Electric Vehicle Service Equipment Infrastructure and the Five-Year Zero Emission Vehicle Infrastructure Readiness Survey

Guidance Document

California Department of General Services
December 2016
Overview
As part of a 10-year plan to reduce California's greenhouse gas emissions at the state level, the administration of Governor Edmund G. Brown Jr. announced in December 2016 the updated 2016 Zero Emission Vehicle (ZEV) Action Plan increasing ZEV and hybrid-electric vehicle purchases and ramping up efforts to install electric vehicle charging infrastructure at state facilities.

The fresh initiatives launched as part of this effort include:

- Increasing and clarifying state government’s procurement goals outlined in Executive Order (EO) B-16-12 of ZEV/hybrid purchases (for light-duty replacement vehicles in the state fleet) to 50 percent by fiscal year 2024-25. This would add approximately 1,500 new ZEV/hybrids to the state fleet.
- Expanding and quantifying the state’s vehicle charging station infrastructure goals outlined in EO B-18-12 to provide electric vehicle charging for at least 5 percent of workplace parking spaces at state facilities. This will add approximately 4,500 new charging stations.

This electric vehicle service equipment (EVSE) guidance document is intended to assist facility and fleet managers in understanding and operationalizing the Brown administration's goals for planning, budgeting, assessing, designing, constructing, and progress reporting for infrastructure improvements related to EVSE at state buildings, parking garages, and surface lots.

2016 ZEV Action Plan
Governor Brown has authorized the release of the 2016 iteration of the 2016 ZEV (Zero Emission Vehicle) Action Plan, which provides an updated roadmap towards achieving the Administration’s goals as identified in EO B-16-12’s call for 1.5 million zero emission vehicles on California roadways by 2025 and a 5 percent EVSE goal supporting EO B-18-12 call for electric vehicle charging infrastructure at state facilities.

This 2016 ZEV Action Plan introduces new actions for state agencies to undertake in order to meet these priorities and build California’s ZEV/hybrid market, remove barriers to future market growth, and to ensure this transition benefits our state and its residents by reducing greenhouse gases (GHG) and lowering California’s carbon footprint. The intent is to clearly communicate what state government will do to advance ZEV/hybrid adoption and provide charging infrastructure.

Central to the ZEV action plan is the call for leadership by example from state agencies in both ZEV/hybrid purchases and in early adoption of infrastructure development by integrating ZEVs into state government fleet acquisition, operations, and facility infrastructure plans.

The Department of General Services (DGS) is charged with implementing the section of EO B-16-12 that mandates the purchase of an increasing amount of ZEVs for the state vehicle fleet and supporting efforts at state agencies to increase ZEV adoption. DGS is charged with monitoring and reporting to the administration the EVSE-related facility assessments and oversight roles regarding the installation of EVSE infrastructure to support both fleet and workplace charging as identified in EO B-18-12. DGS is charged
with supporting state agencies to complete readiness surveys, conduct site assessments, oversight of architectural and engineering, construction management, system activation, and identification of alternate funding options if available. DGS project management, facility assessment, design and engineering, and construction management services are fee based and available to agencies needing support.

Management Memo -implementing ZEV/Hybrid Strategies
In December 2016, DGS released a management memo to all state departments/agencies detailing how to begin fulfilling the ambitious vehicle and infrastructure goals outlined in the ZEV action plan.

This management memo outlines the requirements for both fleet administration and for facility management involving EVSE parking infrastructure as identified in both EO B-16-12 and EO B-18-12.

DGS Guidance Document Instructions

Fleet Acquisition Plans
When submitting a fleet acquisition plan (FAP) to the DGS Office of Fleet and Asset Management (OFAM), state agencies must be able to demonstrate sufficient ZEV infrastructure to support an agency’s existing and projected ZEV purchases in order to receive acquisition approval.

DGS will require agencies to purchase ZEVs as fleet replacement vehicles as needed and state agencies must develop a plan to provide the electric charging infrastructure needed to support these vehicles.

Beginning in fiscal year 2017-18, state agencies will be subject to a “ZEV/hybrid first” policy requiring state agencies to procure battery electric, hydrogen fuel cell, plug-in hybrid, and/or hybrid vehicles, in lieu of fossil fuel consuming internal combustion vehicles and other specified vehicles, when available in a comparable vehicle class on state contract.

When determining additional or replacement vehicles for FAP submission to DGS, a state agency shall select vehicles based on the agency’s ability to integrate and support the operational technology required for the vehicles pursuant to the following priority structure:

1) Pure ZEVs (battery electric and fuel cell vehicles).
2) Plug-in Hybrid ZEVs.
3) Hybrid-electric alternative fuel vehicles.

Additionally, state agencies should prioritize facility surveys and infrastructure assessments to correspond with the ZEV FAP.

Infrastructure and Facility Surveys
No later than Feb.15, 2017, state agencies shall submit to the DGS Office of Sustainability (OS), a Five-Year ZEV Infrastructure Readiness Survey, which evaluates each state...
agency’s ability to support 5 percent workplace charging and projected ZEV integration within its fleets through fiscal year 2020-21.

State agencies with 25 or more facilities may complete the survey for all facilities, or may complete the survey in parts. If completing the survey in parts, the first response covering those facilities supporting their fleet’s ZEVs is due by Feb. 15, 2017. These departments must submit their supplemental survey response for the remainder of their facilities by June 1, 2017.

DGS shall provide the web-based survey platform for agencies to use to report their data. Agencies are responsible for the data content but DGS shall aggregate the data to report to the administration regarding the overarching EVSE goals identified by the executive orders. Survey data may also be used in budget planning and statewide funding efforts.

This survey provides agencies a framework for the first step towards developing accurate and detailed facility infrastructure assessments and is a key component to evaluating each state agency’s plan to support fleet and workplace charging. The survey responses are to combine facility specific data related to both fleet and workplace ZEV parking. The survey responses will provide DGS with the tools to evaluate each facility’s current ZEV readiness and a planning framework to determine the future ZEV capability. Also, the survey data will be used as the prerequisite for a detailed site assessment and the foundation to establish the needs for infrastructure design and engineering.

The survey should be completed by both the fleet coordinator and the individual facility managers, as the data will require collaboration between various responsible parties. The fleet coordinator will need to evaluate the fleet procurement goals to determine the actual and the projected number of ZEV purchases allocated to each facility. The facility managers will need to evaluate the fleet, workplace, and public parking at each facility to provide site specific details and accurate survey responses. The survey responses should be related to each agency’s FAP and 5 percent workplace electric vehicle charging goals.

Early completion and submittal of the survey is strongly encouraged so that agencies can coordinate the FAP and integrate the necessary infrastructure upgrades into each agency’s facility development and planning process. Early completion of the survey will allow for timely reporting to the administration and statewide ZEV program budget planning. If general fund, special funds, spending authorities, grants, and incentives are identified, these funds are usually offered on a first come first served basis and early adopters could have an advantage.

The DGS OS will take steps to post incentive and grant opportunities on a DGS sustainability webpage. This will include utility and rebate programs available to state agencies. If agencies become aware of opportunities that are not posted, DGS requests that those agencies contact DGS OS to share pertinent information. Sharing such information is beneficial to the statewide efforts of all agencies as they move toward achieving the administration’s goals.

*Five-Year ZEV Infrastructure Readiness Survey*
Using a template and instructions provided by DGS OS, state agencies shall complete a survey that:

1) Evaluates an agency’s light-duty fleet and identifies how many traditional internal combustion engine vehicles will be replaced with ZEVs on a year over year basis to meet ZEV purchasing requirements through fiscal year 2020-21.

2) Identifies the number and types of ZEVs that an agency intends to purchase on a fiscal year basis through fiscal year 2020-21.

3) Identifies every parking facility where parking is made available for workplace, public, or fleet purposes, including the following:
   a. Whether the facility is agency owned, privately leased, or publicly leased.
   b. Name and address of each parking facility.
   c. Total number of parking stalls available for fleet, employee, and public parking for each parking facility,
   d. Contact information for the parties responsible for parking operations at the facility.
   e. Whether the parking facility is open to the public.

4) Identifies the current quantity and types (Level 1, Level 2, Level 3, et al.) of electric vehicle (EV) charging stations already present at each facility that are available for public, workplace, and/or fleet vehicle charging. This includes infrastructure upgrades that have been made in anticipation of future EV charging station installations.

5) Estimates the anticipated number and types of additional chargers needed to achieve the 5 percent target goal in the workplace, public, and/or fleet vehicle charging areas.

6) Identifies and lists any hydrogen fueling station locations (as applicable) intended as the primary fueling station to support anticipated fuel cell vehicle acquisitions.¹

7) Identifies and prioritizes an agency’s state-owned facilities that the agency determines to have insufficient EV charging infrastructure to support their state fleet ZEV purchasing requirements. State agencies should prioritize state-owned facilities over privately leased facilities where feasible.

**Note:** beginning Dec. 31, 2017, state agencies shall submit an annual update to DGS OS that details any changes to its original Five-Year ZEV Infrastructure Readiness Survey. This report shall also detail any material changes that have occurred at an assessed (or not yet assessed) facility relevant to EV or hydrogen infrastructure. DGS OS will evaluate the annual updates to ensure that a state agency can support its ongoing ZEV acquisitions for the state fleet.

¹ Open and planned hydrogen fueling stations can be found here: [http://cafcp.org/stationmap](http://cafcp.org/stationmap).
Upon completion of the survey, DGS OS shall review it for completeness and coordinate with agencies to assure the administration’s goals are being adequately addressed. DGS shall coordinate with the agency’s senior managers identified in the surveys to prioritize facilities and develop a plan of action for agencies to move forward with ZEV adoption.

DGS OS will develop a reporting format and agencies will be responsible for the survey data and findings reported to the administration. Agencies are to verify the accuracy of the data they supply and support reporting activities to the administration.

DGS OS will work with agencies to identify potential multi-departmental and regional opportunities that make use of economies of scale for related ZEV infrastructure contracts and grants.

At the conclusion of DGS’ survey review, each agency shall begin conducting Phase 2 site assessments.

Comprehensive Facility Site and Infrastructure Assessments

After agencies have completed the facility surveys, the Phase 2 site assessment stage begins, which will evaluate a site’s ability to integrate infrastructure upgrades and EVSE installation. Agencies shall be responsible for developing a plan to meet the governor’s goals, which include funding, detailed facility assessments, designing and engineering, constructing facility infrastructure, and activation of the EVSE.

State agencies shall coordinate with DGS OS to review the agency’s plans to conduct comprehensive site assessments for each of the prioritized facilities identified in the surveys. As part of these site assessments, agencies shall identify internal fund sources, incentive or grant funds, external fund sources, and work with DGS to identify other potential funding opportunities.

Each facility assessment should identify the number and types of fleet and workplace ZEVs that the facility will need to support through fiscal year 2020-21. The assessments should identify the number and types of fleet and workplace EVSE needed to meet the administration’s target goal to provide 5 percent or greater of workplace parking with EVSE.

Facilities wishing to meet the executive order fleet goals by using hydrogen vehicles shall meet the same assessment requirements as outlined and must identify available hydrogen fueling locations or plans to construct or procure a fueling facility.

Conducting the Assessments:

These assessments will require licensed architects and engineers to perform. While state agencies are responsible for developing a ZEV infrastructure plan, DGS recognizes that few agencies have the authority to contract for these types of services. If an agency does not have the appropriate licensed professionals on staff, does not have the authority to contract for these services, or would otherwise prefer that DGS conduct the assessments,

---

2 If a facility will not support fleet vehicles and is not necessary to achieve the 5% workplace charging goal for the department, the facility does not need to be assessed. However, as DGS reviews the survey data from each department, DGS may contact departments about sites that could be leveraged to advance statewide goals.

3 To contract for these services, departments must have enacted regulations pursuant to Government Code section 4526.
agencies shall initiate a CRUISE request\(^4\) for DGS OS to provide them on the agency’s behalf.\(^5\)

Regardless of which entity conducts the assessments, they must be carried out as follows:

1) Assessments shall identify facility-specific EV charging and hydrogen fueling infrastructure needed to support the agency’s future ZEV needs (fleet, workplace and public).
   
a. For EVSE charging infrastructure, this includes identifying the locations, types, and quantities of EVSE (Levels 1, 2, 3) proposed to be deployed at the facility, and should differentiate deployment between public, workplace, and fleet infrastructure.\(^6\) State agencies must factor in any ongoing or planned facility expansion, program changes impacting staffing or public parking, near term projects in the parking areas, or any other foreseen changes in use.

b. For hydrogen infrastructure, identify nearby refueling stations or outline the facility’s fueling infrastructure plan applicable to fleet refueling.

2) Assessments must take into consideration potential charging times, optimal locations, current electrical capacities, locations of service panels, potential utility upgrades, networking requirements, safety issues, employee access to EV chargers, and path of travel for ADA accessibility requirements in employee and public areas.

3) Assessments must also factor in all federal, state, and local statutes, building codes, and regulations that may have bearing on EV and hydrogen infrastructure improvements, including Division of the State Architect (DSA) accessibility and California State Fire Marshall requirements.

4) Agencies are to provide DGS OS with site specific schematic drawing for each facility outlining the EVSE site parking plan, proposed ADA locations, proposed conduit runs, panel locations, and utility equipment locations. Hydrogen sites will need to provide the same level of information specific to fuel storage and codes governing the location of fueling equipment.

5) Assessments shall include two preliminary cost estimates: 1.) an estimate for adding EVSE using a facility’s current electrical system with minor upgrades and

---

\(^4\) Agencies can initiate a CRUISE request for DGS to undertake all phases of the work (Assessment, Design, and Construction) or only portions. However, if an agency is requesting that DGS perform a phase that is dependent on the successful completion of a prior phase (ex: construction, which is predicated on appropriate design), DGS reserves the right to review the prior phase work. DGS also reserves the right to require an outside peer review.

\(^5\) DGS can also provide the basic scope of work as a guidance document.

\(^6\) Note: agencies are encouraged to utilize public hydrogen fueling stations and/or offer land to host a publically accessible hydrogen charging station. However, “behind the fence” placement of hydrogen fueling infrastructure may be appropriate in certain circumstances.
factoring in the site’s current overall capacity limits; and 2.) an estimate for adding sufficient EVSE units, including all utility and infrastructure improvements necessary (including enhanced electrical backbone and capacity upgrades), to support an agency’s EV charging needs.

6) Agencies shall also include a tentative start date to begin design, engineering, and construction; a project delivery plan or detailed project delivery schedule in Microsoft Project; and must identify the proposed parties responsibly for project management, engineering, and construction.7

**Note:** Beginning Dec. 31, 2017, state agencies that are operating under their own authorities and are conducting comprehensive site assessments and constructing the applicable charging infrastructure without DGS project management shall submit an annual report to DGS that details their progress and any significant setbacks or challenges encountered.

**Funding**

Agencies shall work with DGS and the Department of Finance to identify potential funding opportunities for the design and construction of EVSE for fleet and employee parking. Departments must make every effort to identify and utilize grants, incentives, settlement funds, etc. for their infrastructure needs. If state funding is not available,8 then each agency is responsible for the costs associated with assessments, designs, construction, and activation of EVSE. Agencies without design and construction authority must have funds available to transfer to DGS to perform these tasks.

DGS will take the lead in determining if other supplemental funding or EVSE leasing opportunities exist with local electrical utility companies or grant programs. As part of this leadership role, DGS may coordinate or otherwise represent multiple agencies with local utilities to develop a broader resource allocation plan.

In the event specific resource opportunities are limited by fund amounts or quantities, DGS will take the lead to work with the provider and state agencies to ensure the most effective use of the funding. This includes, but isn’t limited to, ensuring that the funding strategically advances statewide goals, and that the funding is spread equitably based upon need, so that critical infrastructure is prioritized on a statewide basis. In order to determine allocation of scarce resource opportunities, DGS shall consider each facility’s FAP, readiness survey, site assessment, funding proposals, project delivery capability, and timelines.

**Design**

Agencies will enter into the design phase once the assessments are complete and funding has been identified. Facility specific designs will be based upon DGS review and approval of site assessments. Agencies using internal licensed staff may begin design and engineering immediately after DGS reviews and approves site assessments.

---

7 If DGS will be conducting the assessments on an agency’s behalf, the project schedule will be worked out between that agency and DGS.

8 Agencies should consult with DOF before submitting a Budget Change Proposals for their infrastructure needs.
State agencies likewise need architectural and engineering authority\(^9\) to contract for design services, if they do not have licensed professionals on staff. If an agency does not have the appropriate licensed professionals on staff, does not have the authority to contract for these services, or would otherwise prefer that DGS undertake the design work, agencies shall initiate a CRUISE request for DGS OS to provide them on the agency’s behalf.

Agencies doing this work without DGS assistance will be responsible to report to DGS a master schedule, progress reports, and construction status as determined by DGS OS.

The design and engineering will meet all current electrical, fire, life, safety, and access compliance codes when applicable. Design professionals will be licensed and plans will be stamped and signed. Plans and specifications will be of bid quality acceptable for a public works project. Plans will be submitted to the appropriate authorities for review and approval prior to bid.

Some utilities require separate metering for any grant or utility programs. DGS has determined it is desirable to meter the overall EVSE power consumption. Certain EVSE types have smart features that monitor and report electrical consumption at the unit level. DGS requires a metering function but neither defines where meters are to be located nor defines the level of individual EVSE usage data required. Each agency should determine their data needs for the facility and any EVSE program goals. Unit level data is optimum but may not be financially feasible or necessary.

Certain facilities may be better addressed with portable solar powered EVSE. These units are more expensive but have specific applications that enable otherwise difficult sites. These units are portable and can be relocated with relative ease when necessary. The performance is limited and should only be considered an option at sites without the capability to install grid powered EVSE. Other determining factors to choose a solar option may include the cost of ADA compliance, structural issues, expensive infrastructure upgrades, and buildings that are leased and without landlord provided EVSE. This option should be explored during the assessment phase but could be a step to value engineer construction costs and to overcome certain design difficulties. These units are available on the DGS procurement website and can be purchased and installed by the vendor.

**Bidding and Construction**

An agency’s authority to undertake the installation (construction) work will depend upon that agency’s authority under the California Public Contract Code for Public Works.\(^{10}\) For example, smaller installations may be able to be installed by an agency without DGS needing to contract on the department’s behalf.\(^{11}\) Agencies unaware or uncertain of their specific authority should contact DGS OS to clarify their limitations.

---

\(^9\) To contract for these services, departments must have enacted regulations pursuant to Government Code section 4526.

\(^{10}\) Some DGS services, such as inspection services, will still be required, regardless of which entity is contracting for the installation work (unless exempted by statute or policy).

\(^{11}\) The Public Contract Code permits DGS to limitedly delegate work to agencies capable of carrying out the work. DGS will consider project delegations on a case by case basis.
Like the assessments and design functions, agencies with the authority to carry out installations may request that DGS carry out the construction on their behalf as well.\textsuperscript{12} As with the other phases, agencies are responsible to provide adequate funding for this work.\textsuperscript{13}

Bidding will be conducted using complete project documents with stamped and signed plans and specifications of bid quality. Prior to bid, plans will be reviewed by the state fire marshal. DSA review may also be required under certain circumstances.

DGS will be notified of any project awards and kept current as to the progress of this phase.

During construction, agencies will provide DGS OS with the contact information for the project manager and construction manager at each project site. Agencies are required to have DGS inspectors unless an agency has authority to self-inspect.

DGS will be notified of construction start and completion dates and kept current as to the progress. Agencies may use Microsoft Project for this purpose.

**EVSE Activation**

Each agency shall be responsible for activating and maintaining their EVSE. There are several different types of EVSE with smart capabilities and the ability to charge users a fee by credit card or ID badge. Some of these can be operated and maintained by third parties. Some can be operated and maintained on a fee based program. Some may be leased and not be the responsibility of the agency. Some may be owner operated and not be the responsibility of the agency. Other systems have no smart features at all and are basic chargers or dedicated outlets.

The types and mix of chargers have different purposes and have different applications. Each agency should identify their specific needs and corresponding charger type during the assessment phase. However, if an agency determines during design or construction that a different type of charger will better meet the needs of a facility the mix can be changed, but still must comply with the various building codes, fleet needs, and 5 percent target for employee parking.

Periodic EVSE usage and consumption reporting to DGS is required.

**DGS Assistance**

DGS offers services on a fee for service basis.

For agencies without architectural/engineering authority or construction authority, agencies without internal staff resources, or agencies without subject matter experts, DGS can manage the agency’s program development, complete site assessments, develop budget and cost estimates, provide complete project design and engineering, manage DSA access compliance and state fire marshal reviews.

DGS can provide staff support for comprehensive project management to advertise, bid, and award the construction contracts for the infrastructure upgrades and EVSE installation.

\textsuperscript{12} A CRUISE request would initiate this process as well.

\textsuperscript{13} Construction funding must be provided in full, before DGS can solicit for construction services.
DGS project directors can manage the utility interface, bidding, construction, inspection, and system activation.

Contact your agency’s DGS customer service representative in the DGS Real Estate Services Division Asset Management Branch for further information about available services: [http://www.dgs.ca.gov/resd/Programs/AssetManagement.aspx](http://www.dgs.ca.gov/resd/Programs/AssetManagement.aspx).

If your agency is already registered in the DGS CRUISE service request system, a service request can be submitted directly at [http://www.globalcruise.dgs.ca.gov/login.aspx](http://www.globalcruise.dgs.ca.gov/login.aspx), which will assign a project manager to the request and initiate the process.

### Overview of Executive Orders

Executive Order B-16-12 and Executive Order B-18-12 require the development of supporting infrastructure for both fleet and workplace vehicle charging. When making electric vehicle (EV) infrastructure improvements to a state-owned facility in support of state vehicles, state agencies must also install workplace and public charging infrastructure where economically feasible.

By fiscal year 2024-25, state agency light-duty fleet acquisitions will meet or exceed 50 percent ZEVs on an annual basis.\(^\text{14}\)  

Beginning in fiscal year 2017-18, state agency ZEV purchasing requirements will increase by 5 percent each year through fiscal year 2024-25.

Beginning in fiscal year 2017-18, state agencies will be subject to a “ZEV/Hybrid First” policy.

When submitting a fleet acquisition plan to DGS OFAM (see State Administrative Manual section 4120 et. seq.), state agencies must be able to demonstrate sufficient ZEV infrastructure (to support an agency’s existing and requested ZEVs) in order to receive procurement approval.

If a state agency cannot sufficiently demonstrate an ability to support its ZEV acquisitions, DGS may not approve an agency’s fleet acquisition plan.

In 2015, the first year of enactment, 11.74 percent of state fleet purchases were ZEVs, exceeding the 10 percent ZEV purchasing goal. Agencies are on pace to meet the 25 percent goal for 2020 and 50 percent by 2025. Infrastructure to charge electric vehicles is needed to support fleet purchasing and fundamentally linked to meeting the EVSE goals of the administration.

### Overview of Technology

ZEV technologies include hydrogen fuel cell electric vehicles (FCEVs) and plug-in electric vehicles (PEVs), which include both pure battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs).

---

\(^{14}\) In accordance with EO B-16-12, public safety vehicles with special performance requirements are exempt from this requirement.
For an overview of the various ZEV and hybrid technologies, please review the state’s Community Readiness Guidebook, which provides helpful information to local and regional governments, community leaders and residents.

Its purpose is to help state and public entities support their residents and businesses in making the switch to ZEV and hybrid vehicles.

**EVSE Infrastructure and Equipment Accessibility Standards**


**Procurement of EVSE**

DGS has developed statewide EVSE procurement contracts for basic EV charging equipment and smart charging equipment. These contracts offer a wide selection of equipment for Level 1 and Level 2 in both the basic and smart models. This procurement method is not for any architectural/engineering upgrades or infrastructure upgrades to facilities, but intended solely for purchasing the actual EVSE chargers.

Download the statewide contract user instruction from Cal eProcure: [https://caleprocure.ca.gov/pages/index.aspx](https://caleprocure.ca.gov/pages/index.aspx)

Once there, follow these steps to locate contracts:

1. Click on “Quicklinks” at the top of the page.
2. Click on “View/Search Contracts.”
3. Enter a term in the “Description” field, such as “Fleet Vehicles” or “EVSE”. Then choose any of the contracts listed within the category of interest.

**Utility Assistance with EVSE**

Many utilities are currently involved in providing public charging installations, either directly or via rebates and incentives. Contact your local utility to confirm if they have an EVSE incentive available to state agencies for fleet, workplace, and/or public parking.

San Diego Gas & Electric

Southern California Edison

Los Angeles Department of Water & Power

Pacific Gas & Electric

Sacramento Municipal Utility District

NRG Energy