

# SCAG EV Charging Station Study

## EV Charging Station Guide For Property Managers

Revised and Approved October 2022



# SCAG EV Charging Station Guide for Property Managers

Publish Date October 2022

## TABLE OF CONTENTS

Executive Summary .....	2
EV Charging Basics .....	2
Conclusion .....	8



## ABOUT SCAG

SCAG is the nation’s largest metropolitan planning organization (MPO), representing six counties, 191 cities and more than 19 million residents. SCAG undertakes a variety of planning and policy initiatives to encourage a more sustainable Southern California now and in the future.

## VISION

Southern California’s Catalyst for a Brighter Future

## MISSION

To foster innovative regional solutions that improve the lives of Southern Californians through inclusive collaboration, visionary planning, regional advocacy, information sharing, and promoting best practices.

## EXECUTIVE SUMMARY

This guide was developed to assist commercial, retail, and multiunit dwelling (MUD) property owners and managers within the SCAG region understand the benefits and considerations of installing EV charging stations (EVCS) at their facilities.

Property managers should familiarize themselves with EV charging basics, including the types of chargers, appropriate use cases, and typical costs so the correct charging solution can be identified early in the planning process. Site design will vary on a case-by-case basis, but projects should consider key variables such as access to electrical power, ADA requirements, and ease of accessibility to drivers and tenants. Site hosts will need to familiarize themselves with local permitting requirements and may need to work closely with private and public sector partners for a smooth project installation.

As EV adoption grows, property managers have an incentive to provide this service to attract and retain customers, patrons, and tenants who will have a greater need for charging. EVCS can provide direct revenue through the sale of electricity, and supplemental revenue through increased retail sales or higher rents. When funding is limited, property managers can explore alternate ownership structures to reduce upfront costs to project implementation.

### Benefits of EVCS


- > Direct revenue generation from electricity sales
- > Indirect revenue generation from higher rents or retail sales
- > Differentiate from competition
- > Align with sustainability goals





## EV CHARGING BASICS

### CHARGER TYPES AND TYPICAL UPFRONT COSTS

EVCS are categorized into three different levels depending on their power output (Table 1). Product and installation costs generally increase with power output because increased loads are more likely to require electrical upgrades. After installation there are two primary ongoing costs: networking costs and maintenance costs. Most Level 2 and Level 3 EVCS are networked charging stations, where they connect to a cloud platform and allow the EVCS owner to monitor utilization and set prices. Charger maintenance responsibility, while typically minimal, generally falls on the EVCS owner. Most charger issues are software related and can be resolved by rebooting the EVCS. EVCS owners can choose to maintain the stations in-house or contract this service out to the charging manufacturer or another 3<sup>rd</sup> party through a service agreement. These agreements; however, may not cover damage from improper use or vandalism.

**TABLE 1: OVERVIEW OF CHARGING TYPES**

Charger Level	Plug Type and Power Output	Recommended Use Case	Typical Installation Costs (\$/port)	Typical Ongoing Cost (\$/port/yr)	Image
Level 1	Standard household outlet, 1.9kW @ 110V	Overnight residential charging. Optional low-cost charging option in MUDs. Can use pre-existing outlets. Recharges 3.5-6.5 miles per hour.	\$1,000-\$2,000	Networking: N/A. Maintenance: minimal	

Charger Level	Plug Type and Power Output	Recommended Use Case	Typical Installation Costs (\$/port)	Typical Ongoing Cost (\$/port/yr)	Image
<b>Level 2</b>	Standard SAE J1722; 1.9kW-19.2kW. Typical 7.2kW @ 240V.	Overnight residential, workplace, and commercial charging (2-4+hrs). Recharges 14-35 miles of range per hour.	\$10,000-\$50,000	Networking: \$120-\$360. Maintenance: \$150-\$1,000	J1772 
<b>Level 3 Direct Current Fast Charger (DCFC)</b>	Multiple types CCS1, CHAdeMO, Tesla; 25kW-350kW+ @ 480V 3 Phase	Short stops along major corridors and commercial charging (<1hr). The typical EV can expect to recharge from 20% up to 80% in under 30 minutes.	\$50,000-\$100,000+	Networking: \$120-\$360. Maintenance: \$1,000+	CHAdeMO  CCS  Tesla 

### SITE SELECTION & INSTALLATION GUIDELINES

Designing an EVCS project and placement requires thought and planning to be cost effective and beneficial to EV drivers and site hosts. In the earliest deployments vendors and other third parties dictated site selection and charger placement. While that may have worked reasonably well to date with the limited number of charging stations installed, a lack of knowledge about where to site charger stations is still a significant barrier to expansion of an EV charging network. Additionally, sites need guidance on how to choose what type of charging (Level 2 or DCFC) to install at various locations. SCAG hosts a [PEV ATLAS](#) which includes a variety of suitability results throughout the region to help property managers understand if their site has a high need for charging infrastructure. Cities and project developers can use the tool to help identify areas charging stations are most needed in an area. Other resources related to EV charging can be found online at [SCAG's Alternative Fuels & Vehicles Projects](#).

### PRIMARY SITE DEVELOPMENT CONSIDERATIONS

As property managers evaluate their own properties, highly visible and/or highly trafficked sites such as large employment centers, commercial plazas, schools and colleges, hotels, and other popular destinations make for good options to add EVCS. These sites tend to have long dwell times and are well suited for Level 2 charging stations. Multifamily residential locations can consider adding Level 2 EVCS in shared parking areas. If multifamily residential properties want to provide charging infrastructure to every tenant, they may consider Level 1 charging or circuit sharing Level 2 charging technology to reduce electrical upgrade costs. Sites near major travel corridors or sites with high parking turnover may be appropriate for DCFC.

**EVCS Site Selection Best Practices**

- > High vehicle traffic
- > Easy for drivers to see
- > Close to power source
- > ADA compliant
- > Near amenities

As sites are evaluated, the site host should think about where the EVCS are placed in reference to the site as a whole. Placing EVCS closer to site amenities can act as a perk for EV drivers, though that needs to be balanced with ADA and access to power considerations. It is common for EVCS projects to require a new electrical service, so locating EVCS near utility transformers, power poles, or vaults can reduce overall installation costs. In some cases, buildings may have spare electrical capacity the EVCS can tie into. Networked EVCS require access to the internet or cellular signal. Sites with poor signal, such as underground parking garages, may need cellular repeaters or consider EVCS products

with integrated cellular or Wi-Fi capabilities. Some cities may have additional aesthetic requirements that need to be factored into the final EVCS project design. In some cases, these design considerations line up well with each other and result in a cost-effective project. In other cases, the final design may need to balance between opposing considerations if for example utility power is far away from a building entrance. Site hosts may need to decide how to prioritize different factors in the final design.

## DETERMINING QUANTITY OF STANDARD AND ADA EVCS

Once a site has been selected for an EVCS project, the site host or project developer must determine how many charging stations to install. California Building Code (CBC) has minimum requirements for EVCS infrastructure for new construction or major modification projects. Adding EVCS to existing sites typically does not trigger CBC requirements; but these minimum requirements can be a useful reference for determining how many EVCS to install at commercial sites. 2019 and 2022 Non-Residential mandatory measures are summarized in Table 2. The 2022 building adds trigger requirements to existing MUDs. If parking stalls are added or altered, or the lighting or other electron systems are altered such that an electrical permit is required, 10% of the affected stalls must be EV capable.

**TABLE 2: CALIFORNIA BUILDING CODE NON-RESIDENTIAL MANDATORY MEASURES**

Total number of Actual Parking Spaces	Number of Required EV Charging Spaces (2019 Code)	Number of Required EV Charging Spaces (2022 Code)
0-9	0	0
10-25	2	4
26-50	4	8
51-75	7	13
76-100	9	17
101-150	13	25
151-200	18	35
201 and over	10% of total	20% of total

Additionally, any time EVCS are installed at a publicly accessible location, California requires a minimum number of chargers to be ADA compliant (Table 3). EVCS in common areas at multifamily properties would be subject to ADA requirements but would be exempt if EVCS are assigned to specific tenants. ADA compliance can introduce design constraints as these standard and van accessible stalls must have access aisles with truncated domes at the curb, paths of travel, and be graded less than 2%. Sample ADA compliant layouts are shown in Figure 2 and Figure 1. Installing EVCS for dedicated stalls at MUDs may be exempt from ADA requirements.

**TABLE 3: PUBLICALLY ACCESSIBLE EVCS ADA REQUIREMENTS**

Number of EVCS at a Facility	Van Accessible	Standard Accessible	Ambulatory
1-4	1	0	0
4-25	1	1	0
26-50	1	1	1
51-75	1	2	2
76-100	1	3	3
101+	1, Plus 1 for each 300 or fraction thereof, over 100	3, Plus 1 for each 60 or fraction thereof, over 100	3, Plus 1 for each 50 or fraction thereof, over 100

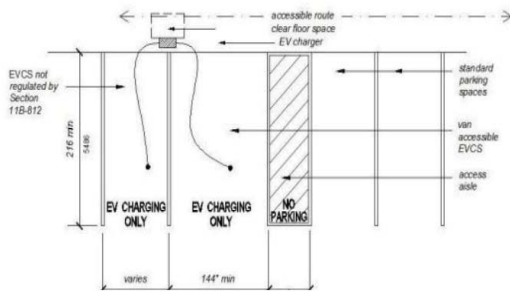


Figure 2. Sample layout with 2 EV Chargers and 1 Van Accessible Stall

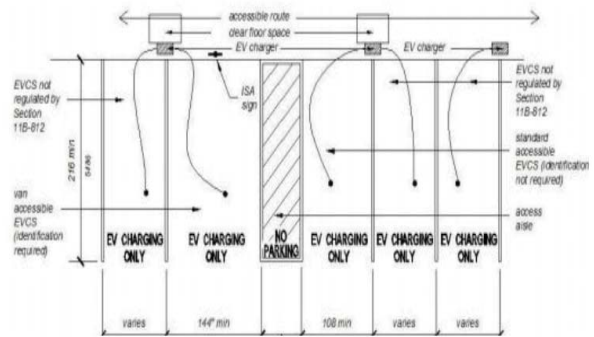


Figure 1. Sample layout with 5 EV Chargers, 1 Van Accessible Stall, and 1 Standard Accessible Stall

## UTILITY COORDINATION

Coordination with utilities is critical for larger EVCS buildouts, or for projects that include DCFC, as it is likely that significant site and utility infrastructure upgrades may be required. Site owners should contact their utility representative early in the planning process to check if there is sufficient electrical capacity to accommodate the new loads. If significant utility upgrades are needed, it can take up to 12-18 before there is sufficient electrical capacity available. If there is a need for chargers sooner, utility representatives may be able to support the site design, provide recommendations on charger placement, and connect the site to available incentives or programs.

## PARKING AND SIGNAGE CONSIDERATIONS

Most EVs still require 30 minutes, or longer, to charge; therefore, clear signage will help ensure a positive and safe user experience. It is generally considered best practice that EVs only park in an EV charging stall while the vehicle is actively charging to increase availability for other EV drivers. In commercial areas, placing time limits for vehicle charging can increase EVCS availability, generally up to 4 hours for Level 2 EVCS. Increasing the cost of charging past established time limits can help keep EVCS open. Non-EVs have been noted to occasionally park in EV charging stalls. As EV ownership increases, the need for consistent signage and enforcement of parking policies may increase. Site hosts can issue warnings on windshields and coordinate with local governments to enforce parking restrictions by ticketing or towing vehicles that do not abide by EVCS parking rules. This should be considered as a last resort for repeat offenders or reserved until EVs have become widely adopted and the drivers become aware of EVCS etiquette.



## PERMITTING AND INSPECTIONS

Adding EVCS to existing facilities typically requires a building or electrical permit. While specific permitting requirements vary by City, a plan check is typically required for commercial EVCS which can result in lengthy review periods and occasionally multiple iterations of corrections. Site hosts and project developers should review City permit requirements early in the planning process. Starting January 1, 2023, all California cities will have established deadlines to review and approve EVCS permits. After installation project developers typically need to schedule a final inspection before EVCS can be operated.

## **BUSINESS OPPORTUNITY FOR EVCS**

Commercial property and multifamily property owners have multiple ways to benefit from installing EVCS at their sites. Networked EVCS owners can set rates and charge users for the electricity dispensed and can markup electricity costs to generate a profit. In California, EVCS owners can generate additional revenue by generating and selling low carbon fuel standard credits, though this may only be viable with larger buildouts or if aggregated among multiple properties. Some charging stations have large displays which can be used for advertisement space (if allowed by the City), providing a secondary revenue stream. There are indirect benefits to installing EVCS including increasing the dwell time of business patrons, and thus increased retail sales, and promoting corporate branding to attract new customers, tenants, or employees<sup>1</sup>. Sites can realize these benefits, even if they decide not to charge users for the electricity.

Overall profitability and return on investment of EVCS will depend on how the site chooses to monetize the station. Sites may elect to not charge users for the electricity and derive value strictly through increased retail sales, rents, or branding. For sites that do want to charge for electricity, public charging rates generally fall between \$0.20/kWh and \$0.60/kWh, with the lower range generally resulting in breaking even and the higher range resulting in net profit over the life of the charger.

## **PAYMENT MECHANISMS**

Site hosts should consider how EV drivers will pay for the electricity they consume. Most networked EVCS come with their own cloud platform where EV drivers can pay through a mobile application or RFID card for certain workplace or tenant charging situations. EV drivers tend to have multiple apps given the variety of charging station vendors they may use. While it may be irrelevant to the site host, this can be cumbersome for users and limits access to those that have a smartphone. As a way to increase access to more EV drivers, site hosts should consider adding credit card readers to charging stations. This is required in California for new Level 2 EVCS as of January 2021, and DCFCs as of January 2023<sup>2</sup>. If a multifamily property intends to electrify all tenant spaces with low cost Level 1 charging or non-networked level 2 charging, it may be simpler to recover costs through increased monthly parking fees or rents. Lastly, the EV industry is currently working on new “plug and charge” protocols, where the charging station automatically identifies the vehicle plugged in and bills the owner at the end of the charging session<sup>3</sup>. This is similar to how the Tesla network already operates, but in an open ecosystem.

## **FUNDING AND FINANCING OPPORTUNITIES**

### **DIRECT INCENTIVES AND REBATES**

There are currently multiple funding sources available to offset the upfront and ongoing costs of EV charging stations. Table 4 summarizes currently available (as of July 2022) incentives and rebate programs available in the SCAG region. An up-to date list of EVCS funding and incentive programs can be viewed at [AFDC Laws and Incentives](#) webpage. Some funding programs may be in high demand and funds can be exhaust

---

<sup>1</sup> <https://atlaspolicy.com/wp-content/uploads/2020/04/Public-EV-Charging-Business-Models-for-Retail-Site-Hosts.pdf>

<sup>2</sup> [https://calevip.org/sites/default/files/docs/calevip/California\\_EVCS\\_Regulations\\_Guide.pdf](https://calevip.org/sites/default/files/docs/calevip/California_EVCS_Regulations_Guide.pdf)

<sup>3</sup> <https://www.caranddriver.com/news/a35044132/plug-and-charge-ev-charging-mustang-mach-e/>

ed quickly. It is recommended to identify available funding sources, eligibility, and availability requirements early in the planning process to increase the chance of securing funds.

**TABLE 4: EVCS REBATE PROGRAMS – JULY 2022**

Entity	Program Name	Summary	Other Notes
Southern California Edison	<a href="#">Charge Ready</a>	No-cost infrastructure up to charger stub out and incentives on eligible charging stations.	4 charging port minimum (10+ recommended). Preference for multifamily and DACs
Los Angeles Department of Water and Power	<a href="#">Charge Up LA!</a>	Rebates on qualifying L2 and DCFCs, varies by power output and site type	Maximum incentives vary by charger type and site type. Open Enrollments during specified times
Burbank Water and Power	<a href="#">Lead The Charge</a>	Rebates on qualifying L2 and DCFCs, varies by power output and site type	MUDs may qualify for Level 1 chargers in common areas. Rebates can be applied for before or after construction
Glendale Water and Power	<a href="#">Charging Station Rebate</a>	Rebates on qualifying L2 and DCFCs, varies by power output and site type	Rebate application submitted after installation
Pasadena Water and Power	<a href="#">Commercial Charger Incentive Program</a>	Rebates on qualifying L2 and DCFCs	Applies to stations installed after August 2018, until funds are exhausted
California Energy Commission	<a href="#">CAleVIP</a>	Rebates on qualifying L2 and DCFCs for qualifying site types	Funding must be reserved before installation. Funding allocated by region and may be exhausted quickly.
California Air Resources Board	<a href="#">Low Carbon Fuel Standard</a>	Generates low carbon credits from the electricity dispensed to vehicles which can be sold each quarter.	Credit prices are market driven and vary over time. Chargers must be registered with CARB, may need to work with broker to facilitate reporting and credit sale

## EV INFRASTRUCTURE OWNERSHIP MODELS

While California will likely continue to provide funding for EV infrastructure, it remains highly competitive. Exploring alternative financing and ownership models (Table 5) can help reduce upfront financial barriers. Site hosts can purchase, own, and operate the chargers themselves but are then responsible for networking fees and maintenance. For this reason, its generally recommended to charge users for the electricity to at least break even on ongoing costs. On the other end of the spectrum, sites may be able to lease parking spaces to third parties and the vendor retains sole ownership of the charging stations and is responsible for maintaining them. Other successful ownership models include charging as a service (CaaS), where the site host pays little to no money upfront and pays the vendor over time via a subscription model, typically on a per kWh basis. Lastly, shared ownership and revenue models may be possible. These ownership models may not be viable for all projects, so site hosts should work closely with project developers to determine the best ownership model for the specific project.



**TABLE 5: SAMPLE EV OWNERSHIP MODELS**

Line Item	Host Owned	Charging as a Service (CaaS)	Hybrid Host-Vendor Owned	Vendor Owned
Service Model	Host own and operate	Vendor own and operate via subscription	Shared ownership	Vendor own and operate
Ideal for:	Pilot projects, site desire to control charging revenue	Large fleet electrification projects	Sites that want limited control on charger O&M	Sites with very high expected EVCS utilization
Equipment Ownership	Host	Vendor	Host or Vendor	Vendor
Installation Costs	Host	Vendor	Host or Vendor	Vendor
Electricity Costs	Host	Vendor	Vendor	Vendor
Support & Maintenance Costs	Host	Vendor	Vendor	Vendor
Charging Revenue	Goes to Host	Varies	Split with Vendor	Majority Percentage to Vendor
Pricing Controls	Host	Vendor	Vendor	Vendor
Contract Term	Contract Typically Not Required	Contract Typically Required	Contract Typically Required	Contract Typically Required
Network Fees	Yes	No	Yes	Yes
Monthly Subscription Fee	No	Yes	No	No

## **CONCLUSION**

The private sector stands to realize multiple benefits by installing EV infrastructure, from additional revenue generation, attracting and retaining new customers or tenants, differentiating themselves from competition, and furthering applicable sustainability goals. To best realize these benefits, property managers should work closely with experienced project developers that can design projects most appropriate for the site type and expected use case.



### Main Office

900 Wilshire Blvd., Ste. 1700,  
Los Angeles, CA 90017  
Tel: (213) 236-1800

### Regional Offices

Imperial County  
1503 North Imperial Ave., Ste. 104  
El Centro, CA 92243  
Tel: (213) 236-1967

Orange County  
OCTA Building  
600 South Main St., Ste. 741  
Orange, CA 92868  
Tel: (213) 236-1997

Riverside County  
3403 10th St., Ste. 805  
Riverside, CA 92501  
Tel: (951) 784-1513

San Bernardino County  
Santa Fe Depot  
1170 West 3rd St., Ste. 140  
San Bernardino, CA 92418  
Tel: (213) 236-1925

Ventura County  
4001 Mission Oaks Blvd., Ste. L  
Ventura, CA 93012  
Tel: (213) 236-1960

**LEARN MORE**

[SCAG.CA.GOV](http://SCAG.CA.GOV)

# SCAG EV Charging Station Study

## EV Charging Station Guide For Anaheim

Revised and Approved  
October 2022

# SCAG EV Charging Station Guide for Anaheim

Publish Date: October 2022

## TABLE OF CONTENTS

Executive Summary .....	2
Public Awareness .....	3
Supporting the Private Sector and Influencing EV Adoption .....	7
City Owned Infrastructure and Fleets .....	9
Conclusion .....	12



## ABOUT SCAG

SCAG is the nation’s largest metropolitan planning organization (MPO), representing six counties, 191 cities and more than 19 million residents. SCAG undertakes a variety of planning and policy initiatives to encourage a more sustainable Southern California now and in the future.

## VISION

Southern California’s Catalyst for a Brighter Future

## MISSION

To foster innovative regional solutions that improve the lives of Southern Californians through inclusive collaboration, visionary planning, regional advocacy, information sharing, and promoting best practices.

## EXECUTIVE SUMMARY

This guide was developed to assist the City of Anaheim (City) to expand its electric vehicle (EV) charging network into harder to reach areas and to continue fostering EV adoption. It includes an overview of general EV charging basics, funding EV infrastructure, state requirements and design considerations, local EV policy and procedures, and guidelines for successfully implementing electric vehicle charging stations (EVCS). The City operates its own municipal electric utility, Anaheim Public Utilities (APU), and thus is uniquely positioned to provide EV infrastructure within the City. The City plays multiple roles in fostering EV adoption including educating the public, coordinating with the private sector, and converting City-owned fleets to demonstrate EV capabilities.

Staff are encouraged to continue their research in EV charging technology advancement, including new charging options, use cases, and typical costs to identify the appropriate charging solution early in the planning process. Site design varies on a case-by-case basis, and project implementation considers a few key variables, including but not limited to access to electrical power, ADA requirements, and visibility of stations to drivers.

The City has proven its dedication at building partnerships with EVCS companies to install EVCS at public parking lots, shared commercial or multiunit dwelling (MUD) parking lots, and other highly trafficked sites throughout the City. The City continues to support the private sector and to facilitate installing EVCS at commercial and MUD properties. This is accomplished by connecting interested parties to resources and posting clear permitting and design requirements to minimize permit processing times. The City has gone above and beyond the State's requirement in electrifying its City-owned fleet, showcasing to the community that they are viable options. While California has multiple funding programs, it remains highly competitive. When funding is limited, cities can explore alternate ownership structures to reduce upfront costs to project implementation. This hands-on project experience will help cities better educate the public and coordinate with private sector partners.

### EVCS Project Considerations for Cities

- > Pick an appropriate site
- > Determine ideal charger quantity, type, and placement
- > Plan for ongoing operation and maintenance
- > Determine ownership structure
- > Apply for available funding

## PUBLIC AWARENESS

Overall public awareness around EV charging stations is still low including the different types, use cases, costs, and best practices around installation. While 71% of drivers overall expect to charge at home, a majority of residents in MUDs expect to charge mostly with publicly available charging stations if they were to own an EV<sup>1</sup>. This presents a clear need for potential site hosts to understand the different types of charging stations, which type is appropriate for their site, how much they may cost, installation best practices, and the overall business case and other potential benefits. Cities play a role in educating stakeholders in their community on this subject.


## EV CHARGING BASICS

### CHARGER TYPES AND TYPICAL COSTS





EV chargers are categorized into three different levels depending on the amount of power they can output to an EV. Product and installation costs generally increase as power output increases because increased loads are more likely to trigger electrical upgrades. Product costs for chargers may decrease over time as manufacturers realize economies of scale, particularly for Level 3 DC Fast Chargers (DCFC); however, installation costs are not likely to decrease over time as electrical equipment is a mature industry and labor costs are expected to increase over time.

After charging stations are installed, there are two primary ongoing costs: networking costs and maintenance/repair costs. Most Level 2 EVCS and DCFCs are networked charging stations; they connect to a cloud platform and allow the charging stations owner to monitor utilization and set charging rates. EVCS may have a cloud platform hosted by the charging manufacturer (i.e. ChargePoint) or a 3<sup>rd</sup> party (i.e. Shell RechargePlus). Charger maintenance responsibility, while typically minimal, generally falls on the charging station owner. Most charger issues are software related and can be resolved by rebooting the charging station. Typical hardware maintenance items include worn out or broken ports, damaged or removed cables, and cracked screens. It is recommended to conduct inspections of charging stations 1-2 times per year. Charging station owners can choose to maintain the stations in-house or contracted this service out to the charging manufacturer or other 3<sup>rd</sup> party through a service level agreement (SLA). Table 1 summarizes the key differences, use cases, and typical costs per port.

**TABLE 1: OVERVIEW OF CHARGING TYPES AND TYPICAL COSTS**

CHARGER LEVEL	Plug Type and Power Output	Recommended Use Case	Typical Installation Costs (\$/port)	Typical Ongoing Costs (\$/port/yr)	Image
Level 1	Standard household outlet, 1.9kW @ 110V	Overnight residential charging. Optional low-cost charging option in MUDs. Can use pre-existing outlets. Recharges 3.5-6.5 miles per hour.	\$1,000- \$2,000	Networking: N/A. Maintenance: minimal	

<sup>1</sup> Consumer Reports. December 2020. Consumer Interest and Knowledge of Electric Vehicles, 2020 Survey Results.

CHARGER LEVEL	Plug Type and Power Output	Recommended Use Case	Typical Installation Costs (\$/port)	Typical Ongoing Costs (\$/port/yr)	Image
<b>Level 2</b>	Standard SAE J1722; 1.9kW-19.2kW. Typical 7.2kW @ 240V.	Overnight residential, workplace, and commercial charging (2-4+hrs). Recharges 14-35 miles of range per hour.	\$10,000-\$50,000	Networking: \$120-\$360. Maintenance: \$150-\$1,000	J1722 
<b>Level 3 (DCFC)</b>	Multiple types CCS1, CHAdeMO, Tesla; 25kW-350kW+ @ 480V 3 Phase	Short stops along major corridors and commercial charging (<1hr). The typical EV can expect to recharge from 20% up to 80% in under 30 minutes with a DCFC.	\$50,000-100,000+	Networking: \$120-\$360. Maintenance: \$1,000+	CHAdeMO  CCS  Tesla 

## SITE SELECTION & INSTALLATION GUIDELINES

Developing an EVCS project requires thought and planning to be cost effective and beneficial to EV drivers. In the earliest deployments vendors and other third parties dictated site selection and charger placement. While that may have worked reasonably well to date with the limited number of charging stations installed, a lack of knowledge about where to site charger stations is still a significant barrier to expansion of an EV charging network within cities. Furthermore, without a guiding criterion in place, cities may not be able to direct the expansion of their EV charging network in a way which meets their specific goals towards equitable access or economic development. Additionally, sites need guidance on how to choose what type of charging (Level 2, Level 3/DCFC) to install at various locations. SCAG hosts a [PEV ATLAS](#) which includes a variety of suitability results throughout the region. Cities and project developers can use the tool to help identify areas charging stations are most needed in an area. Other resources related to EV charging can be found online at [SCAG's Alternative Fuels & Vehicles Projects](#).

## SITE TYPE CONSIDERATIONS

The City actively seeks partnership opportunities and provides resources to privately owned sites to install publicly available charging stations at highly visible and trafficked sites. The City has also installed EVCS infrastructure at City-owned properties. Through APU's EV Demand Response (EVDR) program currently under development, the City works towards the continued expansion of EVCS infrastructure to other publicly owned sites and private locations, such as large employment centers, commercial plazas, schools, hotels, and other popular destinations. Additional sites under consideration include sites near major travel corridors or sites with high parking turnover for potential DCFC charging infrastructure.

As sites are being considered, the City encourages the site host to consider where the EVCS are located in reference to the site as a whole. Placing an EVCS closer to site amenities can act as a perk for EV drivers, while still balancing the needs of ADA and access to power. The City also has aesthetic requirements for certain EVCS projects. In some cases, these design considerations line up well with each other and result in a cost-effective project. In other cases, the final design may

### EVCS Site Selection Best Practices

- > High vehicle traffic
- > Easy for drivers to see
- > Close to power source
- > ADA compliant
- > Near amenities

need to balance between opposing considerations if, for example, utility power is far away from a building entrance. Site hosts may need to decide how to prioritize different factors in the final design.

## DETERMINING QUANTITY OF STANDARD AND ADA EVCS

Once a site had been selected for an EVCS project, the site host or project developer must determine how many charging stations to install and where to place them within the site. California Building Code (CBC) has minimum requirements for EVCS infrastructure for new construction or major modification projects. Adding EVCS to existing sites typically does not trigger CBC requirements; but these minimum requirements can be a useful reference to determine how many EVCS to install at a site. The 2019 and 2022 Non-Residential mandatory measures are summarized in Table 2.

**TABLE 2: CALIFORNIA BUILDING CODE NON-RESIDENTIAL MANDATORY MEASURES**

Total number of Actual Parking Spaces	Number of Required EV Charging Spaces (2019 Code)	Number of Required EV Charging Spaces (2022 Code)
0-9	0	0
10-25	2	4
26-50	4	8
51-75	7	13
76-100	9	17
101-150	13	25
151-200	18	35
201 and over	10% of total	20% of total

Additionally, any time EVCS are installed at a publicly accessible location, California requires a certain minimum number of chargers to be ADA compliant. Specific requirements are summarized in Table 3. ADA compliance can introduce design constraints as these standard and van accessible stalls must have access aisles with truncated domes at the curb, paths of travel, and be graded less than 2%. Sample ADA compliant layouts are shown in Figure 2 and Figure 1.

**TABLE 3: EVCS ADA REQUIREMENTS**

Number of EVCS at a Facility	Van Accessible	Standard Accessible	Ambulatory
1-4	1	0	0
4-25	1	1	0
26-50	1	1	1
51-75	1	2	2
76-100	1	3	3
101+	1, Plus 1 for each 300 or fraction thereof, over 100	3, Plus 1 for each 60 or fraction thereof, over 100	3, Plus 1 for each 50 or fraction thereof, over 100



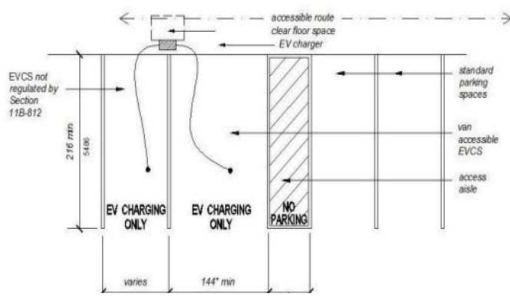


Figure 2. Sample layout with 2 EV Chargers and 1 Van Accessible Stall

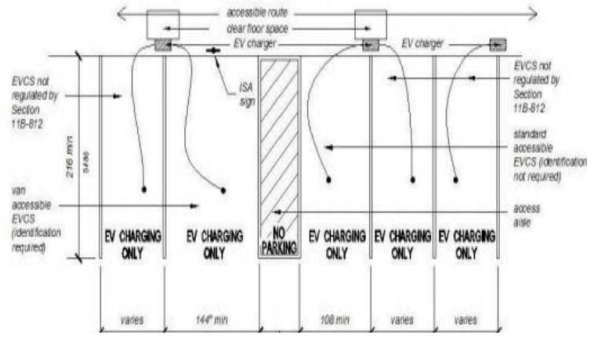


Figure 1. Sample layout with 5 EV Chargers, 1 Van Accessible Stall, and 1 Standard Accessible Stall

## OTHER FACTORS TO CONSIDER

After ADA considerations, access to electrical power should be considered. It is common for EVCS projects to require a new electrical service. Locating EVCS near utility transformers, power poles, or vaults can reduce trenching, conduit, and overall installation costs. In some cases, buildings may have spare electrical capacity the EVCS can tie into. In these situations, EVCS can be located closer to the buildings. Networked EVCS require access to the internet or cellular signal. If signal is weak at a site such as an underground parking garage, cellular repeaters may be needed, or the project may need to consider product options that have integrated cellular or Wi-Fi capabilities.

## UTILITY COORDINATION

Utility coordination is critical for larger EVCS buildouts, or for projects that include DCFC, as it is likely that significant site and utility infrastructure upgrades may be required. As the City operates its own municipal utility, the City is involved in all of the EVCS projects that occur in its jurisdiction. Upon contact by private site owners, APU representatives provide timely response regarding the sufficiency of electrical capacity necessary for the projects, support the site design, provide recommendations on charger placement, and connect the site owners to available incentives or programs.

APU offers several incentive programs to reduce the cost of EVCS including public and private charging stations and infrastructure for fleet conversions. In addition to these rebates, APU also waives permit and plan check fees at the counter for residential and commercial customers installing EVCS at their properties. An EV rideshare program is offered at multifamily complexes to help income-qualified residents who may not have access to or have considered EVs as an option. APU regularly provides educational outreach to high school students. Additionally, APU continuously monitors its rates, rate options, and fees to ensure it provides customers with options that meet their needs and encourage adoption of environmentally friendly technologies. Residential and commercial EV rates and time-of-use (TOU) rates have been offered to encourage further electrification of passenger vehicles, electric transit buses, school buses, delivery vehicles, and other fleet vehicles within the City. Related programs also enhance the City's economic justice efforts by encouraging public transportation agencies to invest in EV fleets that serve a broad array of demographics within the City.

## PARKING AND SIGNAGE CONSIDERATIONS

Since EVs still require at least 30 minutes to charge, even with DCFCs, clear signage that directs EV drivers where to park and charge will help ensure a positive and safe user experience. It is generally considered best practice that an EV can only park in an EV charging stall if the vehicle is actively charging to increase

availability for other EV drivers. Other best practices include placing time limits for vehicle charging, generally up to 4 hours for Level 2 EVCS. One strategy to encourage drivers to not charge beyond stated time limits is to increase the cost of charging past established time limits. While not common, non-EVs have been noted to occasionally park in EV charging stalls. As EV ownership increases, the need for consistent signage and enforcement of parking policies may increase. Cities may reserve the right to ticket or tow vehicles that do not abide by EVCS parking rules. This should be considered as a last resort for repeat offenders or reserved until EVs have become widely adopted and drivers are generally aware of EVCS etiquette. The City may reference the California Plug in Vehicle Collaborative which provides sample EV parking and charging signage<sup>2</sup>. The California Manual of Uniform Traffic Control Devices contains updated directions and guidance for EV related signage placed on public streets<sup>3</sup>.



## PAYMENT MECHANISMS

In many cases EV drivers will need to pay for the electricity dispensed to their vehicle. Traditionally, each charging vendor had its own payment mechanism through a mobile application, or RFID card for workplace charging. This requires users to have multiple apps given the variety of charging station vendors. This is cumbersome for users and limits access to those with a smartphone. As of January 2021, California requires new Level 2 EVCS to include credit card readers, and the same for new DCFCs in January 2023<sup>4</sup>. The intent is to increase access to charging stations to EV drivers that may not have a mobile phone and to simplify payment mechanisms. Lastly, the EV industry is currently working on new “plug and charge” protocols, where the charging station automatically identifies the vehicle plugged in and bills the owner at the end of the charging session<sup>5</sup>. This is similar to how the Tesla network already operates, but in an open ecosystem.

As City-owned EVCS infrastructure are funded by various state funding mechanisms, charging at City-owned EVCS have been offered for free to parking patrons. Should the City becomes in need of fee collection in order to cover installation and maintenance costs, the City’s public EVCS are networked and under service contract to be up-to-date with state protocols.

## SUPPORTING THE PRIVATE SECTOR AND INFLUENCING EV ADOPTION

The City educates the public on EVCS and supports the private sector to rapidly deploy EVCS. This is accomplished by actively reaching out to commercial property and multifamily property owners on benefits to installing EVCS, connecting site hosts to resources, and streamlining permitting processes. In traditional energy efficiency programs, some municipalities have been known to pre-vet qualified

---

<sup>2</sup> [https://www.calbo.org/sites/main/files/file-attachments/ca\\_accessibility\\_for\\_ev\\_charging.pdf](https://www.calbo.org/sites/main/files/file-attachments/ca_accessibility_for_ev_charging.pdf)

<sup>3</sup> <https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/f0018447-13-01-a11y.pdf>

<sup>4</sup> [https://calevip.org/sites/default/files/docs/calevip/California\\_EVCS\\_Regulations\\_Guide.pdf](https://calevip.org/sites/default/files/docs/calevip/California_EVCS_Regulations_Guide.pdf)

<sup>5</sup> <https://www.caranddriver.com/news/a35044132/plug-and-charge-ev-charging-mustang-mach-e/>

contractors to build trust in the community. Through the EVDR program, APU takes similar approaches to streamline the design and installation of EVCS with demand response capabilities. The program will not only install EVCS infrastructure, but also ensure the infrastructure can respond to APU's energy conservation signals in the event of State-initiated energy emergencies.

## BUSINESS OPPORTUNITY FOR EVCS

Commercial property and multifamily property owners have multiple ways to benefit from installing EVCS at their sites. Networked EVCS owners can set rates, charge users for the electricity dispensed and can markup electricity costs at a profit. In California, EVCS owners can generate additional revenue by generating and selling low carbon fuel standard credits, though this may only be viable with larger buildouts or aggregated among multiple properties. Some charging stations have large displays which can be used for advertisement space, providing a secondary revenue stream. There are indirect benefits to installing's EVCS including increasing the dwell time of business patrons, and thus increase retail sales, and promoting corporate branding to attract new customers, tenants, or employees<sup>6</sup>. Sites can realize these benefits, even if they decide not to charge users for the cost the electricity.

Overall profitability and return on investment of EVCS will depend on how the site chooses to monetize the station. Sites may elect to not charge users for the electricity and derive value strictly through increased retail sales, rents, or branding. For sites that do want to charge for electricity, public charging rates generally fall between \$0.20/kWh and \$0.60/kWh, with the lower range generally resulting breaking even and the higher range resulting in net profit over the life of the charger.

## PERMITTING AND INSPECTIONS

One area that the City has directly supported the private sector to deploy EVCS is to streamline the permitting processes, particularly for non-residential applications. The City may consider Culver City's dedicated webpage as an example for clear guidance with an online checklist for residential and commercial EVCS permit applications. This is expected to reduce revisions needed during plan checks for commercial permit applications. The City may consider expanding existing checklists or providing recommendations specifically for larger projects, which can help reduce revisions needed during plan checks for commercial permit applications. The City allows residential EVCS permits to be obtained online, so long as the charger is not visible from the street or by neighbors. Larger commercial EVCS projects typically require a plan check. When commercial projects are subject to the approval of multiple departments including engineering, building and safety, and planning department, these reviews need to be coordinated to minimize processing time and meet AB 970 requirements. An inspection is required after the permits are issued and the equipment has been installed.

If the City would like to further streamline the permitting process, the City of Los Angeles provides a useful example of issuing permits directly online through their [Express Permits | LADBS](#). Los Angeles's express permits instantly issues permit for a variety of project types including EVCS projects up to a 400-amp service, enough for 10 standard Level 2 charging ports. Aesthetics are important to the City; therefore, it may beneficial to consider adding an option to submit photos as part of online permit submittals.

---

<sup>6</sup> <https://atlaspolicy.com/wp-content/uploads/2020/04/Public-EV-Charging-Business-Models-for-Retail-Site-Hosts.pdf>

## VOLUNTARY BUILDING CODE REQUIREMENTS

As previously mentioned, California's 2019 Green Building Code has requirements for EV Infrastructure as part of new construction projects. The 2022 Building code, effective January 1, 2023, significantly increases minimum EV infrastructure requirements. Given the City's focus on EVCS, it is recommended to adopt at a minimum Tier II voluntary measures to significantly increase charging infrastructure as part of new construction projects. The City may also consider adopting more stringent EVCS reach codes that go beyond building code requirements such as those developed by [Bay Area Reach Codes](#).

While building codes address new construction and major modifications, CEC's assessment of EV charging infrastructure finds that new construction building codes alone may not be enough to meet EV demand in 2030<sup>7</sup>. It may be cost prohibitive to include EV infrastructure in building retrofits; therefore, technology options such as mobile charging or sharing multiple chargers on a circuit should be allowed as options to meet local requirements. The City may evaluate curbside charging options to further increase EVCS availability. While curbside chargers may be more challenging and expensive to install, they help supplement more traditional EVCS locations, as shown in Figure 3.



*Figure 3. Sample Curbside EVCS*

## CITY OWNED INFRASTRUCTURE AND FLEETS

The City has already taken great steps towards electrifying its publicly owned vehicle fleet including transit and public works services. This helps increase the visibility and demonstrate the viability of electric vehicles in the community and provides additional benefits of improving the local air quality. Installing EVCS infrastructure and fleet conversions can be capital intensive, and outside funding or creative ownership structures may be needed to scale.

## STATE FLEET CONVERSION REQUIREMENTS

Specific CARB requirements applicable to City-owned fleets includes the Innovative Clean Transit (ICT), Advanced Clean Trucks (ACT), Advanced Clean Fleets (ACF), and executive order N-79-20. The ICT requires all transit vehicles to be zero emission by 2040 and starting in 2029 only zero emission transit buses may be purchased. The ACT imposes purchasing requirements from vehicle manufactures in order to sell minimum percentages of medium and heavy duty zero emission vehicles. It is expected that vehicle manufacturers will rely on fleet sales to meet these requirements. While still being finalized and barring certain vehicle exemptions, the ACF it is expected to require 50% of new medium and heavy-duty public vehicle purchases to be zero emission in 2024 and 100% of new medium and heavy-duty vehicle purchases to be zero emission in 2027. Lastly California is requiring all new light duty vehicle sales to be zero emission by 2035.

## FUNDING OPPORTUNITIES

---

<sup>7</sup> Crisostomo, Noel, Wendell Krell, Jeffrey Lu, and Raja Ramesh. January 2021. Assembly Bill 2127 Electric Vehicle Charging Infrastructure Assessment: Analyzing Charging Needs to Support Zero-Emission Vehicles in 2030. California Energy Commission. Publication Number: CEC-600-2021-001

The following funding opportunities may be used by the public sector to reduce the cost of EV infrastructure or electric vehicles for municipal fleets. Several of these funding sources are available to the private sector too. The City provides information related to available incentives towards electric vehicle purchases, electric vehicle charger purchases, and EVCS infrastructure on a dedicated EV landing page within the City’s website. In several instances, funding is prioritized for Disadvantaged Communities (DACs), which is highlighted.

## DIRECT INCENTIVES AND REBATES

There are currently multiple funding sources available to offset the upfront and ongoing costs of EV charging stations. **Error! Not a valid bookmark self-reference.** summarizes common incentives and rebate programs available to sites within the City’s jurisdiction (as of September 2022). An up-to date list of EVCS funding and incentive programs can be viewed at [AFDC Laws and Incentives](#) webpage. Some funding programs may be in high demand and funds can be exhausted quickly. It is recommended to identify available funding sources, eligibility, and availability requirements early in the planning process to increase the chance of securing funds.

**TABLE 4: EVCS REBATE PROGRAMS – SEPTEMBER 2022**

Entity	Program Name	Summary	Other Notes
California Energy Commission	<a href="#">CAleVIP</a>	Rebates on qualifying L2 and DCFCs for qualifying site types	Funding must be reserved before installation. Funding allocated by region and may be exhausted quickly.
California Air Resources Board	<a href="#">Clean Vehicle Rebate Project</a>	Rebates for qualifying low or zero emission light duty vehicle purchases.	Rebates vary on technology type and are limited to vehicles under certain price thresholds
California Air Resources Board	<a href="#">Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project</a>	Voucher for qualifying low or zero emission medium and heavy duty vehicle purchases.	Voucher issued at point of sale through qualified vendors and manufacturers. Value vary by vehicle and technology type
APU	<a href="#">Public Access EV Charger Rebates</a>	Rebates for Level 2 or higher plug-in chargers installed at commercial, schools, industrial, or municipal properties	Subject to funding availability. Funds need to be reserved before installation. Rebate issued after installation is complete
APU	<a href="#">Personal Use EV Charger Rebates</a>	Rebates for Level 2 chargers installed at residential properties	Subject to funding availability, rebate issued after charger installation is complete
APU	<a href="#">EV Fleet Charger &amp; Infrastructure Rebate</a>	Rebates towards the cost of Level 2 or higher plug-in chargers and infrastructure upgrades for business fleets and school bus fleets	Subject to funding availability. Funds need to be reserved before installation. Installation must be completed within one year after funding approval.

## LOW CARBON FUEL STANDARD

In 2009, California’s AB32 created the low carbon fuel standard (LCFS) to reduce GHG emissions from the transportation sector. The goal is to decrease the carbon intensity of the CA transportation fuel pool, 20%

by 2030, and provide incentives for low carbon alternative fuel sources<sup>8</sup>. Fuel providers can generate credits for producing low carbon fuels, including dispensed electricity from EVCS. After charging stations are installed, the site host should reach out to brokerages that specialize in the sale of LCFS credits. Fuel data and metered energy usage must be reported quarterly to CARB. Site hosts may coordinate with the EVCS manufacturer so that energy usage is automatically sent to brokers who can facilitate the sale of credits generated each quarter. The total number and value of credits generated will be impacted by the carbon intensity of the electricity used, the amount of electricity dispensed from the chargers, and the overall supply and demand of credits in the market. Credit values have fluctuated over time, at one point peaking at \$200/credit. As of October 2022, credit prices have fallen to under \$65/credit<sup>9</sup>. Site hosts may use this LCFS revenue to offset EVS infrastructure costs, hardware costs, and other ongoing costs (maintenance, networking fees, etc.) not recovered by charging fees collected at the EVCS.

## OTHER SOURCES

Over \$1 billion in Carl Moyer Funds has been allocated since 1998 to reduce air pollution in the state. Typically issued by local air quality management districts, these funds can be used for various projects that reduce nitrogen oxides (NO<sub>x</sub>), particulate matter (PM<sub>10</sub>) and reactive organic gases (ROG) from heavy-duty vehicles. The South Coast Air Quality Management District (SCAQMD) runs a new solicitation for projects each year and intends to award funds for infrastructure projects, on-road heavy duty vehicles, and off-road equipment<sup>10</sup>. Public and private sector entities may apply to this program.

The Mobile Source Air Pollution Reduction Review Committee (MSRC) has invested more than \$400 million in clean transportation projects in Southern California since 1990. The organization includes most of Southern California and contains South Coast Air Quality Management District (SCAQMD), Southern California Association of Governments (SCAG), San Bernardino County Transportation Authority (SBCTA), Los Angeles County Metropolitan Transportation Authority (Metro), Orange County Transportation Authority (OCTA), Riverside County Transportation Commission (RCTC), and California Air Resource Board (CARB) as member agencies. Recently MSRC has funded new EV purchases and EVCS installation projects at Costa Mesa, Brea, Los Angeles, Rialto, Hemet, and Highland. MSRC regularly posts requests for proposals for cities or the private sector to apply for funding for specific clean transportation projects<sup>11</sup>.

## SUPPORTING PUBLIC PRIVATE PARTNERSHIPS

### EV INFRASTRUCTURE OWNERSHIP MODELS

While California will likely continue to provide funding for EV infrastructure, it remains highly competitive. Forming public-private partnerships and exploring alternative financing models can help reduce financial barriers. Cities or site hosts can purchase, own, and operate the chargers themselves but that typically comes with networking fees and the responsibility of maintaining the chargers. For this reason, it's generally recommended to charge users for the electricity in order to recover ongoing costs. For highly utilized sites, cities may be able to provide an easement or lease parking spaces to third parties where the vendor retains sole ownership of the charging stations and is responsible for maintaining them. Other successful ownership models include charging as a service (CaaS), where the site host pays little to no

---

<sup>8</sup> <https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/about>

<sup>9</sup> <https://www.neste.com/investors/market-data/lcfs-credit-price>

<sup>10</sup> <http://www.aqmd.gov/home/programs/business/business-detail?title=heavy-duty-engines>

<sup>11</sup> <http://www.cleantransportationfunding.org/current-rfps-solicitations>

money upfront and pays the vendor over time via a subscription model, typically on a per kWh basis. Lastly, shared ownership and revenue models may be possible. These ownership models, summarized in Table 5, may not be viable for all projects, so site hosts should work closely with project developers and charging vendors to determine the best ownership model for the specific project. For third party ownership models, cities should work closely with project partners to ensure sites meet local design requirements and goals such as multiple payment mechanisms and open-access plug types.

**TABLE 5: SAMPLE EV OWNERSHIP MODELS**

Line Item	Host Owned	Charging as a Service (CaaS)	Hybrid Host-Vendor Owned	Vendor Owned
Service Model	Host own and operate	Vendor own and operate via subscription	Shared ownership	Vendor own and operate
Ideal for	Pilot projects, site desire to control charging revenue	Large fleet electrification projects	When sites want limited control on charger O&M	Sites with very high expected utilization
Equipment Ownership	Host	Vendor	Host or Vendor	Vendor
Installation Costs	Host	Vendor	Host or Vendor	Vendor
Electricity Costs	Host	Vendor	Vendor	Vendor
Support & Maintenance Costs	Host	Vendor	Vendor	Vendor
Charging Revenue	Goes to Host	Varies	Split with Vendor	Majority Percentage to Vendor
Pricing Controls	Host	Vendor	Vendor	Vendor
Contract Term	Contract Typically Not Required	Contract Typically Required	Contract Typically Required	Contract Typically Required
Network Fees	Yes	No	Yes	Yes
Monthly Subscription Fee	No	Yes	No	No

## CONCLUSION

The public sector plays multiple roles in fostering EV adoption including educating the general public, partnering with the private sector and converting city-owned fleets to demonstrate EV capabilities. The City has been a leader in infrastructure expansion and rebates programs that remove barriers to EV adoption. The City strives to reach the State’s GHG emissions reduction goal, including those related to renewable energy and transportation electrification. The City is encouraged to pursue additional research and to adopt innovative programs such as the EVDR program that is currently under development. These programs aim to collaborate with EVCS providers and project developers to not only expand EV infrastructure into privately owned sites, but also ensure they are equipped with demand response capabilities necessary to manage the State’s growing charging consumption.



### Main Office

900 Wilshire Blvd., Ste. 1700,  
Los Angeles, CA 90017  
Tel: (213) 236-1800

### Regional Offices

Imperial County  
1503 North Imperial Ave., Ste. 104  
El Centro, CA 92243  
Tel: (213) 236-1967

Orange County  
OCTA Building  
600 South Main St., Ste. 741  
Orange, CA 92868  
Tel: (213) 236-1997

Riverside County  
3403 10th St., Ste. 805  
Riverside, CA 92501  
Tel: (951) 784-1513

San Bernardino County  
Santa Fe Depot  
1170 West 3rd St., Ste. 140  
San Bernardino, CA 92418  
Tel: (213) 236-1925

Ventura County  
4001 Mission Oaks Blvd., Ste. L  
Ventura, CA 93012  
Tel: (213) 236-1960

**LEARN MORE**

[SCAG.CA.GOV](http://SCAG.CA.GOV)



**ATTACHMENT 4 – EV FUNDING GUIDE**

---

# SCAG EV Charging Station Study

## EV Charging Station Funding Guide

Revised and Approved February 28, 2023

# SCAG EV Charging Station Funding Guide

Publish Date February 28, 2023

## TABLE OF CONTENTS

Introduction .....	2
Funding and Financing Opportunities .....	2
Conclusion.....	10



## ABOUT SCAG

SCAG is the nation's largest metropolitan planning organization (MPO), representing six counties, 191 cities and more than 19 million residents. SCAG undertakes a variety of planning and policy initiatives to encourage a more sustainable Southern California now and in the future.

## VISION

Southern California's Catalyst for a Brighter Future

## MISSION

To foster innovative regional solutions that improve the lives of Southern Californians through inclusive collaboration, visionary planning, regional advocacy, information sharing, and promoting best practices.

## INTRODUCTION

California has passed multiple pieces of legislation to increase electric vehicle (EV) adoption. In August 2022, California Air Resources Board (CARB) passed the Advanced Clean Cars II (ACC II) rule to help the State achieve its goal of having 8 million EVs on the road by 2030 by requiring vehicle manufactures to sell an increasingly higher percentage of zero-emission vehicles (ZEVs). The California Energy Commission (CEC) estimates that 1.2 million EV charging stations (EVCS) will be needed to support the State’s 8 million EV goal. Installing 1.2 million EVCS will be a very capital-intensive endeavor and project developers will need to leverage outside funding sources or have creative ownership and financing structures to deploy the EVCS by 2030. There are a variety of federal, state, and local funding sources available to offset the upfront and/or ongoing costs of EVCS. Some funding programs may be in high demand and funds can be exhausted quickly. It is recommended to identify available funding sources, eligibility, and availability requirements early in the planning process to increase the chance of securing funds.

## FUNDING AND FINANCING OPPORTUNITIES

The following funding opportunities may be used by the public or private sector to reduce the cost of EV infrastructure or EVs for municipal and commercial fleets. Cities should consider providing information related to available incentives towards EV purchases and EVCS installation on an EV landing page on the City’ website. In several instances funding is prioritized for disadvantaged communities (DACs) or low-income communities (LICs) and should be highlighted on the City’s website.

## DIRECT INCENTIVES AND REBATES

There are currently multiple funding sources available to offset the upfront and ongoing costs of EV charging stations. Table 1 **Error! Reference source not found.** summarizes available incentives and rebate programs available in within the SCAG Region (as of December 2022). Some funding programs may be in high demand and funds can be exhausted quickly. It is recommended to identify available funding sources, eligibility, and availability requirements early in the planning process to increase the chance of securing funds. Some of these funding sources are explained in further detail in this section.

TABLE 1 – EVCS FUNDING OPPORTUNITIES – DECEMBER 2022

Entity	Program Name	Summary	Other Notes
California Energy Commission (CEC)	<a href="#">National Electric Vehicle Infrastructure Program (NEVI)</a>	Funding from Infrastructure Investment and Jobs Act (IIJA) for DCFC along Alternative Fuel Corridors (AFCs)	Will be issued as competitive grants by region. Only private sector entities may apply. 4 150kW port minimum
Varies/TBD	Inflation Reduction Act (IRA)	Includes tax credits for multiple clean energy measures including electric vehicles and chargers	Starting in 2024 public sector entities may be able to take advantage of tax credits as direct payments. Pending final guidance.
Southern California Edison (SCE)	<a href="#">Charge Ready</a>	No-cost infrastructure up to charger stub out and incentives on eligible charging stations. Waitlist for new applications effective September 1, 2022.	4 charging port minimum (10+ recommended). Preference for multifamily and DACs

Entity	Program Name	Summary	Other Notes
Los Angeles Department of Water and Power	<a href="#">Charge Up LA!</a>	Rebates on qualifying L2 and DCFCs for qualifying site types	Funding must be reserved before installation
Anaheim Public Utility (APU)	<a href="#">Public Access EV Charger Rebates</a>	Rebates for Level 2 or higher plug-in chargers installed at commercial, schools, industrial, or municipal properties	Subject to funding availability. Funds need to be reserved before installation. Rebate issued after installation is complete
California Energy Commission	<a href="#">CAleVIP</a>	Starting in 2023, only DCFC projects will be eligible for this rebate	Funding must be reserved before installation. Funding allocated by region and may be exhausted quickly.
California Air Resources Board	<a href="#">Clean Vehicle Rebate Project</a>	Rebates for qualifying low or zero emission light duty vehicle purchases.	Rebates vary on technology type and are limited to vehicles under certain price thresholds. Income limits.
California Air Resources Board	<a href="#">Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project</a>	Voucher for qualifying low or zero emission medium and heavy-duty vehicle purchases.	Voucher issued at point of sale through qualified vendors and manufacturers. Value vary by vehicle and technology type
California Air Resources Board	<a href="#">Low Carbon Fuel Standard</a>	Program that issues credits for low carbon fuels. Credits can be generated from the electricity dispensed from EVCS.	Credits can be banked or sold up to once per quarter. Credit values fluctuate based on market conditions.
Department of Energy	<a href="#">Energy Efficiency and Conservation Block Grant Program</a>	As part of the IIJA, block grants for capital investments or financing energy efficiency, renewable energy, and zero-emission transportation (and associated infrastructure), projects	Issued as formula funds directly to Cities that may be used for energy projects at their discretion.

## LOW CARBON FUEL STANDARD

Under AB32, in 2009 California created the low carbon fuel standard (LCFS) to reduce GHG emissions from the transportation sector. The goal is to decrease the carbon intensity of the CA transportation fuel pool, 20% by 2030, and provide financial incentives for low carbon alternative fuel sources<sup>1</sup>. Fuel providers can generate credits for producing low carbon fuels, including dispensed electricity from EVCS. After charging stations are installed, the site host should reach out to brokerages that specialize in the sale of LCFS c<sup>2</sup>

<sup>1</sup> <https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/about>

<sup>2</sup> <https://www.neste.com/investors/market-data/lcfs-credit-price>

redits. Fuel data and metered energy usage must be reported quarterly to CARB. Site hosts should coordinate with the EVCS manufacturer so that energy usage is automatically sent to brokers who can facilitate the sale of credits generated each quarter. The total number of and value of the credits generated will be impacted by the carbon intensity of the electricity used, the amount of electricity dispensed from the chargers, and the overall supply and demand of credits in the market. Credit values have fluctuated over time, at one point peaking at \$200/credit. As of January 2023, credit prices have fallen to a low of \$60-70/credit. Public and private sector EVCS owners can use this LCFS revenue to offset EVS infrastructure costs, hardware costs, and other ongoing costs (maintenance, networking fees, etc.) not recovered by selling electricity.

## NEVI

The 2021 Infrastructure Investment and Jobs Act (IIJA) included \$7.5B in to support a national electric vehicle infrastructure (NEVI) program. Of the \$7.5B, \$5B is allocated specifically for DCFCs along Alternative Fuel Corridors (AFCs) to support long distance travel and reduce range anxiety for EV drivers. This funding will be issued as formula funds to states over five years. California is set to receive \$384M. The CEC will issue this funding as competitive grants and in September 2022 released preliminary guidance on eligible projects and how funds will be issued<sup>3</sup>. Some elements of this guidance, current proposals, and how this Study aligns with them are summarized below:

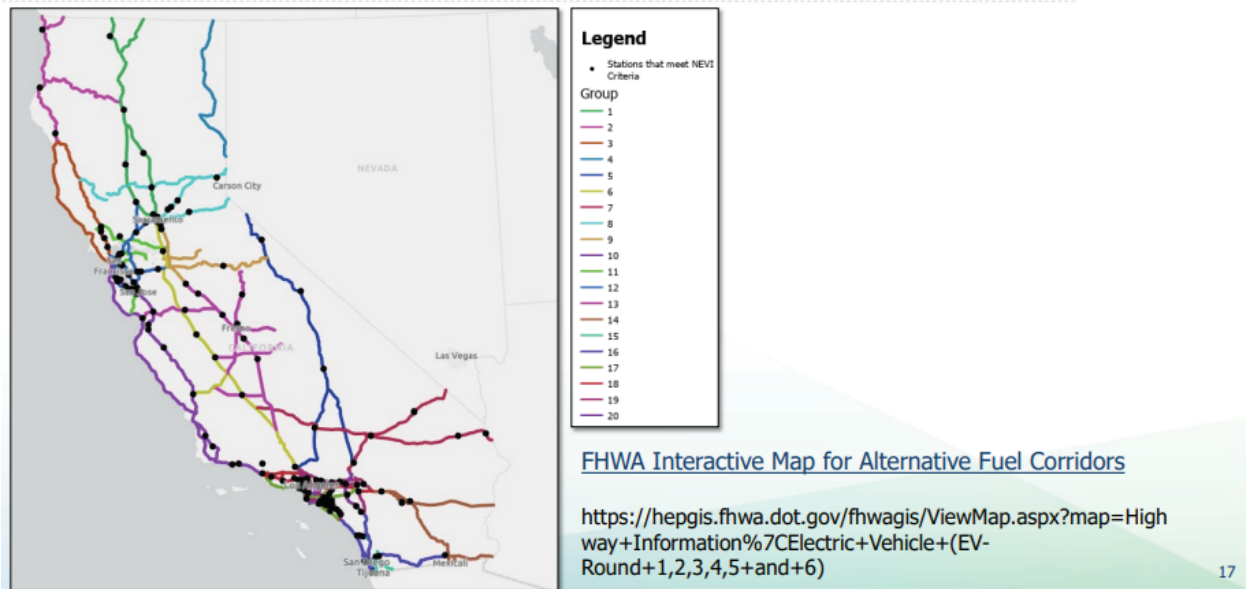
- Projects must have a minimum of four (4) 150kW ports where each port can simultaneously output a maximum of 150kW.
  - This is an IIJA requirement, but California will require infrastructure to support up to five (5) 350kW ports long term.
- Projects must be within 1 mile of an AFC exit and no more than 50 miles apart. This is set from the IIJA.
  - The suitability analysis weighted sites close to highways and major travel corridors higher, though not all highways and major travel corridors are AFCs.
- The projects must include a 5-year networking and maintenance agreement, with a 97% uptime guarantee. Chargers must be available 24/7/365.
- California has evaluated AFCs in the state and broken up the highway system into corridors (Figure 1). The CEC is expected to release solicitations every 6 months; each solicitation will only be for a select number of corridors.
  - Depending on the corridor, project applicants may need to contribute 50% in match share funding. Some corridors will only require 20% match share funding– in line with typical federal funding requirements.
- Only private sector entities will be able to apply for funds. Cities and other public agencies cannot be the lead applicant, though they may be a partner on project applications.
- At least 50% of EVCS must be in a DAC or Low-Income Community (LIC). At least 40% of chargers must benefit Justice 40 communities.
  - The suitability analysis prioritized DACs and areas with lower income (though LIC designations were not used).

CEC's final approach to issuing funds may change based on stakeholder's feedback. During the CEC's September 2022 workshop, the CEC anticipated the first round of solicitations being related in Q1 2023,

---

<sup>3</sup> [National Electric Vehicle Infrastructure Program \(NEVI\) | California Energy Commission](#)

and future solicitations every six months thereafter. At the time of this Study, the first solicitation has not been announced.



**FIGURE 1. CEC'S PROPOSED NEVI CORRIDORS GROUP**

While, SCAG or its member cities cannot directly apply for NEVI funds, they can partner with a private sector developer on project applications. If public owned sites are eligible for NEVI, public sector site hosts can help influence the final project design, contribute towards match funding, and/or expedited the permitting review and approval. SCAG can build on the work completed in this project to narrow down the suitability analysis to just sites that may qualify for NEVI, filtering for sites within one mile from AFCs, and exist within priority populations including DACs, LICs, or Justice 40 census tracts. This can help project developers target the most suitable or prioritized sites for EVCS. SCAG can form partnerships with project developers to further investigate highly ranked sites or provide a list of qualified contractors to member cities.

## INFLATION REDUCTION ACT (IRA)

The Inflation Reduction Act (IRA) passed in 2022 provides funding for EVs and charging stations in the form of tax credits. Individuals and commercial/public entities are eligible for different credits with different conditions.

For individuals, the IRA extends the previous \$7,500 tax credit for EV purchases and removes the previous sales volume cap but instituted several other eligibility requirements including<sup>4</sup>:

- U.S. has a free trade agreement or use critical minerals that were recycled in North America.
- Only vehicles assembled in North America will be eligible.
- Only cars under \$55,000 or SUVs, vans, and pickup trucks under \$80,000 are eligible for the credit.
- On the consumer side, the income cap to be eligible for the credit is \$150,000 for single filers, \$225,000 for head of household and \$300,000 for joint filers.

<sup>4</sup> [Inflation Reduction Act \(IRA\) EV Incentives, Explained - \(pluginamerica.org\)](https://www.pluginamerica.org/inflation-reduction-act-ira-ev-incentives-explained)

- Starting in 2024 individuals can transfer the tax credit to the car dealer to receive the value of the tax credit at the point of sale.
- Starting in 2023 the tax credit will be broken up into two portions, though the following requirements are waived until final guidance is issued.
  - A vehicle is eligible for one-half of the total credit (\$3,750) if the vehicle has battery components that are manufactured or assembled in North America. The percentage of battery components will increase up to 80% starting January 1, 2027.
  - To be eligible for the other \$3,750, a vehicle must have critical minerals that were extracted or processed in the U.S. or countries with a free trade agreement with the U.S. The percentage of battery components will increase up to 80% starting January 1, 2027.

The IRA also establishes new tax credits for used EVs that goes into effect January 1, 2023. The used EV tax credit is for \$4,000 or up to 30% of the vehicle price (whichever is lower.) The used EV tax credit has a few requirements:

- The vehicle must be under \$25,000.
- The vehicle model year must be at least 2 years old (based on when the consumer is purchasing the used vehicle.)
- In order to be eligible, the vehicle must be sold by a dealer.
- The income cap to be eligible for the used EV credit is \$75,000 for single filers, \$112,500 for head of household and \$150,000 for joint filers.
- The credit can only be applied once per vehicle.

The EV charger credit, formally known as the alternative fuel refueling station credit, has been extended through 2032. The credit is available for both individual and commercial uses to help cover the cost of charging stations.

- For individual/residential uses, the tax credit covers 30% (up to \$1,000 per unit) of the cost of the equipment
- For commercial uses, the tax credit covers 6% (up to \$100,000 per unit) of the cost of the equipment
- Bidirectional charging equipment is eligible
- Starting January 1, 2023, equipment must be placed in a low-income community or non-urban area to qualify

EV tax credits will be available for commercial and public entities as well, with fewer eligibility restrictions. EVs with a gross vehicle weight rating (GVWR) under 14,000 pounds will be eligible for a \$7,500 tax credit without the aforementioned assembly or sourcing requirements. EVs with a GVWR over 14,000 pounds will be eligible for a \$40,000 tax credit. In both cases the tax credit is capped at up to 30% of the vehicle cost and cannot exceed the incremental cost difference of a comparable internal combustion engine vehicle.

Public agencies have previously not been able to take advantage of tax credits directly, because they are tax exempt. Starting in 2024 public agencies will be able to receive the tax credits as a direct payment, though final guidance on how this will be issued is still pending.

## SCE CHARGE READY

Cities within Southern California Edison (SCE) territory may apply for the utility's Charge Ready program which opened on July 12, 2021. This program covers utility side infrastructure and behind the meter infrastructure for EV charger installations that have at least four level 2 charging ports and provides rebates to qualified EV chargers, though due to cost effectiveness criteria SCE is required to meet,

### SCE Charge Ready on Hold

Due to an abundance of applications, SCE created a waitlist for new Charge Ready applications starting September 1, 2022. As of February 2023, additional waitlist applications may only be submitted by the sites in DACs.



typically projects must contain at least 10 charging points to get approved. The program has a focus on MUDs and sites located within DACs. SCE has additional Charge Ready Programs to turnkey EVCS in MUDs within DACs, new construction rebate program, and Charge Ready Transport for medium and heavy-duty fleets. The program will help make EVSE installation projects more economically viable. Due to an abundance of applications, SCE has stopped accepting new applications as of September 1, 2022, for public Level 2 EVCS rebates and MUD turnkey application projects<sup>5</sup>. Between September 2022 and January 2023, new applications for these programs were placed on a waitlist. As of February 2023, only sites in DACs may apply for the waitlist for those programs. New construction rebates and Charge Ready Transport project applications are still being accepted.

## CALEVIP 1.0 AND 2.0

CALEVIP is a state rebate program that provides rebate funding for Level 2 EVCS and DCFCs. The previous (CALEVIP 1.0) project allocated funding by county and was issued on a first come-first serve basis. At the time of this plan, Ventura and Imperial Counties still have funding available for Level 2 charging station projects. All other SCAG counties have exhausted their CALeVIP 1.0 funds.

Starting in 2023, the CALeVIP program will be rebranded as the Golden State Priority Project (CALEVIP 2.0) and focus exclusively on DCFC projects that have a minimum power output of 150kW. Eligible applicants can qualify for rebates up to \$100,000 per port or up to 50% of their project's total approved costs, capped at \$100,000 per port. Funding is only available for sites located in DAC or low-income community (LIC) census tracts. The suitability analysis prioritized DACs and areas with lower income (though LIC designations were not used).

Funding will be issued regionally, but instead of issuing funds on a first come first serve basis, funding will be prioritized based on how shovel-ready the project is. This will encourage some initial development so that only the projects with the highest likelihood of getting completed are funded. The first application window will be open from January 24, 2023 through March 10, 2023 and cover eastern and central California including Ventura, San Bernardino, Riverside, and Imperial Counties (Figure 2). After the application window closes, sites will be categorized based on how shovel-ready they are and then funding will be reserved for the most shovel-ready projects.

## ALTERNATIVE FUELS DATA CENTER

The Study provides a snapshot of some of the most common EV and EVCS funding opportunities available at the time of this Study. The list is far from comprehensive; new funding sources may be available; and funding sources may be exhausted and not renewed. The Department of Energy (DOE) Alternative Fuels Data Center (AFDC) maintains a comprehensive, up-to-date database of federal, state,



**FIGURE 2. CALEVIP 2.0 INITIAL FUNDING REGIONS**

### DOE AFDC Database

The Department of Energy Alternative Fuels Data Center maintains a comprehensive, up-to-date database of funding and financing opportunities for EVs and EVCS.

---

<sup>5</sup> [Charging Infrastructure and Rebate Program \(sce.com\)](https://www.sce.com)

utility, or local funding and financing opportunities for EVs and EVCS ([AFDC Laws and Incentives](#)). Cities are encouraged to review this database regularly and include links to the AFDC on City websites. SCAG, Cities, and EVCS project stakeholders should review the AFDC website early in project development to determine what funding sources may be available or appropriate for the given project. Users can search for incentives, rebates, financing, or policies for a variety of fuel types, end users (Figure 3).

## Search Federal and State Laws and Incentives

Search incentives and laws related to alternative fuels and advanced vehicles. You can search by keyword, category, or both.

### Keyword Search

*Note: You can search by title, description, or public law number.*

### Category Search

Jurisdiction	Technology/Fuel	Incentive/Regulation	User
<input type="checkbox"/> All <input type="checkbox"/> Federal <input type="checkbox"/> Alabama <input type="checkbox"/> Alaska <input type="checkbox"/> Arizona <input type="checkbox"/> Arkansas <input type="checkbox"/> California	<input type="checkbox"/> All <input type="checkbox"/> Biodiesel <input type="checkbox"/> Ethanol <input type="checkbox"/> Natural Gas <input type="checkbox"/> Propane (LPG) <input type="checkbox"/> Hydrogen Fuel Cells <input type="checkbox"/> EVs	<input type="checkbox"/> All <input type="checkbox"/> Grants <input type="checkbox"/> Tax Incentives <input type="checkbox"/> Loans and Leases <input type="checkbox"/> Rebates <input type="checkbox"/> Exemptions <input type="checkbox"/> Time-of-Use Rate	<input type="checkbox"/> All <input type="checkbox"/> Commercial <input type="checkbox"/> Government Entity <input type="checkbox"/> Tribal Government <input type="checkbox"/> Personal Vehicle Owner or Driver <input type="checkbox"/> Alternative Fuel

FIGURE 3. AFDC EV INCENTIVE SEARCH AND FILTER FEATURE

## EV INFRASTRUCTURE OWNERSHIP MODELS

While California will likely continue to provide funding for EV infrastructure, it remains highly competitive. Forming public-private partnerships and exploring alternative financing or ownership models can help reduce financial barriers. Cities or site hosts can purchase, own, and operate the chargers themselves but that typically comes with networking fees and the responsibility of maintaining the chargers. For this reason, it's generally recommended for site hosts to charge users for the electricity to recover ongoing costs. In some cases, the site hosts such as employers or MUD owners may choose to not charge for dispensed electricity and instead consider EVCS a differentiator and a perk for their employees or tenants. For highly utilized sites, Cities may be able to provide an easement or lease parking spaces to third parties where the vendor retains sole ownership of the charging stations and is responsible for maintaining them. Other successful ownership models include charging as a service (CaaS), where the site host pays little to no money upfront and pays the vendor over time via a subscription model, typically on a per kWh basis. Lastly, shared ownership and revenue models may be possible. These ownership models, summarized in Table 2 may not be viable for all projects, so site hosts should work closely with project developers and the charging vendors to determine the best ownership model for the specific project. For third party ownership models, Cities should work closely with project partners to ensure sites meet local design requirements and goals such as multiple payment mechanisms and open-access plug types.

**TABLE 2 – SAMPLE EV OWNERSHIP MODELS**

Line Item	Host Owned	Charging as a Service (CaaS)	Hybrid Host-Vendor Owned	Vendor Owned
<b>Service Model</b>	Host own and operate	Vendor own and operate via subscription	Shared ownership	Vendor own and operate
<b>Ideal for:</b>	Pilot projects, site desire to control charging revenue	Large fleet electrification projects	Sites that want limited control on charger O&M	Sites with very high expected EVCS utilization
<b>Equipment Ownership</b>	Host	Vendor	Host or Vendor	Vendor
<b>Installation Costs</b>	Host	Vendor	Host or Vendor	Vendor
<b>Electricity Costs</b>	Host	Vendor	Vendor	Vendor
<b>Support &amp; Maintenance Costs</b>	Host	Vendor	Vendor	Vendor
<b>Charging Revenue</b>	Goes to Host	Varies	Split with Vendor	Majority Percentage to Vendor
<b>Pricing Controls</b>	Host	Vendor	Vendor	Vendor
<b>Contract Term</b>	Contract Typically Not Required	Contract Typically Required	Contract Typically Required	Contract Typically Required
<b>Network Fees</b>	Yes	No	Yes	Yes
<b>Monthly Subscription Fee</b>	No	Yes	No	No

## **CONCLUSION**

EVCS must be rapidly deployed throughout the SCAG region in order to provide the consumer confidence needed to adopt EVs in line with state goals. There is currently a variety of funding sources available to reduce the upfront and on-going cost of EVCS. While Cities can lead the way by installing EVCS at publicly owned locations, most EV infrastructure is expected to be owned and operated by the private sector. The public sector has a role to play in forming public-private partnerships and connecting the private sector to funding sources to encourage EVCS installation.



### Main Office

900 Wilshire Blvd., Ste. 1700,  
Los Angeles, CA 90017  
Tel: (213) 236-1800

### Regional Offices

Imperial County  
1503 North Imperial Ave., Ste. 104  
El Centro, CA 92243  
Tel: (213) 236-1967

Orange County  
OCTA Building  
600 South Main St., Ste. 741  
Orange, CA 92868  
Tel: (213) 236-1997

Riverside County  
3403 10th St., Ste. 805  
Riverside, CA 92501  
Tel: (951) 784-1513

San Bernardino County  
Santa Fe Depot  
1170 West 3rd St., Ste. 140  
San Bernardino, CA 92418  
Tel: (213) 236-1925

Ventura County  
4001 Mission Oaks Blvd., Ste. L  
Ventura, CA 93012  
Tel: (213) 236-1960

### Anaheim City Hall

200 S Anaheim Blvd,  
Anaheim, CA 92805  
Tel: (714) 765-4311

**LEARN MORE**

[SCAG.CA.GOV](http://SCAG.CA.GOV)