

# GUIDE

## Electric Vehicle Infrastructure Requirements in CALGreen Building Code

DEVELOPERS, PROPERTY OWNERS, AND PROPERTY MANAGERS



This guide was developed as part of the City of Sacramento's ongoing efforts to increase electric vehicle (EV) adoption, improve access to chargers, and implement goals set forth in the City's [EV Strategy](#). The 2019 California Green Building Standards Code ("CALGreen", Title 24, Part 11) requires that new construction and major alterations include adding "EV Capable" parking spaces which have electrical panel capacity, a dedicated branch circuit and a raceway to the EV parking spot to support future installation of charging stations.

All new construction and qualifying additions or alterations must comply with CALGreen. The 2019 CALGreen codes become effective on January 1, 2020 and requires the following:

### Residential (Single-Family, Townhomes, & Duplexes)

- All new construction must be EV capable. Each dwelling unit must have a listed raceway to accommodate a dedicated 208/40-volt branch circuit.
- Accessory dwelling units without additional parking do not need to comply with EV charging requirements for new construction (e.g., guest houses).

Source: <https://codes.iccsafe.org/content/CAGBSC2019>  
 Residential Mandatory Measures: Chapter 4.106.4  
 Residential Voluntary Measures (Tiers 1 & 2): Appendix A4.106.8  
 Nonresidential Mandatory Measures: Chapter 5.106.5.3  
 Nonresidential Voluntary Measures (Tiers 1 & 2): Appendix A5.106.5.3  
 Definitions and requirements for alterations & mixed-use buildings:  
 Chapter 3, Sections 301 & 302

### Multifamily Dwellings

Required Percent of Total Parking Spaces to be "EV Capable"	Optional Tier 1 Percent of Total Parking Spaces to be "EV Capable"	Optional Tier 2 Percent of Total Parking Spaces to be "EV Capable"
10%	15%	20%

- If guest parking is available, at least one "EV Capable" space must be for guest parking.

### Hotels & Motels

"EV Capable" spaces are required based on the total number of parking spaces at all types of parking facilities (e.g., garages, flat lots, valet).

### Nonresidential

Total Number of Parking Spaces	Required Number of Parking Spaces to be "EV Capable"	Optional Tier 1 Number of Parking Spaces to be "EV Capable"	Optional Tier 2 Number of Parking Spaces to be "EV Capable"
0-9	0	1	1
10-25	1	2	2
26-50	2	3	4
51-75	4	5	6
76-100	5	7	9
101-150	7	10	12
151-200	10	14	17
201	6% of total	8% of total	10% of total

### Mixed-Use

The code provides a formula to calculate the required number of "EV Capable" parking spaces based on residential and nonresidential units.

## What Are the Different EV Compliance Levels?



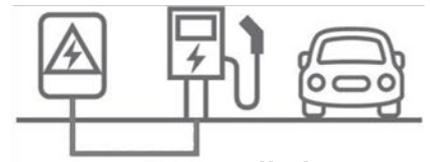
### EV Capable

Installation of "raceway" (the enclosed conduit that forms the physical pathway for electrical wiring to protect it from damage) and adequate panel capacity to accommodate future installation of a dedicated branch circuit and charging station(s).



### EV Ready

EV Capable plus installation of dedicated branch circuit(s) (electrical pre-wiring), circuit breakers, and other electrical components, including a receptacle (240-volt outlet) or blank cover needed to support future installation of one or more charging stations.



### EV Installed

EV Ready plus installation of a minimum number of Level 2 electric vehicle supply equipment (EV chargers)

## Charging Equipment Types

Chargers are identified by their input voltage and designed and sold by many manufacturers with different prices, applications and functionality. There are three categories of EV chargers:

LEVEL 1	LEVEL 2	DC FAST CHARGE
<p>3 to 5 miles of range per hour 7 to 24 hours for a full charge</p>	<p>~3-19kw and 16-40 amps 10 to 20 miles of range per hour 4 to 6 hours for a full charge</p>	<p>50-60kw and 100+ amps 80% charge in 20 to 40 minutes 60 minutes for a full charge</p>

## Estimated Installation Costs

The following examples depict typical cost ranges for installation of L2 chargers, based on common equipment and installation costs in 2019.

### Electric Vehicle Supply Equipment (EVSE, or "EV charger")

EVSE Support	Technical Components	Average Installation Cost	Average EVSE Unit Cost	Average Total Cost
EV Capable (mandatory)	Raceway, Circuit	\$800	N/A	\$800
EV-Ready Outlet	Raceway, Circuit, Wiring, Outlet	\$1,100	N/A	\$1,100
EV-Installed	Raceway, Circuit, Wiring, L2 EVSE	\$3,000	\$3,000	\$6,000

### Parking Lot

Required EV Parking Spots	EV Capable (Mandatory)	EV-Ready	EV-Installed
1	\$800	\$1,100	\$6,000
4	\$3,200	\$4,400	\$24,000
6	\$4,800	\$6,600	\$36,000
8	\$6,400	\$8,800	\$48,000

Estimates for hardware and equipment based on industry input and do not include costs for permitting.

## Incentives & Rebate Programs

Sacramento property owners may be eligible for rebates and incentives from SMUD and the State of California. In addition, low and no-cost financing might be available. [cityofsacramento.org/ev](http://cityofsacramento.org/ev)

