ELECTRIC VEHICLE STRATEGY

DECEMBER 12, 2017

PASSED BY SACRAMENTO CITY COUNCIL MOTION 2017-0374

www.cityofsacramento.org/ev

City of SACRAMENTO

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FIGURES AND TABLES

ABBREVIATIONS

AFDC	Alternative Fuels Data Center
ARRA	American Recovery and Reinvestment Act of 2009
ATOS	Autonomous Open Standards Lab
BERC	Business Environmental Resource Center
BEV	**Battery-electric vehicle:** a vehicle that runs completely on electricity stored in batteries with an electric motor instead of a gasoline engine; BEVs are a type of ZEV.
CARB	California Air Resources Board
CVRP	Clean Vehicle Rebate Project
DCFC	**Direct current fast charge:** a charger at 400 to 500 volts and 50 kilowatts or more, providing an 80% charge in less than 30 minutes.
DMV	Department of Motor Vehicles
EV	**Electric vehicle:** a vehicle that is recharged by electricity; can include BEVs and PHEVs.
EVSE	Electric Vehicle Supply Equipment (i.e. electric vehicle charging stations)
FCEV	**Fuel-cell electric vehicle:** vehicle powered by electricity where hydrogen fuel is converted into electricity by a fuel cell– the only emissions are water vapor and heat; FCEVs are a type of ZEV.
ITS	Institute of Transportation Studies, UC Davis
L1	**Level 1 charger:** charger at 110-120 volts, 4-6 miles of range per hour of charge.
L2	**Level 2 charger:** charger at 208-240 volts, 10-20 miles of range per hour of charge.
MW	Megawatt
OEM	Original equipment manufacturer

PEV	**Plug-in electric vehicle:** another term for EVs, referring to a vehicle that is recharged by electricity; can include both BEVs and PHEVs.
PHEV	**Plug-in hybrid electric vehicle:** a vehicle that has both an electric motor that can be plugged in and a gasoline engine.
RT	Regional Transit
Sac EV	Sacramento EV Association
SACOG	Sacramento Area Council of Governments
Sac PEV Collaborative	Sacramento Area Plug-In Electric Vehicle Collaborative
SCCC	Sacramento Clean Cities Coalition
SHRA	Sacramento Housing and Redevelopment Agency
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMUD	Sacramento Municipal Utility District
VMT	Vehicle miles traveled
VV	Valley Vision
ZEV	**Zero-emission vehicle:** vehicle that emits no exhaust from vehicle sources of power, with zero tailpipe emissions – includes BEVs and FCEVs[1]

[1] The California Air Resources Board defines ZEVs as a vehicle that uses a zero-emissions technology, providing a pathway to full zero emissions. For purposes of this Strategy, ZEVs only include those vehicles that emit no exhaust from vehicle sources of power.

1 INTRODUCTION

This Electric Vehicle (EV) Strategy serves as the City of Sacramento's first EV Strategy to advance the adoption of zero-emission vehicles (ZEVs). The plan, or Strategy, establishes the City's vision to advance ZEVs, bringing together recent City initiatives and new opportunities to establish a clear path for priorities and implementation. The Strategy identifies goals and targets, actions to achieve them, and metrics to assess progress. The actions included in the Strategy will be initiated by 2020 with full implementation by 2025, and outline the City's intended trajectory for zero-emission mobility. This Strategy is a living document that will be monitored, revisited, and updated over time as new issues and opportunities arise.

The primary focus of this Strategy is advancement of light-duty EVs, due to market readiness and early and continued City efforts. For purposes of the Strategy, "EV" is used to refer to all types of plug-in electric vehicles (PEVs), including both battery-electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs). However, the strategy also supports other ZEV

technologies such as fuel-cell electric vehicles (FCEVs). While light-duty passenger vehicles are a key near-term opportunity, this strategy also recognizes the potential for medium- and heavy-duty vehicles and equipment in applications such as transit, freight, and construction.

The guiding vision of the City of Sacramento General Plan is to establish Sacramento as the most livable city in America. Sacramento's concept of livability includes creating a healthy city, maintaining a vibrant economy, and developing a sustainable future. The EV Strategy specifically implements General Plan Mobility Goal 1.5, which calls for the use of emerging transportation technologies and services to increase transportation efficiency. General Plan Mobility Policy 1.5.5 further commits the City to support the rapid adoption of zero-emission and low-emission vehicles. Additionally, the General Plan addresses the importance of improving the health and sustainability of the community with improved regional air quality and reductions in greenhouse gas (GHG) emissions in Environmental Resources Goal 6.1. ZEVs are a key strategy to achieve the General Plan vision. These advanced vehicle technologies provide significant benefits for local air quality, public health, mobility, the economy, and environmental sustainability.

ZEVs have increasingly become a more feasible, cost-effective option for consumers. Three FCEV models are available and more than thirty 2017 EV models, with increasing range available across a spectrum of price points. As of 2017, both Tesla and Chevrolet offer entry-level EV models with range that extends beyond 200 miles. Within the next several years, EVs are anticipated to become even more cost-competitive with internal combustion engine vehicles. Furthermore, dozens of additional EV models have been announced that are anticipated through 2020, which will continue to provide greater options to meet a range of consumer preferences (Slowik et al, 2016). The City plays a key role in enabling and accelerating this transition to cleaner vehicle technologies. This strategy identifies how the City will strive to ensure access to and maximize the benefits of ZEV technologies across Sacramento's diverse communities.

USER'S GUIDE

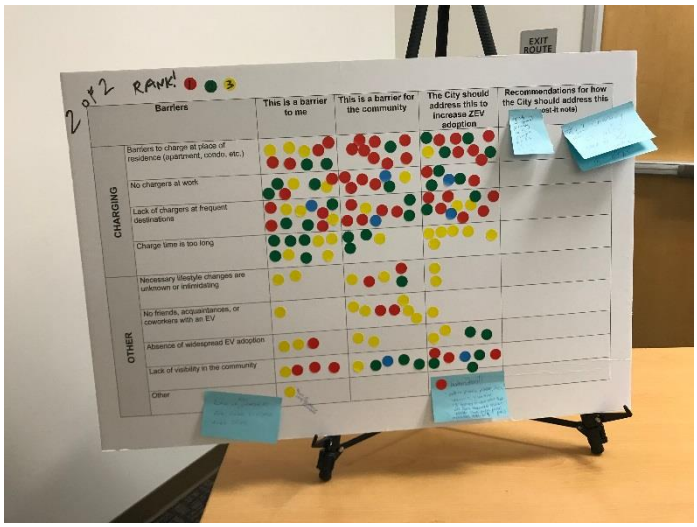
This strategy is presented in eight main sections. Together, this document provides a summary of major City and regional initiatives, identifies the City's vision and goals, and outlines an action plan to attain those vision goals. Sections are organized as follows:

- **Introduction**: Document purpose and scope.
- **EV Context**: EV initiatives in the region, including past and current projects, efforts of other agencies, and public-private partnerships.
- **EV Adoption and Forecasts**: Existing and forecast EV adoption rates countywide and for the City of Sacramento, from analysis completed by the Sacramento Area Council of Governments (SACOG).
- **Opportunities and Issues**: The role of ZEVs in achieving transportation priorities in Sacramento, in addition to ZEV benefits and key issues for expansion.
- **Vision and Goals**: Sacramento's vision and goals for ZEV adoption and mobility, outlining priorities for increased access, and achieving the appropriate balance of infrastructure.
- **Targets and Actions**: Performance targets for 2025 that serve as benchmarks for achievement of EV strategy vision and goals, supported by actions to initiate by 2020 and entities responsible for implementation.
- **Implementation**: The City's approach to implement the actions identified in the Strategy and monitor their outcomes.
- **Additional Resources**: Website addresses, citations and sources, and photo credits.

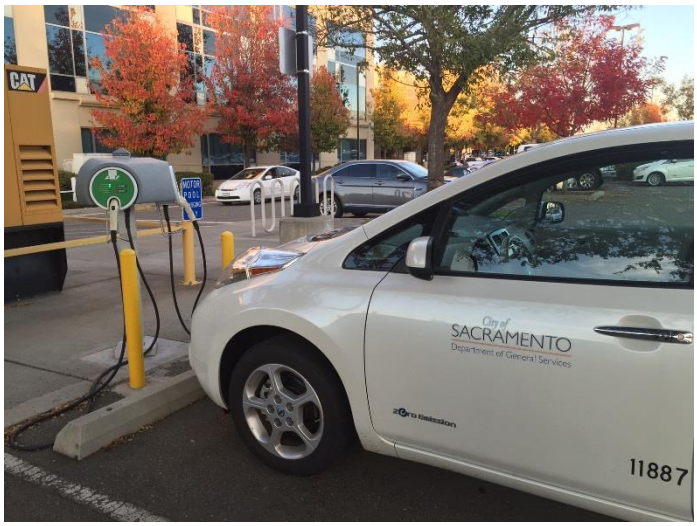
OUTREACH

This Strategy reflects extensive input from agency partners, residents, and other stakeholders. The document was first released for public review in October 2017, following extensive collaboration with the Sacramento Area PEV Collaborative. Key agency partners involved in plan preparation include the County of Sacramento, the Sacramento Municipal Utility District (SMUD), the Sacramento Metropolitan Air Quality Management District (SMAQMD), and SACOG. Other groups engaged in plan development include the Sacramento EV Association (Sac EV), the Institute of Transportation Studies, Davis (ITS), and various private EV charging network companies, transportation network companies, and original equipment manufacturers (OEMs).

City staff updated the Strategy based on public comments. On October 19, 2017, City staff and community members initiated the public comment period at an EV Strategy public workshop. The two-hour event attracted over 55 attendees that provided input through table activities, written comments, and face-to-face conversations with City staff. Two large maps of Sacramento covered one wall, where the community plotted out where more charging infrastructure is needed. Over 17 potential charging locations outside of the Downtown core were identified. Other workshop activities invited feedback on methods the City could use to accelerate the transition from traditional internal combustion engine vehicles to EVs. Challenges to adoption identified by participants include barriers to charging at places of residence, lack of chargers at frequent destinations, and high upfront EV costs. Participants also prioritized the lack of information on EV driving and charging as a top issue for the City to address.



In addition to the public workshop, City staff also met with local community groups to provide updates and invite discussion. Key meetings included presentations to the Sacramento EV general meetings on October 12 and November 8, and a presentation to 350 Sacramento on October 12. City also met regularly with a subgroup of Sac EV leadership to further vet data and refine recommendations.



The City also solicited public comment online using two methods:

- An online form was available on the City website for written comments on the Strategy. The City received 18 comment forms or letters. These comments express general support and recommend a range of opportunities such as charging in alleys and the right-of-way, mandatory standards for EV supply equipment (EVSE) in new construction, and issues for disadvantaged and environmental justice communities.
- In November 2017, the City conducted an online survey of individuals who use City-owned charging infrastructure for input on EV motivators and incentives. The survey targeted participants in the City's EV Parking Program and others who charge at City garages. The City received completed surveys from 168 individuals. Survey findings indicate that the free or discounted parking passes available through the program play a role in spurring EV adoption: 36% of respondents said that the City's EV Parking Program was very influential on their decision to own or lease an EV, and they would not own or lease an EV without the program in place.

The final 2017 EV Strategy includes updates for public comment. Staff considered input and completed substantive updates to the plan. Key revisions include updated performance targets, additional attention to medium- and heavy-duty ZEV opportunities, more information on hydrogen fuel stations and FCEV opportunities, and a commitment to evaluate and recommend methods to facilitate EV charging in new development.

2 EV CONTEXT

Sacramento has been a long-standing leader in electrification. Electrification in the Sacramento region is a collaborative enterprise with other agency and community partners, with notable initiative from SMUD, a nationally-recognized leader in innovation and the adoption of electric transportation. Sacramento has implemented a range of initiatives to deploy EV programs and infrastructure. Recent public-private partnerships also provide a foundation for future efforts.

CITY'S PAST INITIATIVES

City ZEV efforts have focused primarily on parking incentives, infrastructure, and the City's fleet.

EV Parking Program

In 1994, the City Council adopted a policy that first established the City's EV Parking Program, providing free or discounted parking and charging to EV drivers. The original charging infrastructure supporting this effort was installed by SMUD in both the City Hall and Capitol parking garages. This was the City's first program to specifically encourage EVs. The City continues to operate the program, providing free or reduced-cost parking for 316 participants as of August 2017. Participants receive free parking until EV parking transactions exceed 5% of overall parking transactions in any one garage, at which point all EV program participants for that garage will be charged 50% of regular parking fees for the garage. To date, the EV Parking Program has served as the City's primary program to incentivize the use of EVs.

Infrastructure

The City currently owns and operates 91 chargers at City facilities, 78 of which are available for public or employee charging. EV charging is provided at no additional charge to all parking patrons, except for the pay-to-charge direct current (DC) fast charger at the Sacramento Valley Station owned and operated by SMUD. City-owned chargers comprise approximately 20% of all workplace and public charging available in city limits. In August 2017, the City released a

public interactive EV parking map application to identify charging options and parking information for the community.

City Fleet

AVERAGE COSTS FOR CITY FLEET OPERATIONS AND MAINTENANCE

Gasoline sedans:

- $0.062 per mile per vehicle
- $17,770 annually per vehicle

EV sedans:

- $0.030 per mile per vehicle
  51% reduction from gasoline sedans
- $6,550 annually per EV historically in the City fleet
  66% reduction from gasoline sedans

Since 2011, the City of Sacramento's fleet has been consistently recognized as one of the Top 40 green fleets in North America by the Government Green Fleet Awards Program. In 2013, Sacramento achieved recognition as the #1 Green Fleet through this program. First adopted in 2007, the City's Fleet Sustainability Policy established a procurement commitment for 30% of the City fleet to be powered by alternative fuels, without any specific requirement for ZEVs. As of late 2017, 49% of approximately 2,400 City vehicles run on alternative fuels. The City fleet currently has 12 ZEVs, including 10 BEVs and 2 FCEVs. These vehicles comprise just 1% of the City's light-duty vehicle fleet. The original charging infrastructure for the fleet was installed through American Recovery and Reinvestment Act (ARRA) era grants in cooperation with SMUD and other electric vehicle service providers, with recent additions completed by the City with the expansion of PHEVs and BEVs in the fleet. Recent ZEV acquisitions for the fleet include one of the nation's first battery-electric refuse trucks. The procurement of 31 Chevy Bolts is currently underway. While the City estimates that the upfront cost of the Bolts will be 64% more than a traditional gasoline-powered sedan, annual operations and maintenance costs will be 66% lower. This drastic reduction in upkeep costs leads the City to anticipate a return on investment for each Bolt to be realized in less than one year.

CURRENT INITIATIVES AND PARTNERSHIPS

The City's ZEV leadership is part of a broader electrification push with other agencies, community groups, and private partners.

Sacramento Area PEV Collaborative

Together with other partners, the City recently participated in developing the county-wide *Electric Vehicle Readiness and Infrastructure Plan* (2017). This effort was completed in June 2017 by the Sacramento Area Plug-in Electric Vehicle (PEV) Collaborative, a partnership of local and regional agencies and community partners working to improve EV-readiness and

increase accessibility to EV charging infrastructure in the region.[2] The primary focus of the plan was to identify the number and types of chargers to meet public needs while avoiding an excess of chargers. Sacramento County led this countywide planning effort in partnership with SACOG, with the intent of advancing coordinated countywide EV planning and implementation. The *Electric Vehicle Readiness and Infrastructure Plan*[3] serves as a foundation for the City's EV Strategy.

Our Community CarShare

In early 2017, SMAQMD launched the Our Community CarShare program. This inaugural effort is the state's first low-income ZEV car share program. The City is supporting the program with construction of two EV chargers dedicated for the program at the Sacramento Valley Station. Funded by the California Greenhouse Gas Reduction Fund and operated by Zipcar, 300 free memberships are available to residents of three affordable housing developments in Sacramento – Alder Grove, Edgewater, and Mutual Housing at Lemon Hill. Many residents at these locations do not own vehicles, and personal transportation can be a challenge. With the program, residents now have up to nine free hours weekly to use an all-electric Kia Soul. Mutual Housing is also developing a chauffeuring option for the program to increase ridership, which would allow residents who cannot drive to participate.

[2] As of September 2017, Sacramento Area PEV Collaborative members include the City of Sacramento, Sacramento County, Sacramento Metropolitan Air Quality Management District, Sacramento Municipal Utility District, the Sacramento Area Council of Governments, Sacramento Clean Cities Coalition, Sacramento EV Association, and Valley Vision.

[3] The *Electric Vehicle Readiness and Infrastructure Plan* is available on the City website, including a link to a GIS web-based map developed by SACOG that identifies the top 100 charging locations in the plan: www.cityofsacramento.org/ev.

EVgo High-Power Charging Plaza

On July 17, 2017, the Sacramento City Council approved an agreement with EVgo for the first curbside charging project for Sacramento. EVgo will install up to six 150-kilowatt (kW) high-power charging stations in the public right-of-way to serve curbside parking at Southside Park. This new generation of technology can provide up to 240-mile range in as few as 20 to 30 minutes. EVgo operates the largest public fast-charging network in the nation. Partnership with EVgo allows for installation of an innovative EV technology at no cost to the City. The chargers will be available as a paid service for drivers of EVs.

Through the pilot, the City is collaborating with EVgo to understand opportunities for curbside and high-power charging options. Supporting this innovative EV implementation enables the City to evaluate new types of charging applications. This approach is a first step to expanding permit processes to accommodate curbside charging city-wide.

Electrify America Green City Initiative

The City is undertaking a significant partnership with Volkswagen subsidiary Electrify America to expand ZEV access in the community. Electrify America has designated Sacramento as the first Green City in its ZEV Investment Plan.[4] Under this initiative, Electrify America will invest $44 million in Sacramento by 2020 to catalyze a transformational shift in mobility to zero-emission technologies by installing charging infrastructure, conducting outreach and education, and implementing programs designed to increase access to and use of ZEVs.

Electrify America's initial investment in Sacramento will be focused on the following activities:

- Construction and operation of a network of Level 2 chargers, DC fast chargers, and high-power charging, with a minimum of 75 chargers to be installed by mid-2019
- Launch of a new EV car share program
- Evaluation of opportunities for zero-emission delivery fleets and e-taxis
- Expanding access to ZEV technologies for disadvantaged and low-income communities

The City will work as a partner to streamline, support, and guide Electrify America’s investments. The City Council adopted Resolution 2017-0311 on August 2, 2017, directing staff to support Electrify America and ensure delivery of ZEV initiatives that are transformational for the community.

[4] The approved ZEV Investment Plan is available online: https://www.arb.ca.gov/msprog/vw_info/vsi/vw-zevinvest/vw-zevinvest.htm.

This unprecedented investment is part of Electrify America's ten-year, $800 million investment in California. This investment is required by a settlement agreement between Volkswagen, the United States Environmental Protection Agency, the United States Department of Justice, and the California Air Resources Board (CARB), after Volkswagen acknowledged installing "defeat devices" that allowed its diesel vehicles to cheat emissions tests and emit higher levels of emissions than allowed by US EPA and CARB. Electrify America is a wholly owned subsidiary of Volkswagen whose mission is to develop and implement its ZEV investments.

As Electrify America developed its proposed ZEV Investment Plan earlier this year, the City of Sacramento submitted a proposal to Electrify America for Green City investments. The proposal outlines the City's priorities for investment, including enhancing mobility options for low-income residents in disadvantaged communities, strengthening first-mile/last-mile connections to transit, workforce development and training, and establishing Sacramento as a hub for research and development in zero-emission technologies.[5]

[5] The City's Green City proposal is available online: http://www.cityofsacramento.org/Green-City.

Other Regional EV Programs and Efforts

Other partners implement an array of EV programs. Community education and ride-and-drive events to promote EVs are offered by SMUD, the Sacramento Clean Cities Coalition (SCCC), and Sac EV. SCCC, an affiliate of the Department of Energy's Clean Cities Program, prioritizes the reduction of petroleum use in transportation. SCCC facilitates the endeavors of public and private sectors to improve air quality in the region. The coalition promotes alternative fuel vehicles, national energy security, and regional EV planning efforts. SCCC also provides networking and partnership opportunities as well as access to EV funding and resources. SCCC hosts many technology showcases and workshops, including the Annual Northern California Clean Technology Forum and Equipment Expo. These efforts promote the advance of ZEV technologies in the region, and provide an opportunity to recognize and incentivize local ZEV leadership.

Sac EV is a non-profit organization that engages over 630 volunteers to perform critical EV outreach. In partnership with numerous organizations and agencies, Sac EV hosted 30 EV events in 2017 alone, holding over 7,500 conversations and providing approximately 640 test drives. These conversations and events help to increase the visibility of EVs and communicate EV benefits to the public. Sac EV also provides educational scholarships for automotive technology programs, partners with automotive dealerships to develop EV training material, and publishes articles on EV events and activities. The organization works closely with local and regional stakeholders to coordinate EV initiatives across the region.

Public agencies in the region have also collaborated to advanced the deployment of new ZEV tecnologies. In partnership with local school districts, SMAQMD obtained $7.5 million in Cap-and-Trade funds in 2016 for electric school buses. At the time of grant award, the project was the largest deployment of electric school buses in the United States. Funding is providing clean rides for students as well as demonstrating and accelerating the adoption of heavy-duty zero emission technologies. In total, the funding supported 29 zero-emission bus purchases, with three buses for the Sacramento City Unified School District, 16 buses for the Twin Rivers Unified School District, and 10 buses for the Elk Grove Unified School District. Routes for these buses operate primarily in disadvantaged communities. The first buses funded by this project went into service in 2017.

In another step towards clean transportation optons, the City is also participating in the regional launch of bike share with SACOG, Social Bicycles, and the cities of Davis and West Sacramento. Through this partnership, a new electric-assist JUMP bike share program will launch with 300 electric-assist bikes (e-bikes). The program is anticipated to launch in early 2018 as the largest electric-assist bike share system in North America.

Sacramento Municipal Utility District Programs

SMUD has had an active electric transportation program since 1990. The majority of early EV charging infrastructure in downtown Sacramento was installed by SMUD in the early 1990s and has been upgraded to provide service today. The City of Sacramento participated in two federal ARRA grants SMUD won with General Motors and Chrysler. Under these two grants, the City acquired fleet charging infrastructure, PHEVs, and participated in EV test demonstrations.

SMUD has also supported charging infrastructure and EV acquisition for other community organizations including CSUS, UC Davis, Los Rios Community College District, the County of Sacramento, City of Citrus Heights, City of Folsom, City of Elk Grove, City of Rancho Cordova, County Libraries, Sacramento International Airport, and the SCCC. SMUD was also instrumental in engaging other entities in regional EV-readiness planning through the receipt of ARRA grants. SMUD has deep organizational relationships with most of the major auto manufacturers and EV charging equipment suppliers. Currently, SMUD owns and operates a network of 6 DCFC stations in Sacramento County. Two of those stations are inside city limits at the Sacramento Valley Station and at the Sacramento Natural Food Cooperative.

In addition, SMUD has also supported other EV-related technologies for heavy-duty trucks, forklifts, and airport ground support equipment. Heavy-duty truck technologies include truck idle reduction infrastructure at the 49er Travel Plaza in Sacramento, and electric truck refrigeration unit infrastructure at two refrigerated warehouses in Sacramento.

As of late 2017, SMUD provides several incentives for EV buyers or those installing charging infrastructure. For EV buyers, SMUD offers free electricity for two years ($599 value) or a free residential charger. PEVs are eligible for the program, including both BEVs and PHEVs. EV owners can also participate in SMUD's new time-of-day rate, providing discounted electricity rates for charging between midnight and 6 a.m. Further, SMUD also offers incentives to spur EV infrastructure, including a $1,500 incentive for workplace and multi-family charging, and a $100,000 incentive to spur more DCFC in the region for qualified participants.

In addition, SMUD is expanding access to charge EVs with solar power. In mid-2017, the City joined SMUD's Commercial SolarShares program. As an alternative to installing costly photovoltaic (PV) cells on-site, SMUD has dedicated a 13-megawatt (MW) offsite solar array to the City. This installation will provide approximately 35% of all City electricity needs, providing

more than 28,700 MW-hours annually. This program is supplying power for the largest City accounts, including City Hall, parking garages, police stations, firehouses, community centers, and water treatment plants. Through SolarShares, EV patrons of City parking garages can now charge with electricity that is estimated to be 57% carbon free.

Envision Solar EV charging station, the EV ARC, at the 2017 SCCC Clean Technology Forum

3 EV ADOPTION AND FORECASTS

ADOPTION RATES

EVS IN SACRAMENTO

~**3,200 ZEVs** registered to residents of the City of Sacramento

~2% of Sacramento households have a PEV

Sacramento has been recognized as one of the leading metropolitan areas for EV promotion activities, yet EV adoption rates still lag behind other areas of the state and nation. For example, in an evaluation of the 50 most populous US metropolitan regions, the International Council on Clean Transportation ranked the Sacramento region as the fourth highest for its EV promotion actions (2017). Yet as of 2016, EVs comprise approximately just 2% of new vehicles in the Sacramento region, in comparison to regions such as San Jose, where EVs exceed 10% (Ibid).

Currently, Sacramento has approximately 430 public or workplace EV chargers in city limits. Sacramento has no hydrogen stations to support FCEVs in city limits. However, one hydrogen station is in operation in West Sacramento, with two additional stations anticipated in the region soon due to recent grant awards by the California Energy Commission. Data gathered in October 2017 from the Department of Motor Vehicles (DMV) indicates approximately 3,200

ZEVs registered in the City of Sacramento.[6] Of these 3,200 registered ZEVs, the State of California has issued approximately 2,000 rebates through the California Vehicle Rebate Project (CVRP), equivalent to about 65% of all ZEVs registered in the city.

FORECASTS

California Governor Jerry Brown has called for the increased adoption of ZEVs, issuing Executive Order B-16-2012 to establish a goal of 1.5 million ZEVs on California roads by 2025. Senate Bill (SB) 1275, the Charge Ahead California Initiative, also established incentives to increase the availability of ZEVs and near-zero-emission vehicles, with a focus on disadvantaged and low- and moderate-income communities.

At the City scale, analysis by SACOG indicates that the City should strive to support approximately 17,000 to 74,000 ZEVs by 2025 (2017). This level of growth assumes a significant increase in the estimated 3,200 EVs currently in city limits. The lower-growth scenario is based on SACOG's regression analysis of likely EV sales if no additional intervention is taken. Factors influencing the lower forecast include gas prices, the number of unique EV models anticipated to be available, and local EV stock available for sale. By comparison, the high-growth scenario reflects the trajectory to achieve the local share of the Governor's targets by 2025. The Governor's statewide targets are ambitious, indicating the need for more aggressive action that would exceed the rate of historical adoption observed to date.

The amount of public and workplace charging needed to support the forecasted range of local vehicles by 2025 is estimated at approximately 900 to 4,000 chargers in city limits alone. Based on SACOG's travel-demand model for future growth scenarios, SACOG anticipates that most top destinations where countywide charging needs will be the highest are in city limits. Many regional trips will continue to originate or end in Sacramento, resulting in high demand for charging infrastructure. As outlined in the Sacramento Area PEV Collaborative *EV Readiness and Infrastructure Plan* (2017), areas in Sacramento that are identified as priorities for future charging demand include locations in Downtown; at universities, colleges, and hospitals; and along highway and major roadway corridors.[7]

As a major employment destination with more than 20,000 businesses and 290,000 jobs, Sacramento will continue to function as a major backbone for regional charging needs. Chargers in Sacramento support commuters from around the region, enabling ZEV trips that provide air quality and climate benefits both to the city and to the entire region.

[6] Analysis of DMV data California Air Resources Board (CARB) staff (2017a). Further verification of data for ZEV registration data for the region is ongoing with agency partners.

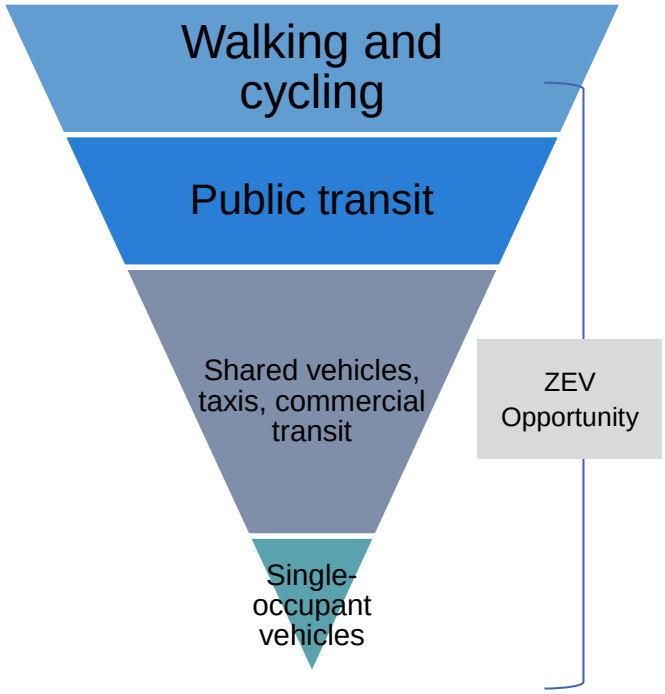
[7] The *Electric Vehicle Readiness and Infrastructure Plan* is available on the City website, including a link to a GIS web-based map developed by SACOG that identifies the top 100 charging locations in the plan: www.cityofsacramento.org/ev.

4 OPPORTUNITIES AND ISSUES

ROLE OF ZEVS IN THE TRANSPORTATION SYSTEM

The City's efforts to transition to ZEVs are one part of a multi-prong approach to improve the transportation system. According to the 2011-2015 American Communities Survey, approximately 73 percent of commuters in Sacramento drove alone to work. Attainment of the City's goals for transportation and mobility must be realized with reductions in the overall number of single-occupant trips. But for vehicle trips with no other viable alternative, the City is working to shift both shared and single-occupant trips into ZEV technologies.

Figure 1: Priorities for People Movement



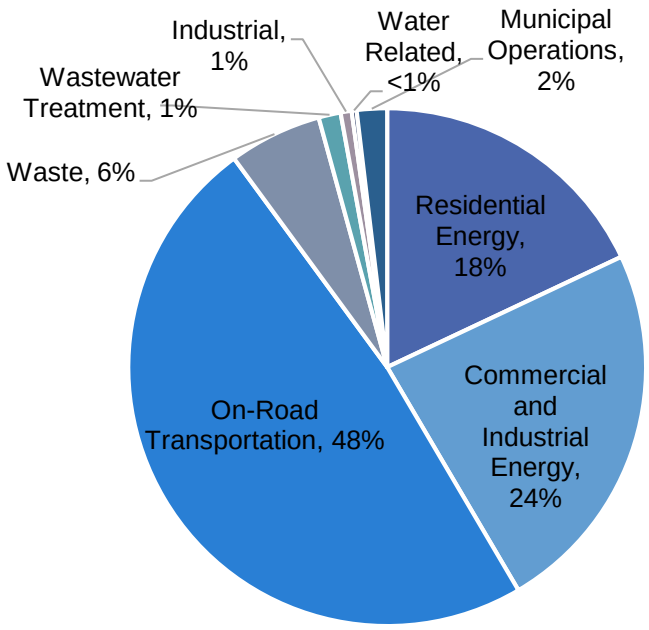
General Plan goals commit the City to reduce reliance on private automobiles and foster emerging transportation technologies and services to increase transportation efficiency. Active transportation, transit, and shared vehicle modes are priorities for a vibrant, efficient, and safe multi-modal system. The General Plan also calls for this multi-modal system to achieve reductions in vehicle miles travelled (VMT). ZEVs can play a key role, with potential to support not just single-occupant vehicles, but also shared vehicle applications and transit. Further, ZEVs hold potential for other types of trips on City streets, such as commercial delivery, and heavy-duty uses like freight.

Advances in electrification, shared-use vehicles, and vehicle automation are part of emerging transportation trends that the UC Davis Institute of Transportation Studies describes as the "Three Revolutions." Shared electric fleets present new opportunities to change the standard mobility paradigm away from personal vehicles to on-demand systems of shared, electric, and automated fleets (2017). This EV Strategy anticipates the potential opportunity of these revolutions for the transportation system. The City will further explore these topics through the development of a Transportation Technology strategy and the pending General Plan update, anticipated to launch in 2018.

ZEV BENEFITS

Advancing ZEVs while realizing the City's goals of reducing VMT offers a broad array of benefits to the community. Together, these strategies implement local goals while delivering measurable environmental, public health, and cost benefits. Widespread ZEV adoption is essential for attainment of state air quality and climate goals. The California Air Resources Board (CARB) also notes that such adoption is key for economic prosperity and energy security (2017).

Figure 2: Sacramento Community GHG Emissions, 2005



Source: City of Sacramento (2012)

Climate and Air Quality

Electrification of the transportation sector is an important strategy to achieve locally adopted climate targets. Climate goals in the General Plan commit to a 15 percent reduction below 2005 community-wide greenhouse gas (GHG) emission levels by 2020, and to strive towards a 49 percent and 83 percent reductions by 2035 and 2050, respectively. Transportation is the largest single contributor to Sacramento's GHG emissions, accounting for 48 percent of baseline GHG emissions. Electrification of this sector will reduce transportation emissions, while delivering other air quality and community benefits.

In addition to climate benefits, the expansion of clean transportation choices is also critical to improving air quality in California's most heavily impacted communities. Exhaust from vehicles creates pollution such as ozone and particulate matter. The impacts of high pollution levels are numerous, such as increased levels of cardiovascular and respiratory illness, damage to respiratory systems, and even shortened life spans.

The clean air benefits of ZEVs heighten the importance of ZEV adoption for the Sacramento region. The Sacramento metropolitan area is classified as a severe nonattainment area for federal ozone levels and a moderate nonattainment area for federal 24-hour PM-2.5 levels. The Sacramento metropolitan area is also a nonattainment area for state annual PM-10 levels.

The American Lung Association has designated the Sacramento-Roseville metropolitan area as the eighth most polluted area in America for ozone, and fourteenth most polluted for 24-hour particle pollution (2017). In a study of the ten U.S. states with ZEV sales programs, the American Lung Association estimates that each tank of gasoline used costs $18.42 in health and climate costs. Across the ten ZEV states, attainment of ZEV targets is anticipated to result in average household savings of $1,045 annually, with cost savings to Californians estimated at $13.5 billion by 2050 (2016). Yet beyond the economic benefits of clean air, transitioning to ZEVs reduces tailpipe emissions from vehicles and helps to deliver significant health benefits. These benefits can be most pronounced for vulnerable populations, including children and the elderly. Often the communities most impacted by poor air quality are those near major roadways and residents least able to afford reliable transportation options, let alone ZEV technologies.

Advancing ZEVs in Sacramento provides broad air quality benefit across the region. Charging infrastructure in Sacramento's downtown parking garages encourages EV commuting from outlying communities such as Roseville, just over 20 miles away. Supporting ZEV commuting from other neighboring communities will help alleviate some of the problems associated with the air quality along the corridor.

Cost Savings and Other Benefits

At the household level, BEVs can be cheaper to drive and maintain. According to the California PEV Collaborative, the cost of charging at home during off-peak hours is the equivalent of paying less than $1 for a gallon of gasoline (2017). In addition, electricity prices are also more stable than oil prices. Electricity comes from more predictable, trusted, and domestic sources of energy. Additionally, electricity rates in Sacramento are established by an elected Board of Directors at SMUD, a publicly owned municipal utility. These public officials are accountable to local voters. A recent customer survey by J.D. Power and Associates also finds SMUD to be among the most highly rated electric utilities in the country, achieving the highest scores for corporate citizenship and pricing. SMUD tied for the highest national score in a survey of business customers, and received the highest score of any California utility in a survey of residential customers (SMUD, 2016).

ZEVs offer the added benefit of lower maintenance costs. Both BEVs and FCEVs lack an internal combustion engine, not requiring oil changes or smog checks and with fewer moving parts. The U.S. Department of Energy reports that BEVs cost 28 percent less per mile for tires and maintenance than gasoline counterparts. While fueling options and cost savings differ for FCEVs, a common manufacturer incentive for vehicles such as the Toyota Mirai is the provision of free hydrogen refueling for the duration of the initial lease period.

Zero-emission technologies are also an emerging area of economic opportunity for the region. In 2016, the Sacramento Capital Region had approximately 700 jobs in advanced

transportation technology sectors (Valley Vision, 2016), representing 65 percent growth from 2011. As the capital of California, Sacramento sits at the confluence of both policy and transportation innovation, with the potential to serve as a test bed of highly visible transportation demonstrations that exemplify California's transportation evolution. Sacramento is poised to catalyze these industries. In 2016, Sacramento created the Innovation and Growth Fund to establish Sacramento as a hub of innovation, technology, and entrepreneurship. The fund encourages new types of investment, seeking to incentivize private sector initiatives. The City Council also adopted a Demonstration Partnerships Policy on April 25, 2017, which calls for the City to streamline partnerships and encourage innovative solutions for City services and community needs. These foundational steps establish a strong foundation to accelerate the local pace of innovation and job creation in alternative fuels.

ZEV ACCESS

Despite the opportunities associated with ZEVs, several barriers constrain the potential for advancement. To date, household income and wealth strongly predict early PEV sales (De Shazo et al, 2017). Low-income and multi-family households are especially challenged to take advantage of ZEV benefits. Public and home charging both play an important role to address these challenges, in addition to other types of ZEV fueling options.

Low-Income and Disadvantaged Communities

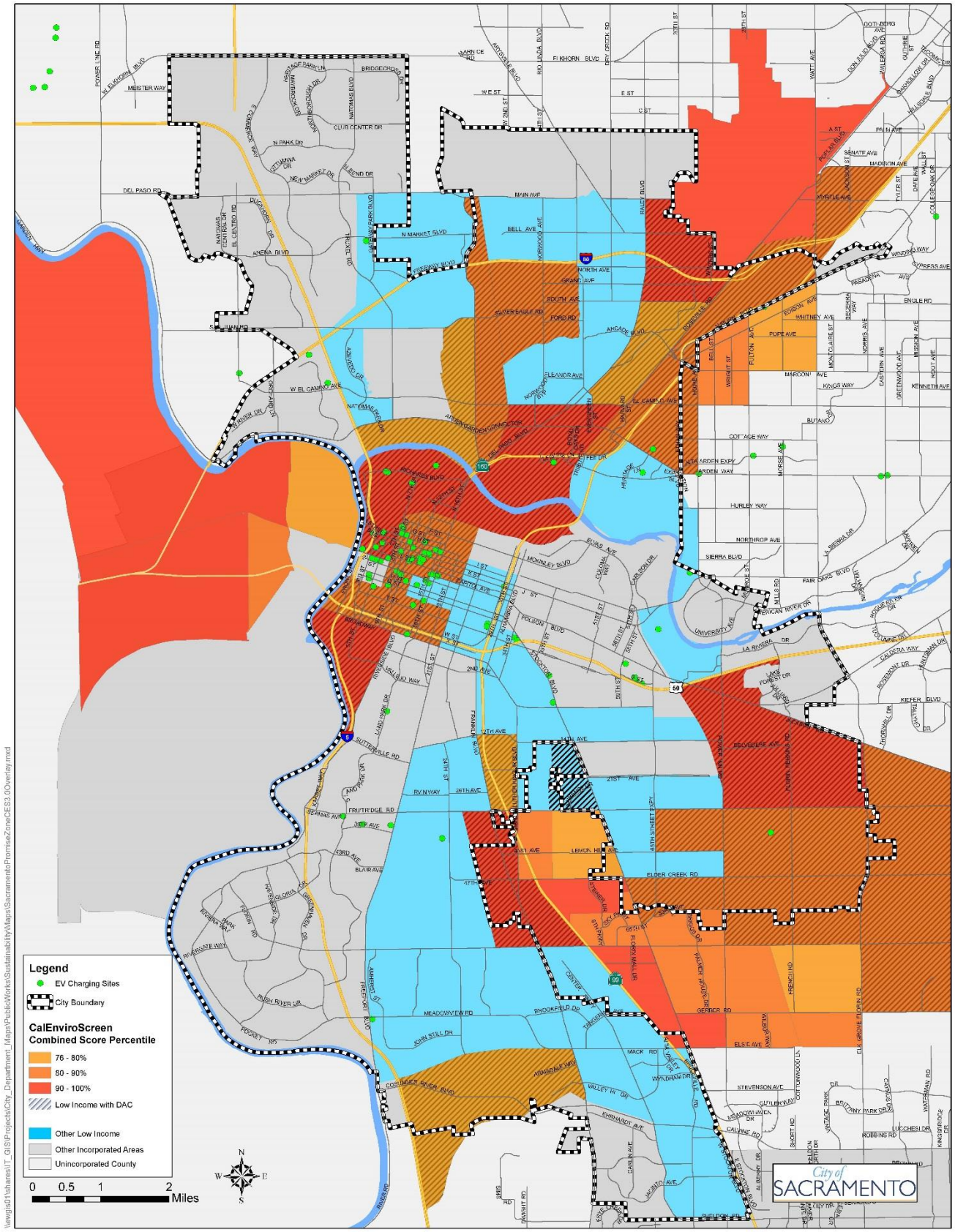
The barriers low-income residents face to accessing ZEV technologies are many. State agencies have been exploring these barriers and opportunities to overcome them pursuant to Senate Bill 350, the Clean Energy and Pollution Reduction Act of 2015. CARB has identified several primary barriers for low-income residents (2017b), including the following:

- Inability to afford higher upfront costs for advanced technologies,
- Absence of infrastructure in low-income communities,
- Lack of exposure to ZEV options and lower understanding of benefits, and
- Limited financing options.

Currently, access to ZEV technologies assumes access to capital and the ability to own and maintain a private vehicle. While state and local rebates are available to those who purchase a ZEV, these rebates require upfront investment by the consumer. Vouchers or some other financial incentive that offset upfront costs can help facilitate greater adoption. New efforts are also emerging to increase the availability of used EVs, which may provide more affordable clean transportation options.

The absence of charging infrastructure is also an obstacle to increasing access. Within Sacramento, charging infrastructure is heavily concentrated in the Downtown core and along major roadway corridors. Some of Sacramento's most disadvantaged communities lack charging options. **Figure 3** presents the location of existing chargers in Sacramento along with low-income areas and CalEnviro Screen 3.0 designations. The State of California developed CalEnviro Screen 3.0 rankings to identify disadvantaged communities that are disproportionately burdened by multiple sources of pollution and socioeconomic vulnerability. Within Sacramento, 36% of residents live in the top 25% of disadvantaged census tracts statewide. While many chargers in Sacramento are in census tracts that are designated as disadvantaged communities, most of these chargers are concentrated in Downtown and are not distributed throughout the community. Many chargers are concentrated at parking garages within Downtown. The remaining chargers are distributed at destinations such as the UC Davis Medical Center, Sacramento State University, the Arden Way corridor, and the City's South Area Corp Yard.

Figure 3: Public EV Chargers and Designations for Low-Income and Disadvantaged (DAC) Communities



Multi-Family Housing

Sacramento's housing stock also poses challenges to accelerated EV adoption. For example, charging EVs in multi-family units can present more challenges than charging in single-family homes. While state legislation has sought to remove many impediments to tenants installing chargers and granted tenants the right to request and install charging installations at the tenant's expense,[8] tenants may still face site-related challenges that prevent charger installation. Even if a site could accommodate an on-site charger, price of installation may be cost-prohibitive to tenants. Many tenants, particularly on the Downtown Grid, also lack access to dedicated off-street parking. When the absence of dedicated parking is combined with lack of awareness of public charging options, EVs are perceived as infeasible by a large portion of the population.

Infrastructure access for multi-family dwelling units is a key issue for Sacramento. Within the city, 38 percent of all housing units are multi-family, approximately 70,000 housing units. By 2020, the number of multi-family units is expected to increase by 26 percent to more than 90,000 dwelling units. Multi-family units are anticipated to comprise more than 40 percent of total dwelling units by 2020.[9] Installing charging infrastructure in new multi-family development during initial construction is a critical opportunity. While the 2016 California Green Building Standards Code (CalGreen) requires EV pre-wiring in new multi-family projects, the code does not require the installation of actual charging units. For projects with 17 units or more, EV-ready spots are required in three percent of the parking spaces. Yet the installation of additional turn-key charging infrastructure in new development has been found to pose minimal increase in the total cost of new construction, with sizeable savings compared to the costs of retrofitting for chargers after construction is complete.[10]

Another potential solution for multi-family housing is the expansion of concentrated ZEV fueling hubs. Opportunities include electric charging depots with fast charging infrastructure located near community amenities, where EV drivers could shop or conduct other activities while vehicles charge. Hydrogen fuel stations could also provide centralized ZEV infrastructure options for multi-family tenants who may not consider an EV due to limited charging infrastructure.

[8] Assembly Bill 2565, Rental property: electric vehicle charging stations.

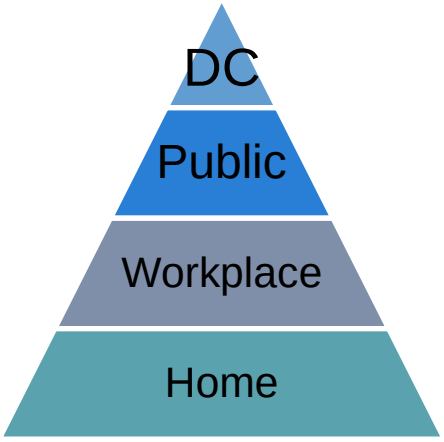
[9] Based on land use modeling for the City's 2035 General Plan. Existing housing unit data represents 2012 data. This inventory will soon be updated as part of the City's General Plan update, anticipated to launch in early 2019.

[10] Energy Solutions (November 17, 2016). *Plug-in Electric Vehicle Infrastructure Cost-Effectiveness Report for San Francisco.*

The Role of Public and Home Charging

Public and workplace charging infrastructure is essential to spur increased EV adoption, particularly for residents of multi-family dwelling units. Highly visible charging locations can increase visibility of ZEV options and dispel notions of "range anxiety." Yet public charging is not the only answer to spurring EV adoption. Many drivers have access to home-based charging options. Where feasible, home charging is generally cheaper and more convenient than public charging. Public and workplace charging are necessary for those who need a charge and those with no home charging option. Yet investments in public and DC fast charging can be expensive, and efforts to expand public and DC fast charging should be strategic and complement, rather than replace, home and workplace charging.

Figure 4: Hierarchy of Charging Needs



Based on observed frequency of use (Source: ITS)

Attaining a suitable balance of charging types is key to EV adoption. While it is estimated that many EV drivers do more than 80% of their charging at home (PlugInsights 2013), research done by ITS found that 38% of EV drivers who charge at their workplace are unable to charge at least once a week due to station congestion. The study found that EV drivers are using free workplace charging 4 times more often than necessary (Nicholas and Tal, 2013). An over-emphasis on public or free charging may lead to excessive public charging demand and incentivize drivers to disregard viable home charging options. This context may result in scarcity of public charging for those who need it.

The availability of public charging can be achieved by instituting a fee, or charge, to charge. According to ITS, implementing a fee for charging at workplace stations that were previously free would significantly lower the burden on workplace charging infrastructure. For example, ITS found that in the free scenario, 41 chargers would serve the demand of 100 vehicles. In a scenario where charging costs were double the price of charging at home, only 11 chargers would be needed per 100 vehicles. Accordingly, ITS notes that providers of free workplace chargers should expect to provide two to four times more chargers than would be necessary under a priced scenario (Ibid).

Reducing charging station congestion leaves infrastructure available to those who have no other charging options, including those without home charging and/or low-range BEV drivers. When home-charging is prioritized, public charging stations can become more accessible and support a greater number of EV drivers.

5 VISION AND GOALS

Sacramento has developed this strategy to advance the near-term deployment of ZEV initiatives. This plan establishes a vision of Sacramento serving as a “Green City,” the ZEV Capital of California, with a robust ZEV system that provides significant improvements in local air quality, mobility, and access. With an expansion of ZEVs, Sacramento is working to increase mobility and access for disadvantaged and low-income communities. This strategy outlines a path to distribute the benefits of ZEVs and increase opportunities for residents to access employment, housing, and services. The City seeks to foster this new technology while increasing the efficiency of each vehicle trip on the road, working to consolidate trips with more passengers in fewer vehicles. To this end, efforts to expand ZEVs will prioritize shared mobility opportunities, and ensure that ZEVs are working to fill the first-mile/last-mile gap to transit and improve the connectivity of areas underserved by transportation options. Further, Sacramento seeks to not just encourage ZEVs, but to also establish them as a highly visible cornerstone of the region’s mobility system. This will include innovative deployments, such as electrified charging hubs and demonstration projects. The deployment of ZEVs in the city will also support a growing industry for advanced transportation technologies. ZEV programs can spur local business and encourage new economic enterprises, delivering jobs to Sacramento’s workforce. Additionally, the City seeks to leverage ZEVs as part of a broader transportation

electrification push within the region, using ZEVs to maximize the benefits of energy storage, increase renewable power, and spur advanced vehicle-to-grid applications that optimize the grid. Implementation of this vision will require sustained partnership and increased levels of collaboration with public and private stakeholders, including new levels of engagement with community leaders on ZEV mobility issues.

This strategy establishes goals that define this vision, supported by a series of core performance targets and actions to achieve them. The City will maintain and update this strategy as a living document over time. Due to the rapidly evolving nature of ZEV technology and emerging opportunities, this strategy establishes near-term actions to advance the City's ZEV vision by 2020, and achieve full implementation by 2025. However, technologies are anticipated to evolve quickly. The City will collaborate with key partners over time to revisit actions and adjust goals as appropriate.

EV STRATEGY GOALS

1. Increase and accelerate ZEV use and adoption levels within the Sacramento region to achieve 75,000 ZEVs in Sacramento by 2025.
2. Establish Sacramento as a Green City, the ZEV Capital of California.
3. Advance the next generation of transformational and highly visible ZEV mobility applications and programs.
4. Increase the visibility and awareness of ZEVs as a viable transportation option.
5. Achieve equitable access to ZEV technologies and benefits by low-income populations and disadvantaged communities, including job training and employment opportunities.
6. Strengthen the local ecosystem of ZEV innovation and industry.
7. Advance an efficient distribution of residential and public charging infrastructure that is optimized for future technologies and demand.
8. Support financially-sustainable ZEV programs and ensure that any public spending on ZEVs or ZEV infrastructure balances charging demands, advances new technologies, or incentivizes ZEV rider trips.
9. Ensure that ZEV programs complement active transportation and transit modes.
10. Encourage shared ZEV options that reduce vehicle trips and the need for personal vehicle ownership.
11. Support the use of renewable energy and advanced energy technologies to help minimize impacts to the grid caused by vehicle electrification and support cost-effective infrastructure installations.

6 TARGETS AND ACTIONS

PERFORMANCE TARGETS

The City will measure progress towards ZEV goals based on several core performance targets. Targets represent full implementation of the City's EV Strategy, to be achieved by 2025. These have been developed in collaboration with local and regional partners, drawing on the early work of the Sacramento PEV Collaborative *Electric Vehicle Readiness and Infrastructure Plan* (2017). Regional data and forecasts were used to develop the city-specific goal of 75,000 ZEVs in Sacramento by 2025, equal to achieving ZEVs in approximately 35% of Sacramento's households. This adoption level is calculated as the local contribution needed to achieve the Governor's goal of 1.5 million ZEVs on California roads by 2025. Based on the local goal of 75,000 ZEVs, this Strategy provides additional performance targets that serve as benchmarks. These performance targets represent the anticipated indicators of successful ZEV adoption, and are supportive of the overall goal to attain 75,000 ZEVs by 2025. The City will use these performance targets to evaluate progress. Key performance targets are identified in **Table 1**. The City will strive to achieve these targets in collaboration with partners, stakeholders, and other agencies. Further, this Strategy recognizes that targets provide guidance but may be revised over time. The Strategy provides flexibility to accommodate future technological advances.

Table 1: Key Performance Indicators

Metric	Current	Target*	Data Source
Households with ZEVs[11]	2%	35%	DMV
Number of registered ZEVs	3,200	75,000	DMV
Annual sales to be ZEV	2%	40%	DMV, SMUD, ITS

**All targets for 2025.*

In addition to the key performance indicators listed in **Table 1**, the City will also track the additional supportive metrics shown in **Table 2**. Not all goals in this Strategy are readily quantifiable, and the City will continue to analyze targets and consider new data sources over time. Key issues the City will continue to evaluate include targets for medium- and heavy-duty ZEVs, measurement of ZEV access and awareness, and appropriate targets for disadvantaged and low-income ZEV programs.

[11] Assumes approximately 221,000 household in 2025, estimated based on the midpoint of available SACOG forecasts for 2020 and 2030. Household forecasts for the City will be revisited in the 2018 General Plan update.

Table 2: Supportive Performance Indicators

Action Category*	Metric	Current	Target**	Data Source
1. Community Charging and Infrastructure	Public or workplace chargers - L2s, DCFC, and high power[12]	430	3,800[13]	US DOE Alternative Fuels Data Center (AFDC), SACOG, SMUD
	DCFC (subset of total chargers above)	23	300	SMUD, US AFDC
2. Heavy Duty and New ZEV Applications	Hydrogen fuel stations in Sacramento	0	1	AFDC
4. City Facility Charging Infrastructure	Chargers or L1 ports at City facilities available for public or employee workplace charging	91	300	Facilities and Fleet Divisions
	EV Parking Program participants	355	800	Parking Division
5. Fleets	Annual City fleet light-duty replacements to be ZEV	12%	50% by 2018, 75% by 2020	Fleet Division
	Private employers or fleets to complete a ZEV commitment	0	50	SMAQMD, Sacramento Clean Cities Coalition
6. Economic Development and Innovation	Advanced transportation jobs	770	2,300	Valley Vision, Business Database
	OEM or transportation company partnerships for ZEV deployments	2	5	City
7. Programs, Partnerships, and Engagement	Annual test drives	640	3,200	SMUD, Sac EV Association, Electrify America, ITS
	Annual events	30	52	

**Includes relevant action categories with citywide metrics for tracking. Not all action categories are addressed in this Table. Refer to Table 4 for all action categories.*

***All targets are for 2025, unless otherwise noted.*

[12] Only captures L2s, DCFC, and high power, due to data limitations for tracking L1 chargers. L1 chargers are also encouraged by the Strategy and will be tracked to the extent feasible.

[13] Based on a target of approximately one public EV charger for every 20 EVs. This target assumes ongoing improvements in vehicle range and an emphasis on home charging options, reducing the need for public L2, DCFC, and high-power charging infrastructure. Current industry standards typically assume three chargers are necessary for each EV on the road, with only 20% of this charging occurring at public or workplace destinations.

ACTIONS

The following pages present the City's implementation actions to initiate by 2020 and achieve full implementation by 2025. These include both new actions to be initiated, or actions already underway. While the City will serve as a lead for many actions, implementation will continue to be a highly collaborative effort. Successful attainment of the Strategy's goals will require ongoing partnership with other agencies, community-based organizations, non-profits, businesses, and industry. This EV Strategy establishes a path to guide the City's ongoing efforts with these partners to achieve the City's ZEV goals.

Lead Departments and Entities

Implementation actions on the following pages identify actions and responsible entities. This includes both actions led by the City, and actions implemented by other entities but supported by the City. While many of the actions identified in this Strategy will be City-led, numerous actions will involve the City in a secondary or supportive role. **Table 3** presents abbreviations for lead and supporting entities, while **Table 4** presents implementation actions. Within **Table 4**, the anticipated lead entity is identified in bold text. The primary City department or division is listed first, followed by other entities or organizations in the order of anticipated involvement.

Table 3: Abbreviations for Implementation Actions

City department and division abbreviations	CCS – Convention and Cultural Services CDD-Planning – Community Development Department, Planning Division CDD-Building – Community Development Department, Building Division CMO – City Manager's Office DPW – Department of Public Works DPW-Parking – Department of Public Works, Parking Division DPW-SM – Department of Public Works, Sustainability Manager DPW-Fleet – Department of Public Works, Fleet Division OIED –Office of Innovation and Economic Development
Other agency and partner abbreviations	ATOS - Autonomous Open Standards Lab CSUS – California State University, Sacramento ITS – Institute of Transportation Studies, UC Davis RT – Regional Transit Sac County – Sacramento County Sac EV – Sacramento EV Association Sac PEV Collaborative – Sacramento Area PEV Collaborative SCCC – Sacramento Clean Cities Coalition SMUD – Sacramento Municipal Utility District SMAQMD – Sacramento Metropolitan Air Quality Management District VV – Valley Vision

Table 4: Implementation Actions

1 Community Charging and Infrastructure		
1.1 Encourage installation of chargers in existing private development.		
No.	Action	Lead
1.1.1	Support the co-location of EV charging infrastructure at existing community amenities, and encourage these as additions to existing parking areas.	**DPW**, CDD-Planning, DPW-Fleet, SMUD
1.1.2	Streamline the planning review process for installation of EV chargers in existing parking lots with mechanisms such as the Administrative Parking Permit process, which allows applicants to avoid the site and plan review entitlement process for installation of EV charging in existing parking lots. *	**CDD-Planning**
1.1.3	Maintain brochures, handouts, and other resources at City permitting counters and on the City website for installation of home and workplace EV charging. *	**CDD-Building**, DPW
1.1.4	Continue to provide 24-hour permit review for single-family residential EVSE applications and five-day permit review for commercial and multi-family EVSE applications, including DCFC, * and update City forms and review cycles to formalize this.	**CDD-Building**
1.1.5	Allow for paper or electronic plan check for EVSE applications.	**CDD-Building**
1.1.6	When approved EVSE construction projects submit a request for inspections, continue to provide inspections within a 24-hour period. *	**CDD-Building**
1.1.7	Explore incentives and develop an educational program in coordination with Sacramento County and other jurisdictions to encourage installation of EV charging citywide in existing development through the plan and permit review process.	**DPW-SM**, CDD-Planning, Sac PEV Collaborative, SMUD

**Already initiated or underway.*

1.2 Facilitate installation of EV charging in new private development.		
1.2.1	Evaluate options to advance EV charging in new development projects citywide, such as mandatory standards, incentives, and educational programs; and provide a recommendation to City Council.	**DPW-SM**, CDD-Planning, SMUD
1.2.2	Develop materials on EVSE resources to share in pre-application meetings for planning entitlements and parking plans, to encourage the installation of EVs in new development.	**DPW-SM**, CDD-Planning, Sac PEV Collaborative, SMUD
1.3 Foster new types of ZEV charging uses.		
1.3.1	Identify opportunities to encourage the conversion of conventional fueling stations to include ZEV charging hubs, and explore methods to encourage installation of EV chargers at existing gas stations.	**DPW-SM**, CDD-Planning, Sac PEV Collaborative, SMUD
1.3.2	Encourage the integration of ZEV infrastructure and ZEV car sharing programs at multi-modal mobility hubs and transit-oriented development centers through the development review process and engagement with property owners and developers. *	**DPW-SM**, RT, CDD-Planning, SMUD
1.3.3	Amend the planning and development code to define a separate land use for EV charging stations when EVSE serves as the primary land use, to support greater distribution and potential streamlining of EV charging hubs beyond existing code requirements for gas stations.	**CDD-Planning**
1.3.4	Support and evaluate implementation of Sacramento's first high-speed charging plaza at Southside Park, developed in partnership with EVgo. *	**DPW**, Sac PEV Collaborative, SMUD
1.3.5	Continue to use the City's Demonstration Partnerships Policy to encourage public-private partnership for the expansion of public charging and ZEV infrastructure, including high-power charging technologies. *	**DPW**, SMUD
1.3.6	Identify priority areas for the co-location of ZEV infrastructure that supports both light-duty and heavy-duty vehicles. *	**CDD**, **DPW**, SMAQMD, SMUD

**Already initiated or underway.*

1.4 Prioritize public charging for those without other charging options, and encourage charging turnover and at-home charging by users when feasible.		
1.4.1	Amend City Code to allow for designation and enforcement of on-street parking spots for EVs, including assignment of a curb color or striping policy and appropriate signage.	**DPW-Parking**
1.4.2	Provide permit guidance to allow private installations of charging infrastructure in the right-of-way, with priority for applications that serve multi-family or workplace charging, or support EV car share or similar shared mobility programs. Any charging infrastructure in the right-of-way shall use non-proprietary connectors, and DCFC shall support both Combined Charging System (CCS) and CHAdeMO charging standards. *	**DPW**, SMUD
1.4.3	Site charging infrastructure in the right-of-way and at City facilities to avoid conflicts with non-vehicular modes. The installation of new infrastructure shall be prohibited where charging infrastructure would pose a direct conflict with existing or planned bicycle, pedestrian, or public transit infrastructure improvements.	**DPW**
1.4.4	Encourage turnover for any new public charging infrastructure at City facilities or in the right-of-way by phasing in requirements that charging be provided as a paid service, except for installations designed to primarily serve low-income or disadvantaged communities.	**DPW**
1.4.5	Evaluate the feasibility of allowing alley encroachments for provision of dedicated EV charging spaces.	**DPW**

**Already initiated or underway.*

2 Heavy-Duty and New ZEV Applications

2.1 Promote ZEV technologies for medium- and heavy-duty vehicles.

No.	Action	Lead
2.1.1	Analyze truck routes and concentration of freight activity in Sacramento, and explore opportunities for ZEV freight applications in Sacramento that serve both regional and interstate operations. *	**DPW**, SMAQMD, SMUD, Sac PEV Collaborative
2.1.2	Support partner efforts to transition bus fleets to ZEV models.[14]	DPW, **SMAQMD**, Sac PEV Collaborative

[14] See Action 5.2.2, which addresses RT and local school district bus fleets.

2.1 Promote ZEV technologies for medium- and heavy-duty vehicles. ***(Continued)***		
2.1.3	Collaborate with RT and other fleet providers for the co-location of EV charging at central sites that can support multiple transit and medium- and heavy-duty fleets.	DPW, **RT**, Sac PEV Collaborative
2.1.4	Advance the visibility and awareness of medium- and heavy-duty vehicle technologies through strategies such as events, fleet recognition programs, and other partnership efforts. *	DPW-SM, **Sac PEV Collaborative, SCC**, SMUD
2.1.5	Partner with other agencies to identify and support grant opportunities for demonstration medium- and heavy-duty ZEV projects.	DPW-SM, **SMAQMD**, Sac PEV Collaborative, SMUD
2.1.6	Encourage off-road ZEV applications at major public facilities, such as airports, corporation yards, and freight centers.[15]	DPW-SM, **SMAQMD**, Sac PEV Collaborative, SMUD
2.2 Advance other types of ZEV technologies.		
2.2.1	Collaborate with partners for development of an electric aircraft program at Sacramento airports, starting with small personal aircraft, to install charging infrastructure and replace aircrafts with internal combustion engines with all-electric models.	**SMAQMD**, Sac County, Calstart, DPW, McClellan Jet Services/McClellan Business Park, Executive Airport
2.2.2	Advocate for deployment of new ZEV services that provide first-mile/last-mile connections and support active transportation and transit ridership. *	DPW, **RT**
2.2.3	Identify priority locations and opportunities to develop integrated multi-modal mobility hubs that include ZEV infrastructure.	**DPW**, CDD-Planning. RT. SACOG, **SMUD**
2.2.4	Participate in regional efforts for ZEV fuel infrastructure planning, including the siting of hydrogen infrastructure. *	**SMAQMD**, Sac PEV Collaborative, DPW

**Already initiated or underway.*

[15] Refer to Actions 5.2.9 and 5.2.10, which support County Airport System electrification efforts. Action 5.1.2 addresses ZEV replacements for the City fleet, including off-road equipment.

2.2. Advance other types of ZEV technologies. *(Continued)*		
2.2.5	Support third-party initiatives to develop hydrogen fueling infrastructure in Sacramento, including encouragement of grant applications and support for permit review.	**DPW,** CDD-Planning, CDD-Building, SMAQMD, Sac PEV Collaborative
2.2.6	Encourage any private installations of charging infrastructure in the right-of-way to evaluate potential to support electric-assist bike charging for the regional bike share program.	**DPW,** SACOG

3 Electrify America Green City Initiative

3.1 Support Electrify America Green City initiatives.

No.	Action	Lead
3.1.1	Collaborate with Electrify America to support the development and implementation of Green City initiatives and California ZEV investments. *	**DPW**, DPW- CDD-Building, CDD-Planning, OIED, CDD-Planning
3.1.2	Facilitate engagement of key partners, stakeholders, and the public for Green City program development and implementation. *	**DPW**, County, SMAQMD, SMUD, SACOG, Sac EV
3.1.3	Use existing City processes to streamline planning and building applications for Green City implementation, including five-day building permit review for commercial EVSE applications. * [16]	**CDD-Building**, CDD-Planning, DPW
3.1.4	Support Electrify America efforts to secure site access agreements with private and public property owners for EV charging installations. *	**DPW**, CDD-Planning
3.1.5	Enable the testing of new car share models with Electrify America, expedite ordinance updates necessary to enable new car share models, and support program launch prior to updates to the citywide car share framework.	**DPW**, SMUD
3.1.6	Support deployment of highly visible ZEV installations, such as an all-electric boulevard serving as a concentrated DCFC EV charging destination.	**DPW**, CDD-Planning, SMUD

**Already initiated or underway.*

[16] Refer to Action 1.1.4, similarly calling for five-day building permit review for all other providers.

3.1 Support Electrify America Green City initiatives. ***(Continued)***		
3.1.7	Leverage City investment in public infrastructure and assets to support Green City initiatives to the extent feasible, such as the testing of intelligent transportation system controls in key project corridors.	**DPW**
3.1.8	Connect Electrify America to opportunities for site access in new and existing development, including the hosting of open houses, and provision of program information in pre-application meetings with applicants. *	**DPW**, CDD-Planning
3.2 Maximize local and regional benefits of Green City initiatives.		
3.2.1	Collaborate with Electrify America to advance investment benefits for Sacramento's diverse communities, with a focus on disadvantaged and low-income communities. *	**DPW**, OIED
3.2.2	Encourage Electrify America's outreach efforts to include local community-based organizations, youth curriculum and programs, and ZEV-workforce training. *	**DPW**, OIED
3.2.3	Leverage Green City programs to attract further investment and partnership opportunities to develop a local research and development center for zero-emission technologies, and establish Sacramento as a test bed for innovative ideas to advance the clean economy. *	**OIED**, SMUD, CSUS, ITS, Sacramento ATOS, Greater Sacramento Economic Council
3.2.4	Work with partners to implement complementary ZEV business efforts, such as workforce development programs, local business support services, and expansion of a competitive, creative economy.	**OIED**
3.2.5	Explore how Electrify America's initiatives can support social services and other community programs, and encourage Electrify America to provide public education and information on the benefits of owning and driving an electric vehicle.	**DPW**, CMO, Sac PEV Collaborative, SCCC, Sac EV

**Already initiated or underway.*

4 City Facility Charging Infrastructure		
4.1 Support public and employee charging at City facilities.		
No.	Action	Lead
4.1.1	Continue to provide and maintain charging for public use at City facilities with public parking, such as parking facilities, community centers, and facilities with public service counters. *	**DPW**, SMUD
4.1.2	Pursue grant funding to upgrade charging infrastructure at City parking garages to allow for submetering of charging activity, improve remote management capabilities, and increase charging options.	**DPW**, SMUD, SACOG
4.1.3	Participate in California's Low Carbon Fuel Standard Program upon upgrades to City charging infrastructure, for the sale of credits and reinvestment of funds into City EV charging initiatives.	**DPW**
4.1.4	Prioritize development of any public or workplace chargers at City facilities that meet at least one of the following criteria: – Location in a disadvantaged community – Multi-use/ mixed-use facilities, with public access	**DPW**, SMUD
4.2 Improve availability and utilization of chargers at City parking facilities.		
4.2.1	Require all new or renovated City-owned buildings to provide chargers at all mandatory EV-ready spots required by CalGreen, and require the provision of additional EV-ready spaces pursuant to CalGreen Tier 2 standards for electric vehicle charging.	**DPW**
4.2.2	Develop a phased approach to update the City's EV Parking Program to increase charging access, encourage other types of ZEVs, encourage at-home charging by patrons when feasible, and ensure the availability of chargers for broad use. *	**DPW**
4.2.3	Evaluate technology options to increase charging turnover and access at City garages, such as managed charging systems, technologies to allow for driver queuing, and fees for cars that charge beyond posted time limits. *	**DPW**
4.2.4	Develop a workplace charging program to expand charging access for employees at City facilities and encourage those converting from internal combustion engines.	**DPW**

**Already initiated or underway.*

4.2 Improve availability and utilization of chargers at City parking facilities. *(Continued)*		
4.2.5	Obtain real-time EV charging data for City parking applications with new technology applications and integrate into the City's Parking Mobile system, upon upgrades to City charging infrastructure.	**DPW**
4.2.6	Identify suitable locations for cost-effective low-power charging solutions conducive to longer dwell times at City facilities, such as L1 charging.	**DPW**
4.2.7	Locate new charging installed at City parking facilities to serve multiple vehicles simultaneously and avoid conflicts with non-PEV parking.	**DPW**
4.2.8	Include installation of 240-volt electrical outlets or conduit for future charging stations when conducting renovations or new construction at City facilities within or adjacent to parking areas.	**DPW**
4.2.9	Encourage installation of electric ports for workplace L1 in new construction or renovations, and allow for Level 1 charging at City facilities by City fleet and employee vehicles.	**DPW**
4.2.10	Locate charger installations that serve the City fleet to allow for daytime public charging and nighttime fleet charging, when feasible.	**DPW**

5 Fleets

5.1 Increase ZEVs in the City fleet.

No.	Action	Lead
5.1.1	Amend the City's Fleet Policy to require a minimum of 50% of annual light-duty vehicle purchases be ZEV by 2018, and 75% of annual light-duty purchases by 2020. *	**DPW-Fleet**
5.1.2	Procure ZEV vehicles for any vehicle replacement when suitable ZEV options are available with equivalent operational capability; but allow for an exemption process for vehicle users based on criteria such as emergency response performance, charging challenges, and other operational issues. *	**DPW-Fleet**
5.1.3	Increase the overall fleet target for alternative vehicle procurement from 30% to 50% across all vehicle classes, inclusive of electricity use. *	**DPW-Fleet**

**Already initiated or underway.*

5.1 Increase ZEVs in the City fleet. *(Continued)*		
5.1.4	Test and evaluate new ZEV options as they become available for all vehicle categories, including heavy duty, and share metrics and performance outcomes with the public and partner agencies. *	**DPW-Fleet**
5.1.5	Continue to establish a process to budget for EV infrastructure costs as part of annual EV replacements. *	**DPW**
5.1.6	Continue participation in joint agency procurements for discounted EV models. *	**DPW-Fleet**
5.1.7	Develop a system to monitor billing and electricity use for each ZEV in the City's fleet, to allow for tracking, allocating, and reporting of costs and benefits.	**DPW-Fleet**, DPW-SM
5.1.8	Support establishment of public-private partnerships to enable City staff to use cost-effective private ZEV mobility options to augment City fleet and employee transportation needs, such as car share programs for motor pool functions.[17]	**DPW-Fleet**, DPW-SM
5.2 Support electrification of public and private fleets.		
5.2.1	Participate in grant efforts with other agency partners to electrify public or private fleets.[18] *	DPW
5.2.2	Encourage RT and local school districts to accelerate the transition of bus fleets to ZEV models.	DPW, RT, **SMAQMD**, Sac PEV Collaborative, SMUD
5.2.3	Identify opportunities for co-location of high-power charging infrastructure to serve RT and other fleet needs.	DPW, **SMAQMD**, RT, SMUD, Sac PEV Collaborative
5.2.4	Collaborate with RT to encourage the development of EV charging and ZEV car share sites at RT park-and-ride lots and light rail stations.	DPW, **RT**, SMUD, Sac PEV Collaborative

**Already initiated or underway.*

[17] Refer to actions in category 2, Heavy-Duty and New ZEV Applications, for additional strategies on ZEV medium- and heavy-duty vehicle advancement.
[18] Refer to Action 2.1.4, which provides further support for medium- and heavy-duty technologies.

5.2 Support electrification of public and private fleets. *(Continued)*		
5.2.5	Collaborate with SMAQMD and the Sacramento Clean Cities Coalition to promote ZEV incentives and rebates to members of chambers of commerce, business associations, and business improvement districts for acquisition of ZEV fleets, and explore creation of an ZEV-designation pledge for employers taking practical steps to increase use of ZEVs. *	DPW, OIED, SMAQMD, SCCC, **Sac PEV Collaborative**, Sac EV, SMUD
5.2.6	Educate businesses about financing options for EV charger installations, such as the CalCAP Electric Vehicle Charging Station Program, or property assessed clean energy financing.	DPW, **Sac PEV Collaborative**, Sac EV, SMUD
5.2.7	Collaborate for advancement of a local program to transition medium- and heavy-duty delivery fleets to ZEV models.[19]	DPW, **SMAQMD**, Sac PEV Collaborative, Sac EV
5.2.8	Support the launch of new types of shared use shuttles and high-occupancy mobility services with ZEV models, such as on-demand electric shuttle programs.	**DPW, RT**, Sac PEV Collaborative
5.2.9	Support the County Airport System in its efforts to expand electric shuttle bus fleet from terminals to parking lots, in support of shuttle electrification targets proposed by CARB by 2031.	Sac County Airports, SMAQMD, SMUD, City DPW
5.2.10	Support efforts by the County Airport System to increase use of renewable diesel by ground service equipment (GSE) and expand to electric GSE as technology for applications such as medium- and heavy-duty tractors, street sweepers, and gang mowers, become available.	Sac County Airports, SMAQMD, City DPW
5.2.11	Engage with car rental companies to provide ZEVs as part of the available car rental fleet, including County Airports.	Sac County, BERC, SMAQMD, City DPW
5.2.12	Support the State of California, as the City's largest employer, in efforts to increase its ZEV fleet.	DPW, State of California

**Already initiated or underway.*

[19] Refer to Action 2.1.5, which addresses grant efforts for medium- and heavy-duty vehicle demonstration.

6 Economic Development and Innovation

6.1 Support a vibrant ZEV transportation industry and establish Sacramento as an economic center for advanced transportation technologies.

No.	Action	Lead
6.1.1	Target a certain portion of the City's funds for local competitive economic development grants to advanced transportation technology enterprises.	**OIED**
6.1.2	Collaborate with local partners, dealers, and OEMs to analyze local barriers to ZEV adoption and advance ZEV sales. *	OIED, DPW-SM, **Sac PEV Collaborative**, Sac EV, ITS, SMUD
6.1.3	Pursue partnerships with OEMs to advance ZEV deployment that provide for collaborative learning, increased ZEV service, workforce training and jobs creation, and community investment. *	OIED, DPW-SM, **Sac PEV Collaborative,** VV
6.1.4	Partner with other agencies, OEMs, and ZEV mobility companies such as Electrify America to showcase ZEV technologies at public events, or for display at City-owned or other public facilities.	DPW-SM, OIED, **Sacramento Area PEV Collaborative**, Sac EV, SCC, VV
6.1.5	Secure sponsorship and funding to develop a showcase or research and development center for electrification and advanced transportation technologies.	**OIED,** ITS, SMUD, CSUS, UC Davis
6.2 Expand the ZEV workforce.		
6.2.1	Encourage and support efforts to recruit ZEV manufacturers to the region.	**OIED,** VV, Sac PEV Collaborative, SMUD
6.2.2	Collaborate with local universities and colleges to strengthen career pathways in Sacramento for the ZEV industry. *	**OIED**, DPW-SM, ITS, CSUS
6.2.3	Explore developing a youth ZEV ambassadors initiative or educational program, with opportunity to use the Summer at City Hall internship program.	OIED, **DPW-SM,** Sac PEV Collaborative

**Already initiated or underway.*

6.2 Expand the ZEV workforce. *(Continued)*		
6.2.4	Promote and encourage efforts to expand local ZEV workforce training programs, such as supporting efforts of the American River College Alternative Fuels Certificate and Electronic Systems Technology Programs, and Green Tech youth workforce training programs.	OIED, DPW-SM**, Sac Area PEV Collaborative**, VV, SMUD
6.2.5	Support partner efforts to develop a ZEV service center in Sacramento, to service new ZEV models and provide the necessary technical support for fleet purchasers and small manufacturers using new ZEV technologies.	OIED, DPW-SM, **Calstart**, Sac PEV Collaborative
6.2.6	Encourage local hire for private installation of EV chargers in the public right-of-way by providing such applications with incentives, such as priority for desired charging locations.	**DPW**
6.3 Spur local ZEV innovation and enterprise.		
6.3.1	Encourage regional autonomous vehicle efforts to prioritize pilots for autonomous vehicles that are zero-emission and shared.	**OIED**, SMUD, ATOS
6.3.2	Consider future charging needs of autonomous, shared, and electric vehicles when evaluating investments in ZEV charging infrastructure.	OIED, **DPW-SM**, ITS, SMUD
6.3.3	Identify potential locations for fast charging depots and hubs for autonomous, shared, electric vehicles.	OIED, **ATOS**, DPW-SM, ITS, SMUD, Sac PEV Collaborative
6.3.4	Collaborate with SMUD, UC Davis, and Sacramento State University (CSUS) to investigate and pilot the viability of managed charging or vehicle-to-grid technologies to mitigate grid impacts and/or support the integration of more renewable electricity into the grid.	DPW-SM, **SMUD**, OIED, ITS, CSUS
6.3.5.	Encourage the deployment of integrated solar photovoltaics and energy storage with ZEV infrastructure, and utilize the same infrastructure where opportunities for e-bike share exist.	**DPW,** SMUD, SMAQMD, SACOG
6.3.6	Explore opportunities for grid-optimized charging to manage grid impacts and maximize economic benefits of ZEVs.	DPW, **SMUD**
6.3.7	Support SMAQMD efforts to conduct regional ZEV infrastructure planning, and identify opportunities to establish infrastructure for hydrogen infrastructure, and other next-generation ZEV technologies.	DPW-SM, **SMAQMD,** Sac PEV Collaborative, SACOG, SMUD, SACOG

6.3 Spur local ZEV innovation and enterprise. *(Continued)*		
6.3.8	Allow for the testing of new ZEV car share models and on-demand shuttle services on a pilot basis.	DPW

7 Programs, Partnerships, and Engagement

No.	Action	Lead
7.1 Integrate ZEV requirements and incentives into local programs.		
7.1.1	Include the provision of EV charging for car share as a transportation demand management strategy.	**DPW**
7.1.2	Encourage a minimum target for local hire and employment of residents within Sacramento's disadvantaged communities in partnerships for the delivery of ZEV services.	**DPW**, OIED
7.1.3	Provide parking incentives to ZEVs, such as business merchant permits for preferential ZEV parking.	**DPW-Parking**
7.2 Collaborate with local agencies and partners to monitor and promote local ZEV deployment.		
7.2.1	Continue to participate in the Sacramento Area PEV Collaborative for joint planning and coordination of EV efforts with other agencies, non-profits, and community-based organizations. *	**DPW**, **Sac PEV Collaborative**
7.2.2	Collaborate with ZEV companies and partners for development of engagement and partnership programs to expand public awareness and education in order to increase public understanding of ZEV feasibility and benefits, with programs that involve local groups, community and business organizations, neighborhood associations, and other stakeholders.	DPW, OIED, **Sac PEV Collaborative**, SMUD, Sac EV
7.2.4	Encourage partner and community-based efforts for ride-and-drive events, ZEV showcases, and other ZEV educational initiatives. *	DPW, **Sac PEV Collaborative, Sac EV, SCCC**, OIED, SMUD
7.2.5	Collaborate with local partners to develop a discounted group-buy or leasing program for used EVs, such as the Sonoma Clean Power Drive-Evergreen EV Incentive Program.	DPW, **Sac PEV Collaborative**, Sac EV, SMAQMD, SMUD

**Already initiated or underway.*

7.2 Collaborate with local agencies and partners to monitor and advance local ZEV deployment. *(Continued)*		
7.2.6	Support efforts by the National Center for Sustainable Transportation and ITS, UC Davis to conduct a baseline EV study and develop a comprehensive database to track data over time on EV usage, sales, and consumer perceptions in the region. *	DPW, **ITS**
7.2.7	Engage UC Davis, CSUS, and other research partners to collaborate for evaluation of EV penetration, deployment of pilots, and shared learning activities.	**DPW**, ITS, CSUS
7.2.8	Work with local partners and auto dealerships to identify appropriate methods to increase sales of ZEVs, such as incentives, dealer training, and increasing ZEV inventory. *	**SMUD**, DPW-SM, OIED, SMAQMD, **Sac PEV Collaborative**
7.2.9	Require that all providers of charging in the right-of-way provide "charging event" data for each EV charging station on a regular basis, and provide application programming interface to the City of Sacramento and any other applicable web or app platform of the City of Sacramento's choosing.	**DPW**
7.2.10	Encourage all publicly accessible EV chargers and ZEV fueling locations to accept multiple payment methods.	**DPW-SM**
7.3 Increase the visibility and awareness of ZEVs throughout the community.		
7.3.1	Maintain an EV website with information on ZEV resources and rebates for consumers and drivers. *	**DPW-SM**
7.3.2	Maintain an online EV parking map application integrated with City parking garage information to inform the public of EV charging options and demonstrate the viability of EVs. *	**DPW-SM**
7.3.3	Explore creation of a public art program for public art displays on utility boxes and equipment associated with EV charging infrastructure.	DPW, **CCS**, SMUD
7.3.4	Encourage development of elementary and high school curriculum on ZEV mobility options and promote incorporation of the curriculum in local programs. *	DPW, Sac PEV Collaborative, **ITS**
7.3.5	For any City facilities with publicly-accessible charging, the City shall install EV signage at the facility entrance to help increase consumer awareness at the facility and from any key adjacent roadways.	**DPW**

**Already initiated or underway.*

7.3 Increase the visibility and awareness of ZEVs throughout the community. *(Continued)*		
7.3.6	Collaborate with other EV providers and agencies to increase EV signage and wayfinding throughout the community, improving the visibility of EV options to EV drivers and non-EV drivers alike.	**DPW**, Sac PEV Collaborative, SMUD
7.3.7	Explore sponsorship partnerships that allow for ZEV educational displays and signage in City parking garages. *	**DPW**

8 ZEV Access

8.1 Spur ZEV access and increase mobility for disadvantaged and low-income communities.		
8.1.1	Develop a citywide outreach strategy to increase awareness of ZEVs, with a focus on environmental justice, disadvantaged, and low-income communities.	**DPW-SM,** Sac PEV Collaborative, Sac EV Association, SMUD, SMAQMD, ITS
8.1.2	Continue to support car share programs for affordable options that support low-income mobility needs, and encourage program expansion to other neighborhoods and community facilities. *	**DPW**, OIED, **SMAQMD**, Sac PEV Collaborative, the Sacramento Housing and Redevelopment Agency (SHRA)
8.1.3.	Review the City's ordinances to develop guidance for car share programs that incentivize ZEV deployments, and prioritize providers that offer service in disadvantaged and low-income communities. *	**DPW**, OIED
8.1.4	Promote the Air District's EFMP "scrap and replace" program to provide rebates to low-income households living in DACs who replace internal combustion vehicles with EVs.	DPW-SM, **SMAQMD**, SHRA, Mutual Housing

**Already initiated or underway.*

8.1 Spur ZEV access and increase mobility for disadvantaged and low-income communities. *(Continued)*		
8.1.5	Coordinate with agency partners and support efforts to pursue funding opportunities for new ZEV efforts, such as ZEV ride hailing, commuter shuttles, or ZEV car share. *	**DPW**, OIED, Sac PEV Collaborative, SHRA
8.1.6	Support efforts to expand ZEV programs to affordable housing communities that do not qualify as disadvantaged communities per CalEnviro Screen 3.0, and are therefore less competitive for Cap-and-Trade grant funding.	**DPW,** SHRA, Mutual Housing, AQMD
8.1.7	Encourage SMAQMD efforts to leverage rebate and incentive funds to transition low-income workers into ZEVs, either with ZEV ride hail, financial incentives, or scrap and replace programs. *	**DPW**, OIED, **SMAQMD**, Sac PEV Collaborative, SHRA
8.1.8	Collaborate with local partners to develop a discounted group-buy or leasing program for used EVs for low- and medium-income households.[20]	DPW, OIED, **Sac PEV Collaborative**, Sac EV, SHRA, SMAQMD, SMUD
8.1.9	Collaborate for the co-location of ZEV demonstrations at workforce training centers, community-based organizations, and community centers in Sacramento's disadvantaged communities.	**DPW, Sac PEV Collaborative**, SHRA, Sacramento Employment and Training Agency

**Already initiated or underway.*

[20] Refer to Action 7.2.5, for promotion of discounted group-buy or leasing programs for all household types.

7 IMPLEMENTATION

This strategy establishes the City's first set of comprehensive targets and actions for ZEVs. Implementing this strategy will require City leadership and widespread coordination with partners. This document will serve as a guide, functioning as an implementation tool of the General Plan. Actions presented in **Section 6** (Targets and Actions) identify the City's priorities to attain the vision and goals established in this plan. Implementation will initiate by 2020, to achieve full attainment of targets by 2025. Responsible departments or partners are also identified in **Section 6**. City staff will maintain a separate work plan with additional implementation guidance, including timelines and milestones. Attainment of Strategy goals and targets will require involvement from multiple departments, agencies, business and industry partners, and the community.

To ensure the success of this EV Strategy, the City of Sacramento will integrate the goals and actions of this plan into other local and regional plans as applicable, and implement the programs and activities identified herein. Key goals, targets, and metrics in this EV Strategy will inform the anticipated 2018 update to the City's General Plan and Climate Action Plan. As the City progresses with updating these and other strategic documents, staff will ensure that updates support and are consistent with the adopted EV Strategy.

Staff will monitor progress on an ongoing basis and submit an annual update to City Council. Not all actions in this strategy may be necessary for the City to achieve its EV targets. During implementation, the City may elect to alter or remove individual actions to allow Sacramento to achieve its goals and targets in a manner that better meets community needs and values. Technology and ZEV applications are anticipated to evolve quickly, with potential for new or unanticipated opportunities to better achieve adopted goals and targets of the strategy. The City's Sustainability Manager of the Department of Public Works will serve as the lead for implementation of this strategy and submission of annual reports. The Sustainability Manager will also serve as an ongoing advisor and coordinator to other departments, agencies, and partners for implementation. City staff will evaluate the effectiveness of actions and provide recommendations for updates. Over time, if implementation does not occur as anticipated, the City may modify and add additional actions to ensure attainment of targets and goals.

While this strategy builds on existing efforts in the region, the strategy also demonstrates the City commitment to increase EV engagement with the community. Actions in **Section 6** outline the City's priorities for engagement and goals to work towards. Increased levels of engagement and partnership with the community, public partners, and the private sector are key for successful implementation.

8 ADDITIONAL RESOURCES

CITY RESOURCES

www.cityofsacramento/ev

www.cityofsacramento/demonstration-partnerships

PHOTO CREDITS

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SOURCES

American Lung Association. “State of the Air 2017.” http://www.lung.org/our-initiatives/healthy-air/sota/

California Air Resources Board (CARB) (2017a). Personal communication, Mark Williams, Air Pollution Specialist. mark.williams@arb.ca.gov.

CARB (2017b). Low-Income Barriers Study, Part B: Overcoming Barriers to Clean Transportation Access for Low-Income Residents. https://www.arb.ca.gov/msprog/transoptions/draft_sb350_clean_transportation_access_guidance_document.pdf

CARB and California PEV Collaborative. Drive Clean California. https://www.driveclean.ca.gov/pev/Plug-in_Electric_Vehicles/Maintenance.php

California Vehicle Rebate Project (CVRP) (2017). CVRP Rebate Statistics. https://cleanvehiclerebate.org/eng/rebate-statistics

City of Sacramento (2012). Climate Action Plan. https://www.cityofsacramento.org/Community-Development/Resources/Online-Library/Sustainability

De Shazo et al (2017). *Examining Factors that Influence ZEV Sales in California.* Final Report to the California Air Resources Board, Contract No. 13-303. https://www.arb.ca.gov/research/apr/past/13-303.pdf

Electrify America (March 8, 2017). California ZEV Investment Plan: Cycle 1. https://www.arb.ca.gov/msprog/vw_info/vsi/vw-zevinvest/documents/vwinvestplan1_031317.pdf.

Electrify America (June 29, 2017). Supplement to the California ZEV Investment Plan. https://www.arb.ca.gov/msprog/vw_info/vsi/vw-zevinvest/documents/california_zev_investment_plan_supplement_062917.pdf.

International Council on Clean Transportation (2017). Expanding the Electric Vehicle Market in U.S. Cities. http://www.theicct.org/leading-us-city-electric-vehicle-2017

Nicholas, Michael A. and Gil Tal (2013). *Charging for Charging at Work: Increasing the Availability of Charging Through Pricing.* Institute of Transportation Studies, University of California, Davis, Working Paper UCD-ITS-WP-13-02

Office of Environmental Health Hazard Assessment (OEHHA) (2018). CalEnviro Screen 3.0. https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30

PlugInsights (2013). 2013 U.S. PEV Charging Study. http://www.plugincars.com/comprehensive-study-ev-drivers-reveals-plug-attitudes-128883.htm

Sacramento Area Council of Governments (SACOG) (2017). Personal communication, Raef Porter, Senior Analyst. RPorter@sacog.org

Sacramento Area Plug-in Electric Vehicle PEV Collaborative (2017). *Electric Vehicle Readiness and Infrastructure Plan.* https://www.cityofsacramento.org/-/media/Corporate/Files/Public-Works/Electric-Vehicles/Sac-County-EV-Inf-Plan.pdf?la=en

Sacramento EV Association (Sac EV) (2017). Personal communication. Guy Hall, Chief Strategy Officer. Guy.Hall@Sac EV.org

Sacramento Municipal Utility District (SMUD) (2016). Annual Report. https://www.smud.org/

Slowik, P., Pavlenko, N., & N. Lutsey (2016). *Assessment of next-generation electric vehicle technologies*. International Council on Clean Transportation; www.theicct.org/next-generation-electric-vehicle-technologies.

Valley Vision (2016). Clean Economy Cluster: Workforce Needs Assessment. http://valleyvision.org/resources/clean-economy-workforce-needs-assessment.