PROJECT NARRATIVE

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1 SUMMARY

This proposal is to develop the Sacramento Electric Vehicle (EV) Implementation Blueprint for the city of Sacramento and its EV advancement partners. Sacramento is uniquely poised to implement and test various programs to increase deployment of electric vehicles. The City is rapidly emerging as a test bed for EV deployments. As a mid-sized community with a diversity of land uses, its lessons are applicable to many other Californian cities. The region, community, and private sector are all extremely supportive of advancing EV deployment in Sacramento with the potential to test strategies that can be duplicated statewide and across the nation.

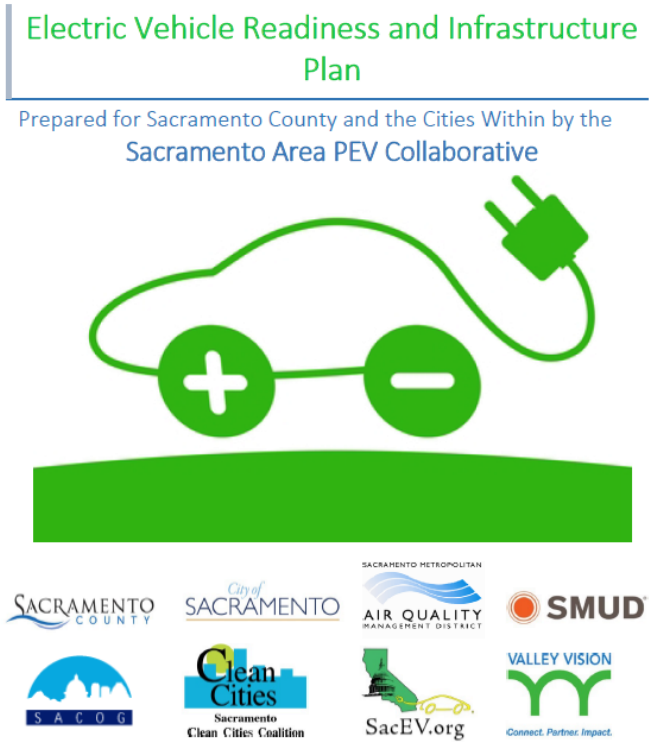
- In December 2017, the Sacramento City Council adopted by the City's first *Electric Vehicle Strategy*[1] with ambitious goals and targets for EV adoption. Built out of strong regional partnerships and community and industry support, the *EV Strategy* identifies existing programs and highlights near-term priorities. More than just a staff-driven initiative, Mayor Darrell Steinberg and the City Council are champions of the City's EV efforts.
- In 2017, Electrify America's selected Sacramento as its first "Green City", with a planned investment of $44 million by mid-2019 in EV infrastructure and EV mobility programs.
- There is strong multi-agency collaboration among the City's regional agencies, local agencies, public electric utility company, air district, and private non-profit and industry sectors to achieve these goals. This institutional framework will help to test and adopt programs. The Sacramento Area Plug-In Electric Vehicle (PEV) Collaborative (SacPEV Collaborative) is an active body incorporating local and regional agencies, the local Sacramento Area EV Owner's Association (Sac EV), and Valley Vision, a local non-profit leading community-building work across the valley. The City, Sacramento Municipal Utilities District (SMUD), Sacramento Area Council of Governments (SACOG), and the Sacramento Air Quality Management District (SMAQMD) have a strong history of innovative programs and support to advance EV usage through this partnership.

This confluence of strong political leadership and significant private investment provide a unique opportunity to test and demonstrate successful strategies to advance EV usage in various facets, from expanding public and private infrastructure, providing community education, supporting electric car share programs, increasing EV adoption in disadvantaged communities, and identifying regulatory tools to facilitate EVs in public and private development. Success in these areas promises to deliver environmental and economic benefits.

"Electrify America selected Sacramento as a Green City to demonstrate the potential of ZEV adoption within metro areas and to increase affordable mobility options," Mark McNabb, CEO of Electrify America.

[1] Available online: www.cityofsacramento.org/ev

Grant funding for the Sacramento EV Implementation Blueprint would allow the City to accelerate its current efforts and capacity to advance EV initiatives, equipping the City with turn-key projects and directives for implementation. Grant funding will enable the City to capitalize on progressive EV efforts, evaluating lessons learned and developing scalable tools that can catalyze EV efforts across the state.



This proposal outlines next steps to fully achieve the City's adopted vision for EV mobility. Building on the foundation of extensive analytical work and policy development for the City's *EV Strategy*, this proposal presents priority near-term actions for funding. With adoption of the *EV Strategy*, the City Council committed to ambitious goals and targets for EV adoption. Supportive funding opportunities are imperative to support level of effort needed to achieve the City's goals.

Grant funding will increase capacity for implementation. If funded, staff would issue a request for proposals (RFP) for consultant services to complete EV Blueprint tasks. Key tasks include community engagement, development of an EV deployment plan and implementation strategies, technical and cost analysis, and guidance for economic development.

Vision

Sacramento is seeking funding to advance the near-term deployment of EV initiatives, building on the early progress achieved in the City's *EV Strategy*. The *EV Strategy* establishes a vision of Sacramento serving as a "Green City," the EV Capital of California, with a robust zero-emission mobility system that provides significant improvements in local air quality, mobility, and access. With an expansion of EVs, Sacramento is working to increase mobility and access for disadvantaged and low-income communities. Grant funding will equip the City to outline a path for better distributing the benefits of EVs and increasing 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. Funding will equip the City to deploy EVs in shared mobility applications and ensure that EVs are working to fill the first-mile/last-mile gap to transit and improve the connectivity of areas underserved by transportation options.

The deployment of EVs in the city will also support a growing industry for advanced transportation technologies. EV programs will spur local business and encourage new economic enterprises, delivering jobs to Sacramento's workforce. Realizing an electrified community will be based on connecting low-income and disadvantaged communities to the new EV mobility service economy. Additionally, the City seeks to leverage EVs 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.

In order to achieve this vision, the grant will specifically equip the City to achieve the following through a subconsultant contract, as further described throughout this Project Narrative:

- Translate planning-level targets and forecasts into a detailed plans and monitoring approaches, guiding public and private investment to maximize benefits.
- Conduct a cost-effectiveness study to evaluate options to accelerate EV infrastructure in new construction and develop recommended code updates.
- Develop a strategy to increase EV infrastructure development and spur EV awareness, including development of toolkits, schematic design templates.
- Create roadmaps to advance innovative aspects of the City's vision for EV adoption, including guidance to implement EV shared mobility programs, and recommendations for EV workforce development.
- Fund a comprehensive community engagement effort, to increase awareness and involve disadvantaged and low-income communities in identification of priority sites for EV infrastructure, in addition to engagement of developers, EV mobility companies, and other agency partners to build momentum for implementation.

2 TECHNICAL MERIT AND NEED

Operational Goals and Objectives

The ultimate purpose of the Sacramento EV Implementation Blueprint is to develop actionable blueprint planning tools that implement the City's *EV Strategy*. Goals in the proposed project address those adopted by City Council in the City's *EV Strategy*. Specifically, project goals and objectives to achieve with grant funding are as follows in **Table 1***:*

Table 1: Summary of Goals and Objectives

Goal	Objective
Develop pathways to achieve the City *EV Strategy* goal of 75,000 ZEVs in Sacramento by 2025, representing the City's contribution to Governor Brown's goal of 1.5 million ZEVs on California roads by 2025 and the Governor's goal of 5 million ZEVs statewide by 2030.	Create an EV Deployment Plan Evaluate and recommend updates to City Code for EV adoption
Develop a strategy to optimize public charging infrastructure to facilitate the City *EV Strategy* target of 3,800 public or workplace chargers by 2025.	Prepare a Public charging prioritization plan, Recommended EVSE Upgrades to Optimize Public Charging Access
Provide strategies to advance the next generation of transformational and highly visible ZEV mobility applications and programs.	Prepare EV Toolkit and Advanced EV Mobility Opportunities Report
Launch a comprehensive engagement campaign that advances City efforts to achieve equitable access to EV technologies and benefits by low-income populations and disadvantaged communities, including job training and employment opportunities	Develop EV Economic Pathways Report and EV Mobility Curriculum
Identify financially-sustainable EV programs and ensure that public spending on EVs or EV infrastructure that balances charging demands, advances new technologies, or incentivizes EV rider trips	Evaluate and Prepare Advanced EV Mobility Opportunities Report

Summary of Current Efforts

Existing efforts in Sacramento provide a platform for EV innovation. In addition to implementing several EV programs, the City has been participating collaboratively with a core group of electrification leaders in the community. Recent public-private partnerships also provide a foundation for future efforts. Sacramento has implemented a range of initiatives to deploy EV programs and infrastructure. For more information on the City's existing efforts, refer to the summary in **Section 5** of this Project Narrative. However, while much work has been completed to date, the City is newly embarking on efforts to implement ambitious, comprehensive goals for electrification. Additional resources are necessary to achieve the City's ambitious EV targets.

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. Even with strong local utility incentives, adoption rates are slow. 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). Despite significant investment and long-standing work by SMUD and other agencies, countywide EV adoption in Sacramento County is just 0.4%, the lowest of metro regions in the state (EPRI)[2].

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.[3] 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.

The need and rationale for this grant request is identified below in **Table 2**. Despite early regional investments, Sacramento's EV adoption rates are still far below target levels necessary for the City to meet the Governor's targets. The number of registered ZEVs must increase by over 2,000 percent in less than seven years to achieve City goals.

Table 2: Existing and Target EV Adoption Levels

Metric	Current	Target*	Data Source
Households with ZEVs	2%	35%	DMV[4]
Number of registered ZEVs	3,200	75,000	DMV
Annual sales to be ZEV	2%	40%	DMV, SMUD, ITS

[2] EPRI data, reported by SMUD (2017).

[3] 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. Refer to additional discussion on

[4] Ibid.

Key overarching questions to be addressed with grant funding include:

- Since financial incentives alone aren't enough, how can the City and partners develop a community literacy in EVs for adoption?
- How can the City take advantage of early regional investment, but address the outstanding barriers of knowledge and understanding?
- Since incentives are already available from SMUD with more to come from the state, what else needs to be done to actually ensure property owners install EV infrastructure, and to ensure that residents want to drive EVs?
- What are best practices to connect low-income residents to new employment opportunities, and how can the City develop an ecosystem for advanced transportation technologies that includes the life-cycle of EV opportunities, from research and development to installation and service, and new tech employment sectors?
- And lastly, how can the City increase overall EV adoption even while residents don't buy many cars and new cars are out of reach for many, and what opportunity is available with new forms of shared e-mobility?

Key Issues

Despite a strong foundation of early investment and regional efforts, the City's work on the *EV Strategy* identified several core challenges to achieve adopted EV goals. In collaboration with SacPEV Collaborative partners and other partners, the City has analyzed priority issues and structured this grant proposal to address them. The following section identifies key issues to be addressed by project deliverables, outlining the project purpose and rationale, or the "*why*,*"* of proposed grant tasks. A summary of key issues and project deliverables is provided in **Table 3**. Key issues for the grant are further analyzed in the following section. Project tasks and deliverables are then later addressed in **Section 3***,* presenting "*how"* the City will seek to address key issues and achieve the project goals and objectives. Specifically, the City would issue an RFP and secure a subconsultant team to implement the key grant outcomes. This process would be guided by a highly collaborative effort guided by a multi-agency Project Advisory Team, as further outlined in **Section 4**.

Table 3: Summary of Issues, Project Tasks, and Key Outcomes

Issue	Task*	Key Outcomes
Charting and Tracking progress	2 – EV Deployment Plan	Sacramento EV Infrastructure and Deployment Plan, with user's guide and methods
Advancing EV Infrastructure while removing barriers to housing construction	3 – Community Planning Blueprint	Cost-Effectiveness Study Recommended code updates
Multi-family and workplace EV charging access	2 – EV Deployment Plan 4 – Public Charing Prioritization Plan	Sacramento EV Infrastructure and Deployment Plan, with targets for infrastructure across geographies and new vs. existing development Report: Recommend EVSE Upgrades and Strategies to Optimize Public Charging Access Stakeholder engagement Concept design and schematic design

Issue	Task*	Key Outcomes
		templates
Access to EV mobility and infrastructure in disadvantaged communities	5 – EV Toolkits 7 – Community Engagement	Sacramento EV Infrastructure and Deployment Plan, with targets for infrastructure in disadvantaged communities Stakeholder engagement EVSE toolkits
ZEV Workforce	6 – Advanced EV Mobility Opportunities	Report: EV Economic Pathways Stakeholder and community engagement on opportunities and priorities
Access to EV mobility and programs	6 – Advanced EV Mobility Opportunities	Focus group and stakeholder interviews E-Mobility Hub Recommendations Report: Advanced EV Mobility Opportunities
Awareness and education	3 – Community Planning Blueprint 4 – Public Charing Prioritization Plan 5 – EV Toolkits 6 – Advanced EV Mobility Opportunities 7 – Community Engagement	Stakeholder focus groups on EVSE in new construction Identification of priority areas and stakeholder input on public charging needs New educational materials and resources Report: Advanced EV Mobility Opportunities Community engagement campaign, EV Curriculum

**Tasks that address multiple issues are identified more than once*

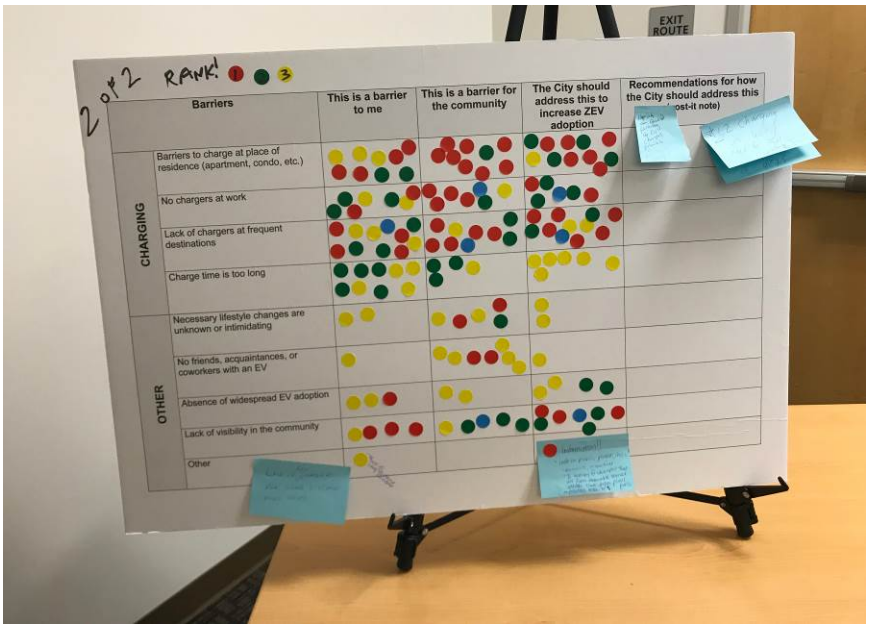
1. Charting and Tracking Progress

Background

A first key issue to address through this project is development of accurate EV baseline metrics and a path for monitoring and reporting. Despite extensive work in the Sacramento region, agency partners are challenged to effectively monitor and evaluate ongoing EV deployments. Through development of the *EV Infrastructure and Readiness Plan*, SACOG has led the modeling of EV metrics for Sacramento County, using readily-available metrics from the Clean Vehicle Rebate Project (CVRP). Building on these baseline figures, SACOG used advanced modeling tools to conduct regression analysis and the development of EV forecasts. Modeling accounts for gas prices, the number of unique EV models anticipated to be available, EV range, and local EV stock available for sale. However, several limitations with the SACOG numbers include:

- Assumptions based on older vehicle models, including an assumed-100-mile range
- Exclusion of medium-duty and heavy-duty forecasts
- Basis on CVRP numbers, which undercount EV ownership

Community ratings on EV barriers, at an October 2017 EV workshop hosted by the City



Yet for tracking purposes, the City does not have an accurate or accessible data source. California Air Resources Board staff recently assisted the City and County with attaining and reviewing countywide EV registrations from the California Department of Motor Vehicles, but these numbers diverge from comparable figures tracked by SMUD. While SMUD purchases regular reports from the Electric Power Research Institute, data is tracked at the county-scale. Additional work is currently underway with the SacEV Association to determine baseline ZEV registrations for the region. SMAMQD is currently evaluating this data through a separate CEC-funded grant for region-wide ZEV planning. While this early work provides information to leverage for City planning, the City is lacking the tools to track and evaluate City-specific data relative to locally-adopted targets.

Issues for Grant Funds to Address

- What are the best methods for cities and counties to track local levels of EV adoption over time, without having to purchase costly data sets?
- What are appropriate targets for medium- and heavy-duty vehicles and infrastructure?
- How does consumer awareness correlate to EV adoption, and what are appropriate metrics to monitor changes in awareness over time?

2. Advancing EV Infrastructure while Removing Barriers to Housing Construction

Background

Second, this grant will allow the City to evaluate how best to accelerate EV infrastructure while removing barriers to new housing construction. Sacramento has historically maintained a relatively affordable housing stock, but in recent years the community has been struggling to realize the construction of new housing units like many other communities. New construction significantly underperforms, and the City is challenged to reach target housing levels. Sacramento is also seeking to expand the construction of affordable housing and streamline development procedures. The City has not amended the California Building Code, with no local amendments requiring developers to exceed minimum state standards for EV-readiness. Additional mandatory EV standards from the state are anticipated in the next update cycle in 2019.

Many communities have adopted EV-ready codes that exceed CALGreen standards. The City *EV Strategy* calls for evaluation of appropriate measures to advance EV-readiness in new construction. In a review of the EV-ready ordinances adopted by Bay Area communities and coordination with other agencies initiating EV-ready codes, the City identified several potential challenges during development of the *EV Strategy*:

- Aggressive levels of EV-readiness can potentially trigger the need to include larger

electrical services, adding significant costs to new construction.

- Anecdotal information has highlighted that the most significant opposition to EV-readiness standards in Oakland came from affordable housing developers, who identified the standard as a new cost that unfairly burdened their projects. Cities such as Oakland have reduced minimum levels of required parking to address concerns over the extra costs; however, Sacramento has already waived parking requirements in the Central Business District with a tiered range of requirements for other zones, removing one potential barrier but leaving the unanswered question of what additional tools are needed to offset additional costs for EVSE.
- Many perceive EV-readiness as an additional cost, but the biggest barrier may be a lack of information shared with developers during the planning and entitlement process, including the absence of resources on incentives and cost-effective options to providing charging units at mandatory pre-wired spaces.
- Cost-effectiveness studies have shown that installing the appropriate raceways, circuits, and panels in new construction is cheaper than future retrofits for installing service for EVSE; however, there is limited information available comparing the marginal cost of prewiring parking spaces beyond minimum CALGreen standards to base CALGreen compliance. There may also be a split-incentive between costs to property owners and benefits for tenants.
- Extensive engagement of the development community is necessary to evaluate and identify recommended options that are both cost-effective and politically feasible.

Issues for Grant Funds to Address

- As the City seeks to streamline the new construction of housing, what are the best methods to advance EV-readiness while not imposing significant costs or impeding construction?
- Is there a path to cost-effective code updates that does not increase costs or perceived costs for new construction?
- How can the City best collaborate with developers to remove development barriers to increasing EV infrastructure?
- Are there other incentives that can offset EV infrastructure costs?
- Is closing the information gap as important as new standards for new EV infrastructure in new construction, and how far should the City push new construction?

3. Multi-Family and Workplace EV Charging Access

Background

Third, grant funds will allow the City to evaluate the needs of multi-family and workplace charging, and develop implementable plans and tools to address these needs. While charging at home will remain the primary point of charge for many drivers, the inability to charge in multi-family units will be prohibitive to equitable EV adoption. To support the needs of all future EV drivers, including those who live in multi-family households, public and workplace charging will continue to play an important role in spurring EV adoption. However, public EV charging infrastructure is a costly endeavor that often relies on competitive grant funding. While the City is encouraging private development of public EV charging infrastructure through the Curbside Charging Program, the City is seeking to identify a more diverse portfolio of EV charging options for Sacramento residents, employees, and visitors.

The burden on public and workplace charging can be lessened to an extent if dedicated private EV charging opportunities exist for new multi-family dwelling units. The City expects to see a build-out of 10,000 new housing units in Sacramento's Central City within the next 10 years. Parking minimums are waived for new construction in the Central Business District. For all other areas within the Central City Specific Plan, the City Code requires 0.5 to 1 parking spaces per dwelling unit. By 2035, the city-wide housing stock of multi-family units will grow by 84% from 2012 levels. The additional housing units should support a range of housing price points and tenure options, as well as support multi-modal transportation opportunities.

However, with a housing shortage, Sacramento is also challenged to identify incentives to retrofit existing construction. While SMUD is providing incentives for multi-family retrofits, the City is challenged to engage and encourage property owners to install EVSE. Community input is also key to identify priority multi-family projects across the community where EVSE is desired and likely to lead to EV adoption.

Public and workplace charging infrastructure are also 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, including those that are residents of single-family units. 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. Also ensuring that appropriate pricing mechanisms are in place can help ensure station availability. Instituting a fee for charging can help encourage turnover, and allow access by EV drivers without home-based charging options.

Issues for Grant Funds to Address

- How can the City spur voluntary retrofits in existing multi-family construction?
- What is the appropriate balance of public and residential charging infrastructure?
- How effective are new types of off-site public charging applications to meet multi-family residential needs, such as high-power EV charging depots, or curbside charging infrastructure?
- What is the utilization of existing public charging infrastructure by multi-family residents, and what are best practices to optimize its use to address multi-family needs?
- What is the role of public charging infrastructure in increasing community awareness of EVs, versus its role in providing functional charging? Are there options to better design public charging infrastructure to maximize both its utility for promoting awareness and providing functional charging?

4. Access to EV Mobility and Infrastructure in Disadvantaged Communities

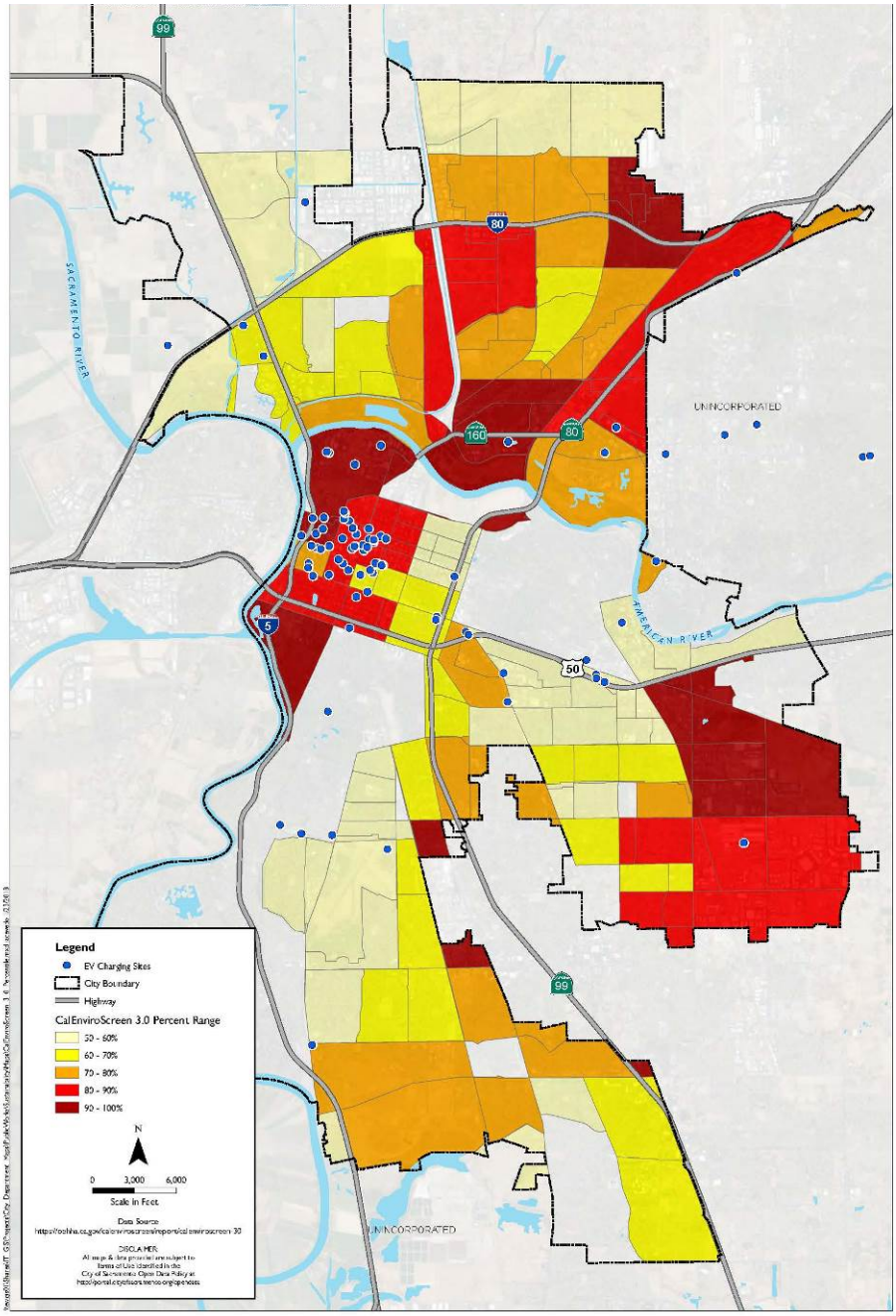
Background

Fourth, grant funds will equip the City to develop an EV Deployment Plan and conduct outreach to address the needs of disadvantaged communities and prioritize charging opportunities and alternatives to personal car ownership. Currently, EV infrastructure is not sited or designed to target the needs of disadvantaged communities. Most of the infrastructure in the Sacramento region to date has been installed in Downtown Sacramento, the work center of the region. 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.

Yet there are barriers to zero-emission mobility for disadvantaged and low-income communities. The barriers low-income residents face to accessing ZEV technologies are many. 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, as shown in **Figure 1**.

Figure 1: Disadvantaged Communities in Sacramento



The State of California developed CalEnviroScreen 3.0 rankings to identify disadvantaged communities, or census tracts with high overall index scores. Within Sacramento, **87% of residents live in the top 50% of disadvantaged census tracts statewide** (466,488 residents)**.** In Sacramento's disadvantaged communities, emergency departments reported asthma-related visits occurred at a rate of 90 visits per 10,000 residents (Table 2). In one of Sacramento's

most afflicted neighborhoods, the rate was as high as 148 visits per 10,000 residents- a frequency nearly three times greater than the state average of 50 visits per 10,000 residents. In addition to disparities in respiratory health, households in disadvantaged communities have significantly lower annual earnings compared to the citywide median for all households. For 50th percentile disadvantaged communities in 2016, the median annual income was $43,607, whereas the citywide median income was $55,322. In 2016, the median annual incomes for the 75th and 90th percentiles were $35,953 and $30,909, respectively.

Greater access to EVs and EV charging infrastructure, citywide and throughout the Sacramento region, will benefit neighborhoods such as Ben Ali and Del Paso Park, which scored in the 90th percentile of CalEnviroScreen 3.0 for both traffic density and asthma-related emergency doctor visits. The Franklin Boulevard Corridor, running parallel to CA-99 from Sutterville Road to 47th Avenue, intersects a community that scored in the 80th percentile for asthma-related emergency doctor visits and the 90th percentile for traffic density. Fuel-switching and universal access to alternative transportation options can help to alleviate pollution burden, provide opportunities for upward economic mobility, and bring about environmental justice for the disadvantaged communities of Sacramento.

While efforts are underway to expand EV mobility in disadvantaged and low-income communities, more work is needed to understand effective program design. Pilots in the region for EV in low-income communities such as Our Community CarShare rely on significant public subsidy, and the program has still been challenged to meet target participation rates. Even with free membership, the Air District has only enrolled approximately 100 of the target for 300 memberships. Public dollars are also limited, and dependent on grant funding. Electrify America is launching significant car share investments in Sacramento, with a target of 35% investment in disadvantaged communities. The CEC also recently funded Envoy to bring EV car share to 15 sites in disadvantaged communities by mid-2018. Yet collaboration with service providers is still underway to determine how to better target and incentivize low-income ridership in a for-profit car share model.

Issues for Grant Funds to Address

- What other critical factors beyond financial subsidies do agencies need to implement to advance EV adoption in disadvantaged communities, and where should future public EV infrastructure go to support EV adoption in those communities?
- How can electric mobility programs other than owning personal vehicles, like car share, better address the needs of low-income and disadvantaged communities?
- How much help are financial incentives? And what other financing or acquisition support is necessary to spur sales?
- In households for whom the purchase of an EV is out of reach, what are the most effective EV programs to increase mobility?
- What is the appropriate role of the public agency in launching or incentivizing EV car share or other EV programs?

5. ZEV Workforce

Another key opportunity to address with grant funds is development of a strategy to maximize economic benefit for the local workforce from EV-related industries. With a 2016 median income of just $52,071, and 21% of persons living in property,[5] establishing workforce opportunities in

[5] US Census, 2012-2016 American Communities Survey

advanced transportation technologies is a priority for Sacramento. The City seeks to connect local low-income employees to all aspects of employment opportunities related to ZEV-technologies and services. Jobs may include installing and maintaining charging infrastructure, operating as an EV service provider, or participating in the research and development fields of electrification. Valley Vision developed a Clean Economy Cluster: Workforce Needs Assessment for the Sacramento Capital region (2017).[6] Approximately 288 advanced transportation employment establishments are currently in the Sacramento Capital region. Locally, American River College offers an Alternative Fuels and Green Vehicle Technology certificate program. In addition, companies such as Phil Haupt Electric offer full commercial and residential electrical services in the Sacramento region. Services include site analysis, engineering, and installation of electric vehicle charging stations at various residential, commercial, and public locations. The company has installed nearly 700 charging stations throughout northern California. However, the company is experiencing difficulty in finding qualified workers in the electrical field that meet minimum standards.[7]

The rise in the number of advanced technology vehicles and alternative fuel vehicles has increased the demand for qualified workers with specialized knowledge and diagnostic skills. As a result, many employers operating fleets dealerships, and automotive shops are now requiring supplementary certification or training. This increasing demand will further exacerbate this deficit of qualified workers. There are currently workforce development programs available that provide this training in other energy fields, such as GRID Alternatives workforce development programs for solar photovoltaic installations. However, Sacramento is currently lacking a developed workforce program for EV service industries.

Realizing the City's goals will only accelerate the demand for a qualified labor force. The City's *EV Strategy* identifies many goals, yet the City needs additional expertise to identify next steps. The City also recognizes opportunity for new creative economic partnerships. One key concept prioritized in the City's *EV Strategy* was development of a ZEV service center. Such a project could provide models and the necessary technical support for fleet purchasers and small manufacturers using new technologies, spurring community-wide fleet adoption. Yet the City lacks information on recommended partnership structures and funding needs to establish such a center.

Issues for Grant Funds to Address

- How can the City most effectively encourage and expand local certification programs for electrical vehicle services through economic development efforts?
- What will be the demand for EV services necessary to support the City's EV targets, and how many certified trainees are necessary to support these business needs?
- What are recommendations to connect local low-income and disadvantaged community residents to the new opportunities with advanced transportation technologies?
- What are the workforce development lessons and models that the City can learn from other industries to apply to EV-related fields, such as solar photovoltaic certification and workforce development programs? What would similar trainings look like for the EV industry?
- What can the City require and/or incentivize for local hire and employment of

[6] Available online: http://valleyvision.org/wp-content/uploads/2017/10/coe-clean-economy-web_copy.pdf

[7] Ibid.

disadvantaged communities in public or public-serving EV projects?

- What are the partnerships and investment necessary to realize the City's goal of developing innovative ZEV service center in Sacramento that can support the needs of regional fleets and small manufacturers trying new types of ZEV equipment?

7. Access to EV Mobility and Programs

Background

Next, grant funds will allow the City to analyze lessons from early pilots and recommend next steps to accelerate innovative EV programs, such as car share, or visible community projects such as e-mobility hubs. 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. 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.

Sacramento's size, mobility patterns, and potential for impact provide a key test case for EV programs, including programs that increase access for disadvantaged communities. As a member of the Smart Cities Collaborative and participant in SACOG's Civic Lab effort, Sacramento is also involved in launching two near-term mobility pilots with exciting EV applications: an autonomous shuttle for Sacramento State, and an EV mobility service (such as EV car share) for Franklin Boulevard. Although SACOG is supporting with identification of funding, both efforts are currently unfunded. Through collaboration with other agency and community partners the City is working to identify sustainable and replicable EV mobility business models.

New types of technologies hold immense promise for mobility: on-demand EV shuttles, microtransit, autonomous vehicles, and more. Yet even as private operators and transportation

Demonstration Envision solar charger at a Sacramento Clean Cities event in 2017

network companies (TNCs) launch innovative services, early projects have generally depended on public investment or grant funds. Early pilots utilizing EV technologies in this space have faced challenges, such as Car2Go's failed launch of electric car share in San Diego. The siting of infrastructure and expense of installing EV infrastructure are two potential issues complicating EV applications in new mobility territory. To date, Zipcar's participation in the Our Community CarShare pilot has depended on public dollars for the construction and operation of EV chargers. Electrify America is going to test the viability of these technologies with a significant near-term investment and concentration of high-power charging, providing a test lab for car share and a range of e-mobility programs. However, evaluating lessons from these early pilots will be key to bringing programs to scale and ensuring on-going longevity of program service.

The Sacramento PEV Collaborative also recognizes the importance of highly-visible, innovative community resources to spur community awareness and remove barriers to adoption and ridership in new forms of EV mobility. E-hubs may include innovative deployments, such as electrified charging hubs, "electric avenues," and demonstration projects. New and creative applications of electrification will become cornerstones of the community. Neighborhood charging depots and e-mobility hubs will provide access to a range of clean mobility options, from electric bike share to EV charging and EV car share. Located in key community destinations, these e-hubs could also offer "e-buddies" available onsite to show how to use new technologies, and to introduce visitors to the range of mobility options. Partners have explored concepts to pilot an e-mobility hub, but additional funds are necessary to actualize this concept and identify operational models.

Issues for Grant Funds to Address

- What are the best practices to spur shared ZEV mobility while reducing VMT and congestion?
- What are sustainable business models to launch and operate new types of EV car share, shuttle service, and TNC service?
- What is the optimal design of EV charging infrastructure to support a multi-modal EV mobility system? What are opportunities for dual-use charging, and what are preferred structures to maximize service through various ownership and operation models?
- How can public agencies get the greatest return on investment for investing in EV mobility, and what are appropriate metrics to evaluate success?
- What is a template to fund and operate a successful e-mobility hub that provides functional e-mobility options while also serving a public education purpose?
- How can the City or other public entities realize economies of scale to expand EV infrastructure development with other multi-benefit infrastructure, including solar photovoltaics and energy storage?

8. Awareness and Education

Background

Expanding EV awareness is another key barrier to address through grant funds. Despite significant investment and long-standing work by SMUD and other agencies, countywide EV adoption in Sacramento County is just 0.4%, the lowest of metro regions in the state. This partially reflects the region's lower propensity to buy new vehicles compared to other areas. However, this indicator also reflects that mere presence of EV infrastructure is an inadequate indicator of success. Even if the City hits the target levels of infrastructure established in the *EV Strategy*, this is not a measure of success. Adoption of vehicles is key. Through the City's

collaboration with MBUSA and the local SacEV Association, partners continue to emphasize the importance of education and awareness to create an EV-ready population.

Sacramento provides a unique test case: with low levels of overall EV adoption and strong government leadership, accelerated investment will support the rapid evaluation and analysis of factors driving EV adoption. Sacramento will serve as a unique pilot to measure the efficacy of ambitious EV programs. As Electrify America's first Green City with investment of $44 million, Sacramento is an unparalleled testing ground to shed light on impact of EV efforts. Evaluating the impact of an accelerated $44 million investment will provide an important foundation to inform and guide future state efforts, including the Governor's commitment of $2.5 billion for a new eight-year ZEV initiative.

For development of the *EV Strategy*, the City has already initiated significant engagement of community stakeholders and key agency partners. Extensive collaboration has occurred to date with the SacEV Owner's Association, learning about various programs and efforts. Additional collaboration is occurring through the SacPEV Collaborative to develop an EV Helpdesk and launch other efforts, in addition partnership with agencies and community-based groups in the Civic Lab Franklin Boulevard project. The City is also collaborating with the Sacramento Housing and Redevelopment Agency (SHRA), Mutual Housing, and various developers on program design. In addition, the City collaborates regularly with EV mobility companies and other businesses, including Electrify America, MBUSA, EVgo, and others.

However, despite early partnerships, much work remains to be done to engage a broader spectrum of community-based leaders and organizations. Despite leadership of affordable housing agencies such as SHRA and Mutual Housing, more work is needed to engage other leaders and members of the community. The City also stands as a key local policy driver but is under-staffed to fully evaluate and act on any findings or launch new educational campaigns.

Issues for Grant Funds to Address

- What is the effect of a $44 million investment on local EV awareness and adoption, and what are scalable lessons for smaller future investments or government-led endeavors?
- Where is future investment best directed to achieve maximize impact on EV adoption?
- What are best practices for comprehensive engagement programs that can be replicated elsewhere in the state?
- What do disadvantaged communities identify as their priority needs and opportunities for e-mobility, such as car share or other new types of mobility programs?
- What are best practices for local agency EV outreach; where should local agencies direct their staff time, and where should they defer to or encourage work by other community-based organizations, academic groups, or others?
- What are the best practices for offering multi-lingual EV education and outreach to serve Sacramento's diverse communities, such as Spanish, Hmong, and Chinese communities, recognizing that the US Census indicates that Spanish, Russian, Hmong, Vietnamese, Tagalog, and Chinese are the most common languages spoken at home in Sacramento?

3 TECHNICAL APPROACH

Approach to Transition to an EV-Ready Community

This proposal leverages the early work of the Sacramento region to advance an EV-ready community with relevance and lessons for other communities across the state. The following

section describes tasks to address key issues and achieve project goals and objectives. The City's existing efforts and partnerships are further described in **Section 5**. The proposed scope of work outlines the City's approach to build on the region's existing foundation and rapidly move through identified challenges to build an inclusive, EV-ready community. Early lessons and investments in Sacramento allow for the rapid scaling of work-to-date towards ambitious targets. Only through this early leadership is the City of Sacramento poised to implement an ambitious one-year work program.

This proposal outlines a deliberate approach to accomplish the following:

- Use Sacramento's early work and regional collaborations as a test case, building on existing efforts to establish an actionable plan for the advancement of EVs and transformation of the mobility sector.
- Focus blueprint funds on priority initiatives identified in the City's *EV Strategy* to accelerate EV adoption and position for future funding and implementation.
- Leverage unique, innovative pilots in Sacramento to create replicable blueprint templates that can address barriers to achieving EV and broader ZEV goals.

Summary of Proposed Tasks

Tasks in this scope of work provide a step-by-step process to transition the City of Sacramento towards goals identified in the City's *EV Strategy*. The approach for project tasks is described below and further detailed in the attached Scope of Work. The following tasks will equip the City to implement project objectives and realize project goals, addressing key issues and barriers to the City's vision for EV adoption established in the City's *EV Strategy.* Collectively, projects tasks described below will function as Sacramento's EV Implementation Blueprint.

Task 1: Administration

Key benefits of Task 1:

Compliance with grant terms and conditions.

Effective project management and delivery.

Disseminate work products and lessons learned.

The City of Sacramento will work with the California Energy Commission to manage, administer, and complete the proposed project, meeting or exceeding the minimum expectations established herein and in the proposed scope of work. The City would use CEC grant funds to issue an RFP for a consultant. Grant funding would overcome a major barrier of limited staff resources, allowing for hiring of a consultant team. Through the RFP, the City would select a competitive team of experts that can complete technical tasks, prepare planning and report documents, and facilitate community engagement. The City will leverage City staff time as in-kind match to complete groundwork and analysis that supports the consultant-lead project.

Further, the City will administer a highly participatory advisory committee of local partners to provide guidance and feedback on the project. A summary of committed project partners and roles is described in **Section 4**. Letters of commitment from project partners are included in **Appendix A**. This project will benefit from the existing SacPEV Collaborative.

Task 2: EV Deployment Plan

Realizing the City's goals will require a more detailed roadmap to guide investments and public policy. As a first core step, the City's consultant team will conduct technical modeling to identify the proposed distribution of EV infrastructure to achieve the City's goals of 75,000 EVs by 2025, and future targets to align with the Governor's 2030 goals. The final deliverable of this task will be an EV Deployment Plan, which encompasses several items:

- A detailed map of proposed locations for infrastructure to serve light-duty, medium-duty, and heavy-duty vehicles to achieve City goals, identifying the number and type of units to be built, including location of DCFC and high-power charging technologies exceeding 50-kilowatts. The map will account for travel patterns and circulation
- A detailed user's guide summarizing modeling methods and establishing guidance, providing a user-friendly summary for others to replicate Sacramento's EV forecasting and mapping, including a description of assumptions and tools.
- Analysis of the realistic penetration of EV infrastructure into the existing building stock, and identification of recommended targets for chargers needed in new development.

Existing work with the SacPEV Collaborative provides a foundation for this task. For the Sacramento Area PEV Collaborative EV Readiness and Infrastructure Plan (2017), SACOG has already conducted countywide modeling to identify the top 100 sites for public and workplace charging needs (available at http://arcg.is/1yGP9O). This modeling provides a foundation for the task, based on SACOG's travel-demand model. SACOG's analysis 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. Yet the map only identifies concentration hot spots for charging, and does not indicate the number of chargers or general citywide distribution needed to achieve City goals.

Key benefits of Task 2:

Create an EV Deployment Plan, including spatially-specific targets for EV infrastructure across geographic zones within the city.

Identify priority areas to target for charging that will serve the needs of disadvantaged communities, based on community input.

Identify the gap between realistic penetration for EV infrastructure and policy goals.

Develop targets and forecasts for medium- and heavy-duty EVs.

Determine amount of EV charging infrastructure to be incorporated into new development versus existing development.

This effort will also be informed by the SMAQMD's CEC project to conduct region-wide EV planning. SMAQMD's team is already in the process of vetting baseline EV registration data from the DMV against other sets and other agency records. The SMAQMD's plan development process has engaged an array of SacPEV Collaborative stakeholders, who are already working to identify targets. Leveraging this information, the City team can develop City-specific information that is informed by regional efforts. CALSTART, an industry leader in medium- and heavy-duty EV infrastructure needs, is also committed to serve as a technical advisor for this task.

Sacramento's consultant team will utilize the UC Davis GIS EV Planning Toolbox for MPOs[8] to develop targeted, census-tract level maps for siting of EV infrastructure. The tool suggests the location of demand for PEVs based on a given market size. The tool can also be customized to provide the location and magnitude of anticipated demand for fast-charging infrastructure, including the number of anticipated charging events & number of kWh by location (within a 1-2-mile area). Each function in the toolkit includes instructions, data sets, and suggestions for personalizing the forecast scenarios to specific localities. The consultant team will engage with the PH&EV Center, a project partner, for expertise and guidance in completing the modeling work. Functions in the tool allow for analysis of census tracts with high likelihood for EVs, workplace charging needs, and citing of fast charging infrastructure.

[8] https://phev.ucdavis.edu/project/uc-davis-gis-ev-planning-toolbox-for-mpos/

Completion of the EV Deployment Plan in Task 2 will equip the project team to conduct the remaining tasks, providing the technical baseline from which the project team can analyze and address opportunities in new construction, existing construction, and through community programs as described in the following tasks. Disadvantaged communities will also be engaged to vet the maps and prioritize areas for infrastructure development, accounting for community priorities that the EV models may not account for.

Key benefits of Task 3:

Prepare a Cost-Effectiveness Report evaluating cost-benefits of approaches to advance EV adoption.

Engage affordable housing providers and local developers to determine recommended options to accelerating EV infrastructure.

Develop recommended code updates for new construction.

Task 3: Community EV Planning Blueprint

Using targets established in Task 2, the project team will evaluate options for advancing EV infrastructure in new construction. To initiate the task, the consultant team will evaluate constraints and opportunities, accounting for Sacramento's policy context and unique challenges for housing construction. This task will include preparation of a new cost-effectiveness report for the Sacramento region, which compares costs of different levels of EV-readiness in new construction. As part of this analysis, the cost-effectiveness report will also consider local incentives that could be used to offset any incremental costs. The report will include evaluation of the anticipated effectiveness of each option for attaining the City's EV targets for new construction.

Drawing on results of the cost-effectiveness report, the project team will conduct focused stakeholder focus groups with developers and affordable housing providers. Primary partners committed to participate as stakeholders are identified in **Table 4** and **Appendix A,** including several developers of multi-family projects in Sacramento. The focus group will be engaged to provide feedback and assist the team with a recommendation. Specifically, the team will evaluate trade-offs between voluntary tools and EV-readiness requirements that exceed CalGreen.

Findings and recommendations from the stakeholder group will drive the approach to complete this task, addressing the following minimum components:

- Recommendations for code updates for EV-readiness and infrastructure requirements in the City Building and Construction Code (Title 15) for the next cycle of the California Building Code in 2019, which may include recommendations to exceed mandatory CalGreen standards such as CalGreen Tier 1 or 2, or another locally-specific recommendation such as 20% EV readiness in new construction and retrofits.
- Recommendations for updates to the City Planning and Development Code (Title 17) to incentivize and/or require EV-readiness through land use standards, which will guide implementation tasks in the City's 2040 General Plan update.
- Creation of new incentive packages and materials to provide turn-key resources that address information gaps (to be completed through subsequent tasks) to minimize risks and uncertainties around design, permitting, planning, and financing.

Working through the PEV Collaborative, Sacramento's cost-effectiveness study and code updates will be used as a template to spur electrification in other agencies across the region. The task includes preparation of a summary report, the Community EV Planning Blueprint Report. This document will summarize findings, stakeholder recommendations, and templates for code or planning updates. As key members of the SacPEV Collaborative, SACOG and SMAQMD will assist will disseminating the report to other agencies throughout the region. Sacramento will also present the report to local working groups and professional associations,

seeking to further disseminate learnings throughout the region. Sacramento is also kicking off a General Plan update beginning in early 2018. Outcomes of this task will be used to inform policy development for incorporation into the General Plan, including analysis of related GHG reductions and contributions.

Task 4: Public Charging Prioritization Plan

Key benefits of Task 4:

Develop a pipeline of fundable public charging projects that will benefit disadvantaged communities.

Prepare a Public Charging Prioritization Plan, with priority projects to maximize access to disadvantaged communities.

Create blueprint EV design templates to guide future development and equip private property owners for future installations.

Identify methods to optimize public charging.

While Task 3 focuses on new construction, Task 4 seeks to optimize existing public and workplace EV charging infrastructure. Building on this, the task will establish a strategy for future expansion in existing construction. This optimization is a key foundational step before significant investment in new infrastructure, with the potential to serve existing demand more effectively and create capacity to support new EV drivers. Of the more than 400 public or workplace chargers in city limits, the City owns and operates approximately 20%. The project team will conduct an in-depth evaluation of current utilization and provide a plan to optimize and increase public access at key facilities, with a focus on service in disadvantaged communities. This task will address gaps between existing EV access and the EV infrastructure needs identified in the geospatial analysis in Task 2. Public engagement in Task 7 would allow for further vetting of these findings and identification of priority locations for charging.

This task will include an analysis of various business models to expand EV charging, including an evaluation of options for ownership and maintenance arrangements with EVSE charging companies, free EV charging models, or public-private partnerships. The City has implemented several different models to date, with various costs and benefits. Sacramento is launching a curbside charging framework will be launched in 2018 quarter 1, building on partnership with EVgo to launch in mid-2018. The task will also account for opportunities for dual-use charging, with recommended configurations to support public and restricted fleet charging needs.

Key benefits of Task 5:

Establish a consumer toolkit to use in community engagement for increasing awareness and removing barriers to EV adoption.

Create a strategy to accelerate workforce and economic development for vehicle electrification industries.

Identify a path to establish a ZEV service center.

In addition to providing the City with a pipeline of projects, this task will also provide blueprint design templates and cost estimates for key project typologies that can be replicated in private development. These templates will serve as replicable examples for other public and private projects. City staff will use these templates as educational resources for developers during the plan review process, identifying possible options and cost estimates. Templates will also be used as general educational materials as the City engages with other stakeholders, through the SacPEV Collaborative and through outreach tasks summarized in **Task 7**. This outreach will involve presentations to both local neighborhood associations and property owners, in addition to regional and statewide professional associations and conferences.

Task 5: EV Toolkits

In this task, the City will develop toolkits to foster both community and agency awareness. Priorities for this task are to remove consumer barriers to EV adoption and identify a path for creating an economic EV ecosystem. Development of a new Consumer EV Toolkit in Task 5 will

capitalize on learnings and outcomes from analytical and EV planning tasks described above. The project team will prepare a package of EV informational resources designed to inform property owners and the general public on EVSE and EV options. The toolkit will equip the City and other project partners to expand EV awareness and remove barriers to EV adoption. Numerous state resources provide a baseline of information to start from. However, this task will address new issues in electrification. Early pilots in Sacramento allow for compilation of emerging lessons and cost-benefits from the unique innovations in the region to date.

The second toolkit, EV Economic Pathways, will establish a strategy for the City to catalyze a ZEV service center and support additional workforce certification and training programs. This task will also identify anticipated demand for EV service needs, establishing targets for the type and size of qualified workforce necessary to support the City's EV targets. Key issues to be addressed include barriers entry for low-income and disadvantaged communities into the advanced transportation technology space. This new information will serve as a critical guiding resource, equipping the City with a project concept and actionable economic development strategies for electrification. The task would also equip the City with a project concept to use for the recruitment of project partners and funding.

Task 6: Advanced EV Mobility Opportunities

Key benefits of Task 6:

Evaluate outcomes of early pilots.

Identify best practices for effective EV mobility programs.

Develop a prototype and organizational structure for Sacramento's first e-mobility demonstration hub.

This task allows for a comprehensive review of findings and development of recommendations based on Sacramento's early electrification initiatives. Focusing on early pilots, the project team will develop a report that evaluates deployments to date and recommends how to improve program outcomes. While the task includes a review of efforts already initiated or underway, the City and SacPEV Collaborative partners are limited in the capacity to conduct a comprehensive evaluation of outcomes. This task is a key effort to measure progress to date and allow for dissemination of lessons to other parts of the state. These findings can inform investments in other regions, addressing challenges and successes in Sacramento's programs. Findings will also help the City and partners to identify sustainable business models and partnership approaches to increase service and access, learning from successes and failures of pilots in Sacramento. This report will include analysis of various business and service models, and relative cost-benefits of each program, both to the operating entity and the customer.

Additionally, the report will include a recommended prototype for a holistic e-mobility demonstration hub that the City can use to refine and package for future funding requests in partnership with the County, SMUD, SACOG, and SMAQMD. The e-hub concept will include both a preliminary site plan layout and recommended operational structure. The e-hub will provide both functional EV charging and mobility, in addition to educational resources and on-site staff support. This may include recommendations for leveraging Strategic Growth Council funding for the Franklin Boulevard Playbook program, which will fund outreach staff to catalyze planning efforts in Franklin Boulevard.

The project advisory committee will participate in evaluating findings and providing insights. Early findings from Sacramento's pilots provide critical learnings that can inform and guide statewide efforts. The report will also inform guide efforts. The City and other project partners will use information to refine structures of existing programs. Additionally, the report will equip the City and partners to prioritize the next round of EV mobility projects for funding.

Task 7: Community Engagement

A key outcome of this project is the implementation of a comprehensive outreach and engagement campaign with a focus on disadvantaged communities. The project team will develop a community engagement plan, identifying methods to maximize effectiveness and increase awareness. Community leaders and neighborhood groups will be engaged to identify priority charging locations for new infrastructure and e-mobility services. Outreach will be designed to build momentum for implementation. Early work from UC Davis ITS and the PH&EV Center identifies the importance of engaging trusted community institutions for outreach. Drawing on expertise of the PH&EV Center and other partners, the project team will develop a plan for effective outreach. This work will leverage outreach by the SMAQMD to promote the forthcoming scrap-and-replace incentives, in addition to SMUD's outreach for EV incentive programs. Project partners will work for unified branding and consistency in messaging, leveraging resources.

Key benefits of Task 7:

Direct engagement of community leaders and disadvantaged residents in issues of EV awareness and adoption and workforce development.

Identify priority charging locations and mobility needs of disadvantaged communities.

Create EV ambassadors, to disseminate EV resources throughout the community.

Several key challenges exist to engaging disadvantaged communities, which will be mitigated through a comprehensive outreach approach as follows:

- **Lack of neighborhood leadership in disadvantaged communities.** To address this, the City will collaborate with trusted community-based organizations and conduct pop-up events in conjunction with other community events. The City will leverage incentives and giveaways from other project partners, such as SMUD, SMAQMD, and SacEV. Working with community groups such as La Familia, the City will engage community members in trusted locations where residents can learn about new programs and incentives. The City will also support by leveraging events for the launch of Electrify America's outreach and Green City services, including ride-and-drives and car share events.
- **Workshop fatigue and community perception of disjointed messaging from the City.** The City will leverage existing education and outreach programs, developing new materials that place electrification within the context of community-wide mobility and economic innovation. The City will collaborate with Breathe California Sacramento Region, a local nonprofit that already receives funding from SMAQMD to conduct educational sessions in low-income communities. Outreach may also occur at events planned for the 2040 General Plan update.
- **Disconnect between EV technologies and immediate community priorities for job creation and public safety.** To counter this, the City will strive to present electrification as part of a comprehensive strategy for community enhancement, workforce development, and economic development. Participants will be engaged in evaluation of recommendations from the City's EV Economic Pathways report. The City will collaborate with local property business improvement districts and chambers of commerce to engage and promote electrification benefits and opportunities, including workforce development. This will include engagement with local programs seeking to spur workforce development, such as GreenTech or American River College, which offers an Alternative Fuels Certificate, and certification for Electronic Systems Technology. GRID Alternatives will provide technical feedback on workforce development opportunities in the electrification fields.

The City will utilize project partners to design outreach, facilitate events, and engage community

members. Key partners that will assist in outreach and engaging their communities include: SHRA, Mutual Housing California, La Familia, and Breathe California Sacramento Region. Of these, Mutual Housing and Breathe already operate education programs for EVs and mobility. Outreach will utilize materials developed in **Task 5**, **EV Toolkits**. Community members will be engaged for feedback on identification of priority locations for EV charging, EV mobility needs, and priorities for workforce development. Additionally, the City will utilize its strong relationships with property business improvement districts, chambers of commerce, and other business groups. The City of Sacramento Department of Parks and Recreation Neighborhood Services Division (NSD) will also support with community engagement and outreach. The NSD seeks to equip Sacramento's diverse residents with resources to revitalize, maintain and promote healthy communities. A key focus of the division is focusing on developing neighborhood relationship building and connecting neighborhoods to resources. Building on recent City efforts, the NSD will assist with developing and executing an effective outreach campaign.

Additionally, the City of Sacramento will also disseminate project outcomes regionally, statewide, and nationally. Key regional forums to present results include the Capital Region Climate Readiness Collaborative (CRC), a consortium of private, public, and faith-based organizations in the Sacramento Metropolitan Region. A sample of recent City staff presentations and current presentation commitments include the following, but actual presentations for the project will reflect the project period of performance:

- October 25, 2018: Urban Sustainability Director's Network Annual Meeting, panel presenter, *Strategies for Proliferating EVs within the Community*
- January 30, 2018: Young Professionals in Energy, Young Planners Group, Young Professionals in Transportation, panel presenter, *From Grid to Garage, Electric Cars in Sacramento Neighborhoods*
- April 2018: Green California Summit and Exposition (confirmed), panel presenter, *The 2 Best Electric Vehicle Stories in 2018*
- June 2019: EV Roadmap 11 Conference, panel presenter (confirmed), *Smart and Electric Cities*

4 TEAM QUALIFICATIONS AND EXPERIENCE

Summary

The SacPEV Collaborative will function as the primary advisory committee for the project. This group includes key local partners, from the local EV owner's association, SacEV, to the local electric utility, air district, and other local non-profits and public agencies. Additionally, the City will also engage existing partners for technical expertise and feedback and project tasks. The City will leverage recent and ongoing work with these partners to inform and maximize grant project outcomes. Lastly, the City will engage numerous other stakeholders in focus group meetings and project engagement. Stakeholders include those already involved in EV programs or infrastructure efforts in Sacramento. This proposal identifies initial stakeholders committed to participate; however, additional stakeholders would be identified for engagement upon grant funding. A summary of partners is provided in **Table 4**. Letters of commitments from these partners are included in **Appendix A**. Resumes for key personnel are included in **Appendix B,** including key City staff and partner staff to guide the effort. The City will also issue an RFP to select a highly qualified consultant team.

Table 4: Project Partners*

Advisory Group	Partners
SacPEV Collaborative – Project Advisory Committee	***Agencies*** • Sacramento Air Quality Management District (SMAQMD) • Sacramento Area Council of Governments (SACOG) • Sacramento County • Sacramento Municipal Utility District (SMUD) ***Other Community Groups and Organizations*** • Sacramento Electric Vehicle Owner's Association (SacEV) • UC Davis Institute of Transportation Studies, Plug-In Hybrid & EV (PH&EV) Research Center ***Nonprofits*** • Breathe California Sacramento Region • Valley Vision
Technical Advisors and EV Project Partners	***Existing Public Transit and Private EVSE/EV Mobility Partners*** • Electrify America • EVgo • Mercedes Benz USA • Sacramento Regional Transit (SacRT) • Zipcar ***Civic Lab Partners**** • Franklin Neighborhood Development Corporation • La Familia Counseling Center • SMAQMD • SMUD
Other Stakeholders	***Affordable Housing Providers and Developers*** • College Town International, LLC • Mutual Housing of California • Sacramento Housing and Redevelopment Agency • Symphony Development ***EV and EV Technology Companies, and Industry Experts*** • CALSTART • Greenlots • GRID Alternatives • Tesla • Volta

**Includes PEV Collaborative partners that will also serve on project advisory committee.*

In addition, the City of Sacramento is equipped to effectively manage the deliver the project. The City of Sacramento Public Works Department has extensive experience successfully implementing grant projects, including planning grants and capital projects including public facilities, including planning, design, environmental review, public outreach, infrastructure installation, studies, and construction of buildings and infrastructure. The Public Works Department includes 724 FTE responsible for tasks from transportation engineering to facility

construction, parking services, and management of the right-of-way. Public Works has a Capital Improvement Program over $300 million in federal, state, and other grant and funding programs. On average, the City delivers about $15 million annually in grant-funded programs and projects, primarily through the following federal grant funding programs: Regional Surface Transportation Program, Congestion Management and Air Quality, Highway Bridge Replacement Program, Highway Safety Improvement Program, and Active Transportation Program. The City has long experience in implementing State funded grants though various agencies, include Sustainable Transportation Planning Grants, Proposition 1C Transit-Oriented Development and Infill Infrastructure Grants, and several major programs under State Proposition 1B, including the Traffic Signal Synchronization Program, Highway Rail Crossing Safety Account, Trade Corridor Improvement Program, and State-Local Partnership Program.

The City has experience in implementing grants of various sizes and complexities with many agencies and organizations. It is currently completing a $30 million renovation of the historic Sacramento Valley Station with federal Transportation Investment Generating Economic Recovery (TIGER) program. Sacramento was also the recent recipient of a $250,000 grant from the California Energy Commission (ARV-15-018) for construction of a compressed natural gas fueling station by March 31, 2018. The City's focus is on implementing sustainable projects incorporating innovative technologies. The City has a long success record of compliance, monitoring, reporting, and delivery consistent with relevant guidelines, reiterated by reviews by state and federal oversight agencies, and has a record of good financial management. Please see relevant audit reports on the following webpage: http://www.cityofsacramento.org/Finance/Accounting/Reporting.

To successfully implement the project on time and on budget, the City will enter into an agreement with a subconsultant team to construct the project. Oversight of the project will occur through the Office of the Director of Public Works, with project management provided by the Sustainability Manager and senior management personnel. The Sustainability Manager will serve as the Project Manager, who will oversee all aspects of project administration and management. Technical expertise will be provided by various City staff across relevant departments and divisions (refer to attached resumes for key staff). Additional resources will be made available as needed.

Supportive Efforts

This grant proposal includes an in-kind match of $190,045 in City staff time, for 35% cost share. However, the value of several additional efforts is not identified in this proposal, reflecting that in some instances supportive efforts are highly regulated and complex arrangements that preclude reporting as official match. Nonetheless, these efforts provide a critical enabling foundation for this proposal:

- SacPEV Collaborative work to support launch of an EV Helpdesk, in partnership SacEV Association, the National EV Association, and Plug-In America.
- Electrify America's $44 million Green City investment in Sacramento by mid-2019.
- Partnership with Mercedes Benz for dealer training programs.
- SMAQMD's pilot Our Community CarShare program and development of a $5 million Clean Cars 4 All Incentive Program (formerly the Enhanced Fleet Modernization Program, EFMP).
- Technical expertise and partner input to guide and refine project deliverables, provided in-kind at no charge by agencies and private companies, including expertise from SMUD, SMAQMD, SACOG, the County of Sacramento, SacEV Association, US Davis

ITS, and others. Letters from committed partners are available in **Appendix A**.

5 ADDITIONAL BACKGROUND ON EXISTING EV EFFORTS IN SACRAMENTO

The City will implement the tasks described above in partnership with a subcontractor team and project partners. Efforts will leverage and build on the City's recent EV projects, as further described below.

Sacramento Area Plug-In EV Collaborative

Sacramento is a member of the Sacramento County EV Working Group [renamed Sacramento Area Plug-in EV Collaborative (SacPEV Collaborative)], which has been working together since 2015 to increase the deployment of EVs and related infrastructure in the region. This is the group behind this proposal, and committed to partnering for implementation. The EV Working Group is made up of public agencies, non-profits, and stakeholders with a goal of having the necessary charging infrastructure in place to meet the deployment of EVs and zero-emission vehicles and anticipated increase in EV owners/drivers in the Sacramento County region. The group typically meets at least monthly, with additional sub-groups coordinating on projects and efforts as needed. Partners in the SacPEV Collaborative include:

- City of Sacramento
- County of Sacramento
- Sacramento Municipal Utility District (SMUD)
- Sacramento Metropolitan Air Quality Management District (SMAQMD)
- Valley Vision
- SacEV Owner's Association
- Sacramento Clean Cities
- Sacramento Area Council of Governments (SACOG)
- UC Davis Institute of Transportation Studies (ITS)

Together with these partners, the City recently participated in developing the county-wide *Electric Vehicle Readiness and Infrastructure Plan* (2017). 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*[9] served as a foundation for the City's *EV Strategy*, providing data to determine the City's EV baseline and forecasts.

Existing City Programs and Infrastructure

Sacramento has been leading by example in City facilities and operations. Key examples include the following:

- The City currently owns and operates 91 chargers at City facilities, 78 of which are available for public or employee charging. City-owned chargers comprise approximately 20% of all workplace and public charging available in city limits.
- In December 2017, the Sacramento City Council also adopted a" ZEV First" commitment for the City fleet, committing to a minimum of 50% of annual light-duty Fleet purchases to be ZEV by 2018 and 75% of annual light-duty Fleet purchases to be ZEV by 2020. As of late 2017, 49% of approximately 2,400 City vehicles run on alternative fuels.

[9] 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.

- 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. Recent acquisitions for the fleet include one of the nation's first battery-electric refuse trucks. The procurement of 31 Chevy Bolts is currently underway.
- 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 City continues to operate the program, providing free or reduced-cost parking for 316 participants as of August 2017.

Curbside Charging Program

In 2017, the City of Sacramento initiated development of a curbside EV charging program. This effort has involved the analysis of curbside pilots in California and around the world for issues such as appropriate business models, accessibility requirements for the Americans with Disabilities Act, and other design and operational issues. To advance City efforts, in June 2017 the City entered into an agreement with EVgo for up to six high power, 150-kilowatt chargers in the public right-of-way at Southside Park, at no cost to the City. 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. The project site is also located in the federally-designated Promise Zone, and is designated in the top 25th percentile of CalEnviro Screen 3.0.

Southside Park, location of EVgo's High-Power Charging Plaza, to be operational by mid-2018.

The City is also in the process of negotiating two other proposals for curbside charging application. Development of permitting guidance is currently underway. Staff plan to release a public draft of the guidance by Spring 2018. The City is simultaneously developing a framework for citywide car share permitting, which will provide parking passes for car share and incentive EV programs. The framework will facilitate traditional round-trip car share and free-floating, "master" car share permits to authorize parking throughout parking zones in the City, without a designated curbside space.

Electrify America Green City Initiative

Sacramento 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.[10] Under this initiative, Electrify America will invest $44 million in Sacramento by mid-2019 to catalyze a transformational shift in mobility to zero-emission technologies by installing charging infrastructure, conducting outreach

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

and education, and implementing programs designed to increase access to and use of ZEVs. Additional investments are anticipated in subsequent investment cycles. Despite the large scale of this unprecedented investment, the City is not a direct recipient of any EV funding.

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. 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.

Sacramento Metropolitan Air Quality Management District Programs

The SMAQMD is leading numerous incentive and pilot programs to encourage electrification for the region. Efforts have focused on improving mobility for disadvantaged communities. In partnership with local school districts, SMAQMD obtained $7.5 million in Cap-and-Trade funds in 2016 for 29 zero-emission electric school buses operating primarily in disadvantaged communities. In early 2017, SMAQMD also launched the pilot Our Community CarShare program. This inaugural effort is the state's first low-income ZEV car share program. Despite significance of this launch, the program is only funding 8 EVs at four disadvantaged community sites. The City is supporting the program with construction of two EV chargers dedicated for the program at the Sacramento Valley Station.

Currently SMAQMD is also developing *a* voluntary scrap-and-replace retirement program for older, polluting cars. Funding will come from the California Air Resources Board through the Clean Cars 4 All program. Financial incentives will be available to encourage low-income residents in disadvantaged communities to turn in older cars in exchange for

newer, cleaner, low- to zero-emission cars. The program is planned for launch in late-2018 or early 2019.

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. Sac EV is another local 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.

Local partnerships are also seeking to address barriers to EV sales. In a unique partnership with Mercedes Benz USA (MBUSA), Sacramento and the Sacramento PEV Collaborative are also collaborating to evaluate and deploy new EV sales programs..MBUSA selected Sacramento as one of just two communities in the nation to develop and launch an EV dealer training program. Together, MBUSA and the Sacramento PEV Collaborative have conducted initial trainings with local dealers. Through this effort, MBUSA and Sacramento PEV Collaborative partners will continue to share data and lessons to identify best practices for accelerating the sale of EVs.

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. SMUD offers an array of EV-related support to public agencies, and has been instrumental in engaging 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.

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.

EV Helpdesk

The SacPEV Collaborative is currently collaborating to develop an EV Helpdesk. SMAQMD is currently using CivicSpark fellows to create initial materials for the EV Helpdesk program. This resource is intended to serve regionwide and can serve as a model for state efforts to launch similar outreach programs. The SacEV Association has also secured a commitment of support from the National EV Association to pilot a new EV Welcome Program concept in Sacramento, with a pledge of support from Plug-In America. The intent of this program is to provide on-call support for any interested party in EVs, with ongoing support to purchasers. Launching this new program in Sacramento will serve as a test before the National EV Association develops a national program. The program is based on Norway's successful program and will provide a welcome kit, welcome services, customized EV content, and staff to manage the effort.

Civic Lab – Franklin Boulevard

SACOG is convening a year-long collaborative to bring together public and private stakeholders for the launch of innovative mobility programs. The City is participating on the Franklin Boulevard team, seeking to launch a zero-emission mobility service for Franklin Boulevard. Franklin Boulevard is a low-income, suburban area with dispersed stores and shopping centers. Currently no public transit operates in the district. The group is seeking to launch a new EV mobility service and collaborate with SACOG to seek funding. This project is being implemented in partnership with SMUD, SMAQMD, the Franklin Boulevard Business District, and La Familia Resource Center, a community-based counseling organization located in the Franklin Boulevard neighborhood. This pilot project serves as a test case, as the solutions identified for Franklin Boulevard may be applicable in other areas of the Sacramento region with limited mobility options. The project hypothesizes that increased mobility options for Franklin residents and employees will positively affect access to jobs, healthcare, fresh food, education, entertainment, and other opportunities, all while positively contributing to GHG reductions strategies of the region and state. Primary objectives of the Civic Lab effort include the following:

- Identify low-cost, low-emissions transportation solutions that improve access to transit for the Franklin Boulevard community while increasing mobility per dollar spent
- Test the economies of scale by combining zero-emission mobility services with energy generation and storage technologies.
- Improve employment and economic mobility by better connecting businesses, residents, and services.
- Identify sustainable business models and recommended operation and maintenance structures to sustain long-term mobility services for the community.

Timeline of Existing Efforts

Table 5 below summarizes primary City efforts and timelines. These efforts provide a foundation for the tasks described in this grant application, identifying resources the City will leverage to achieve proposed project objectives and goals.

Table 5: Summary of Primary Current and Future Efforts to Leverage for Sacramento EV Implementation Blueprint

Partnership or Project	Status/Notes	Anticipated Timeline
Curbside EV Charging Guidance		
EVgo High-Power Curbside Charging Plaza	Agreement with City executed for up to six high-power 150-kilowatt chargers, currently undergoing permitting	Operational by mid-2018
Volta Curbside EV Chargers	Under negotiation for phased installation of curbside infrastructure	Enter into agreement by mid- to late 2018, construction by early 2019 (anticipated, pending City Council action)
Sacramento Curbside Charging Guidance	Development of guidance in process	Public release and stakeholder meetings by Spring 2018, release permitting guidance by mid-2018
EV Programs		
Our Community Car Share	First phase in operation, planning for expansion in second phase	Funded through approximately 2019
Electrify America (EA) $44 million Green City Initiative	First investment cycle underway, finalization of EA agreements with third-party providers in process; RFP released for input on ZEV shuttle and options	Construction of infrastructure anticipated by late 2018, EV car share to launch early 2019
Civic Lab – ZEV Mobility for Franklin Boulevard	Planning underway	ZEV mobility service launch by late 2018
SMAQMD Scrap-and-Replace Program	Development and agreements underway with CARB	Launch mid- to late-2018
UC Davis In-Depth EV Survey of Sacramento	Study kickoff is underway	To be completed by late 2018
City Updates to EV Parking Program	Program survey completed in late 2017 and audit currently underway	Program to be updated by late 2018
City code updates for EV car share and on-street EV parking designations	Planning underway	To be completed by mid-2018
EV Helpdesk	Scoping underway	Anticipated by late 2018
Other		
2040 General Plan Update	Development of RFP underway	RFP to be released by March 2018, project kick-off in July 2018 and anticipated completion by April 2020.