boiler water chemistry.
- Routine inspections and maintenance programs for condensate pumps.

- Performing scheduled inspections of both the water side and fire side of the boilers. Cleaning the tube surfaces or replacing tubes, as needed, to ensure optimal heat transfer thereby maximizing system energy efficiency.
- Adjusting boiler and cooling tower blowdown rate to maintain TDS at levels recommended by manufacturers' specifications. Utilizing chemical treatment to minimize the use of blowdown water.
- Shutting off water-cooled air conditioning units when not needed and maximizing the use of economizers.

## Landscaping Hardware Maintenance BMPS

DGS/FMD oversees and performs landscaping BMPs at the DMV HQ campus. DGS staff is responsible for implementing the BMPs identified by the DGS Office of Sustainability, by code, by state policy and Executive Order. Hardware maintenance provided by DGS includes:

- Installing check valves and swing joints
- Replacing nozzles as needed and installing quick-couplers for hoses

A few DMV field offices receive landscaping services from DGS/FMD, but most have landscaping services through private contractors. DMV's contracts require the landscape companies to follow BMPs for landscape hardware, including leak detection and repair.

There is no available data regarding water savings for each landscape hardware maintenance BMP at DMV's field offices.

## Living Landscape BMPs

During California's historic multi-year drought, DMV and DGS followed the policy directive to prioritize and maintain the life of trees, large shrubs and significant plant resources, but to reduce water to other landscape plants and turf. This resulted in very large water savings statewide and DMV's water use reduction has been quantified in Table 3. As part of DMV's BMPs, the following strategies were implemented:

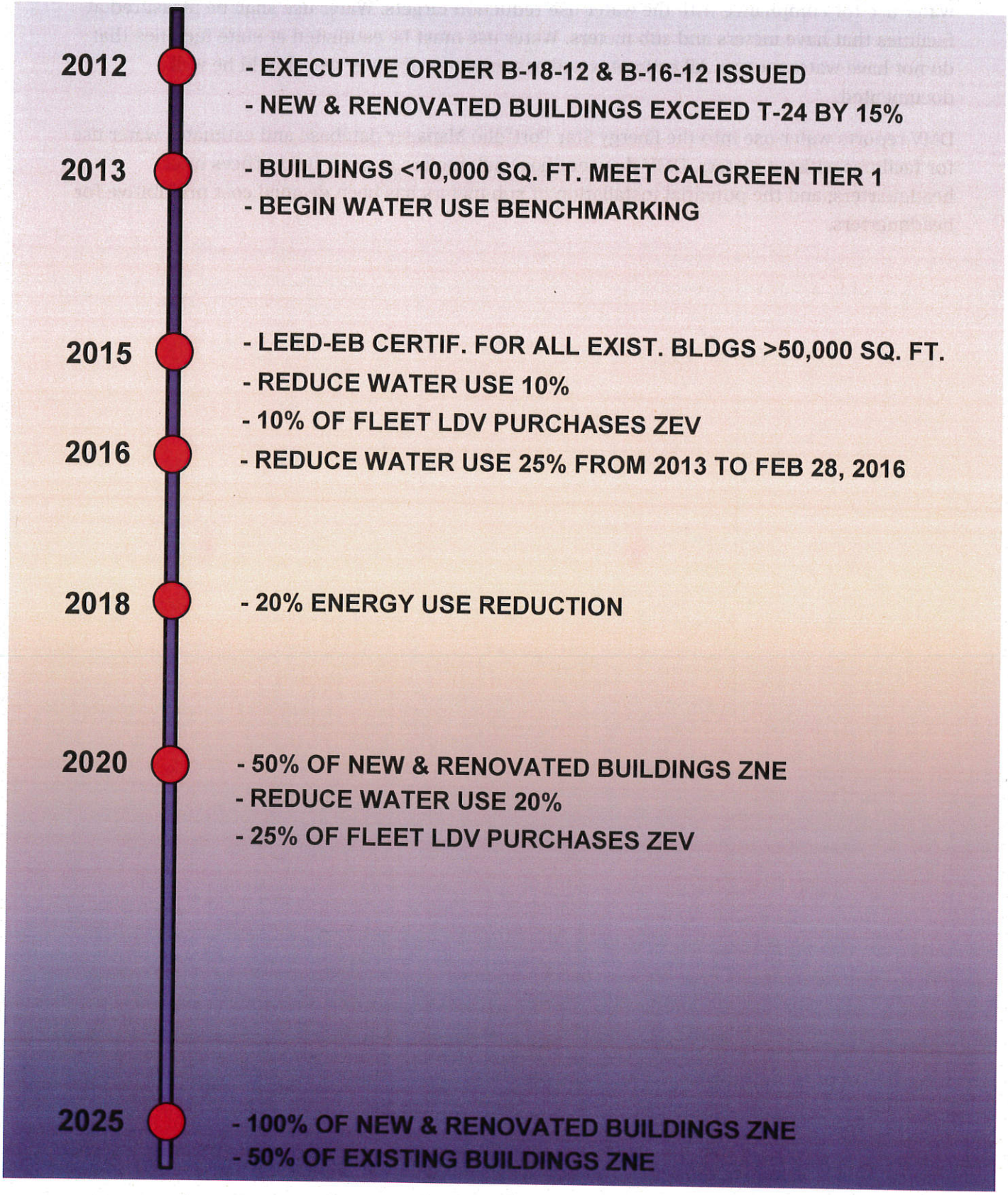
- Prioritize and assign value to plants within a landscape.
- Irrigation timers were used to reduce watering to bare minimums.
- Irrigation hardware was checked for leaks and repaired immediately upon detection.
- DMV continued past BMPs of watering at night or early morning.
- Sprinklers were adjusted to avoid overspray and runoff.
- No new plantings or replacement plantings took place; landscaped areas for new capital outlay projects were filled with mulch during the drought.
- New projects are being constructed with water conservation measures. They may include on-site retention, first flush systems and bioswales, moisture sensors and high efficiency watering systems. Native and drought tolerant plants will be utilized to reduce water use and compost will be added to soil and bedding areas.

## Monitoring, Reporting and Compliance

Each state agency is responsible for monitoring water use and reporting baseline and annual water use for compliance with the water use reduction targets. Water use shall be measured at facilities that have meters and sub meters. Water use must be estimated at state facilities that do not have water meters. All estimates and assumptions of water use should be well documented.

DMV reports water use into the Energy Star Portfolio Manager database and estimates water use for facilities without meters. DMV does not have sub-meters at most field offices or at headquarters; and the potential installation of sub-meters has been deemed cost prohibitive for headquarters.

# SUSTAINABILITY MILESTONES & TIMELINE



# RESPONSIBLE DEPARTMENT, PROGRAMS AND EMPLOYEES

| Indoor Water Efficiency Projects In Progress First initiative | |
|---|---|
| James Derby | DCMS, Facilities Operations Branch |
| | . |

| Boilers and Cooling Systems Projects In Progress | |
|---|---|
| Delbert Carter | Chief Engineer II, Facilities Operations Branch |
| Kelly Piceno | Staff Services Manager II, Facilities Operations Branch |
| **Landscaping Hardware Water Efficiency Projects In Progress** | |
| Kelly Piceno | Staff Services Manager II, Facilities Operations Branch |
| | |

| Living Landscaping Water Efficiency Projects In Progress | |
|---|---|
| Kelly Piceno | Staff Services Manager II, Facilities Operations Branch |
| | |

| Buildings with Urban Water Shortage Contingency Plans In Progress | |
|---|---|
| James Derby | DCMS, Facilities Operations Branch |
| | |