

# Sustainability Roadmap 2018-2019: Zero Emission Vehicles

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

**California State Lottery**

Edmund G. Brown Jr., Governor



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# **California State Lottery**

## **Sustainability Roadmap 2018-2019:**

### **Zero Emission Vehicles**

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# Acronyms

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<b>BEV</b>	<b>Battery Electric Vehicle</b>
<b>CV</b>	<b>cargo vans</b>
<b>DO</b>	<b>District Office</b>
<b>DC</b>	<b>Distribution Center</b>
<b>DSRs</b>	<b>District Sales Representatives</b>
<b>EO</b>	<b>Executive Order</b>
<b>EV</b>	<b>Electrical Vehicle</b>
<b>EVCS</b>	<b>Electric Vehicle Charging Station</b>
<b>EVSE</b>	<b>Electric Vehicle Supply Equipment (charging equipment)</b>
<b>FMU</b>	<b>Fleet Management Unit</b>
<b>GHGe</b>	<b>Greenhouse Gas Emissions</b>
<b>HQ</b>	<b>Headquarters</b>
<b>MM</b>	<b>Management Memo</b>
<b>MPG</b>	<b>Miles per gallon</b>
<b>NDC</b>	<b>Northern Distribution Center</b>
<b>POS</b>	<b>Point-of-Sale</b>
<b>RFI</b>	<b>Request for Information</b>
<b>RSRs</b>	<b>Route Sales Representatives</b>
<b>SAM</b>	<b>State Administrative Manual</b>
<b>SLED</b>	<b>Security/Law Enforcement Division</b>
<b>ZEV</b>	<b>Zero Emission Vehicle</b>

# EXECUTIVE SUMMARY

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In 1984, Proposition 37 amended the California Constitution to authorize the establishment of a statewide lottery. As an initiative statute, the California State Lottery Act of 1984 (Lottery Act) created the California State Lottery Commission and gave it broad powers to oversee the operations of a statewide lottery. The purpose of the Lottery Act was to provide supplemental monies to benefit public education without the imposition of additional or increased taxes. The California State Lottery (Lottery) is administered by a five-person commission appointed by the Governor and confirmed by the California Senate. In the 32 years since sales began in October 1985 through June 30, 2017, the Lottery has raised more than \$32.5 billion for California public education, including more than \$1.5 billion in Fiscal Year 2016-17. We're proud of the contributions we make to California's schools, and we work hard to increase our funding through efficient business practices.

The Lottery has been able to meet Executive Order (EO) B-16-12 requiring at least 10 percent of fleet purchases be Zero Emission Vehicles (ZEVs) by 2015 by purchasing sedans for replacement vehicles. The Lottery will continue to work on identifying available ZEVs (that satisfy business needs) to meet the EO goal of 25 percent ZEVs by 2020.

Due to the uniqueness of the Lottery's operation and the type of vehicle many Lottery fleet drivers require to perform their duties, EO B-16-12 has proved to be a challenge. Full-sized cargo vans (with and without all-wheel drive) and minivans are light-duty vehicles assigned to District Sales Representatives (DSRs) and Route Sales Representatives (RSRs) who are in the field 90 percent of the time and have specialized equipment installed in them to store Lottery products and signage. Full-sized cargo vans (CV) and minivans, such as the Chevrolet Express and Dodge Ram CV, meet the driving range and cargo capacity needed for the positions, and follow AB 32, as described on page 3. However, currently the mileage capacity offered in light duty ZEV commercial vans and location of electrical vehicle charging stations are not conducive to the business requirement needs for the Lottery Sales force.

The Lottery will continue to monitor the implementation of electrical vehicle charging stations and reevaluate our vehicle replacement plan as more options become available to fit the Lottery's business model.

The Lottery is committed to achieving the goals of both Executive Orders B-18-12 and B-16-12 and will continue to strive to do so.

Sincerely,



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Hugo López  
Executive Director

# SUSTAINABILITY GOALS

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

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

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

## **Executive Order B-18-12**

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

## **Executive Order B-16-12**

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

## **Executive Order B-30-15**

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

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

## **2016 Zero Emission Vehicle Action Plan**

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

## **AB 32 Scoping Plan**

The scoping plan assumes widespread electrification of the transportation sector as a critical component of every scenario that leads to the mandated 40% reduction in GHG by 2030 and 80% reduction by 2015.

## **Public Resources Code §25722.8**

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

## **State Administrative Manual & Management Memos**

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

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



# **FLEET VEHICLES**

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## **Department Mission and Fleet**

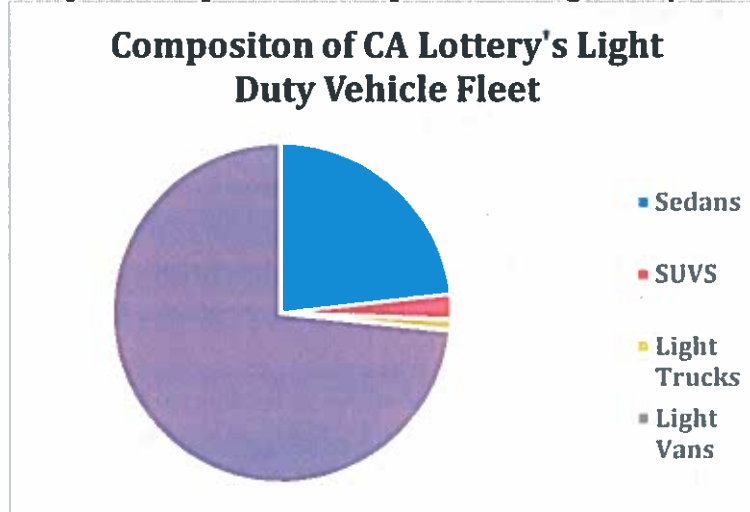
This ZEV Report and Plan demonstrates to the Governor and the public the progress the Department has made toward meeting the Governor's sustainability goals related to Zero Emission Vehicles. This report identifies successful accomplishments, ongoing efforts, outstanding challenges and future efforts.

In accordance with the Governor's Executive Order B-16-2012, the Lottery has begun incorporating ZEVs into its fleet, meeting the 2015 ZEV purchase requirement, and continues to work towards achievement of the 2020 and 2025 purchase requirements. Additionally, the Lottery plans to install electric vehicle charging stations at all its owned facilities. The Lottery has already added these stations at some of their locations, while other Lottery locations will see installation within the next few years. The Lottery's annual fleet purchases will include a greater percentage of ZEVs as installation of these stations is completed.

Challenges in the execution of the Lottery's plans pertain more to the vehicles themselves than the charging infrastructure. The greatest challenges the Lottery faces regarding incorporation of ZEVs into its fleet is the lack of electric vans. The Lottery assigns vehicles to field staff to conduct various types of Lottery business throughout the state and 74% of the Lottery's fleet is comprised of minivans and full-size vans. This vehicle type is necessary due to the nature of our drivers' work responsibilities. Though a plug-in hybrid van option is now available with the introduction of the Chrysler Pacifica hybrid minivan, it is predominantly considered a passenger van rather than a cargo van and a cargo model is not offered. Lottery sales representatives require cargo vans to meet their business needs of transporting heavy loads of tickets, equipment, and point-of-sale (POS) materials (the maximum payload of the Pacifica is approximately 1,350 lbs. vs. 1,880 lbs. for the Ram ProMaster City). Additionally, the Chrysler Pacifica hybrid minivan is not yet available via Department of General Services (DGS) State contract.

Lottery representatives drive a state-issued vehicle regularly to: visit their assigned retailers to distribute POS materials, provide merchandising expertise, analyze data and sales activities, fill ticket inventory, and service Lottery equipment; Sales supervisors monitor the routes of their staff throughout the state and Lottery investigators drive throughout the state to complete their investigative duties. In the past, the low range of ZEVs has posed a problem since many of our drivers work in high-traffic areas, rural areas, and/or territories that cover a great distance. The introduction of ZEVs with greater range such as the Chevrolet Bolt, however, continue to make it easier for the Lottery to integrate ZEVs into its fleet.

**Graph 1: Composition of Department's Light Duty Fleet**



The average miles per gallon (mpg) of the Lottery's Fleet for 2016 was 15 mpg. In 2015, the average mpg was 12. Although this data would suggest a trend of improvement, the Lottery is currently only able to access past years' information as far back as 2015 to calculate this information.

**Table 1: Total Purchased Fuel 2016**

Purchased Utility	Quantity	Cost (\$)
Gasoline	287,472.39 Gallons	\$ 804,828.92
Diesel	1,321.94 Gallons	\$ 3,647.84
Renewable Diesel	0 Gallons	\$ 0
<b>TOTAL GGE</b>	<b>288,794.33 Gallons</b>	<b>\$ 808,476.76</b>

## **Incorporating ZEVs into the State Fleet**

A widespread shift to Zero Emission Vehicles is essential for California to meet its Green House Gas (GHG) emission goals. State departments are now required to incorporate larger numbers of ZEVs in their vehicle fleets. Starting in FY 17/18 the percentage of new light duty vehicles that must be Zero Emission Vehicles increases by 5% each year, reaching 25% in FY 19/20 and 50% in FY 24/25.

The Lottery has begun replacing all vehicles which have a comparable ZEV or Battery Electric Vehicle (BEV) with these types of vehicles. All of the Lottery's sedan purchases for the 16-17 fiscal year consisted of plug-in hybrids (PHV) and all future sedan acquisitions will continue to consist of some type of ZEV. Sales supervisors and recruiters now typically drive plug-in hybrid vehicles due to the current lack of charging infrastructure, performance of work duties (described previously), and the territory covered which prevents them from driving BEV. The Lottery's current fleet includes BEVs for DO supervisors and HQ personnel who conduct business in town; (e.g., mailroom staff delivering interoffice mail, custodial and maintenance staff conducting tasks at the local DO) where charging ports are located.

Lottery drivers are on the road all day every weekday with minimal exception, and the challenges they face pertaining to charging are not due to a lack of charging stations available in the public or at the Lottery offices themselves, but rather a lack of stations at the retailers they visit since this is where most of their day is spent. Lottery drivers visit several retailer locations throughout their day, with our sedan drivers driving almost 200 miles daily on average, and they do not have the time to wait at a public station to charge. Level 2 ChargePoint chargers average 40 additional miles for 3-5 hours of charge time (vehicles with fast charging capability and the fast chargers that support them are not yet widely available). Charging station availability also varies from territory to territory.

With plans for the implementation of charging ports at all other Lottery offices within the next two years, the Lottery can begin incorporating more BEVs into its fleet. As stated earlier, the Lottery has already begun incorporating some BEVs into its fleet. In 2016, Kia Soul EVs were leased for Lottery supervisors assigned to an office with charging infrastructure already installed. Though these vehicles have a 90-mile range, the drivers have faced the same challenges described above (lack of charging stations at retailer locations and their homes, charging station availability in their territories, and average distance traveled daily). As noted earlier, the introduction of ZEVs with a greater range, such as the Chevrolet Bolt, will make it easier for the Lottery to integrate ZEVs into its fleet. With a battery range of 238 miles, sedan drivers need not worry about recharging as often.

Though approximately 70% of the Lottery's fleet is comprised of vans, replacement of these vehicle types has not yet begun for reasons noted in the previous section.

Vehicles over meet specified mileage and age thresholds are eligible for replacement. Currently ZEVs are available on statewide commodity contracts in the sub-compact, compact, mid-size sedans and mini-vans vehicle classes. There are currently 8 vehicles in our fleet that are currently eligible for replacement in vehicle classes for which ZEVs are available on contract.

**Table 2: Vehicles in Department Fleet Currently Eligible for Replacement**

	Sub-Compact Sedan	Compact Sedan	Midsize Sedan	Mini Van/ Full-size Vans	Total
# of vehicles eligible for replacement	0	0	8	0*	8

\*No comparable ZEV replacement available

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

**Table 3: ZEV Additions to the Department Fleet**

Table Header Format	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22
Battery Electric Vehicle	2	4	0	0	2	2	2	4
Plug-in Hybrid Vehicle	0	1	25*	0	1	3	1	2
Fuel Cell Vehicle	0	0	0	0	0	0	0	0
Percent of total purchases			40%	N/A	100%	100%	100%	100%
Required ZEV Percentage	10%	10%	10%	15%	20%	25%	30%	35%
Total number of ZEVs in Fleet	2	5	25*	0	3	5	3	6

\*Jump in procurements due to addition of new positions

## Telematics Plan

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

The Lottery is currently in the process of evaluating telematics tools to capture fleet inventory data and operational fleet information from its drivers. The goal is to capture data in real-time and automate current process to utilize data as required to meet a variety of analysis and reporting mandates.

## Public Safety Exemption

The updated rules for public safety vehicles do not impact the incorporation of ZEVs for Lottery investigators. The Lottery has begun the integration process for FY 2016-17 by procuring ZEVs for SLED investigators in need of replacement vehicles.

# ZEV INFRASTRUCTURE

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## Introduction to the California State Lottery Parking Facilities

The most common type of facilities the Lottery operates are nine DOs located statewide. They range in size from 6,500 to 13,000 square feet and are typically industrial flex buildings that offer a public facing lobby, office space for staff, and warehouse space for storing and distributing Lottery tickets and Point of Sale (POS) materials. They typically have 20-40 parking spots that are usually shared among other adjacent properties as the DOs are part of business or industrial parks. The Lottery also operates southern and northern DCs. Each facility is approximately 60,000 square feet, are mainly warehouse with some office space, and are not open to the public. The DCs are responsible for warehousing and distributing Lottery tickets and POS materials. The HQ facility houses much of the Lottery's staff. HQ staff perform administrative functions for the Lottery and has a public lobby but is not specifically public facing. DO and HQ parking is for employees, customers, and fleet vehicles. At the DC, parking is mainly for employees but is sometimes used for temporarily parking fleet vehicles. Parking at DOs is mixed. At HQ, there is a designated visitor area but visitors can also park in unreserved spots. At HQ fleet vehicles are parked in the general employee parking lot. The Lottery currently owns 75 percent of its facilities and 25 percent are leased. All Lottery facilities host fleet vehicles to some extent.

Graph 2: Parking Facilities



Given the nature of the department’s fleet operations, the length of stay for visitors and employees we have determined that it appropriate that L1 chargers should make up approximately 0% of chargers in employee parking areas and 0% of chargers in fleet parking areas, with the remainder being L2. The Lottery does not currently have any L1 chargers at any of its facilities. The Lottery opted to install L2 and L3 chargers at its facilities; 19-L2 and 3-L3 chargers are currently installed statewide.

Based on estimates of future ZEV fleet purchases and a count of visitor and workplace parking spaces it has been determined that the Department will need 0-L1, 29-L2 and 9-L3 chargers to adequately serve fleet vehicles and achieve the goals established in the ZEV Action Plan.

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

**Table 4: High Priority EVSE Projects**

Facility Name	Total Parking Spaces	Existing L1 Chargers	Existing L2 Chargers	New L1 Chargers Needed	New L2 Chargers Needed
Headquarters	485	0	10	0	16
Fresno DO	49	0	3	0	0
San Diego DO	39	0	0	0	4
<b>Total</b>	<b>529</b>	<b>0</b>	<b>13</b>	<b>0</b>	<b>20</b>

The facilities listed in Table 4 were chosen as “High Priority EVSE Projects” because the facilities are all undergoing construction to achieve the goals established by the ZEV Action Plan.

## Outside Funding Sources for EV Infrastructure

The Lottery’s sustainability analyst reviewed available grants and special pricing through local utility companies, but found the available options did not meet Lottery fiscal requirements or provide a good return on investment. The Lottery has been working with nrg EVgo, who would provide free infrastructure for additional charging stations at the southern DC, cover partial costs for additional infrastructure at Santa Fe Springs DO and free infrastructure at the northern DC. The property management and other tenants at the southern DC have not given approval to proceed with additional infrastructure. The Lottery will continue working with nrg EVgo, monitor local utility funding and rebate options, and other offers as they arise.

## Hydrogen Fueling Infrastructure

The Lottery does not have any hydrogen fueling stations that could serve as the primary refueling station for vehicles in its fleet and there are no plans to install hydrogen fueling stations at any of the Lottery facilities.

## Comprehensive Facility Site and Infrastructure Assessments

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

**Table 5: Results of Site Assessments**

Facility Name	L1 Chargers with Current Electrical System	L2 Chargers with Current Electrical System	Total cost for Project using Current Electrical System	L1 Chargers with Electrical System Upgrades	L2 Chargers with Electrical System Upgrades
Santa Fe Springs DO	0	3	*	0	4
Southern DC	0	3	*	0	10
<b>Total</b>	0	6	0	0	14

\*The total costs of the projects are included with the entire budget for all tenant improvements required on each building, therefore a specific cost cannot be determined.

## EVSE Construction Plan

At the six new district office facilities remaining to be developed under the Facilities Master Plan, EV charging stations will be installed in quantities and locations compliant with current building code. To perform the design and construction activities the Lottery has an architect and general contractor under contract who design and bid out the work, respectively. The Lottery uses ChargePoint EV charging stations and activate them via Lottery staff. The current program schedule has all Lottery projects being completed by the second quarter of Calendar Year 2019 although that may change depending on when new buildings are purchased and how long construction activities take.

## EVSE Operation

Currently the Lottery does not regularly use the reporting features of the ChargePoint portal for the Electric Vehicle Charging Stations (EVCS); however, the goal is to use reporting capabilities offered by the stations and portals to improve operations and directly capture usage from them. Using the reporting features of the ChargePoint portal, the Lottery can quickly access information to better understand how our charging stations are being used and how they are contributing to the Lottery's business. The Lottery can gather and analyze valuable information such as revenue generated by the stations, amount of gasoline saved, energy used, greenhouse gas (GHG) savings, session length and average utilization, unique drivers, and alarms associated with the charging ports (type, time, location) to identify any trends or potential issues with the



ports. To maintain the electric vehicle supply equipment (EVSE) in working order, maintenance calls are placed by the Lottery to ChargePoint service partner whenever notified of an issue by a driver or a station displays a "needs service" on the "Stations Overview" page of the portal. ChargePoint also runs weekly reports on all stations and notifies the Lottery of any resulting alerts via automatically-generated tickets. Additionally, the ChargePoint portal offers the option to receive "Batched Email Alerts" in which Network Managers can receive hourly emails containing alerts on all stations. Usage of these charging stations is addressed in the Lottery's "Electric Vehicle Charger Use" corporate policy, which outlines daily time limits and the effects and consequences of exceeding these limits.

The Lottery developed a formula for usage fees, per kilowatt hour, at each location. Predicted usage and local electric company charges were used to determine the usage costs to recuperate the charging station initial purchase costs.

# SUSTAINABILITY MILESTONES & TIMELINE

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# DEPARTMENT STAKEHOLDERS

<b>Incorporating ZEVs Into the Department Fleet</b>	
Lottery, Operations Division	Susana Sanchez, Business Services Manager
Lottery, Operations Division	Angela Conway, Fleet Officer

<b>Telematics</b>	
Lottery, Operations Division	Susana Sanchez, Business Services Manager
Lottery, Operations Division	Derick Brickner, Facilities Development Manager

<b>Public Safety Exemption</b>	
Lottery, Operations Division	Derick Brickner, Facilities Development Manager
Lottery, Operations Division	Susana Sanchez, Business Services Manager
Lottery, Operations Division	Colleen Uhlenhop, Facilities Manager

<b>Outside Funding Sources for ZEV Infrastructure</b>	
Lottery, Operations Division	Derick Brickner, Facilities Development Manager
Lottery, Operations Division	Susana Sanchez, Business Services Manager
Lottery, Operations Division	Colleen Uhlenhop, Facilities Manager

<b>Hydrogen Fueling Infrastructure</b>	
Lottery, Operations Division	Derick Brickner, Facilities Development Manager
Lottery, Operations Division	Colleen Uhlenhop, Facilities Manager

<b>Comprehensive Facility Site and Infrastructure Assessments</b>	
Lottery, Operations Division	Derick Brickner, Facilities Development Manager
Lottery, Operations Division	Colleen Uhlenhop, Facilities Manager

<b>EVSE Construction Plan</b>	
Lottery, Operations Division	Colleen Uhlenhop, Facilities Manager
Lottery, Operations Division	Derick Brickner, Facilities Development Manager
Lottery, Operations Division	Susana Sanchez, Business Services Manager

<b>EVSE Operation</b>	
Lottery, Operations Division	Susana Sanchez, Business Services Manager
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