SCAG EV Charging Station Study

Electric Vehicle (EV) Infrastructure Plan – Culver City

REVISED AND APPROVED

FEBRUARY 28TH, 2023

INNOVATING FOR A BETTER TOMORROW

EV Infrastructure Plan – Culver City

PUBLISH DATE: February 28, 2023

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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.

OVERVIEW

In September 2020, California Governor Gavin Newsom issued Executive Order N-79-20 which created a goal of 8 million EVs on the road by 2030. To meet this goal, in August 2022, California Air Resources Board (CARB) passed the Advanced Clean Cars II (ACC II) rule to which will require vehicle manufactures to sell an increasingly higher percentage of zero-emission vehicles (ZEVs), until 100% of new light-duty vehicle sales are zero-emission in 2035.[1] The California Energy Commission (CEC) estimates that up to 1.2 million EV charging stations (EVCS) may be needed in California by 2030 to support the State's EV goal[2]. As of December 2022, only about 80,000 EVCS have been installed in the State, leaving a substantial infrastructure gap to be filled.

Depending on the mix of EVCS, the City of Culver City (City) may need between 380 and 1,154 charging stations by 2030 to help support statewide goals. Cities may also seek opportunities to convert their own fleets and provide supporting infrastructure and may also influence broader infrastructure development. While the City of Culver City can lead the way by installing EVCS at publicly owned locations such as City Hall, libraries, parks, and public parking lots, the majority of EVCS will be owned and operated by the private sector. The City still has several roles to play in fostering that private development including:

- Increasing education and awareness about EVs and EVCS
- Creating policies that encourage and streamline EVCS development and installation
- Connecting EV and EVCS stakeholders to funding resources to reduce upfront costs of EVs and EVCS installation
- Creating a dedicated EV landing page on their website and link to trusted sources of information on EVs including funding opportunities

The Southern California Association of Governments (SCAG) conducted an EV Charging Station Study (Study) between Jan 2020 and Feb 2023 with the goal of preparing the region for the development and deployment of EV charging infrastructure needed to accelerate transportation electrification. The study was informed through a comprehensive and multi-pronged community and stakeholder engagement effort. Study goals included:

- Helping jurisdictions in the SCAG region promote electric vehicle charging stations (EVCS) to accelerate transportation electrification
- Developing tools and resources for Cities
- Focusing on increasing EV infrastructure in traditionally hard to serve sectors – specifically disadvantaged communities (DACs) and multi-unit dwellings (MUDs)

The Study found that issues like cost, range anxiety, and limited charging infrastructure are still problems that the EV industry needs to overcome, but the technology continues to improve, and more charging stations are installed each year. Despite obstacles, there is a great deal of enthusiasm and in 2022, 18% of new car sales in CA were zero-emission[3]. The City of Culver City was one of 18 cities participating in this Study. As a result, the following resources and tools were prepared for the City to use to continue fostering EVCS installation and EV adoption:

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[1] Advanced Clean Cars II | California Air Resources Board

[2] Electric Vehicle Charging Infrastructure Assessment - AB 2127 | California Energy Commission

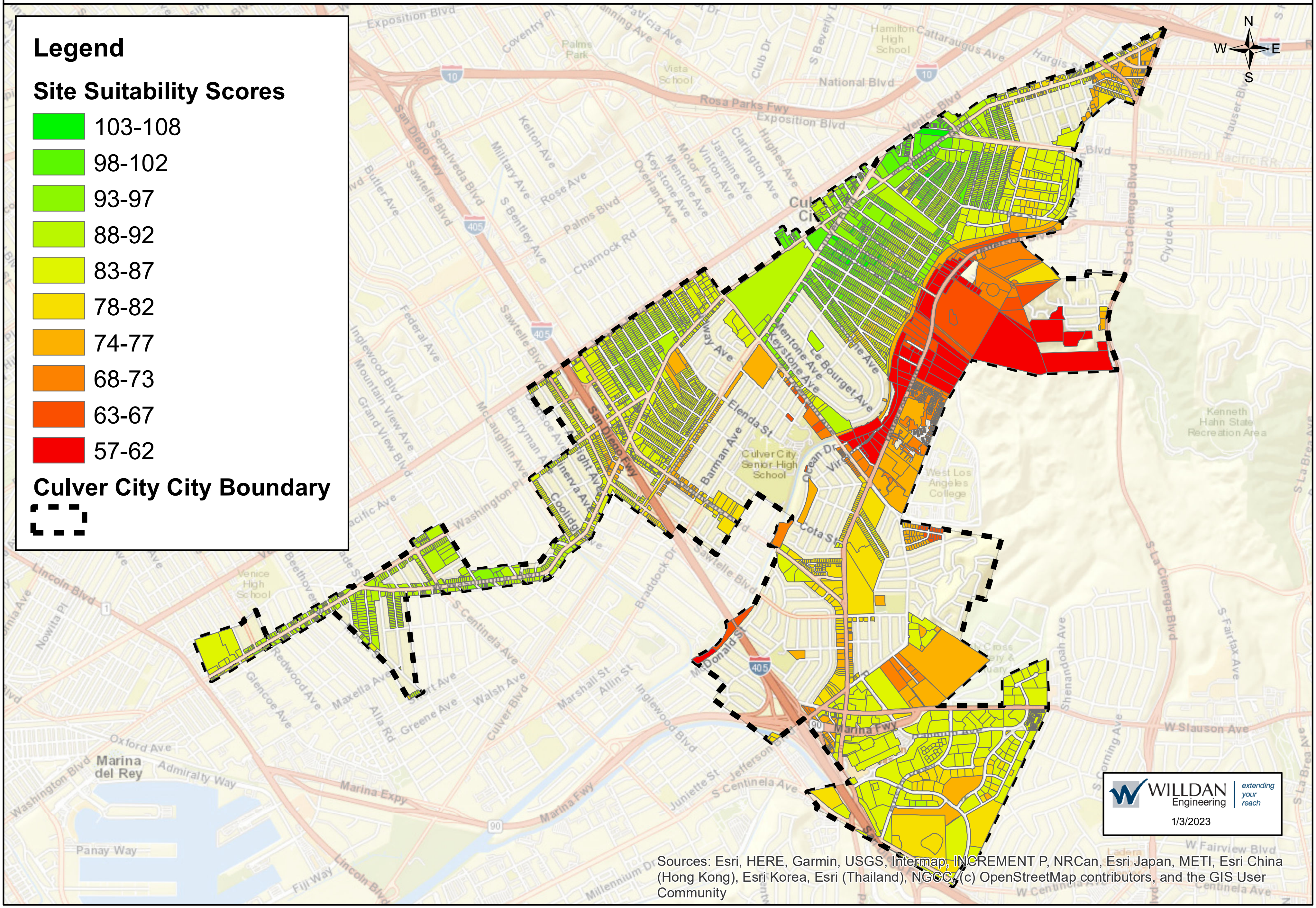
[3] https://www.gov.ca.gov/2023/01/20/california-zev-sales-near-19-of-all-new-car-sales-in-2022/

- Results of an EVCS Suitability Analysis that demonstrate where EVCS can be located throughout the region. Multiple scenarios were developed to better align with varying levels of existing EV infrastructure and/or varying City priorities for EVCS deployment. City results of the following four scenarios are contained in Attachment 1. Results of the larger regional analysis may be found on SCAG's PEV Atlas at https://scag.ca.gov/southern-california-pev-readiness-atlas.
    - A regional baseline scenario that prioritized SCAG's goals of serving DACs and MUDS
    - Expanding – Cities with substantially built out EV infrastructure and are looking to expand into hard-to-reach areas
    - Progressing – Cities with some EV infrastructure, but still have significant gaps to fill
    - Initiating – Cities with little to no existing EV Infrastructure and have a need to start with the most desirable, highly utilized sites
- A template to create a conceptual level plan for potential EVCS sites that includes design guidelines and best practices for determining the quantity and power level needed.
    - Completed conceptual site evaluations from top scoring sites from the City's suitability analysis were prepared using these best practices and can be found in Attachment 2
- A policy memorandum on best practices for streamlining EVCS permit approvals to meet the requirements of AB 1236 and AB 970 was provided to the City. These bills set requirements around permit streamlining and approval times. Some of these best practices include:
    - Clear and easy to find requirements posted to City website
    - Allowing for electronic submittals, review, and approval
    - Close internally coordination for larger EVCS projects
    - Automating permit approval if resources allow
    - More information and best practices can be found at GO-BIZ's website for Plug-in Electric Vehicle Charging Station Readiness.
- Educational materials including an EV brochure, EV guides for Property Managers, and EV Guide for City Staff. These documents are included in Attachment 3.
- A list of notable funding sources available at the time of this study is included in Attachment 4. The Department of Energy (DOE) Alternative Fuels Data Center (AFDC) maintains a comprehensive up to date list at the AFDC Laws and Incentives webpage. Cities are encouraged to review this site regularly and/or include links to it on City EV webpages.

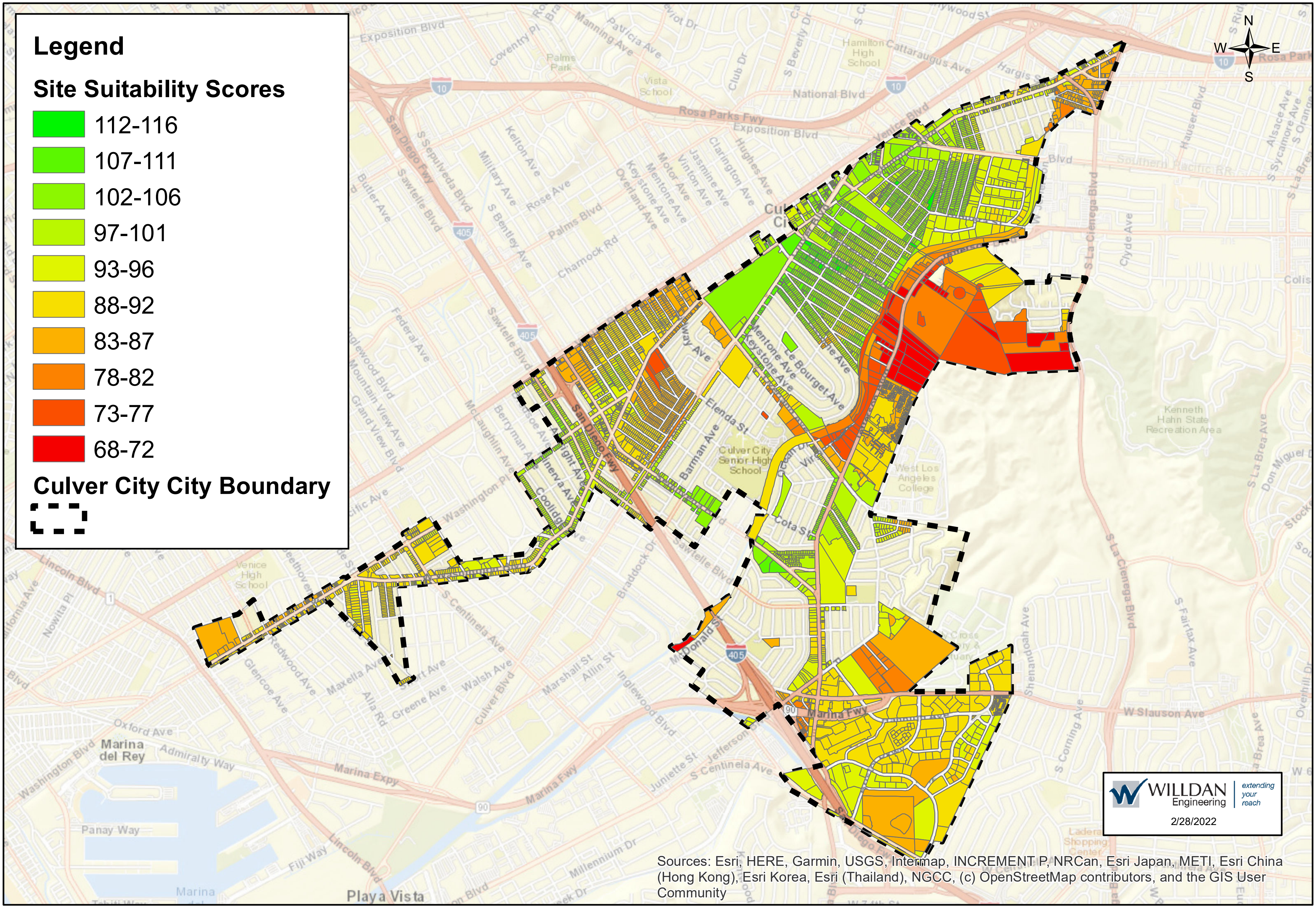
Resources associated with this study can also be found on the SCAG website https://scag.ca.gov/alternative-fuels-vehicles-projects or by contacting the SCAG Project Manager, Alison Linder at linder@scag.ca.gov

ATTACHMENT 1 – SUITABILITY MAPS

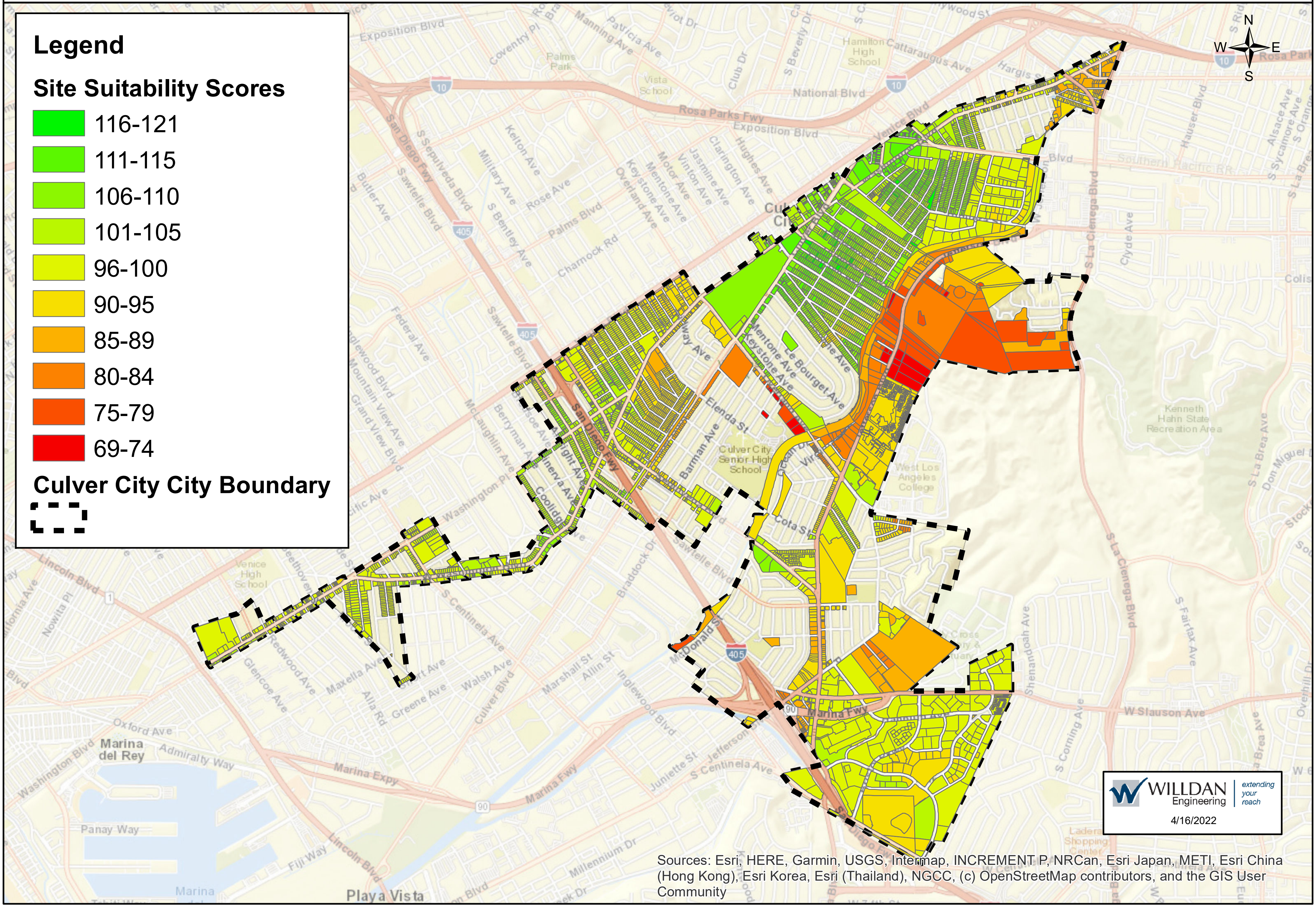
CITY OF CULVER CITY
EV CHARGER SITE SUITABILITY ANALYSIS
BASELINE SCENARIO



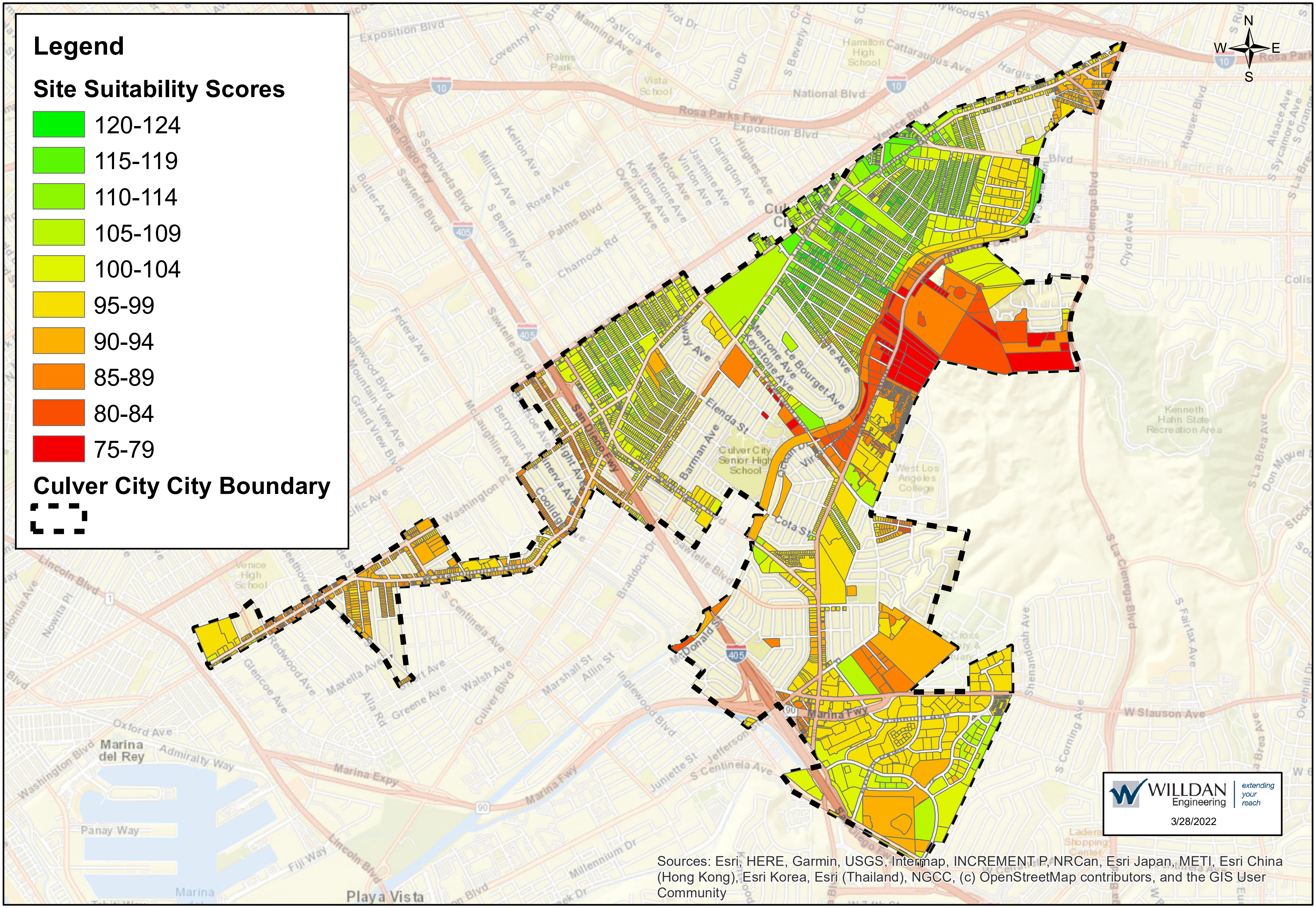
CITY OF CULVER CITY
EV CHARGER SITE SUITABILITY ANALYSIS
INITIATING SCENARIO



CITY OF CULVER CITY
EV CHARGER SITE SUITABILITY ANALYSIS
PROGRESSING SCENARIO



CITY OF CULVER CITY
EV CHARGER SITE SUITABILITY ANALYSIS
EXPANDING SCENARIO



ATTACHMENT 2 – SITE EVALUATIONS

SCAG EV CHARGER SITE ASSESSMENT - CULVER CITY
CITY HALL - 9770 CULVER BOULEVARD

SCAG
SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

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PROJECT SUMMARY	
SITE TYPE / OWNERSHIP	GOVERNMENT / PUBLIC
RECOMMENDED SCOPE	(3) LEVEL 3 CHARGE PORTS
ESTIMATED PROJECT COST	$265,391
AMMENITIES	CITY HALL, MUD, POLICE DEPT.

LEGEND

- STANDARD PARALLEL EV CHARING STALL, 24' TYP
- CONCRETE EQUIPMENT PAD, METERED ELECTRICAL SERVICE SWITCHBOARD, AND DISTRIBUTION
- SINGLE PORT LEVEL 3 EV CHARGING STATION
- UTILITY SERVICE
- UNDERGROUND VAULT, SOURCE NOT VERIFIED

SCAG EV CHARGER SITE ASSESSMENT - CULVER CITY
CITY HALL - 9770 CULVER BOULEVARD

SCAG SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

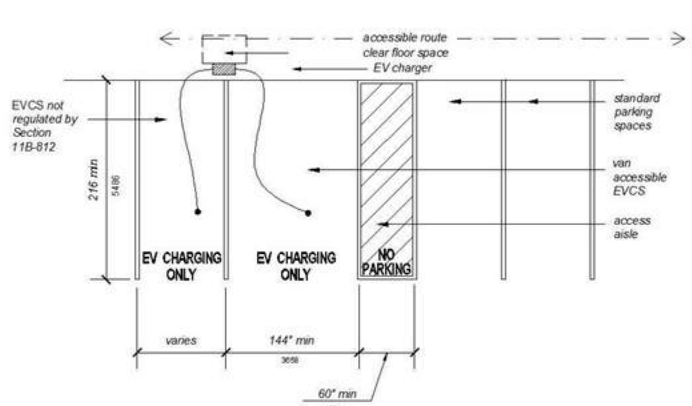
SITE DETAILS		
SCAG CITY		CITY OF CULVER CITY
SITE NAME / IDENTIFIER		CITY HALL
ADDRESS	STREET	9770 CULVER BOULEVARD
	CITY, STATE, ZIP	CULVER CITY, CA 90232
HOURS OF OPERATION	MON - FRI	7:30 AM - 5:30 PM
	SAT - SUN	N/A
CONTACT INFORMATION		(310) 253-6000
LAND USE OR BUSINESS TYPE		MUNICAIPAL
PARKING CONFIGURATION		CURBSIDE
EXISTING PARKING SPACES		108 IN ADJACENT LOT
ELECTRICAL UTILITY		SCE
DAC	TOP QUARTILE	NO, 68%

CHARGER DESIGN DETAILS		
EVSE/CHARGE PORTS PROPOSED:	EVSE	3
	PORTS	3
EVSE TYPE		LEVEL 3; 250A @480VAC
MAX POWER REQUIREMENT		552 KVA
ADA CHARGING STALL REQUIREMENT	VAN ACCESSIBLE	N/A
	STD. ACCESSIBLE	N/A
	AMBULATORY	N/A
PLANNING-LEVEL COST ESTIMATE	TOTAL	$265,391
	TRENCHING/ CIVIL	$43,356
	ELECTRICAL	$34,535
	EV CHARGERS	$187,500
SITE DESCRIPTION / DEFINING CHARACTERISTICS		CURBSIDE METERED PARKING ON SOUTH SIDE OF LAFAYETTE PLACE ADJACENT TO CITY HALL. FUTURE CHARGING FOR POLICE VEHICLES AND PUBLIC

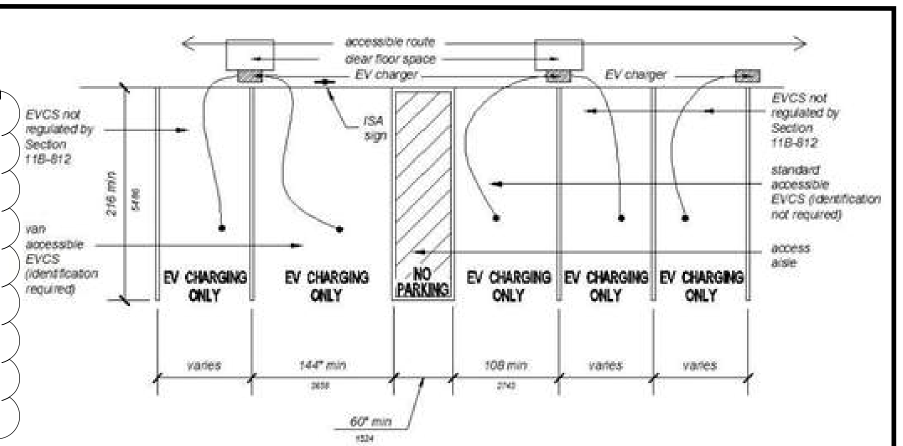
QUALIFICATIONS				
CRITERIA	DETAIL	YES	NO	TBD
PROXIMITY TO UTILITY POWER SOURCE	<150 FT FROM UTILITY TO METER?			X
SPACE AVAILABLE FOR ELECTRICAL INFRASTRUCTURE	METER/ MAIN DISTRIBUTION, STEP-DOWN TRANSFORMER	X		
CAN THE SITE ACCEPT THE QUANTITY OF PROPOSED CHARGERS?	PER CALGREEN TABLES 4.106.4.3.1 OR 5.106.5.3.3	X		
DO EVSE ADA ACCESSIBLY REQUIREMENTS APPLY PER 11B?	ARE CHARGERS PUBLICALLY ACCESSIBLE AND NON-RESERVED?		X	
NEARBY ACCESSIBLE STALLS OR PATH OF TRAVEL			X	
IS PARKING AREA PAVED?		X		
IS PARKING AREA LEVEL?	<2% SLOPE IN ALL DIRECTIONS?		X	
DOES THE PROPOSED QUANTITY OF CHARGE PORTS MEET THE MINIMUM REQUIREMENT FOR SCE CHARGE READY CRITERIA	4 LEVEL 2 PORTS / PROJECT OR 2 LEVEL 3 PORTS / PROJECT?			X
IS THE PROJECT LOCATED IN AN AREA TO MAXIMIZE VISIBILITY?	VISIBLE FROM SURROUNDING STREETS?	X		
IS THERE EASY INGRESS/EGRESS FROM TRAFFIC?		X		
IS LIGHTING AVAILABLE AFTER DARK TO CREATE A SAFE ENVIRONMENT?		X		
ARE THERE NEARBY SERVICES/ AMMENITIES?	RESTROOM, SHOPPING, RECREATION?	X		

EV CHARGING STATION CONFIGURATION SAMPLES WITH ACCESSIBLE STALLS

EV CHARGERS WITH (1) VAN ACCESSIBLE STALL



EV CHARGERS WITH (1) VAN ACCESSIBLE AND (1) STANDARD ACCESSIBLE STALL



DETERMINATION OF QTY. OF EV CHARGE PORTS

THE RECOMMNEDED QUANTITY OF CHARGER PORTS IS BASED ON THE 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE:

"The number of required EV spaces shall be based on the total number of parking spaces provided for all types of parking facilities in accordance with Tables 5.106.5.3.3 (Non-Residential) or 4.106.4.3.1 (Residential). Calculations for required number of EV spaces shall be rounded up to the nearest whole number."

PARKING COUNT BASED ON ADJACENT PARKING LOT

NON-RESIDENTIAL MANDATORY		RESID... URES	
TABLE 5.106.5.3.3			
TOTAL # OF PARKING SPACES	# OF REQUIRED EV CHARGING SPACES	TOTAL # OF PARKING SPACES	# OF REQUIRED EV CHARGING SPACES
0-9	0	0-9	0
10-25	2	10-25	1
26-50	4	26-50	2
51-75	7	51-75	4
76-100	9	76-100	5
101-150	13	101-150	7
151-200	18	151-200	10
201+	10% OF TOTAL	201+	6% OF TOTAL

DETERMINATION OF QTY. OF DC FAST PORTS

WHEN DC FAST CHARGE PORTS ARE PROPOSED, ONE (1) DC FAST CHARGE PORT WILL SUPPLEMENT FIVE (5) LEVEL 2 CHARGE PORTS AS IDENTIFIED IN TABLES 5.106.5.3.3 AND 4.106.4.3.1, PER THE 2022 CALIFORNIA GREEN BUILDING CODE

DETERMINATION OF QTY. AND TYPE OF ACCESSIBLE CHARGERS

...ND TYPE OF ACCESSIBLE CHARGING SPACES ...NIA BUILDING CODE SECTION 11B-812

EXEMPT - CURBSIDE CHARGING. NO-ADA STANDARD ADOPTED

EVCS AT A FACILITY	...(BY TYPE) OF EVCS REQUIRED TO COMPLY WITH SECTION 11B-812		
	VAN ACCESSIBLE	STANDARD	AMBULATORY
1 TO 4	1	0	0
5 TO 25	1	1	0
26 TO 50	1	1	1
51 TO 75	1	2	2
76 TO 100	1	3	3
101+	1, PLUS 1 FOR EACH 300, OR FRACTION THEREOF, >100	3, PLUS 1 FOR EACH 60, OR FRACTION THEREOF, >100	3, PLUS 1 FOR EACH 50, OR FRACTION THEREOF, >100

SCAG EV CHARGER SITE ASSESSMENT - CULVER CITY CONDOMINIUM - 4045 LINCOLN AVENUE

SCAG SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

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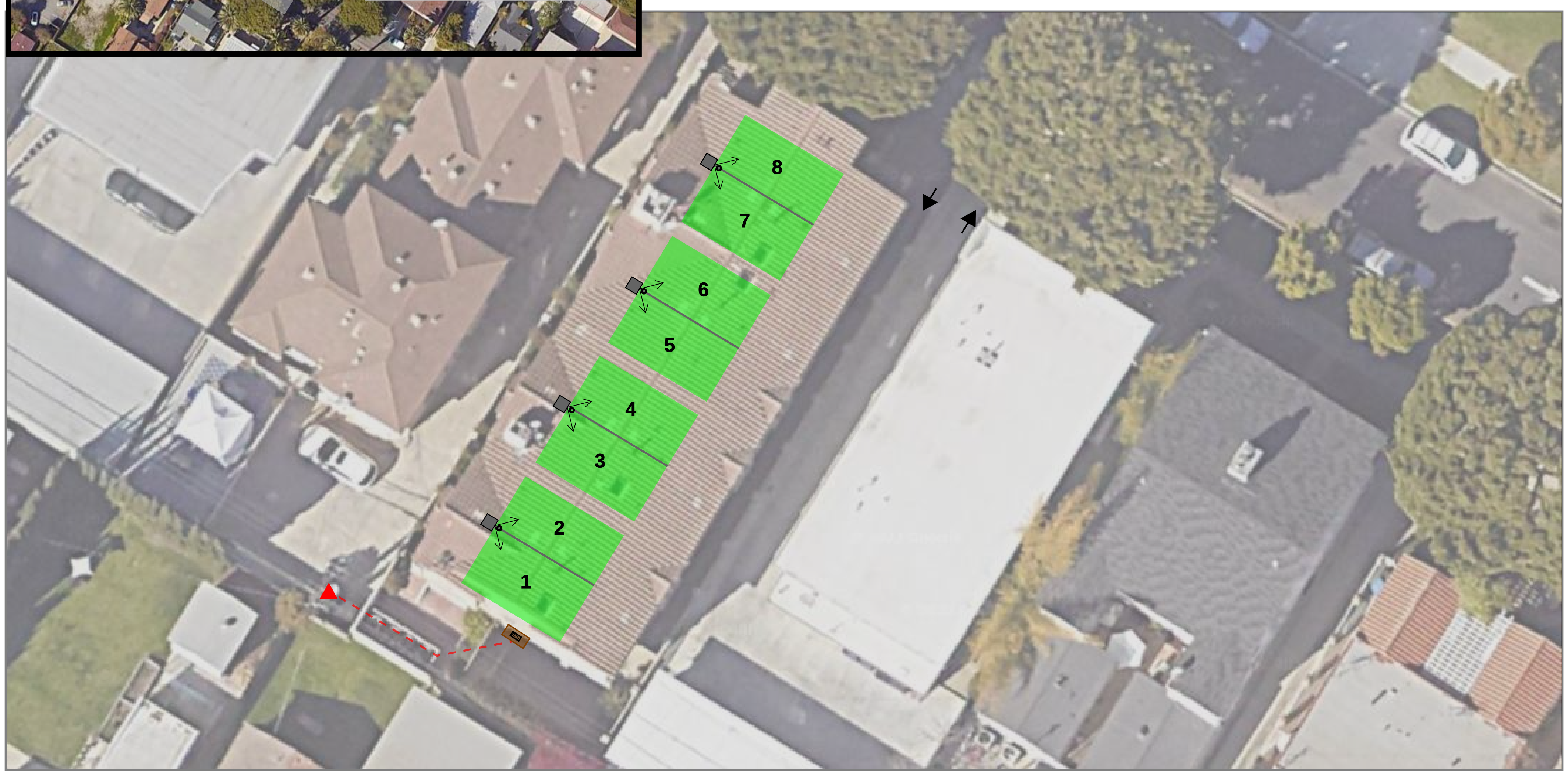
PROJECT SUMMARY	
SITE TYPE / OWNERSHIP	RESIDENTIAL / PRIVATE
RECOMMENDED SCOPE	(8) LEVEL 2 CHARGE PORTS
ESTIMATED PROJECT COST	$97,544
AMMENITIES	HOUSING



LEGEND

- STANDARD EV CHARING STALL, 9' TYP
- METERED SERVICE PANELBOARD, WALL-MOUNT
- DUAL PORT LEVEL 2 EV CHARGING STATION
- PROTECTIVE BOLLARD, 4" DIAMETER STEEL TYP
- UTILITY SERVICE
- EXISTING POWER POLE, AVAILABILITY NOT VERIFIED WITH UTILITY

SCAG EV CHARGER SITE ASSESSMENT - CULVER CITY CONDOMINIUM - 4045 LINCOLN AVENUE

SCAG SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

SITE DETAILS		
SCAG CITY		CITY OF CULVER CITY
SITE NAME / IDENTIFIER		CONDOMINIUM
ADDRESS	STREET	4045 LINCOLN AVENUE
	CITY, STATE, ZIP	CULVER CITY, CA 90232
HOURS OF OPERATION	MON - FRI	N/A
	SAT - SUN	NA
CONTACT INFORMATION		UNKNOWN
LAND USE OR BUSINESS TYPE		MULTI-FAMILY RESIDENTIAL
PARKING CONFIGURATION		GARAGE
EXISTING PARKING SPACES		8
ELECTRICAL UTILITY		SCE
DAC	TOP QUARTILE	NO, 43%

CHARGER DESIGN DETAILS		
EVSE/CHARGE PORTS PROPOSED:	EVSE	4
	PORTS	8
EVSE TYPE		LEVEL 2; 32A @ 240VAC
MAX POWER REQUIREMENT		61.44 KVA
ADA CHARGING STALL REQUIREMENT	VAN ACCESSIBLE	N/A
	STD. ACCESSIBLE	N/A
	AMBULATORY	N/A
PLANNING-LEVEL COST ESTIMATE	TOTAL	$97,544
	TRENCHING/ CIVIL	$18,568
	ELECTRICAL	$38,976
	EV CHARGERS	$40,000
SITE DESCRIPTION / DEFINING CHARACTERISTICS		FOUR-UNIT CONDOMINIUM WITH RESIDENT GARAGES BELOW THE BUILDING. ASSIGNED PARKING, NO ADA REQUIRED

QUALIFICATIONS				
CRITERIA	DETAIL	YES	NO	TBD
PROXIMITY TO UTILITY POWER SOURCE	<150 FT FROM UTILITY TO METER?	X		
SPACE AVAILABLE FOR ELECTRICAL INFRASTRUCTURE	METER/ MAIN DISTRIBUTION, STEP-DOWN TRANSFORMER	X		
CAN THE SITE ACCEPT THE QUANTITY OF PROPOSED CHARGERS?	PER CALGREEN TABLES 4.106.4.3.1 OR 5.106.5.3.3	X		
DO EVSE ADA ACCESSIBLY REQUIREMENTS APPLY PER 11B?	ARE CHARGERS PUBLICALLY ACCESSIBLE AND NON-RESERVED?		X	
NEARBY ACCESSIBLE STALLS OR PATH OF TRAVEL			X	
IS PARKING AREA PAVED?		X		
IS PARKING AREA LEVEL?	<2% SLOPE IN ALL DIRECTIONS?		X	
DOES THE PROPOSED QUANTITY OF CHARGE PORTS MEET THE MINIMUM REQUIREMENT FOR SCE CHARGE READY CRITERIA	4 LEVEL 2 PORTS / PROJECT OR 2 LEVEL 3 PORTS / PROJECT?	X		
IS THE PROJECT LOCATED IN AN AREA TO MAXIMIZE VISIBILITY?	VISIBLE FROM SURROUNDING STREETS?		X	
IS THERE EASY INGRESS/EGRESS FROM TRAFFIC?				X
IS LIGHTING AVAILABLE AFTER DARK TO CREATE A SAFE ENVIRONMENT?		X		
ARE THERE NEARBY SERVICES/ AMMENITIES?	RESTROOM, SHOPPING, RECREATION?	X		

DETERMINATION OF QTY. OF EV CHARGE PORTS

THE RECOMMNEDED QUANTITY OF CHARGER PORTS IS BASED ON THE 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE:

"The number of required EV spaces shall be based on the total number of parking spaces provided for all types of parking facilities in accordance with Tables 5.106.5.3.3 (Non-Residential) or 4.106.4.3.1 (Residential). Calculations for required number of EV spaces shall be rounded up to the nearest whole number."

PROPOSED QUANTITY OF CHARGERS EXCEEDS RESIDENTIAL MANDATORY MEASURES

TO… PA… SPACES	…V …CHARGING SPACES
0-9	0
10-25	2
26-50	4
51-75	7
76-100	9
101-150	13
151-200	18
201+	10% OF TOTAL

RESIDENTIAL MANDATORY MEASURES TABLE 4.106.4.3.1	
TOTAL # OF PARKING SPACES	# OF REQUIRED EV CHARGING SPACES
0-9	0
10-25	1
26-50	2
51-75	4
76-100	5
101-150	7
151-200	10
201+	6% OF TOTAL

DETERMINATION OF QTY. OF DC FAST PORTS

WHEN DC FAST CHARGE PORTS ARE PROPOSED, ONE (1) DC FAST CHARGE PORT WILL SUPPLEMENT FIVE (5) LEVEL 2 CHARGE PORTS AS IDENTIFIED IN TABLES 5.106.5.3.3 AND 4.106.4.3.1, PER THE 2022 CALIFORNIA GREEN BUILDING CODE

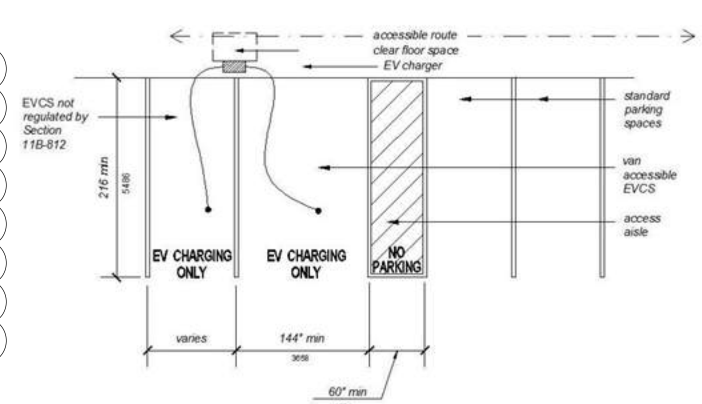
DETERMINATION OF QTY. AND TYPE OF ACCESSIBLE CHARGERS

THE REQUIRED QUANTITY AND TYPE OF ACCESSIBLE CHARGING SPACES IS BASED ON THE CALIFORNIA BUILDING CODE SECTION 11B-812

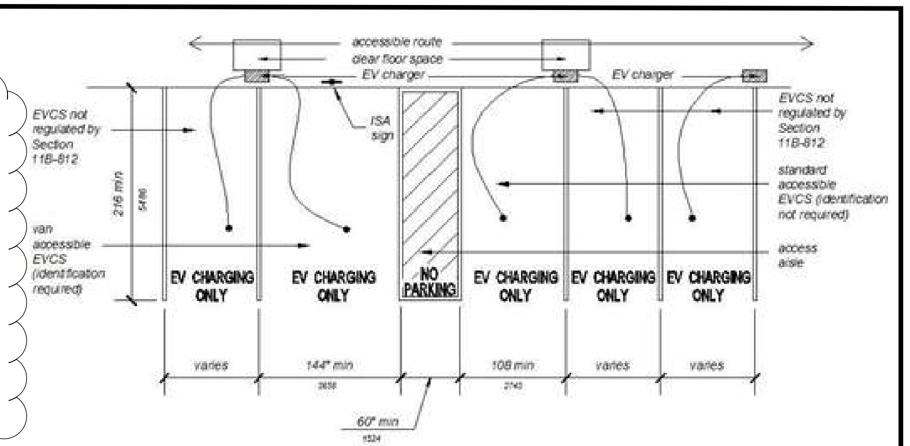
TOTAL # OF EVCS AT A FACILITY	MINIMUM # (BY TYPE) OF EVCS REQUIRED TO COMPLY WITH SECTION 11B-812		
	VAN ACCESSIBLE	STANDARD	AMBULATORY
1 TO 4	1	0	0
5 TO 25	1	1	0
26 TO 50	1	1	1
51 TO 75	1	2	2
76 TO 100	1	3	3
101+	1, PLUS 1 FOR EACH 300, OR FRACTION THEREOF, >100	3, PLUS 1 FOR EACH 60, OR FRACTION THEREOF, >100	3, PLUS 1 FOR EACH 50, OR FRACTION THEREOF, >100

EV CHARGING STATION CONFIGURATION SAMPLES WITH ACCESSIBLE STALLS

EV CHARGERS WITH (1) VAN ACCESSIBLE STALL

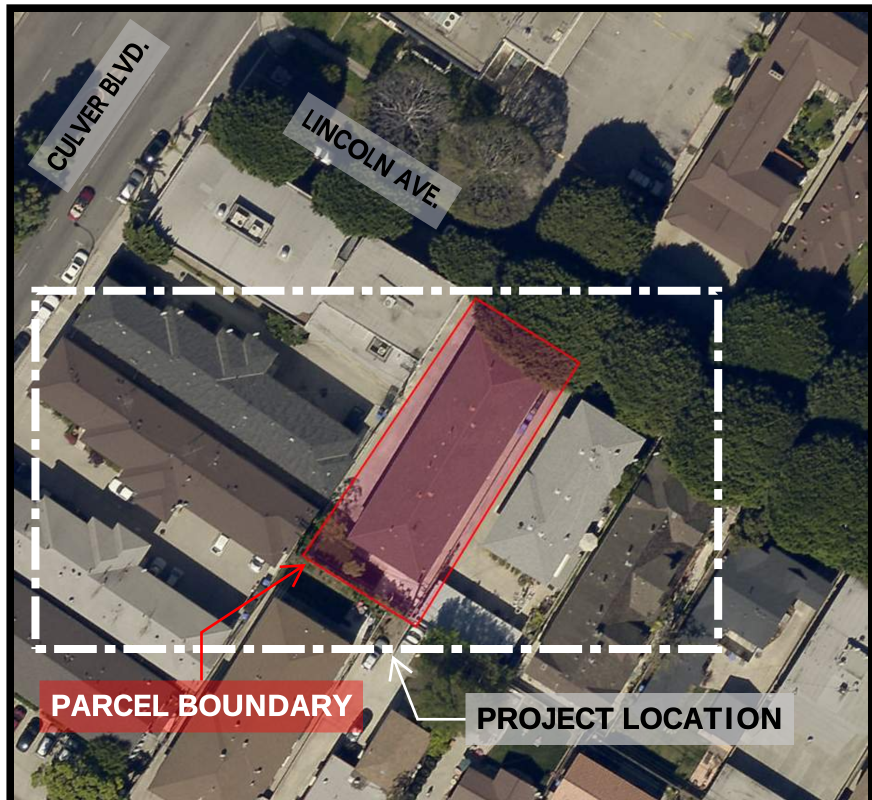


EV CHARGERS WITH (1) VAN ACCESSIBLE AND (1) STANDARD ACCESSIBLE STALL



SCAG EV CHARGER SITE ASSESSMENT - CULVER CITY CONDOMINIUM - 4017 LINCOLN AVENUE

SCAG SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS



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PROJECT SUMMARY	
SITE TYPE / OWNERSHIP	RESIDENTIAL / PRIVATE
RECOMMENDED SCOPE	(7) LEVEL 2 CHARGE PORTS
ESTIMATED PROJECT COST	$101,251
AMMENITIES	HOUSING

LEGEND

- STANDARD EV CHARING STALL, 9' TYP
- EXISTING TENANT ADA STALL
- EXISTING ADA ACCESS AISLE
- METERED SERVICE PANELBOARD, WALL-MOUNT
- SINGLE PORT LEVEL 2 EV CHARGING STATION
- DUAL PORT LEVEL 2 EV CHARGING STATION
- PROTECTIVE BOLLARD, 4" DIAMETER STEEL TYP
- UTILITY SERVICE
- EXISTING POWER POLE, AVAILABILITY NOT VERIFIED WITH UTILITY

SCAG EV CHARGER SITE ASSESSMENT - CULVER CITY CONDOMINIUM - 4017 LINCOLN AVENUE

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

SITE DETAILS		
SCAG CITY		CITY OF CULVER CITY
SITE NAME / IDENTIFIER		CONDOMINIUM
ADDRESS	STREET	4017 LINCOLN AVENUE
	CITY, STATE, ZIP	CULVER CITY, CA 90232
HOURS OF OPERATION	MON - FRI	N/A
	SAT - SUN	N/A
CONTACT INFORMATION		UNKNOWN
LAND USE OR BUSINESS TYPE		MULTI-FAMILY RESIDENTIAL
PARKING CONFIGURATION		CARPORT
EXISTING PARKING SPACES		7
ELECTRICAL UTILITY		SCE
DAC	TOP QUARTILE	NO, 31%

CHARGER DESIGN DETAILS		
EVSE/CHARGE PORTS PROPOSED:	EVSE	4
	PORTS	7
EVSE TYPE		LEVEL 2; 32A @ 240VAC
MAX POWER REQUIREMENT		53.76 KVA
ADA CHARGING STALL REQUIREMENT	VAN ACCESSIBLE	N/A
	STD. ACCESSIBLE	N/A
	AMBULATORY	N/A
PLANNING-LEVEL COST ESTIMATE	TOTAL	$101,251
	TRENCHING/ CIVIL	$25,223
	ELECTRICAL	$41,028
	EV CHARGERS	$35,000
SITE DESCRIPTION / DEFINING CHARACTERISTICS		FOUR-UNIT MULTI-FAMILY RESIDENTIAL BUILDING. ASSIGNED PARKING, ONE EXSITING ADA STALL, NO VAN ACCESSIBLE ADA REQUIRED

QUALIFICATIONS				
CRITERIA	DETAIL	YES	NO	TBD
PROXIMITY TO UTILITY POWER SOURCE	<150 FT FROM UTILITY TO METER?	X		
SPACE AVAILABLE FOR ELECTRICAL INFRASTRUCTURE	METER/ MAIN DISTRIBUTION, STEP-DOWN TRANSFORMER			X
CAN THE SITE ACCEPT THE QUANTITY OF PROPOSED CHARGERS?	PER CALGREEN TABLES 4.106.4.3.1 OR 5.106.5.3.3			X
DO EVSE ADA ACCESSIBLY REQUIREMENTS APPLY PER 11B?	ARE CHARGERS PUBLICALLY ACCESSIBLE AND NON-RESERVED?		X	
NEARBY ACCESSIBLE STALLS OR PATH OF TRAVEL		X		
IS PARKING AREA PAVED?		X		
IS PARKING AREA LEVEL?	<2% SLOPE IN ALL DIRECTIONS?			X
DOES THE PROPOSED QUANTITY OF CHARGE PORTS MEET THE MINIMUM REQUIREMENT FOR SCE CHARGE READY CRITERIA	4 LEVEL 2 PORTS / PROJECT OR 2 LEVEL 3 PORTS / PROJECT?	X		
IS THE PROJECT LOCATED IN AN AREA TO MAXIMIZE VISIBILITY?	VISIBLE FROM SURROUNDING STREETS?		X	
IS THERE EASY INGRESS/EGRESS FROM TRAFFIC?				X
IS LIGHTING AVAILABLE AFTER DARK TO CREATE A SAFE ENVIRONMENT?		X		
ARE THERE NEARBY SERVICES/ AMMENITIES?	RESTROOM, SHOPPING, RECREATION?	X		

DETERMINATION OF QTY. OF EV CHARGE PORTS

THE RECOMMNEDED QUANTITY OF CHARGER PORTS IS BASED ON THE 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE:

"The number of required EV spaces shall be based on the total number of parking spaces provided for all types of parking facilities in accordance with Tables 5.106.5.3.3 (Non-Residential) or 4.106.4.3.1 (Residential). Calculations for required number of EV spaces shall be rounded up to the nearest whole number."

PROPOSED QUANTITY OF CHARGERS EXCEEDS RESIDENTIAL MANDATORY MEASURES

		RESIDENTIAL MANDATORY MEASURES TABLE 4.106.4.3.1	
TO[illegible] PA[illegible] SPACES	[illegible]V CHARGING SPACES	TOTAL # OF PARKING SPACES	# OF REQUIRED EV CHARGING SPACES
0-9	0	0-9	0
10-25	2	10-25	1
26-50	4	26-50	2
51-75	7	51-75	4
76-100	9	76-100	5
101-150	13	101-150	7
151-200	18	151-200	10
201+	10% OF TOTAL	201+	6% OF TOTAL

DETERMINATION OF QTY. OF DC FAST PORTS

WHEN DC FAST CHARGE PORTS ARE PROPOSED, ONE (1) DC FAST CHARGE PORT WILL SUPPLEMENT FIVE (5) LEVEL 2 CHARGE PORTS AS IDENTIFIED IN TABLES 5.106.5.3.3 AND 4.106.4.3.1, PER THE 2022 CALIFORNIA GREEN BUILDING CODE

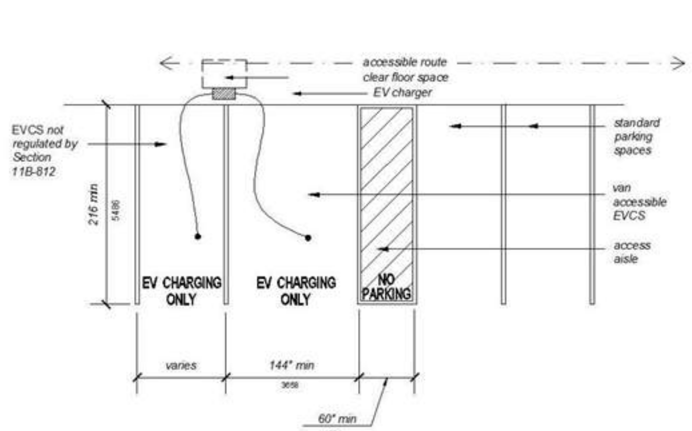
DETERMINATION OF QTY. AND TYPE OF ACCESSIBLE CHARGERS

THE REQUIRED QUANTITY AND TYPE OF ACCESSIBLE CHARGING SPACES IS BASED ON THE CALIFORNIA BUILDING CODE SECTION 11B-812

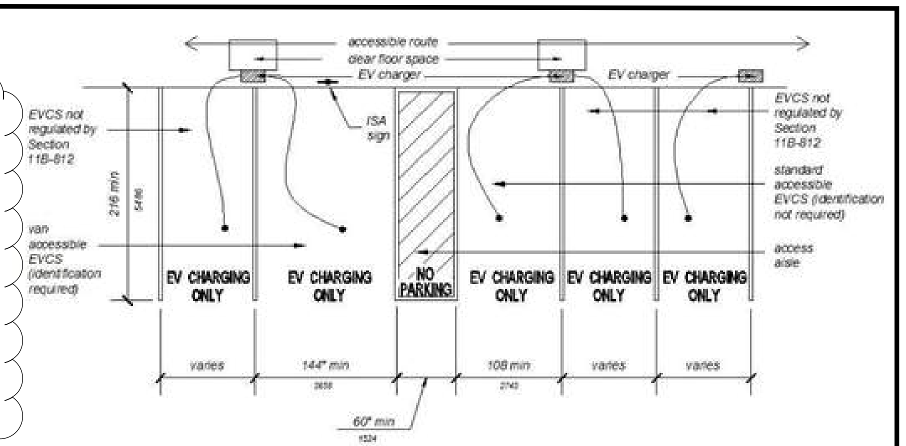
TOTAL # OF EVCS AT A FACILITY	MINIMUM # (BY TYPE) OF EVCS REQUIRED TO COMPLY WITH SECTION 11B-812		
	VAN ACCESSIBLE	STANDARD	AMBULATORY
1 TO 4	1	0	0
5 TO 25	1	1	0
26 TO 50	1	1	1
51 TO 75	1	2	2
76 TO 100	1	3	3
101+	1, PLUS 1 FOR EACH 300, OR FRACTION THEREOF, >100	3, PLUS 1 FOR EACH 60, OR FRACTION THEREOF, >100	3, PLUS 1 FOR EACH 50, OR FRACTION THEREOF, >100

EV CHARGING STATION CONFIGURATION SAMPLES WITH ACCESSIBLE STALLS

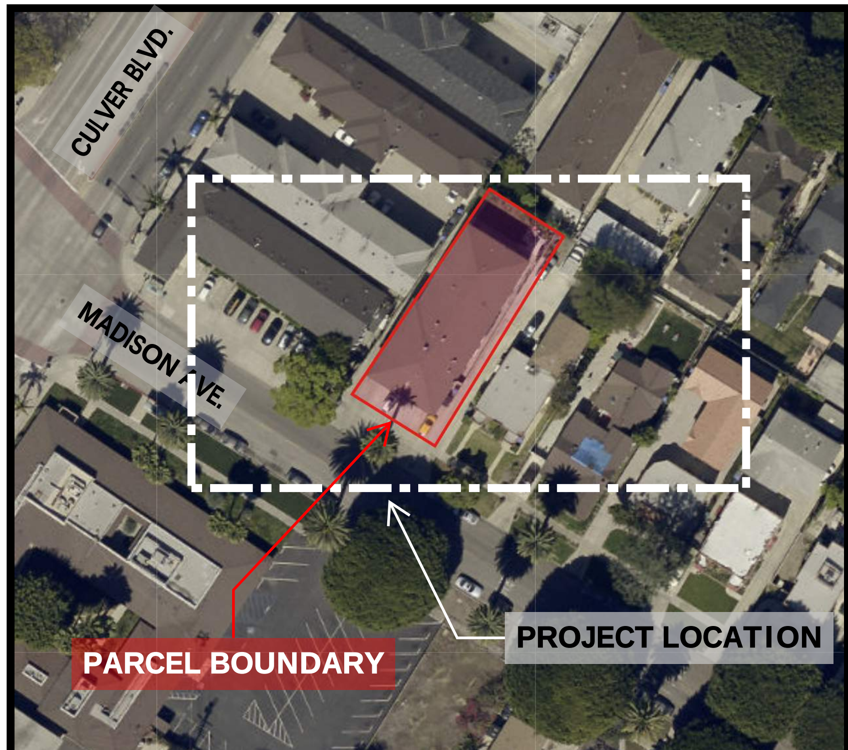
EV CHARGERS WITH (1) VAN ACCESSIBLE STALL



EV CHARGERS WITH (1) VAN ACCESSIBLE AND (1) STANDARD ACCESSIBLE STALL

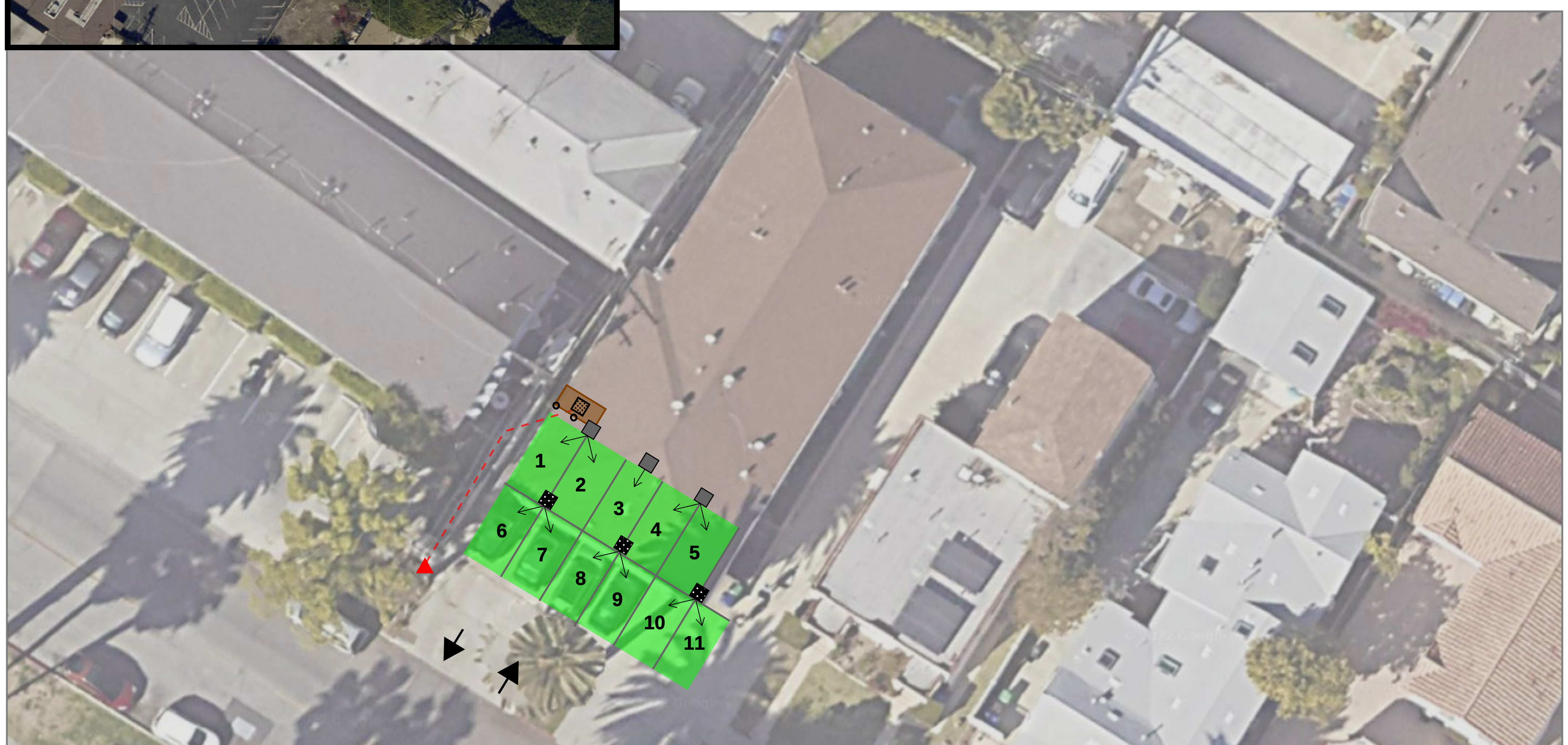


SCAG EV CHARGER SITE ASSESSMENT - CULVER CITY
MULTI-FAMILY RESIDENTIAL - 4016 MADISON AVENUE



N

PROJECT SUMMARY	
SITE TYPE / OWNERSHIP	RESIDENTIAL / PRIVATE
RECOMMENDED SCOPE	(11) LEVEL 2 CHARGE PORTS
ESTIMATED PROJECT COST	$132,490
AMMENITIES	HOUSING



LEGEND

- STANDARD EV CHARING STALL, 9' TYP
- CONCRETE EQUIPMENT PAD, METERED ELECTRICAL SERVICE SWITCHBOARD AND DISTRIBUTION
- SINGLE PORT, LOW PROFILE LEVEL 2 EV CHARGING STATION, WEBASTO OR SIMILAR
- 2X SINGLE PORT, LOW PROFILE LEVEL 2 EV CHARGING STATION, WEBASTO OR SIMILAR
- 2X SINGLE PORT, LOW PROFILE, COLUMN-MOUNTED LEVEL 2 EV CHARGING STATION, WEBASTO OR SIMILAR
- PROTECTIVE BOLLARD, 4" DIAMETER STEEL TYP
- UTILITY SERVICE
- POWER POLE, AVAILABILITY NOT VERIFIED WITH UTILITY

SCAG EV CHARGER SITE ASSESSMENT - CULVER CITY
MULTI-FAMILY RESIDENTIAL - 4016 MADISON AVENUE

SCAG SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

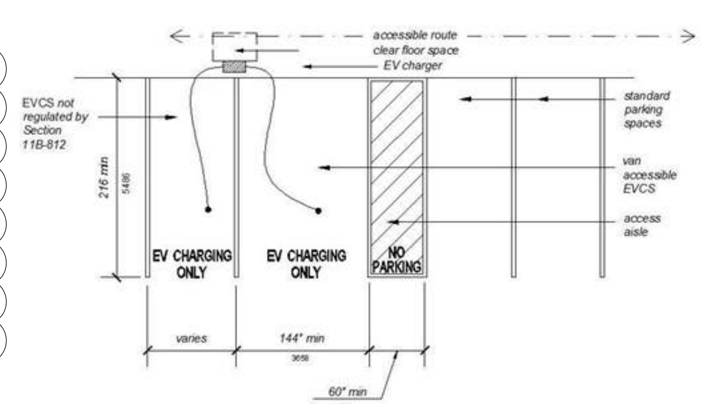
SITE DETAILS		
SCAG CITY		CITY OF CULVER CITY
SITE NAME / IDENTIFIER		MULTI-FAMILY RESIDENTIAL
ADDRESS	STREET	4016 MADISON AVENUE
	CITY, STATE, ZIP	CULVER CITY, CA 90232
HOURS OF OPERATION	MON - FRI	N/A
	SAT - SUN	N/A
CONTACT INFORMATION		UNKNOWN
LAND USE OR BUSINESS TYPE		MULTI-FAMILY RESIDENTIAL
PARKING CONFIGURATION		CARPORT/ SURFACE
EXISTING PARKING SPACES		11
ELECTRICAL UTILITY		SCE
DAC	TOP QUARTILE	NO, 31%

CHARGER DESIGN DETAILS		
EVSE/CHARGE PORTS PROPOSED:	EVSE	6
	PORTS	11
EVSE TYPE		LEVEL 2; 32A @ 240VAC
MAX POWER REQUIREMENT		84.48 KVA
ADA CHARGING STALL REQUIREMENT	VAN ACCESSIBLE	N/A
	STD. ACCESSIBLE	N/A
	AMBULATORY	N/A
PLANNING-LEVEL COST ESTIMATE	TOTAL	$132,490
	TRENCHING/ CIVIL	$28,814
	ELECTRICAL	$48,675
	EV CHARGERS	$55,000
SITE DESCRIPTION / DEFINING CHARACTERISTICS		EIGHT-UNIT MULTI-FAMILY RESIDENTIAL BUILDING, ASSIGNED PARKING, NO ADA REQUIRED

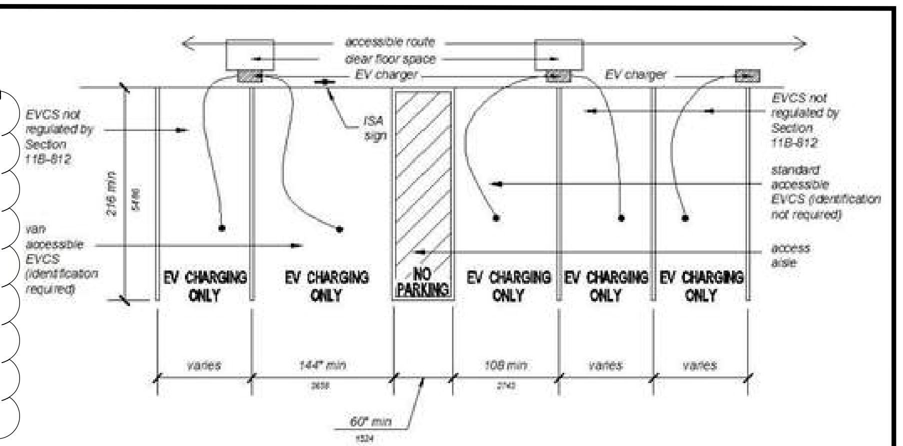
QUALIFICATIONS				
CRITERIA	DETAIL	YES	NO	TBD
PROXIMITY TO UTILITY POWER SOURCE	<150 FT FROM UTILITY TO METER?	X		
SPACE AVAILABLE FOR ELECTRICAL INFRASTRUCTURE	METER/ MAIN DISTRIBUTION, STEP-DOWN TRANSFORMER			X
CAN THE SITE ACCEPT THE QUANTITY OF PROPOSED CHARGERS?	PER CALGREEN TABLES 4.106.4.3.1 OR 5.106.5.3.3			X
DO EVSE ADA ACCESSIBLY REQUIREMENTS APPLY PER 11B?	ARE CHARGERS PUBLICALLY ACCESSIBLE AND NON-RESERVED?		X	
NEARBY ACCESSIBLE STALLS OR PATH OF TRAVEL			X	
IS PARKING AREA PAVED?		X		
IS PARKING AREA LEVEL?	<2% SLOPE IN ALL DIRECTIONS?		X	
DOES THE PROPOSED QUANTITY OF CHARGE PORTS MEET THE MINIMUM REQUIREMENT FOR SCE CHARGE READY CRITERIA	4 LEVEL 2 PORTS / PROJECT OR 2 LEVEL 3 PORTS / PROJECT?	X		
IS THE PROJECT LOCATED IN AN AREA TO MAXIMIZE VISIBILITY?	VISIBLE FROM SURROUNDING STREETS?	X		
IS THERE EASY INGRESS/EGRESS FROM TRAFFIC?				X
IS LIGHTING AVAILABLE AFTER DARK TO CREATE A SAFE ENVIRONMENT?		X		
ARE THERE NEARBY SERVICES/ AMMENITIES?	RESTROOM, SHOPPING, RECREATION?	X		

EV CHARGING STATION CONFIGURATION SAMPLES WITH ACCESSIBLE STALLS

EV CHARGERS WITH (1) VAN ACCESSIBLE STALL



EV CHARGERS WITH (1) VAN ACCESSIBLE AND (1) STANDARD ACCESSIBLE STALL



DETERMINATION OF QTY. OF EV CHARGE PORTS

THE RECOMMNEDED QUANTITY OF CHARGER PORTS IS BASED ON THE 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE:

"The number of required EV spaces shall be based on the total number of parking spaces provided for all types of parking facilities in accordance with Tables 5.106.5.3.3 (Non-Residential) or 4.106.4.3.1 (Residential). Calculations for required number of EV spaces shall be rounded up to the nearest whole number."

PROPOSED QUANTITY OF CHARGERS EXCEEDS RESIDENTIAL MANDATORY MEASURES

N		RESIDENTIAL MANDATORY MEASURES	
		TABLE 4.106.4.3.1	
TO PA SPACES	CHARGING SPACES	TOTAL # OF PARKING SPACES	# OF REQUIRED EV CHARGING SPACES
0-9	0	0-9	0
10-25	2	10-25	1
26-50	4	26-50	2
51-75	7	51-75	4
76-100	9	76-100	5
101-150	13	101-150	7
151-200	18	151-200	10
201+	10% OF TOTAL	201+	6% OF TOTAL

DETERMINATION OF QTY. OF DC FAST PORTS

WHEN DC FAST CHARGE PORTS ARE PROPOSED, ONE (1) DC FAST CHARGE PORT WILL SUPPLEMENT FIVE (5) LEVEL 2 CHARGE PORTS AS IDENTIFIED IN TABLES 5.106.5.3.3 AND 4.106.4.3.1, PER THE 2022 CALIFORNIA GREEN BUILDING CODE

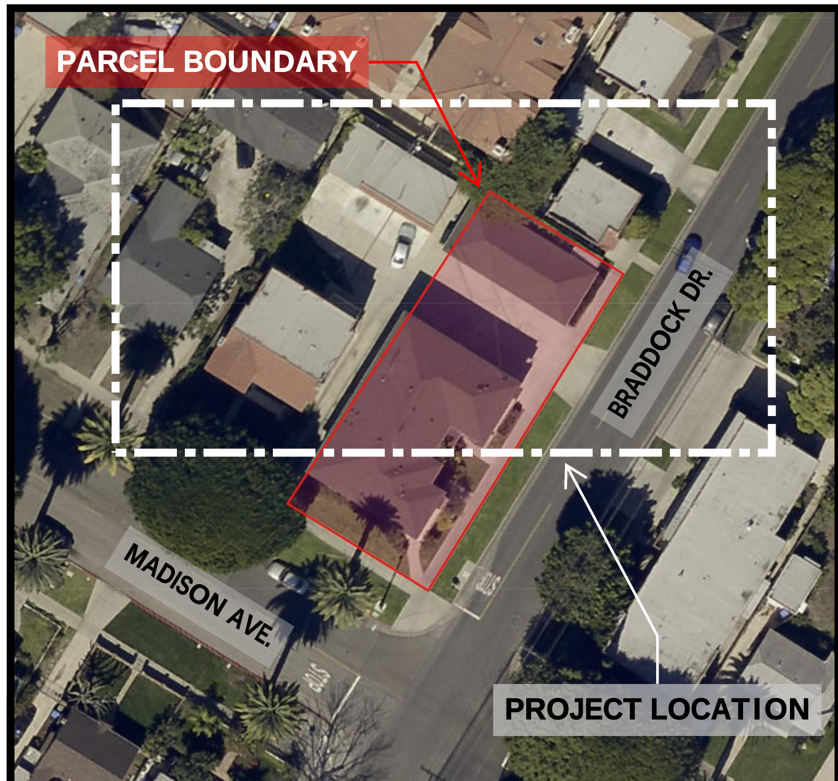
DETERMINATION OF QTY. AND TYPE OF ACCESSIBLE CHARGERS

THE REQUIRED QUANTITY AND TYPE OF ACCESSIBLE CHARGING SPACES IS BASED ON THE CALIFORNIA BUILDING CODE SECTION 11B-812

TOTAL # OF EVCS AT A FACILITY	MINIMUM # (BY TYPE) OF EVCS REQUIRED TO COMPLY WITH SECTION 11B-812		
	VAN ACCESSIBLE	STANDARD	AMBULATORY
1 TO 4	1	0	0
5 TO 25	1	1	0
26 TO 50	1	1	1
51 TO 75	1	2	2
76 TO 100	1	3	3
101+	1, PLUS 1 FOR EACH 300, OR FRACTION THEREOF, >100	3, PLUS 1 FOR EACH 60, OR FRACTION THEREOF, >100	3, PLUS 1 FOR EACH 50, OR FRACTION THEREOF, >100

SCAG EV CHARGER SITE ASSESSMENT - CULVER CITY
MULTI-FAMILY RESIDENTIAL - 4080 MADISON AVENUE

SCAG SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS



N

PROJECT SUMMARY	
SITE TYPE / OWNERSHIP	RESIDENTIAL / PRIVATE
RECOMMENDED SCOPE	(6) LEVEL 2 CHARGE PORTS
ESTIMATED PROJECT COST	$87,089
AMMENITIES	HOUSING

LEGEND

- STANDARD EV CHARING STALL, 9' TYP
- CONCRETE EQUIPMENT PAD, METERED ELECTRICAL SERVICE SWITCHBOARD, TRANSFORMATION, AND DISTRIBUTION
- DUAL PORT LEVEL 2 EV CHARGING STATION
- PROTECTIVE BOLLARD, 4" DIAMETER STEEL TYP
- UTILITY SERVICE
- POWER POLE, AVAILABILITY NOT VERIFIED WITH UTILITY

SCAG EV CHARGER SITE ASSESSMENT - CULVER CITY
MULTI-FAMILY RESIDENTIAL - 4080 MADISON AVENUE

SCAG SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

SITE DETAILS		
SCAG CITY		CITY OF CULVER CITY
SITE NAME / IDENTIFIER		MULTI-FAMILY RESIDENTIAL
ADDRESS	STREET	4080 MADISON AVENUE
	CITY, STATE, ZIP	CULVER CITY, CA 90232
HOURS OF OPERATION	MON - FRI	N/A
	SAT - SUN	N/A
CONTACT INFORMATION		UNKNOWN
LAND USE OR BUSINESS TYPE		MULTI-FAMILY RESIDENTIAL
PARKING CONFIGURATION		CARPORT
EXISTING PARKING SPACES		6
ELECTRICAL UTILITY		SCE
DAC	TOP QUARTILE	NO, 31%

CHARGER DESIGN DETAILS		
EVSE/CHARGE PORTS PROPOSED:	EVSE	3
	PORTS	6
EVSE TYPE		LEVEL 2; 32A @ 240VAC
MAX POWER REQUIREMENT		46.08 KVA
ADA CHARGING STALL REQUIREMENT	VAN ACCESSIBLE	N/A
	STD. ACCESSIBLE	N/A
	AMBULATORY	N/A
PLANNING-LEVEL COST ESTIMATE	TOTAL	$87,089
	TRENCHING/ CIVIL	$25,830
	ELECTRICAL	$31,258
	EV CHARGERS	$30,000
SITE DESCRIPTION / DEFINING CHARACTERISTICS		SIX-UNIT MULTI-FAMILY RESIDENTIAL BUILDING, ASSIGNED PARKING, NO ADA REQUIRED

QUALIFICATIONS				
CRITERIA	DETAIL	YES	NO	TBD
PROXIMITY TO UTILITY POWER SOURCE	<150 FT FROM UTILITY TO METER?	X		
SPACE AVAILABLE FOR ELECTRICAL INFRASTRUCTURE	METER/ MAIN DISTRIBUTION, STEP-DOWN TRANSFORMER	X		
CAN THE SITE ACCEPT THE QUANTITY OF PROPOSED CHARGERS?	PER CALGREEN TABLES 4.106.4.3.1 OR 5.106.5.3.3	X		
DO EVSE ADA ACCESSIBLY REQUIREMENTS APPLY PER 11B?	ARE CHARGERS PUBLICALLY ACCESSIBLE AND NON-RESERVED?		X	
NEARBY ACCESSIBLE STALLS OR PATH OF TRAVEL			X	
IS PARKING AREA PAVED?		X		
IS PARKING AREA LEVEL?	<2% SLOPE IN ALL DIRECTIONS?		X	
DOES THE PROPOSED QUANTITY OF CHARGE PORTS MEET THE MINIMUM REQUIREMENT FOR SCE CHARGE READY CRITERIA	4 LEVEL 2 PORTS / PROJECT OR 2 LEVEL 3 PORTS / PROJECT?	X		
IS THE PROJECT LOCATED IN AN AREA TO MAXIMIZE VISIBILITY?	VISIBLE FROM SURROUNDING STREETS?	X		
IS THERE EASY INGRESS/EGRESS FROM TRAFFIC?		X		
IS LIGHTING AVAILABLE AFTER DARK TO CREATE A SAFE ENVIRONMENT?		X		
ARE THERE NEARBY SERVICES/ AMMENITIES?	RESTROOM, SHOPPING, RECREATION?	X		

DETERMINATION OF QTY. OF EV CHARGE PORTS

THE RECOMMNEDED QUANTITY OF CHARGER PORTS IS BASED ON THE 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE:

"The number of required EV spaces shall be based on the total number of parking spaces provided for all types of parking facilities in accordance with Tables 5.106.5.3.3 (Non-Residential) or 4.106.4.3.1 (Residential). Calculations for required number of EV spaces shall be rounded up to the nearest whole number."

PROPOSED QUANTITY OF CHARGERS EXCEEDS RESIDENTIAL MANDATORY MEASURES

TO PA SPACES	V CHARGING SPACES
0-9	0
10-25	2
26-50	4
51-75	7
76-100	9
101-150	13
151-200	18
201+	10% OF TOTAL

RESIDENTIAL MANDATORY MEASURES TABLE 4.106.4.3.1	
TOTAL # OF PARKING SPACES	# OF REQUIRED EV CHARGING SPACES
0-9	0
10-25	1
26-50	2
51-75	4
76-100	5
101-150	7
151-200	10
201+	6% OF TOTAL

DETERMINATION OF QTY. OF DC FAST PORTS

WHEN DC FAST CHARGE PORTS ARE PROPOSED, ONE (1) DC FAST CHARGE PORT WILL SUPPLEMENT FIVE (5) LEVEL 2 CHARGE PORTS AS IDENTIFIED IN TABLES 5.106.5.3.3 AND 4.106.4.3.1, PER THE 2022 CALIFORNIA GREEN BUILDING CODE

DETERMINATION OF QTY. AND TYPE OF ACCESSIBLE CHARGERS

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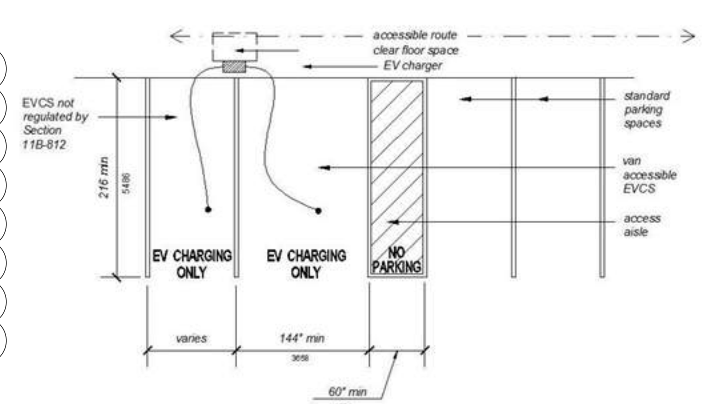
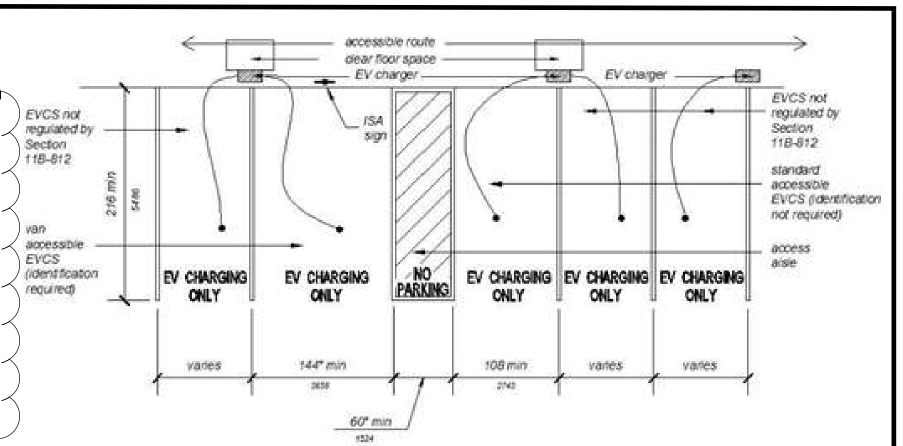
TOTAL # OF EVCS AT A FACILITY	MINIMUM # (BY TYPE) OF EVCS REQUIRED TO COMPLY WITH SECTION 11B-812		
	VAN ACCESSIBLE	STANDARD	AMBULATORY
1 TO 4	1	0	0
5 TO 25	1	1	0
26 TO 50	1	1	1
51 TO 75	1	2	2
76 TO 100	1	3	3
101+	1, PLUS 1 FOR EACH 300, OR FRACTION THEREOF, >100	3, PLUS 1 FOR EACH 60, OR FRACTION THEREOF, >100	3, PLUS 1 FOR EACH 50, OR FRACTION THEREOF, >100

EV CHARGING STATION CONFIGURATION SAMPLES WITH ACCESSIBLE STALLS

EV CHARGERS WITH (1) VAN ACCESSIBLE STALL



EV CHARGERS WITH (1) VAN ACCESSIBLE AND (1) STANDARD ACCESSIBLE STALL



CITY	NAME	ADDRESS	SITE DESCRIPTION	PARKING CONFIGURATION	RECOMMENDED CHARGER TYPE	RECOMMENDED CHARGER QUANTITY per CBC	SITE TYPE/OWNERSHIP	CONTACT INFO
Culver City	Condominiums	9900 CULVER BLVD	Condos with private parking	Parking Structure	Level 2	12	Condos/Private	
Culver City	Apartment Building	4140 BALDWIN AVE	Apartment Bulding w/assigned parking	Surface	Level 2	5	Apartments/Private	
Culver City	Apartment Building	4023 LINCOLN AVE	Apartment Bulding w/assigned parking	Surface	Level 2	4	Apartments/Private	
Culver City	Multi-Unit Dwelling	4060 MADISON AVE	Apartment Bulding w/assigned parking	Surface	Level 2	4	Apartments/Private	
Culver City	Multi-Unit Dwelling	4125 DUQUESNE AVE	Apartment Bulding w/assigned parking	Surface	Level 2	5	Apartments/Private	

ATTACHMENT 3 – EV EDUCATIONAL GUIDES AND BROCHURES

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

ELECTRIC VEHICLE CHARGING STATION STUDY

SCAG™

LET YOUR NEXT VEHICLE BE AN ELECTRIC VEHICLE (EV)

$800/year in fuel cost savings

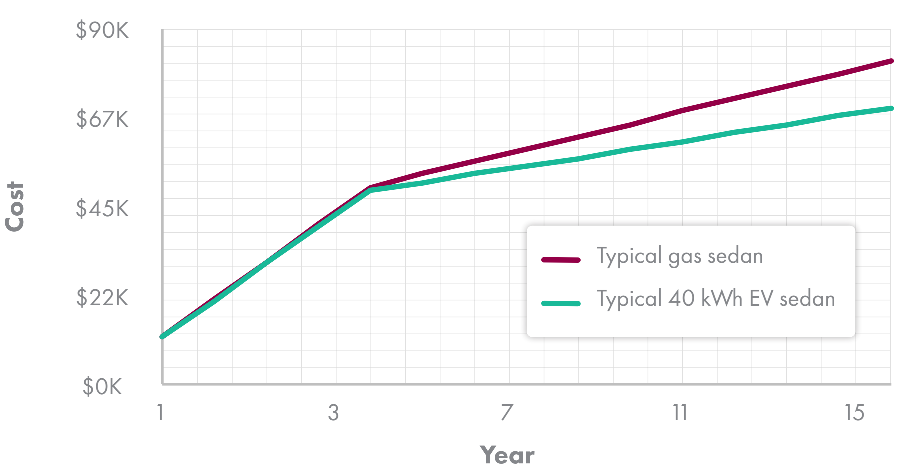
Up to 8-year/ 100k-mile battery warranty

$700/year on maintenance cost savings

New EVs starting under $35k (before incentives)

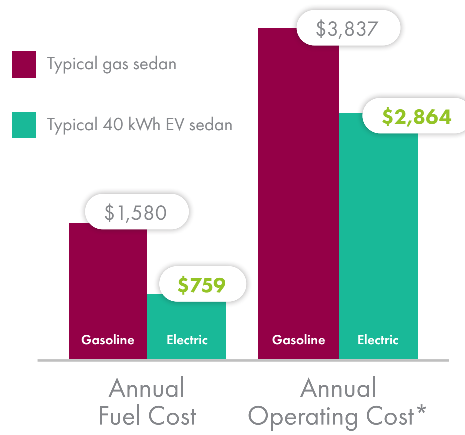
See available EVs at https://afdc.energy.gov/vehicles/search/

LIFETIME COST OF OWNERSHIP



Average savings calculated using the Alternative Fuels Data Center Vehicle Cost Calculator (https://afdc.energy.gov/calc/)

SAMPLE ANNUAL VEHICLE OWNERSHIP COSTS



*Includes fuel, tires, maintenance, registration, license, and insurance

Average savings calculated using the Alternative Fuels Data Center Vehicle Cost Calculator (https://afdc.energy.gov/calc/)

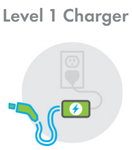
EV DRIVING BENEFITS

> Quiet ride
> Fun to drive
> Smooth operation
> Better handling
> Increased reliability

EV ENVIRONMENTAL BENEFITS

> No tailpipe emissions
> Cleaner air
> Greenhouse Gas emission reduction
> Improved community health and air quality

ALL THE WAYS TO CHARGE



Level 1 Charger
Uses a standard 110-V household outlet. Very low cost and ideal for overnight residential charging. Recharges 3.5-6.5 miles of range per hour.

Level 2 Charger
Ideal for overnight residential, workplace, and commercial charging. Low-mid cost and recharges 14-35 miles of range per hour. All EVs can use Level 2 chargers.

Level 3 DC Fast Charger
Ideal for short stops along major travel corridors. High cost but can recharge up to 80% in under 30 minutes. Different EV brands are compatible with different chargers.

★ Charge at home, at work, or on the road

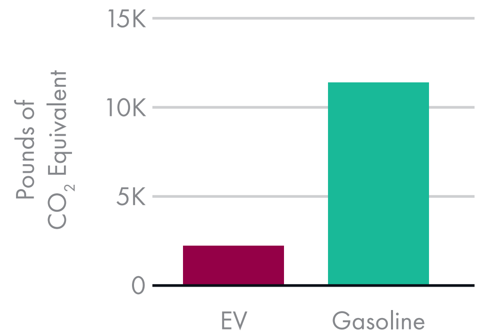
★ 20,000 charging stations in Los Angeles County with another 40,000 being added by the end of 2025

★ If you rent, ask your landlord about installation

To find the location of your nearest EV charging station, visit: www.plugshare.com

BECAUSE CALIFORNIA USES A LOT OF CLEAN ENERGY, THE EMISSIONS FROM DRIVING AN EV ARE SIGNIFICANTLY LESS THAN A GASOLINE VEHICLE.

Emissions Savings (Annual) EV vs. Gasoline

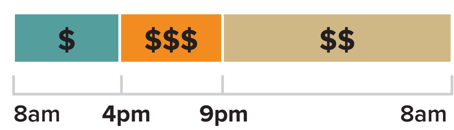


Emissions for California calculated using the Alternative Fuels Data Center Emissions Calculator (https://afdc.energy.gov/vehicles/electric_emissions.html)

TIME-OF-USE RATES

Save money by charging your EV during off-peak times in the middle of the day when there is extra solar power, or overnight when demand is low. With smart meters you can charge your EV when there is extra renewable energy available. In the future, vehicle-to-grid technology can allow the EV to power the grid and YOU will get paid for it!

Cost of Electricity During the Day



Save Even More with Federal, State, Local, and Utility Incentives for EVs and Chargers*

Federal	California State	Southern California Local	California Utility
Federal Tax Credit for Electric Vehicles: $7,500 (max incentive, varies by manufacturer)	California Clean Vehicle Rebate Project for New EVs: $2,000 – $4,500 (income-eligible)	South Coast Air Quality Management District – Replace Your Ride: $9,500 for New EVs (income-eligible)	All – Special time-of-use rates to reduce the cost of EV charging
	California Clean Fuel Reward for New EVs: $750	South Coast Air Quality Management District – Residential EV Charging Incentive Pilot Program: $500	LADWP – Charge Up LA!: Used EVs -$1,500 Chargers - $750
			Southern California Edison Pre-Owned EV Rebate: $1,000 – $4,000 (income-eligible)

*As of February 2022, to see a list of all available incentives in your area visit https://afdc.energy.gov/laws

ASOCIACIÓN DE GOBIERNOS DEL SUR DE CALIFORNIA

ESTUDIO DE ESTACIÓN DE CARGA PARA VEHÍCULOS ELÉCTRICOS

SCAG™

DEJA QUE TU PRÓXIMO VEHÍCULO SEA UN VEHÍCULO ELÉCTRICO (EV)

Ahorros de $800/año en gasolina

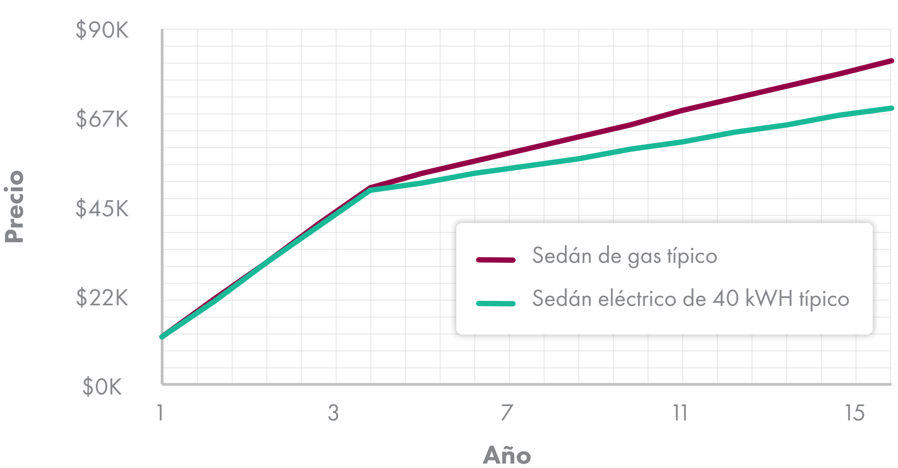
Garantía de las baterías hasta 8-años/ 100k millas

Ahorros de $700/año en mantenimiento

Vehículos eléctricos nuevos empezando desde $35k (antes de incentivos)

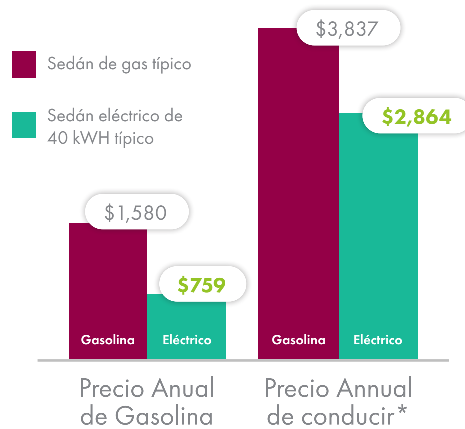
Para ver vehículos eléctricos en el mercado visite https://afdc.energy.gov/vehicles/search/

COSTO DE POR VIDA DE LA PROPIEDAD DEL VEHÍCULO



El promedio de ahorros fue calculado utilizando la calculadora de costos de vehículos creado por El Centro de Datos de Combustibles Alternativos (https://afdc.energy.gov/calc/)

EJEMPLO DE COSTOS ANUALES DEL VEHÍCULO



*Incluye gasolina, llantas, mantenimiento, registración, licenciatura, y póliza de seguro

El promedio de ahorros fue calculado utilizando la calculadora de costos de vehículos creado por El Centro de Datos de Combustibles Alternativos (https://afdc.energy.gov/calc/)

BENEFICIOS DE CONDUCIR UN VEHÍCULO ELÉCTRICO

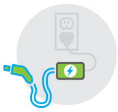
> Cabina Silenciosa
> Divertido de Conducir
> Tablero Sencillo
> Mejor Manejo
> Mayor confiabilidad

BENEFICIOS AMBIENTALES DE UN VEHÍCULO ELÉCTRICO

> Cero emisiones
> Aire más limpio
> Reducción de las emisiones de gases de efecto invernadero
> Mejora la salud de la comunidad y la calidad de aire

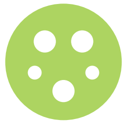
TODAS LAS FORMAS DE CARGAR

Cargador de Nivel 1



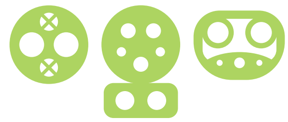
Cargador de Nivel 1
Utiliza un enchufe doméstico de 110-V. Bajo en precio y ideal para carga en casa durante la noche. Recarga 3.5-6.5 millas de alcance por hora.

J1772



Cargador de Nivel 2
Ideal para carga en casa durante la noche, en los trabajos, y en negocios comerciales. De precio bajo o medio y recarga 14-35 millas de alcance por hora. Todos los vehíuclos eléctricos pueden usar cargadores de nivel 2.

CHAdeMO CCS-1 Tesla



Cargador Rápido de CC de Nivel 3
Ideal para paradas cortas a lo largo de carreteras principales. De precio Alto pero puede recargar hasta un 80% en menos de 30 minutos. Las diferentes marcas de vehículos eléctricos son compatibles con diferentes cargadores.

Carga en casa, en el trabajo, o el camino

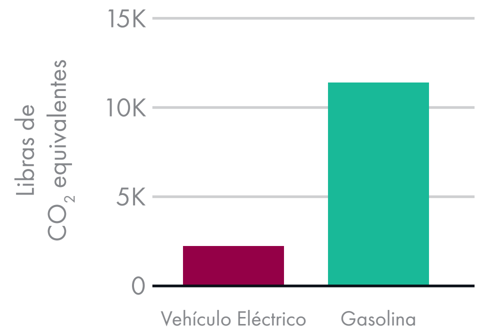
Hay 20,000 estaciónes de carga en el Condado de Los Angeles, con planes de agregar otras 40,000 estaciónes para finales de 2025.

Si eres alquiler, pregúntale a el dueño de la propiedad sobre la instalación

Para encontrar la estación de carga más cercana, visite: www.plugshare.com

CALIFORNIA UTILIZA MUCHA ENERGÍA LIMPIA, ENTONCES LAS EMISIONES DE CONDUCIR UN VEHÍCULO ELÉCTRICO SON SIGNIFICATIVAMENTE MENORES QUE LAS DE UN VEHÍCULO DE GASOLINA

Ahorro de Emisiones (Anual) Vehículo Eléctrico vs. Gasolina

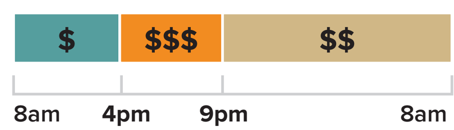


Emisiones para California fueron calculadas utilizando la calculadora de emisiones creada por El Centro de Datos de Combustibles Alternativos (https://afdc.energy.gov/vehicles/electric_emissions.html)

TARIFAS DE TIEMPO DE USO

Ahorra dinero cargando su vehículo eléctrico durante las horas de precio bajo uso a medio día cuando hay energía solar adicional, o durante la noche cuando la demanda es baja. Con los medidores inteligentes puede cargar su vehículo eléctrico cuando haya adicional energía renovable disponible. En un futuro, la tecnología de vehículo a la red electrica podra permitir que su vehículo eléctrico apoye a la red, ¡y a usted se le pagara por su ayuda!

Precio de la Electricidad Durante el Dia



Ahorre Más con incentivos Federales, Del Estado, Locales, y de Servicios Públicos para Vehículos Eléctricos y Cargadores*

Federal	Estado de California	Local del Sur de California	Servicios Públicos de California
Credito en impustos federal para Vehiculos Nuevos Electricos e Hibridos Enchufables: $7,500 (incentivo máximo, según la marca del vehículo)	California Clean Vehicle Rebate Project para Vehículos Eléctricos nuevos: $2,000-$4,500 (según sus ingresos)	AQMD de La Costa Sur – Replace Your Ride: $9,500 para Vehículos Eléctricos Nuevos (según sus ingresos)	Todos los Servicios Públicos – Ofrecen tarifas de tiempo de uso especiales para reducir el costo de cargar un vehículo eléctrico
	California Clean Fuel Reward para Vehículos Eléctricos Nuevos: $750	AQMD de La Costa Sur – Programa de Incentivo de cargador de Vehículos Eléctricos Residenciales: $500	LADWP – ¡Energízate Los Ángeles!: Vehículos Eléctricos Usados - $1,500 Estaciónes de Carga - $750
			Southern California Edison – Programa de Reembolso de Vehículos Eléctricos Usados: $1,000-$4,000 (según sus ingresos)

*A partir de Febrero de 2022, para ver una lista de todos los incentivos disponibles en su área visite https://afdc.energy.gov/laws

SCAG EV Charging Station Study

EV Charging Station Guide For Property Managers

Revised and Approved October 2022

INNOVATING FOR A BETTER TOMORROW

SCAG EV Charging Station Guide for Property Managers

Publish Date October 2022

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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.

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

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.

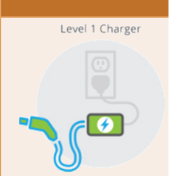
As EV adoption grows, property managers have an incentive to provide this service to attract and retain customers, patrons, and tenants who will have a greater need for charging. EVCS can provide direct revenue through the sale of electricity, and supplemental revenue through increased retail sales or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

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 3rd 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. Maitenance: minimal	

Charger Level	Plug Type and Power Output	Recommended Use Case	Typical Installation Costs ($/port)	Typical Ongoing Cost ($/port/yr)	Image
Level 2	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. Maitenance: $150-$1,000	J1772 
Level 3 Direct Current Fast Charger (DCFC)	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. Maitenance: $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

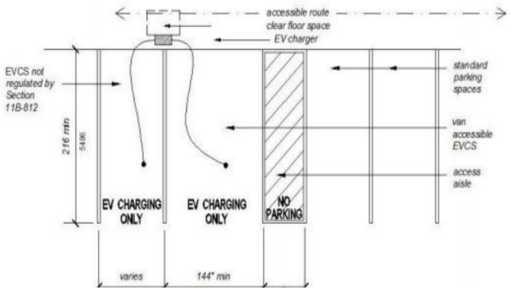


Figure 2. Sample layout with 2 EV Chargers and 1 Van Accessible Stall

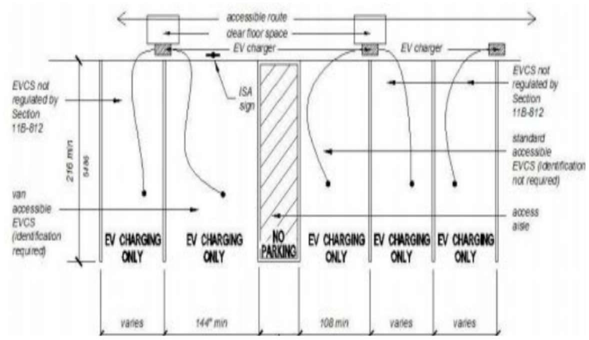


Figure 1. Sample layout with 5 EV Chargers, 1 Van Accessible Stall, and 1 Standard Accessible Stall

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[1]. 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[2]. 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[3]. 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

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

[2] https://calevip.org/sites/default/files/docs/calevip/California_EVCS_Regulations_Guide.pdf

[3] https://www.caranddriver.com/news/a35044132/plug-and-charge-ev-charging-mustang-mach-e/

ed quicky. 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	Charge Ready	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	Charge Up LA!	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	Lead The Charge	Rebates on qualifying L2 and DCFCs, varies by power output and site type	MUDs may quality for Level 1 chargers in common areas. Rebates can be applied for before or after construction
Glendale Water and Power	Charging Station Rebate	Rebates on qualifying L2 and DCFCs, varies by power output and site type	Rebate application submitted after installation
Pasadena Water and Power	Commercial Charger Incentive Program	Rebates on qualifying L2 and DCFCs	Applies to stations installed after August 2018, until funds are exhausted
California Energy Commission	CALeVIP	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	Low Carbon Fuel Standard	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.

INNOVATING FOR A BETTER TOMORROW

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

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SCAG EV Charging Station Study

EV Charging Station Guide For Culver City

Revised and Approved

September 26, 2022

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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 Culver City to continue along its Electric Vehicle (EV) journey and expand its EV charging network into harder to reach areas to continue fostering EV adoption. This guide includes an overview of general EV charging basics, funding EV infrastructure, state requirements and design considerations, coordinating with utilities, local EV policy and procedures, and guidelines for successfully implementing electric vehicle charging stations (EVCS). Culver City has multiple roles to play in fostering EV adoption including educating the public, coordinating with the private sector, and converting city-owned fossil-fuel powered fleets to electric to demonstrate their capabilities.

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

Culver City staff should familiarize themselves with EV charging basics, including the types of chargers, their 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 a few key variables such as access to electrical power, ADA requirements, and visibility of stations to drivers. As EVCS infrastructure grows, Culver City needs to consider enforcing EVCS parking space use regulations, so chargers remain accessible to drivers. Culver City can also work closely with the private sector to facilitate installing EVCS at commercial and MUD properties by connecting them to resources such as funding opportunities, providing EV property owner guidelines, pre-approved contractors, and posting clear permitting and design requirements to minimize permit processing times.

Culver City has already done a great job at installing EVCS in highly trafficked public sites. Culver City has taken some great first steps in electrifying its City-owned fleet, showcasing to the community that they are viable alternatives. While California has multiple funding programs, they remain highly competitive. When funding is limited, cities can explore alternative ownership structures to reduce upfront costs to foster project implementation. This hands-on project experience will help cities better educate the public and coordinate with private sector partners.

PUBLIC AWARENESS

Overall public awareness around EV charging stations is still low including the different types, use cases, costs, and best practices surrounding their installation. While 71% of drivers expect to charge at home, a majority of residents in MUDs expect to charge their EV using publicly available charging stations [1]. 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 cost, installation best practices, and making the overall business case and communicating other potential benefits. Cities have a key role to play in educating stakeholders in their community on this subject.

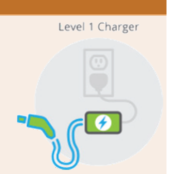
EV CHARGING BASICS

CHARGER TYPES AND TYPICAL COSTS

EV chargers are categorized into three different levels depending on the amount of power they output to an EV. Product and installation costs generally increase as power output increases because increased loads are more likely to trigger costly electrical infrastructure upgrades. Product costs for chargers may decrease over time as manufacturers achieve economies of scale, particularly for Level 3 Direct Current Fast Chargers (DCFC); however, their 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 3rd 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 inspect 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 3rd 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. Maitnenace: minimal	

[1] 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
Level 2	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. Maintenace: $150-$1,000	J1772 
Level 3 (DCFC)	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. Maintenace: $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 that have thus far been overlooked by the private sector. 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 such as equitable access to EV Charging or as a key component of 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

Culver City has already started building out charging infrastructure at City-owned properties for staff and public use including City Hall, parking structures, the Senior Center and the Veteran's Memorial building. These sites are highly visible within the community and receive high vehicle traffic. Culver City should continue to expand EVCS infrastructure curbside and at any remaining publicly owned sites. Culver City can also work with community stakeholders and property managers of private locations or other highly visible and high traffic areas such as large employment centers, commercial plazas, shopping centers, schools, hotels, and other popular destinations. Lastly, identifying 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 being considered, the site host should think about where the EVCS are located 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 the ADA regulations and access to power considerations. 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 be a balance between opposing considerations if for example utility power is far away from parking or a building entrance. Site hosts may need to decide how to prioritize different factors when preparing their 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 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 (2022 Code)
0-9	0
10-25	4
26-50	8
51-75	13
76-100	17
101-150	25
151-200	35
201 and over	20% of total

Additionally, any time EVCS are installed at a publicly accessible location, California requires a certain minimum number of chargers be ADA compliant. Specific requirements are summarized in Table 3. ADA accessibility 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

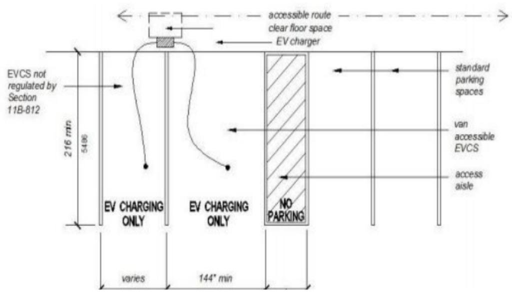


Figure 2. Sample layout with 2 EV Chargers and 1 Van Accessible Stall

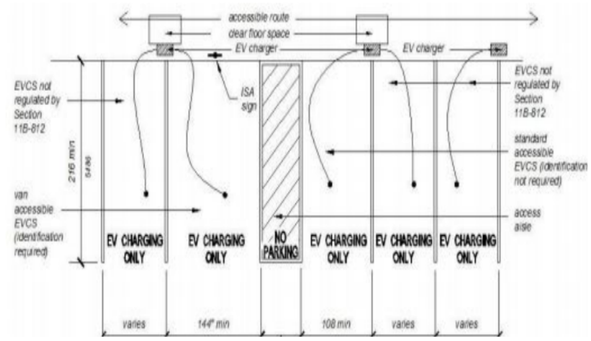


Figure 1. Sample layout with 5 EV Chargers, 1 Van Accessible Stall, and 1 Standard Accessible Stall

OTHER FACTORS TO CONSIDER

After ADA considerations, access to electrical power should be considered. It is common for EVCS projects to require new electrical service, so 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 hard-wired access to the internet or a wireless cellular signal. If the wireless signal is weak at a site such as those located in an underground parking garage, cellular repeaters may be needed, or the project may need to consider equipment options that have integrated cellular or Wi-Fi capabilities.

UTILITY COORDINATION

Coordination with electric 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 electric 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 12-18 months in some cases before there is sufficient electrical capacity available. Electric utility representatives can also support the site design, providing recommendations on charger placement, and connect the site to available incentives and related programs. Culver City primarily resides in SCE territory and can leverage the Charge Ready program which launched on July 12, 2021. Under this program, SCE will complete the engineering design and pay for utility side infrastructure and behind the meter infrastructure for EV charger installations that have at least four level 2 charging ports. This program has internal cost per port effectiveness criteria so not all sites may qualify. Increasing the number of charging stations to 10 or more is a strategy to increase the likelihood of being selected into the program as infrastructure upgrade costs are spread among more charging ports. The program has a focus on MUDs so fewer chargers may be needed to qualify at those sites. The program also prioritizes disadvantaged communities under CalEnviroScreen; however, Culver City does not have any disadvantaged communities within its jurisdiction. The program fast-tracts any needed infrastructure upgrades and offers rebates on qualified charging stations. SCE customers who purchase their electricity from the Clean Power Alliance may qualify to participate in the Alliance's incentive program. For LADWP customers located in Culver City, they should consider participating in their Charge Up LA! Program, which provides incentives on qualifying Level 2 and DCFS chargers.

PARKING AND SIGNAGE CONSIDERATIONS

Most EVs still require at least 30 minutes to charge, even with DCFCs; therefore, 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 and 1 hour for DCFS. 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 reserve the right to issue warnings, citations 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 become aware of EVCS etiquette. Culver City can reference the California Plug in Vehicle Collaborative which provides sample EV parking and charging signage[2]. The California Manual of Uniform Traffic Control Devices contains up to date directions and guidance for EV related signage placed on public streets[3].

PAYMENT MECHANISMS

In most 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[4]. 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[5]. This is similar to how the Tesla network already operates, but in an open ecosystem. Culver City should continue to track the development of this protocol and coordinate with manufactures to update City-owned EVCS when the protocol has been finalized.

SUPPORTING THE PRIVATE SECTOR AND INFLUENCING EV ADOPTION

Culver City can go beyond educating the public on EVCSs and support the private sector to rapidly deploy EVCS. The City can help educate commercial property and multifamily property owners on the benefits of installing EVCS, connect site hosts to resources, and streamline permitting processes. In traditional energy efficiency programs, some municipalities have been known to pre-vet and create a list of qualified contractors to hire to build trust in the community. The City can take similar approaches with EVCS

[2] https://www.calbo.org/sites/main/files/file-attachments/ca_accessibility_for_ev_charging.pdf

[3] https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/f0018447-13-01-a11y.pdf

[4] https://calevip.org/sites/default/files/docs/calevip/California_EVCS_Regulations_Guide.pdf

[5] https://www.caranddriver.com/news/a35044132/plug-and-charge-ev-charging-mustang-mach-e/

vendors, either building their own list of pre-qualified contractors or directing interested site hosts to other reputable sources such as SCE's Trade Pro list[6].

BUSINESS OPPORTUNITY FOR EVCS

Commercial, multifamily, and mixed-use property owners can benefit in multiple ways by installing EVCS at their sites. Networked EVCS owners can set rates and charge users for the electricity dispensed and can markup electricity costs for 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 to generate a secondary revenue stream, if located on private property. There are indirect benefits to installing EVCS including increasing the dwell time of business patrons and promoting corporate branding to attract new customers, tenants, or employees[7]. Sites can realize these benefits, even if they decide not to charge users for the cost of 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.

PERMITTING AND INSPECTIONS

One area that Culver City can directly support the private sector to deploy EVCS is to streamline the permitting processes, particularly for non-residential applications. Culver City has a dedicated webpage with clear guidance and a permit checklist for residential and commercial EVCS permit applications online. This is expected to reduce revisions needed during plan checks for commercial permit applications. Culver City expedites EVCS permit applications and is expected to meet AB 970 permit processing deadlines, when they go into effect on January 1, 2023. When commercial projects are subject to the approval of multiple departments including engineering, building and safety, and planning department, these reviews should be coordinated to minimize processing time. If Culver City would like to further streamline this 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. An inspection is required after the permits are issued and the equipment has been installed.

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 Culver 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. Culver City may also want to adopt more stringent EVCS reach codes that go beyond building code requirements such as those developed by Bay Area Reach Codes.

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[6] https://sce-chargeready.force.com/s/trade-professional-resources

[7] https://atlaspolicy.com/wp-content/uploads/2020/04/Public-EV-Charging-Business-Models-for-Retail-Site-Hosts.pdf

While building codes address new construction and major modifications to existing buildings, CEC's assessment of EV charging infrastructure finds that new construction building codes alone may not be enough to meet EVCS demand in 2030[8]. 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. Culver City has focused on adding curbside charging options to further increase EVCS availability. While curbside chargers can be more challenging and expensive to install, they can help supplement more traditional EVCS locations, as shown in Figure 3.

Figure 3. Sample Curbside EVCS

CITY OWNED INFRASTRUCTURE AND FLEETS

Culver City has already taken great steps towards electrifying its publicly owned vehicle fleet including public transit and public works services. This helps increase visibility and demonstrates the viability of EVs in the community and provides additional benefits of improving local air quality, since Culver City purchases 100% renewable, carbon-free electricity to recharge their fleet's batteries. Installing EVCS infrastructure and fleet conversions can be capital intensive, and outside funding or creative ownership structures may be needed to supplement internal funding sources. The City should consider employee/fleet vehicle shared use of the EVCS infrastructure the City installs. In this scenario, when the EVCS is not being used by a fleet vehicle, it would become available for use employees.

STATE FLEET CONVERSION REQUIREMENTS

Specific CARB requirements applicable to City-owned fleets includes the Innovative Clean Transit (ITC), Advanced Clean Trucks (ACT), Advanced Clean Fleets (ACF), and California Governor Newson's 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 does not directly impact fleets, as it imposes purchasing requirements upon manufactures 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. The ACF is the compliment to the ACT. While still being finalized and barring certain vehicle exemptions for public fleets it is expected to require 50% of new medium and heavy-duty 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

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. Culver City should consider providing information related to available incentives towards EV purchases, EVCS purchases, and EVSE infrastructure on their EV landing page within the City's

[8] 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

website. In several instances funding is prioritized for Disadvantaged Communities (DACs). While Culver City has small DAC districts, making the information readily available can support EVCS deployment in these areas.

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 within the SCAG region (as of July 2022). An up-to date list of EVCS funding and incentive programs can be viewed at the AFDC Laws and Incentives webpage. Some funding programs may be in high demand and funds can be exhausted quicky. It is recommended to identify available funding sources, eligibility, and other 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	Charge Ready Charge Ready Transport	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
California Energy Commission	CAleVIP	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	Clean Vehicle Rebate Project	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	Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project	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
Clean Power Alliance	County of LA	Rebates on qualifying L2 and DCFCs for qualifying site types	Funding must be reserved before installation
Los Angeles Department of Water and Power	Charge Up LA!	Rebates on qualifying L2 and DCFCs for qualifying site types	Funding must be reserved before installation

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 by 20% by 2030, and to provide incentives for low carbon alternative fuel sources[9]. 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

[9] https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/about

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 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 July 2022, credit prices have fallen to under $100/credit[10]. Site hosts can use this LCFS revenue to offset EVSE infrastructure, equipment and hardware costs, and operating costs (maintenance, networking fees, etc.) not recovered by selling electricity.

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 (NOx), particulate matter (PM10) 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[11] and public and private sector entities may apply.

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 the SCAQMD, 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 to implement specific clean transportation projects[12].

SUPPORTING PUBLIC PRIVATE PARNTERSHIPS

EV INFRASTRUCTURE OWNERSHIP MODELS

While California will likely continue to provide funding for EVSE 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 is generally recommended to charge users for the electricity they use 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 money upfront and pays the vendor over time via a subscription model, typically on a per kWh basis. Lastly, shared ownership and revenue models are available. These ownership models, summarized in Table 5, 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 owne

[10] https://www.neste.com/investors/market-data/lcfs-credit-price

[11] http://www.aqmd.gov/home/programs/business/business-detail?title=heavy-duty-engines

[12] http://www.cleantransportationfunding.org/current-rfps-solicitations

rship 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 has multiple roles to play in fostering EV adoption including educating the general public, partnering with the private sector and converting city-owned fleets to demonstrate EV capabilities. Culver City can continue to be a leader for smaller cities in Southern California like Santa Monica, and support EV adoption through multiple pathways. Culver City has done a great job with deploying EV infrastructure at publicly owned sites, electrifying its own fleet, and making EV information readily accessible on the City website. As Culver City continues to expand its EV infrastructure, it should look to make partnerships with EVSE vendors and project developers to expand EV infrastructure into privately owned sites that might not otherwise be addressed.

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

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ATTACHMENT 4 – EV FUNDING GUIDE

SCAG EV Charging Station Study

EV Charging Station Funding Guide

Revised and Approved February 28, 2023

SCAG™

INNOVATING FOR A BETTER TOMORROW

SCAG EV Charging Station Funding Guide

Publish Date February 28, 2023

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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 quicky. 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 quicky. 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)	National Electric Vehicle Infrastructure Program (NEVI)	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)	Charge Ready	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	Charge Up LA!	Rebates on qualifying L2 and DCFCs for qualifying site types	Funding must be reserved before installation
Anaheim Public Utility (APU)	Public Access EV Charger Rebates	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	CAleVIP	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	Clean Vehicle Rebate Project	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	Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project	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	Low Carbon Fuel Standard	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	Energy Efficiency and Conservation Block Grant Program	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[1]. 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[2]

[1] https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/about

[2] 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[3]. 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,

[3] 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.

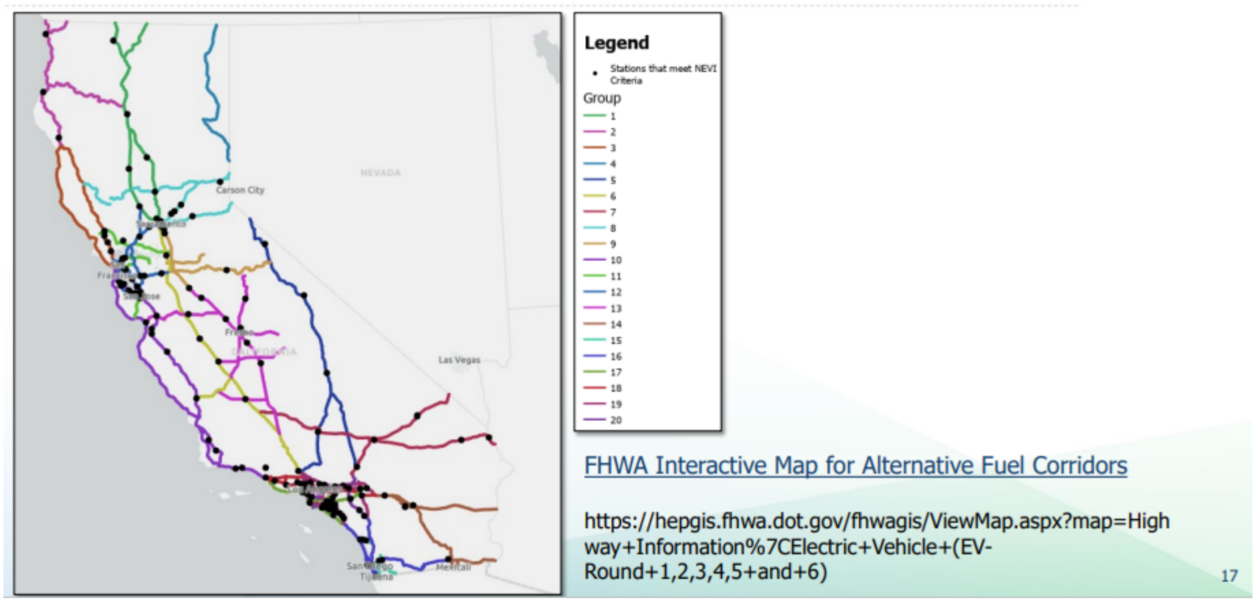

FIGURE 1. CEC'S PROPOSED NEVI CORRIDORS GROUP

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[4]:

- 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.

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[4] Inflation Reduction Act (IRA) EV Incentives, Explained - (pluginamerica.org)

- 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[5]. 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).

FIGURE 2. CALEVIP 2.0 INITIAL FUNDING REGIONS

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 catagorized 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,

> **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.

[5] Charging Infrastructure and Rebate Program (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).

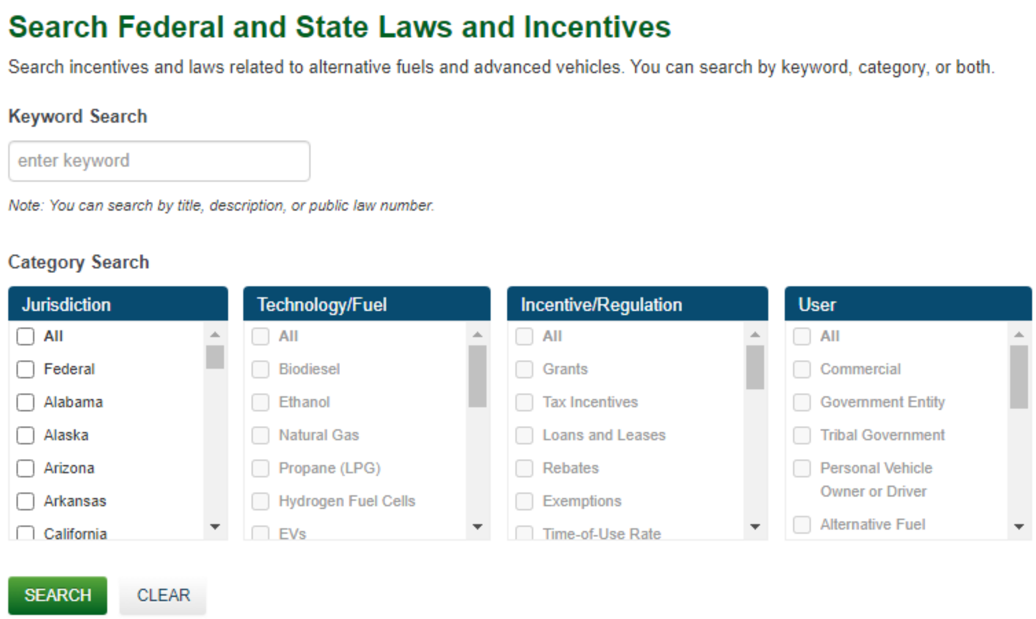

FIGURE 3. AFDC EV INCENTIVE SEARCH AND FILTER FEATURE

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, its 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
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

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.

SCAG™
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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

Culver City City Hall
9770 Culver Blvd,
Culver City, CA 90232
Tel: (310) 253-6000

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