October 25, 2021
To: Raphael Guillen
125 E. College Street
Covina, CA 91723
Transmitted via email to rguillen@covinaca.gov cc: rfajardo@covinaca.gov
SUBECT: Final EV Charger Station (EVCS) Study EV Policy Memoranda for City of Covina

This memo has been prepared to assist the City of Covina understand its current progress towards full compliance with California Assembly Bill (AB) 1236 which requires cities to update and streamline their EV charging station permitting requirements. This memo also describes additional best practices for cities to improve their EV programs, including those recommended by California's 2019 Governor's Office of Business and Economic Development (GOBIZ) EV Charging Permitting Guidebook to further foster EV charger installations within the City. This memo was prepared following an online review of the City's EVCS permitting requirements and a listening session with City stakeholders held on September 21, 2021.

AB 1236 Requirements

Permitting requirements and prolonged approval timelines have been, and still are, significant barriers for electric vehicle supply equipment (EVSE) installation projects. To ensure consistency in process and encourage permitting of electric vehicle (EV) charging stations, California passed Assembly Bill 1236 in October 2015 requiring all Cities and Counties to develop streamlined EV charging station permitting protocols by September 30, 2017. The legislation is designed to create uniform standards to facilitate permitting and decrease overall EVSE installation costs to support increased EV ownership. Table 1 summarizes AB1236's requirements and the City's current progress in meeting them. Recommended actions or improvements to meet any deficiencies are also included. Appendix A contains resources to assist the City coming into full compliance with AB 1236.

Table 1 Summary of City of Covina Compliance with AB 1236

AB 1236 Requirements	Compliance Status	Recommended Action or Improvement
Ordinance creating an expedited, streamlined permitting process for Electric Vehicle Charging Stations (EVCS) including Level 2 and Direct Current Fast Charger (DCFC) has been adopted	Met	N/A
Checklist of all requirements needed for expedited review posted on County or City website	In Progress	Use template checklists in Appendix A to develop checklist for Covina. Then add checklist to Forms and Submittal Checklists page of City website.

AB 1236 Requirements	Compliance Status	Recommended Action or Improvement
EVCS projects that meet expedited checklist are administratively approved through building or another non-discretionary permit	Met	N/A
EVCS projects reviewed with focus on health and safety	Met	N/A
Authority Having Jurisdiction (AHJ) accepts electronic signatures on permit applications	Met	N/A
EVCS permit approval not subject to approval of an association (as defined in sec. 4080 of Civil Code)	In Progress	Add language to municipal code 14.04.220 clarifying that building officials will not subject EVCS permit approval to approval of an association
AHJ commits to issuing one complete written correction notice detailing all deficiencies in an incomplete application and any additional information needed to be eligible for expedited permit issuance	Met	N/A

GOBIZ Best Practices

California's 2019 Governor's Office of Business and Economic Development (GOBIZ) EV Charging Permitting Guidebook[1] includes best practices for cities to follow, facilitate, and expedite the EV charger station permitting process. Table 2 summarizes the progress made by the City of Covina in relation to these best practices.

Table 2 - Summary of City of Covina meeting AB 1236 Best Practices

AB 1236 Best Practices	City Status	Recommended Action or Improvement
Clear EVCS permitting process detailed on website	Explore Implementation	Update permitting section of City website to state that EVCS are included as part of general building or electrical plan check
Zero Emission Vehicle (ZEV) permitting ombudsperson appointed to help applicants through entire permitting process	In Use	Building Division answers any questions regarding EVCS.
Guidance documents for permitting and inspecting charging stations at single family home, multifamily home, workplace, public and commercial medium, and heavy duty posted on website	Explore Implementation	Consider developing additional guidance documents as part of permitting section of City website

[1] California's 2019 Governor's Office of Business and Economic Development (GOBIZ) EV Charging Permitting Guidebook

AB 1236 Best Practices	City Status	Recommended Action or Improvement
Preapplication meetings with staff offered	Explore Implementation	Update website or guidance documents to state that Building Division staff can have preapplication meetings for potential EVCS applications
AHJ has published bulletin or ordinance that states EV charging space counts as one or more parking spaces	Explore Implementation	Update parking ordinances to allow EV spaces to count as parking spaces
Concurrent reviews are made available for building, electrical and planning (if necessary)	In Use	Plan checkers already conduct concurrent EVCS reviews with other building or electrical reviews.
Planning for EV and related infrastructure incorporated in general plan, capital improvement plan, climate action plan and design guidelines	Explore Implementation	Recommended to include public EVCS in a revision to the 2019 Energy Action Plan
EVCS classified as accessory use, not as a fueling station	Explore Implementation	Update parking guidance to classify EVCS as an accessory use
AHJ established timelines that are expedited compared to standard building permit review timelines	In Use	Currently City already expedites EVCS permitting, offering quick turnaround times. Suggested to include average turnaround times for EVCS permitting on City website.
AHJ conditionally approves permits ("approved as noted")	Explore Implementation	City plan checkers should be trained to conditionally approve EVCS permits as noted

Additional Best Practices and Considerations

Below are some additional recommended best practices, taken from the experience of other cities throughout the state.

Additional Best Practices & Stretch Goals

Setting Tangible Targets and Goals

To make transportation electrification efforts more tangible, the City of Covina should consider establishing a timeline to install a target number of chargers. The California Energy Commission (CEC) projects that about 968,000 public and shared private chargers will be needed statewide to support 5 million electric vehicles by 2030: approximately 1 public charger for every 5 electric vehicles[2]. The CEC's analysis does not include private charging stations at personal residences

[2] 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

towards these targets. Based on the population of Covina and statewide car ownership rates this translates to approximately 1,217 public and shared private EV chargers by 2030 to support approximately 6,086 electric vehicles in the City.

The City of Los Angeles has been a great example of setting tangible goals and then meeting them. In their 2019 Sustainable City Plan, Los Angeles Department of Water and Power (LADWP) set the goals of installing 10,000 EV charger stations by 2022, and 28,000 EV charger stations by 2028[3]. The City of Los Angeles met their first target 2 years ahead of schedule, installing over 11,000 EV charging stations by January 1, 2021[4]. Their success can be attributed to factors such as generous incentives from LADWP and other agencies installing EV charging stations as part of their own needs. The Bureau of Street Lighting has specifically targeted LED retrofitted streetlights for curbside EV charging. While the City of Covina may not have access to the same resources as a larger city, a good first step would be incorporating public EVCS into the city's general plan or in a revision to the Energy Action Plan and establishing smaller interim goals. The City can also leverage SCE's Charge Ready program to then help achieve these goals. The program provides generous incentives towards EVCS infrastructure and rebates on charging stations[5].

The City of Covina can also set target goals for electrification transition of the city owned vehicles. While there are several regulations and state goals in the works to require public and private fleets to electrify their vehicles over the next 15-20 years, City of Covina can still plan to get ahead of this timeline. A good first step would be to inventory municipally owned vehicles and start identifying which vehicles can be electrified today. A public announcement would set an example for the community that electric vehicles are a viable option for a variety of use types. For example, in 2013, Hermosa Beach implemented a local policy that new city owned vehicles be either an alternative fuel or zero emission vehicle whenever feasible to reduce their greenhouse gas impact. Hermosa Beach installed the infrastructure needed to support these vehicles as part of the policy. A copy of their memorandum is contained in Appendix B.

Parking, Signage, and Enforcement

EVs still require 30 minutes, or longer, to charge, even with Level 3/DC Fast Chargers; therefore, clear signage that directs EV drivers where to park and charge will help ensure a positive and safe user experience. It will also help denote where non-EV drivers cannot park to ensure spots are left open for EV charging. While not very common, non-EVs have been noted to occasionally park in EV charging spots. As EV ownership increases, the need for consistent signage and enforcement of parking policies may increase. The City can reference the California Plug in Vehicle Collaborative which provides sample EV parking and charging signage. The California Plug in Vehicle Collaborative provides additional information related to accessibility requirements for EV parking spaces. California manual of uniform traffic control devices contains updated directions and guidance for EV related signage placed on public streets. These parking and signage resources are contained in Appendix C.

[3] https://plan.lamayor.org/sites/default/files/pLAn_2019_final.pdf
[4] https://www.lamayor.org/mayor-garcetti-announces-city-has-helped-install-10000-ev-chargers
[5] https://energized.edison.com/stories/sce-gets-green-light-for-expanded-ev-charging-program

Local Codes and Ordinances

It is recommended that local building codes or ordinances be updated to require EV spaces for new construction or large renovation projects. California 2019 Green Building Code requires set minimums of EV spaces and accessibility requirements for new construction of multifamily residential and nonresidential new construction[6]. Per the latest code, EV spaces do not currently require EV chargers, but must install infrastructure and have available capacity for future installations. The City should adopt these codes under local ordinance and as a stretch goal consider increasing the minimum percentage requirements and/or requiring EVCS to be installed as part of the project. As another stretch goal, the City of Covina can expand EV space and infrastructure requirements to minor building retrofits and alterations, which are not subject to new construction building codes. CEC's assessment of EV charging infrastructure finds that new construction building codes alone may not be enough to meet EV demand in 2030[7]. 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. In addition, the City could consider curbside charging options. While challenging and potentially more expensive to install in these locations it could help supplement more traditional EVCS locations.

City of Los Angeles also offers a great example of updating building codes to foster EV adoption and going above and beyond CA 2019 Green Building Code requirements. City of Los Angeles currently requires new multiunit dwellings (MUDs), hotels and motels to set aside 30% of parking spaces for EV spaces and installation of EVCS in 10% of total parking spaces; greater than the 6-8% of parking spaces indicated in the CA 2019 Green Building Code. Setting larger EV space requirements should be considered within the City's expected EV adoption rate and other local building or parking codes. Increasing the percentage of EV parking spaces too high, which only EV drivers may use, in areas with low EV adoption rates may not provide enough parking for non-EV drivers. In some cases, local codes require a minimum number of parking spaces for MUDS, commercial properties, etc. If local codes do not allow EV spaces to count towards these minimums it could unnecessarily increase new construction costs.

Funding

The GOBIZ guidebook recommends that cities post guidance for EV permitting on their websites or link it to online permitting software as pop-up adverts. This can be included on a separate EV landing page to include other EV related resources such as funding opportunities and incentives. In several instances funding is prioritized for Disadvantaged Communities (DACs) and should be highlighted on the City's website.

[6] 2019 California Green Building Standards Code California Code of Regulations, Title 24, Part 11

[7] 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

EV Purchase Rebates and Incentives
Funding is a common barrier for property owners to install EV charging stations. The City of Covina should consider providing information related to available incentives towards electric vehicle purchases, electric vehicle charger purchases, and EVSE infrastructure. Examples include: https://cleanvehiclerebate.org/eng, https://www.cleanfuelreward.com/ and https://calevip.org/ The clean vehicle rebate program has increased incentive values for low-income individuals. Note that these funding programs have been in high demand and may be subject to annual funding renewals from the State.

Utility Incentives and Coordination
Coordination with utilities is critical for large EVSE buildouts, in particular for projects that include DCFC, as it is likely that significant site upgrades and utility infrastructure may be required. Covina is within Southern California Edison territory, which launched their new Charge Ready program 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. The program has a focus on MUDs and sites located within DACs. The program will help make EVSE installation projects more economically viable. The City may want to consider directing site developers to this program during the permitting process.

Low Carbon Fuel Standard (LCFS) and Credits
Under AB32, California created the low carbon fuel standard to reduce GHG emissions from the transportation sector. The goal is to decrease the carbon intensity of the CA transportation fuel pool, 20% by 2030, and provide incentives for low carbon alternative fuel sources. Fuel providers can generate credits for producing low carbon fuels, including dispensed electricity from public and fleet EV charging stations. Credit values fluctuate over time but are currently trading at upwards of $200/credit. Fuel data and metered energy usage must be reported quarterly to CARB. The total number of and value credits generated will be impacted by the carbon intensity of the electricity used and the amount of electricity dispensed from the chargers, but the current credit value translates to approximately $0.15/kWh. Municipalities 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.

Mobile Source Air Pollution Reduction Review Committee (MSRC)
The Mobile Source Air Pollution Reduction Review Committee (MSRC) has invested more than $400 million in clean transportation projects in Southern California since 1990. The organization includes most of Southern California and contains South Coast Air Quality Management District (SCAQMD), Southern California Association of Governments (SCAG), San Bernardino County Transportation Authority (SBCTA), Los Angeles County Metropolitan Transportation Authority (LACMTA), 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 to apply for funding for specific clean transportation projects[8].

Local Revenue Generation
Covina has successfully leveraged existing revenue streams to install public EVCS. Within the downtown areas, city-owned parking lots generate revenue each year that must be spent on parking lot improvements. Covina has reinvested these funds to install EVCS in these parking lots. Users must pay to use these charging stations. To date these charging stations have seen high utilization, bringing in additional revenue to the City. The City may be able to continue this method to further build out public charging infrastructure in high demand areas.

Sample Language and Templates

California Building Officials has developed an AB1236 toolkit to assist cities within complying with the regulation, including a template checklist and sample ordinances a city can pass to come into full compliance with AB 1236. Considering that the City has already updated the municipal code to cover most of AB 1236's requirements, it is recommended the City only add language to the municipal code from the sample ordinance related to Association Approval. Appendix A includes these toolkits as well as draft language for the City of Covina to use for ordinances and a template staff report for formal adoption. In addition, a template checklist, the City of Monrovia's checklist, and the City of West Hollywood's checklist are included as examples for the City to develop their own EVSE checklist.

Summary of Findings

Currently the City of Covina meets 5 of seven (7) of AB 1236 requirements and 3 of 10 recommended best practices from California's GOBIZ EV Charging Permitting Guidebook. The City is close to come into compliance with AB 1236. While the State has not enforced this bill with any penalties, it is important that the City of Covina work expeditiously to update their EVSE permitting protocols to support the growing demand for EVs throughout the SCAG region. By creating a requirement checklist for expedited review and making it accessible on the city website, Covina would be one step closer to achieving compliance with AB 1236. Sample Checklists from the City of Monrovia and other checklist templates are included in the appendices for the City of Covina to use. Lastly, by adding to Covina's established AB1236 ordinances to include EVCS permit approval that is not subject to approval of an association (as defined in sec. 4080 of Civil Code), would result in Covina coming into full compliance with AB 1236. The City of Covina can reference California's 2019 GOBIZ EV Charging Permitting Guidebook to further adopt the best practices for EVCS installations.

So far, Covina has been a great example of how smaller cities can come into compliance with AB 1236 by constantly seeking opportunities to expand their support for EVCS. While funding continues to remain an issue for cities alike, Covina can slowly expand their EVCS infrastructure by looking into funding sources mentioned above. This can include installing public EVCS in areas of interest, or by continuing to incorporate EVCS as part of new development projects, parking

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

projects, etc. Furthermore, Covina is actively increasing the sustainability of their city, as per their updated Energy Action Plan in 2019. By establishing small interim goals regarding EVCS, Covina can accommodate the growing demand of EVCS, as the adoption of EV's continue to rise.

Respectfully submitted,
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Vanessa Munoz, PE, TE, PTOE
Project Manager

Appendices

Appendix A – AB 1236 Resources

AB 1236 Sample Ordinance Template - ***Administrative*** for Small Jurisdictions

ORDINANCE NUMBER ____

AN ORDINANCE OF THE CITY COUNCIL / COUNTY BOARD OF SUPERVISORS OF THE CITY OF _____ / COUNTY OF _____
SETTING FORTH PROCEDURES FOR EXPEDITING PERMITTING PROCESSING FOR ELECTRIC VEHICLE CHARGING SYSTEMS

WHEREAS, the State of California and the City of _____ / County of _____ has consistently promoted and encouraged the use of fuel-efficient electric vehicles; and

WHEREAS, the State of California recent adopted Assembly Bill 1236, which requires local agencies to adopt an ordinance that creates an expedited and streamlined permitting process for electric vehicle charging systems; and

WHEREAS, creation of an expedited, streamlined permitting process for electric vehicle charging stations would facilitate convenient charging of electric vehicles and help reduce the City's / County's reliance on environmentally damaging fossil fuels.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF _____ / COUNTY BOARD OF SUPERVISORS OF THE COUNTY OF _____ DOES ORDAIN AS FOLLOWS:

SECTION 1. TITLE, WORDS AND PHRASES

This Ordinance shall be known as the City of _____ / County of _____ Electric Vehicle Charging Station Permit Expediting Ordinance. The terms, phrases, and words used in this Ordinance shall be construed in compliance with the definitions set forth by California Government Code Section 65850.7.

SECTION 2. Section _____ of the City of _____ Municipal Code / County of _____ County Code is hereby added to read as follows:

Section _____ Expedited Electric Vehicle Charging Station Permitting

Electric Vehicle Charging Stations which qualify for expedited permit processing, pursuant to Government Code Section 65850.7, shall be subject to the administrative permitting procedures set forth in the City's Electric Vehicle Charging Station Permit Expediting Ordinance.

SECTION 3. EXPEDITED REVIEW PROCESS

Consistent with Government Code Section 65850.7, the Building Official shall implement an expedited administrative permit review process for electric vehicle charging stations, and adopt a checklist of all requirements with which electric vehicle charging stations shall comply with in order to be eligible for expedited review. The expedited administrative permit review process and checklist may refer to the recommendations in the checklist prescribed by the most current version of the "Plug-In Electric Vehicle Infrastructure Permitting Checklist" of the "Zero-Emission Vehicles in California: Community Readiness Guidebook" published by the Governor's Office of

Planning and Research. The City's / County's adopted checklist shall be published on the City's / County's website.

SECTION 4. ELECTRONIC SUBMITTALS

Consistent with Government Code Section 65850.7, the Building Official shall allow for electronic submittal of permit applications covered by this Ordinance and associated supporting documentations. In accepting such permit applications, the Building Official shall also accept electronic signatures on all forms, applications, and other documentation in lieu of a wet signature by any applicant.

SECTION 5. ASSOCIATION APPROVAL

Consistent with Government Code Section 65850.7, the Building Official shall not condition the approval for any electric vehicle charging station permit on the approval of such a system by an association, as that term is defined by Civil Code Section 4080.

SECTION 6. PERMIT APPLICATION PROCESSING

A permit application that satisfies the information requirements in the City's / County's adopted checklist shall be deemed complete and be promptly processed. Upon confirmation by the Building Official that the permit application and supporting documents meets the requirements of the City / County adopted checklist, and is consistent with all applicable laws, the Building Official shall, consistent with Government Code Section 65850.7, approve the application and issue all necessary permits. Such approval does not authorize an applicant to energize or utilize the electric vehicle charging station until approval is granted by the City / County. If the Building Official determines that the permit application is incomplete, he or she shall

issue a written correction notice to the applicant, detailing all deficiencies in the application and any additional information required to be eligible for expedited permit issuance.

SECTION 7. TECHNICAL REVIEW

It is the intent of this Ordinance to encourage the installation of electric vehicle charging stations by removing obstacles to permitting for charging stations so long as the action does not supersede the Building Official's authority to address higher priority life-safety situations. If the Building Official makes a finding based on substantial evidence that the electric vehicle charging station could have a specific adverse impact upon the public health or safety, as defined in Government Code 65850.7, the City / County may require the applicant to apply for a use permit.

SECTION 8. Any provision of the City of _____ Municipal Code / County of _____ County Code or appendices thereto, inconsistent with the provisions of this Ordinance, to the extent of such inconsistencies and no further, are hereby repealed or modified to that extent necessary to effect the provisions of this Ordinance.

SECTION 9. If any section, subsection, sentence, clause, or phrase of this Ordinance is for any reason held to be invalid or unconstitutional by a decision of any court of any competent jurisdiction, such decision shall not affect the validity of the remaining portions of this Ordinance. The City Council / County Board of Supervisors hereby declares that it would have passed this Ordinance, and each and every Section, subsection, sentence, clause, or phrase not declared invalid or unconstitutional without

regard to whether any portion of the Ordinance would be subsequently declared invalid or unconstitutional.

SECTION 10. The Mayor shall sign and the City / County Clerk shall attest to the passage of this Ordinance. The City / County Clerk shall cause this Ordinance, or a summary thereof to be published once in the official newspaper within 15 days after its adoption. This Ordinance shall become effective on September 30, 2016.

APPROVED AS TO FORM:

_____

NAME
City Attorney / County Counsel

Eligibility Checklist for Expedited Electric Vehicle Charging Station Permit: RESIDENTIAL DWELLINGS

Type of Charging Station(s)	Power Levels (proposed circuit rating)	Check one
Level 1	110/120 volt alternating current (VAC) at 15 or 20 Amps	☐
Level 2 - 3.3 kilowatt (kW) (low)	208/240 VAC at 20 or 30 Amps	☐
Level 2 – 6.6kW (medium)	208/240 VAC at 40 Amps	☐
Level 2 – 9.6kW (high)	208/240 VAC at 50 Amps	☐
Level 2 – 19.2kW (highest)	208/240 VAC at 100 Amps	☐
Other (provide detail):_____	Provide rating:_____	☐

1. Permit Application Requirements:

A. Does the application include EVCS manufacturer's specs and installation guidelines?	☐ Y	☐ N

2. Electrical Load Calculation Worksheet:

A. Is an electrical load calculation worksheet included? (**CEC 220**)	☐ Y	☐ N
B. Based on the load calculation worksheet, is a new electrical service panel upgrade required?	☐ Y	☐ N
1) If yes, do plans include the electrical service panel upgrade?	☐ Y	☐ N
C. Is the charging circuit appropriately sized for a continuous load of 125%?	☐ Y	☐ N
D. If charging equipment proposed is a Level 2 – 9.6 kW station with a circuit rating of 50 Amps or higher, is a completed circuit card with electrical calculations included **with the single line diagram**?	☐ Y	☐ N

3. Site Plan and Single Line Drawing:

A. Is a site plan and separate electrical plan with a single-line diagram included with the permit application?	☐ Y	☐ N
1) If mechanical ventilation requirements are triggered for indoor venting requirements **(CEC 625.29 (D))**, is a mechanical plan included with the permit application?	☐ Y	☐ N
B. Is the site plan fully dimensioned and drawn to scale?	☐ Y	☐ N
1) Showing location, size, and use of all structures	☐ Y	☐ N
2) Showing location of electrical panel to charging system	☐ Y	☐ N
3) Showing type of charging system and mounting	☐ Y	☐ N

4. Compliance with the 2016 California Electrical Code:

A. Does the plan include EVCS manufacturer's specs and installation guidelines?	☐ Y	☐ N
B. Does the electrical plan identify the amperage and location of existing electrical service panel?	☐ Y	☐ N
1) If yes, does the existing panel schedule show room for additional breakers?	☐ Y	☐ N
C. Is the charging unit rated more than 60 amps or more than 150V to ground?	☐ Y	☐ N
1) If yes, are disconnecting means provided in a readily accessible location in line of site and within 50' of EVCS. (**CEC 625.23**)	☐ Y	☐ N

D. Does the charging equipment have a Nationally Recognized Testing Laboratory (NRTL) approved listing mark? (UL 2202/UL 2200)	☐ Y	☐ N
E. If trenching is required, is the trenching detail called out?	☐ Y	☐ N
1) Is the trenching in compliance with electrical feeder requirements from structure to structure? (**CEC 225**)	☐ Y	☐ N
2) Is the trenching in compliance with minimum cover requirements for wiring methods or circuits? (18" for direct burial per **CEC 300**)	☐ Y	☐ N

5. Compliance with the 2016 California Green Building Standards Code (CGBSC):

A. Do the CAL Green EV Readiness installation requirements apply to this project?	☐ Y	☐ N
1) Do the construction documents indicate the location of the proposed EV spaces where at least one is located in common use areas and available to all residents for use **(4.106.4.2.1)**	☐ Y	☐ N
2) Do the construction documents indicate the required stall dimensions for the proposed EV spaces on site **(4.106.4.2.2)**	☐ Y	☐ N
3) When EV chargers are installed, EV spaces required by Section **4.106.4.2.2**, **item 3** shall be accessible and comply with at least one of the following options: a. The EV space shall be located adjacent to an accessible parking space that complies with **CBC Chapter 11-A**, to allow use of the EV charger from the accessible parking space. b. The EV space shall be located on an accessible route, as defined by CBC Chapter 2, to the building.	☐ Y	☐ N

Notes: This criteria is intended for an expedited EVCS permitting process. If any items are checked NO, you may revise the plans to fit within the eligibility checklist or otherwise the permit application may go through the standard plan review and approval process.

Electrical plans shall be completed, stamped and signed by a California Licensed Electrical Engineer or a C-10 electrical contractor.

Project Address: _____

Applicant Signature: _____

Applicant Printed Name: _____

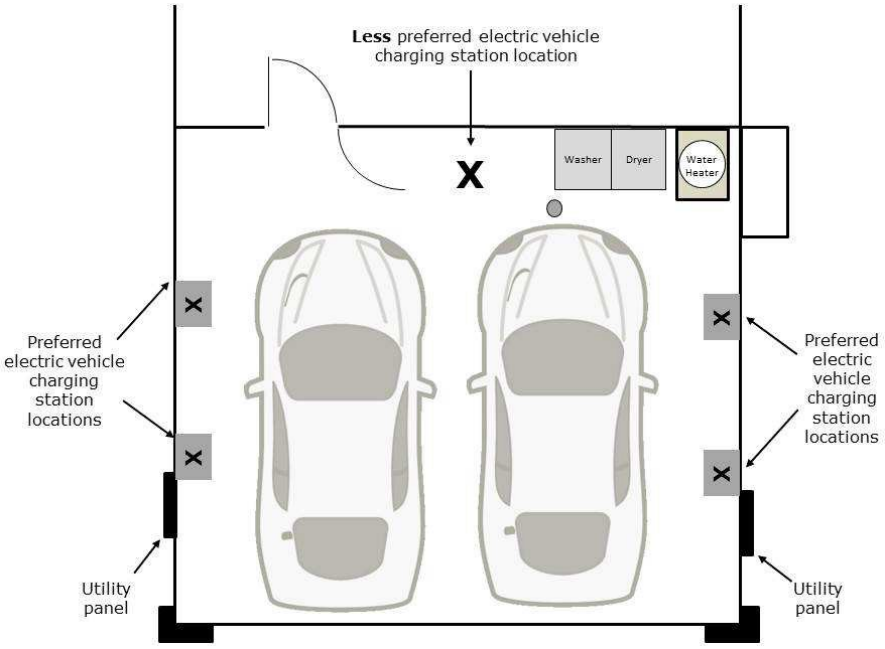
Contractor's License number and type: _____

Required Documentation:

Level 1 – Electric Vehicle Charging Stations:

The following is required for the installation of a **Level 1** electric vehicle charging station only:

- ☐ Illustrative Diagram – An illustrative diagram indicating the location of equipment and conduit routing shall be submitted as an attachment to this application. For your reference, a diagram illustrating the preferred installation location of an electric vehicle charging station within a single-family residential garage is provided below:



Level 2 – Electric Vehicle Charging Stations:

The following is required for the installation of a **Level 2** electric vehicle charging station only:

- ☐ Site Plan – Provide two (2) copies of a site plan.
- ☐ Floor Plan – Provide two (2) copies of a floor plan.
- ☐ Load Calculations – Provide complete "Load Calculations" for all Level 2 electric vehicle charging station installations. Please fill out page 4 of this handout.

Please Note: For exterior installations of electric vehicle charging stations or equipment, a ground fault circuit interrupter (GFCI)/ ground fault interrupter (GFI) outlet shall be required. Any equipment installed on the exterior of the garage shall be rated for outdoor use. In addition, an illustrative diagram and an exterior elevation showing the location of the equipment and conduit routing shall be submitted as an attachment to this application. Electric vehicle charging stations shall be protected against vehicle impact damage when located in the path of a vehicle.

Load Calculations (Level 2 Installations Only):

The completion of this section is required **only** if a Level 2 electric vehicle charging station is being installed. Applicants installing a Level 1 electric vehicle charging station just need to provide an Illustrative Diagram as explained on the previous page.

Total floor area of dwelling unit:_____sq. ft.

Existing main circuit breaker size:_____amps

Electric Vehicle Service Equipment Load Calculations (Please complete the table provided below for all applicable loads within your dwelling unit.)

Check all applicable loads	Description of Load	Typical Usage	Total Volt Amperes (VA)
General Lighting Load			
☐	Dwelling area square footage:	sq. ft. x 3 VA =	
Kitchen Circuits			
☐	Small appliance circuits (min. 2)	1,500 VA x circuits =	
☐	Electric oven	Nameplate rating	
☐	Electric range	8,000 VA or Nameplate (nameplate rating must be used if larger)	
☐	Microwave	1,500 VA	
☐	Garbage disposal	1,000 VA	
☐	Dishwasher	1,200 VA	
☐	Garbage compactor	Nameplate rating	
☐	Instantaneous hot water at sink	1,500 VA	
Laundry Circuits			
☐	Laundry circuit	1,500 VA x circuits=	
☐	Electric clothes dryer	5,000 VA minimum	
Heating & Air Conditioning Circuits			
☐	Central heating (gas) and air conditioning	Nameplate rating	
☐	Window-mounted A/C	Nameplate rating	
☐	Whole-house or attic fan	500 VA	
☐	Central electric furnace	8,000 VA	
☐	Evaporative cooler	500 VA	
Other Electrical Loads			
☐	Electric water heater (storage type)	Nameplate rating	
☐	Electric tank less water heater	15,000 VA	
☐	Swimming pool/spa	3,500 VA	
☐	Other:		
☐	Other:		
☐	Other:		
Electric Vehicle Charger Circuit			
☐	Level 2 electric vehicle charger rating		
		Total VA Used (Add up all the VA for the applicable loads)	

Installation of Electric Vehicle Charging Stations:

Please comply with the installation requirements for electric vehicle charging stations as noted:

1. General Requirements. All electrical vehicle charging stations shall comply with the applicable sections of the California Electrical Code, including Article 625.

2. Listed Equipment. Electric vehicle charging stations and its components shall be listed and labelled by a nationally recognized testing laboratory (ETL/UL).

3. Equipment Height. The coupling means of the electric vehicle charging station shall be stored at a height of not less than eighteen inches (18") above the floor level for indoor charging stations [CEC 625.50] and twenty-four inches (24") above the parking surfaces for outdoor charging stations [CEC 625.50].

4. Fastened in Place. Electric vehicle charging stations must be permanently connected and fastened in place in accordance with the manufacturer's installation instructions [CEC625.44].

5. Protection From Physical Damage. Electric vehicle charging stations shall be protected against vehicle impact damage when located in the path of a vehicle. In order to avoid the required installation of a pipe bollard as an equipment guard, locate the electric vehicle supply on the garage side wall, out of a vehicular path [CEC 110.27(B)].

6. If More Than 60 Amps. For electric vehicle charging stations rated more than 60 Amps or more than 150 volts to ground, the disconnect means shall be provided and installed in a readily accessible location. The disconnecting means shall be capable of being locked on the open position [CEC 625.42].

7. Overcurrent Protection. Overcurrent protection for feeders and branch circuits supplying electric vehicle charging stations shall be sized for continuous duty and shall have a rating of not less than one hundred twenty five percent (125%) of the maximum load of the electric vehicle supply equipment [CEC 625.40].

8. Markings. Where an electric vehicle charging station is installed indoors, the electric vehicle charging station shall be listed and clearly marked by the manufacturer as follows: "VENTILATION NOT REQUIRED". The marking shall be located so as to be clearly visible after installation [CEC 625.52(A) & CEC 625.15(B)].

Please Note: Please follow the manufactures installation instructions in addition to these installation guidelines as referenced in the 2016 California Electrical Code.

City of West Hollywood
California 1984

WEST HOLLYWOOD
8300 Santa Monica Boulevard West Hollywood, CA 90069-6216

Building & Safety Division
tel 323 848.6475 fax 323.848.6569

PERMITTING CHECKLIST FOR ELECTRIC VEHICLE SERVICE EQUIPMENT FOR Existing RESIDENTIAL AND NONRESIDENTIAL BUILDINGS

Please complete the following information related to permitting and installation of electric vehicle chargers/ electric vehicle service equipment (EVCS / EVSE) as a supplement to the application for a electrical and/or building permit. This checklist contains the technical aspects of EVSE installations and is intended to help expedite permitting and use for electric vehicle charging.

This checklist substantially follows the *"Plug-In Electric Vehicle Infrastructure Permitting Checklist"* contained in the *Governor's Office of Planning and Research "Zero Emission Vehicles in California: Community Readiness Guidebook"* and is purposed to augment the guidebook's checklist.

Qualifying EVCS / EVSE will be processed similarly to nondiscretionary permits (zone clearance). New EVCS / EVSE that are found to adversely impact public health and safety will not qualify for the streamlined permitting process. A Zone Clearance permit (granted by the Planning Division) shall not be conditioned on approval of an application of an association (*https://www.opr.ca.gov).*

Job Address:	Permit No.

☐ Single-Family ☐ Multi-Family (Apartment) ☐ Multi-Family (Condominium)

☐ Commercial (Single Business) ☐ Commercial (Multi-Business)

☐ Mixed-Use ☐ Public Right-of-Way

Location and Number of EVSE to be Installed:

Garage _____ Parking Level(s) _____ Parking Lot _____ Street Curb _____

Description of Work:

Permitting Checklist for Electric Vehicle Service Equipment

City of West Hollywood
California 1984

WEST HOLLYWOOD
8300 Santa Monica Boulevard West Hollywood, CA 90069-6216

Building & Safety Division
tel 323 848.6475 fax 323.848.6569

Applicant Name:	
Applicant Phone & email:	
Contractor Name:	License Number & Type:
Contractor Phone & email:	
Owner Name:	
Owner Phone & email:	

EVSE Charging Level: ☐ Level 1 (120V) ☐ Level 2 (240V) ☐ Level 3 (480V)	
Maximum Rating (Nameplate) of EV Service Equipment = _____ kW	
Voltage EVSE = _____ V	Manufacturer of EVSE: _____
Mounting of EVSE: ☐ Wall Mount ☐ Pole Pedestal Mount ☐ Other _____	

System Voltage:

☐ 120/240V, 1ϕ, 3W ☐ 120/208V, 3ϕ, 4W ☐ 120/240V, 3ϕ, 4W

☐ 277/480V, 3ϕ, 4W ☐ Other _____

Rating of Existing Main Electrical Service Equipment = _____ Amperes

Rating of Panel Supplying EVSE (if not directly from Main Service) = _____ Amps

Rating of Circuit for EVSE: _____ Amps / _____ Poles

AIC Rating of EVSE Circuit Breaker (if not Single Family, 400A) = _____ A.I.C.

(or verify with Inspector in field)

Permitting Checklist for Electric Vehicle Service Equipment

City of West Hollywood
California 1984

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Specify Either Connected, Calculated or Documented Demand Load of Existing Panel:
• Connected Load of Existing Panel Supplying EVSE = _____ Amps
• Calculated Load of Existing Panel Supplying EVSE = _____ Amps
Demand Load of Existing Panel or Service Supplying EVSE = _____ Amps *(Provide Demand Load Reading from Electric Utility)*
Total Load (Existing plus EVSE Load) = _____ Amps
For Single Family Dwellings, if Existing Load is not known by any of the above methods, then the Calculated Load may be estimated using the "Single-Family Residential Permitting Application Example" in the Governor's Office of Planning and Research "Zero Emission Vehicles in California: Community Readiness Guidebook" https://www.opr.ca.gov

EVSE Rating _____ Amps x 1.25 = _____ Amps = Minimum Ampacity of EVSE Conductor = # _____ AWG
For Single-Family: Size of Existing Service Conductors = # _____ AWG or kcmil or - : Size of Existing Feeder Conductor Supplying EVSE Panel = # _____ AWG or kcmil *(or Verify with Inspector in field)*

I hereby acknowledge that the information presented is a true and correct representation of existing conditions at the job site and that any causes for concern as to life-safety verifications may require further substantiation of information.

Signature of Permit Applicant: _____ Date: _____

Permitting Checklist for Electric Vehicle Service Equipment

Appendix B – Hermosa Beach Clean Fleet Policy

ADMINISTRATIVE MEMORANDUM

TO: All Departments **FUNCTION:** Finance

FROM: Viki Copeland, Finance Director
Tom Bakaly, City Manager **NO:** F-17

SUBJECT: **Clean Fleet Policy and Action Plan – Adopted June 11, 2013**

The City of Hermosa Beach has established and is aggressively pursuing a Carbon Neutral goal for municipal facilities and operations. Carbon neutral may be generally defined as "net zero greenhouse gas emissions" to be achieved by a specified date. Thus, the gap between greenhouse gas emission reductions achieved and zero greenhouse gas emissions would need to be "netted out" through the purchase of greenhouse gas offsets from activities outside the City or other measures such as generation of excess "green electricity" or carbon sequestration (the process of removing carbon from the atmosphere and depositing it in a reservoir).

The City Fleet Policy should be consistent with and balance the following directives in the Council's Strategic Plan (Attachment 1):

- Reduce the carbon footprint and become carbon neutral as a municipal corporation
- Increase the use of alternative energy sources
- Carbon neutral municipality as an example of "best practice"
- Incorporate sustainability principles in city decisions, budgets, facilities and plans
- Evaluate the environmental return on City investments and decisions
- Monitor the condition of the environment and evaluating the impacts of City decisions and actions

This policy establishes a clean vehicle and fleet policy that requires progressive transition to alternative fuel and zero and low emission vehicles and on- and off-road equipment as well as improved fleet management and operations. These measures will advance a carbon neutral goal and accelerate greenhouse gas reduction, improve air quality and health, reduce petroleum dependence and increase energy security in Hermosa Beach and beyond.

Policies apply to procurement, lease, retrofit and use of City fleet vehicles and equipment. Contractor vehicles providing city services should be held to the same standards through contractual provisions to the maximum extent possible.

1. Maximize the use of alternative fuel and low emission vehicles used to supply city services, including the City fleet and contractor vehicles.

A. Zero and low emission vehicles shall be acquired or used whenever feasible, taking into account vehicle function and specialized needs, vehicle miles traveled and other relevant factors.

B. Select the most efficient vehicle for each day's use by matching duty requirements to the lowest greenhouse gas emitting vehicle possible. Seek to meet occasional vehicle needs that cannot be met with alternative fuel vehicles through alternative arrangements (pooling, rentals, etc.).
C. Retrofit existing vehicles and equipment to reduce emissions when practical.
D. Manage overall fleet composition to achieve the aggregated lowest greenhouse gas emissions reasonably feasible, taking into account vehicle miles traveled.
E. Strictly adhere to California Air Resources Control Board Fleet Rules and South Coast Air Quality Management District fleet, vehicle and equipment statute, rules and guidelines requiring low-emitting gasoline or alternative-fuel vehicles and other air toxic control measures. Apply standards to categories below required thresholds where feasible.
F. Include minimum fuel efficiency standards and alternative fuel types for each vehicle class in procurement specifications. Consider purchase timing and retrofit potential as technology evolves when acquiring vehicles and equipment with long life spans that currently have limited alternative fuel options.
G. Environmental priorities and potential reduced operation and maintenance costs of alternative vehicles are valid return on investment considerations when costing alternative fuel vehicle purchases.

Target:
The City fleet is one of the few areas in which the City has control over its assets (comprising most of the 11.4% of emissions under direct control of the City in 2005) and therefore a rigorous goal should be set. As indicated by the action plan above, the realistic potential over time based on expected technology and City fleet demands should be performed before setting targets. However, staff believes an interim target can be set with the objective of evaluating the potential and timeline to meet this interim target along with a long-term net carbon neutral goal.

Interim: Determine feasibility of 50% emissions reduction for City fleet and 20% emissions reduction for contractor service vehicles (implemented with new contracts, or with amendments when feasible).

Long-term:
- **Net zero greenhouse gas emissions for City fleet.**
- **Alternative fuel used for 100% of contracted city service vehicles**. This is a lesser goal in that it is not a net carbon neutral goal.

Determination of the potential, cost and timeframe to achieve these targets would be undertaken as specified in the Actions outlined. Net zero means no petroleum-based fuels are used to power the vehicle or equipment unless offset by energy production or other means.

Actions:
1. Update the City fleet greenhouse gas emissions inventory: 2013/14
2. Prepare a master plan and determine the target date for carbon neutrality: End of FY 2013/14
    a. Establish a standard protocol and conduct a comprehensive review of the fleet demands, composition and conversion opportunities. The above "Guidelines for Vehicle Purchase and Replacement" developed by city staff is a starting point and should be reviewed for consistency with the Policy and adjusted as technology changes.
    b. Evaluate the potential for vehicles retrofits.

c. Evaluate the return on investment of various fleet vehicle scenarios (marginal cost per metric ton of carbon reduction) versus cost/benefit of implementing strategies in other sectors (building, water, waste).
d. Factor in the City's environmental priorities value of 'leading by example' together with lifecycle costs (fuel, maintenance costs, etc.) when considering overall priorities and strategies for conversion to alternative fuel vehicles.
e. Determine the maximum feasible greenhouse gas reduction possible by 2018 (5 years) taking into account functional needs, projected technology, vehicle miles traveled, etc. along with long-term strategies.

3. Revise the City's contract template to require alternative fuel or ultra low greenhouse gas emissions for all vehicles contracted to provide city services: 2013
4. Include minimum fuel efficiency standards and alternative fuel types for each vehicle class in procurement specifications. Consider retrofit potential as technology evolves when acquiring vehicles and equipment that have limited options: 2013/Ongoing.

Monitoring:
End of FY 2013/14 and then review annually as part of mid-year budget review process.

2. Reduce vehicle emissions through efficient fleet management and operations.

A. Efficiently operate fleet vehicles maintaining proper tire inflation and timely vehicle maintenance.
B. Enforce and accelerate state and regional laws, rules and guidelines to reduce air toxics. Consider local rules when not in conflict with state law.
C. Reduce vehicle miles traveled by using alternative modes for intercity and intra-city trips (walk, transit, bike, carpool), eliminating excess trips, combining trips, employee use of alternative fuel vehicles to reduce employee commute emissions, using videoconferencing and other online tools, and other techniques.
D. Increase driver efficiency.

Target:
Reduce vehicle miles traveled using petroleum-fueled vehicles as part of a comprehensive strategy.

Actions:
1. Identify and strictly enforce CARB, SCAQMD and other laws, rules and guidelines designed to improve efficiency, reduce air toxics, and accelerate conversion to alternative and low emission fuels, such as anti-idling, installation of diesel filters, etc. Identify areas in which the City should apply standards to its own fleet (and contractor vehicles): 2013/14
2. Establish a procedure to check tire pressure monthly on all vehicles: 2013
3. Conduct a systematic review and implementation of options for reducing vehicle miles traveled: Part of Master Plan
4. Work with the IT department to implement online meeting tools (teleconferencing, etc.): 2013/14
5. Incorporate provisions into City service provider contracts templates to implement the above measures: 2013
6. Educate and incentivize employees to fully and consistently implement these practices: 2013/14

Monitoring:
Review annually as part of budget process.

3. Facilitate infrastructure to support alternative fuel vehicles.

A. Expand and facilitate the increased utilization of publicly available alternative fuel infrastructure in the City.
B. Prepare for new vehicle technologies on an ongoing basis.

Target:
Locally convenient infrastructure to support a range of alternative fuel vehicles.

Actions:
1. Evaluate needs and plan for electric vehicle charging without reducing the availability of the city's charging infrastructure for public use: Part of Master Plan
2. Integrate into CIPs consideration of elements to facilitate new technologies. When repaving sidewalks or parking lots, bury electrical conduit to allow for future plug-in parking spaces. When designing or remodeling buildings, provide 110 volt outdoor outlet plugs near parking spaces and size circuits for future installation of 240 volt charging.
3. Evaluate installation of a CNG charging station in the local area.[1] May involve a partnership and serve City fleet, city contractors, etc. The outcome of the evaluation may affect the desirability of obtaining more CNG vehicles.
4. Fully utilize funding, partnerships and demonstration program opportunities that advance the above goals: Ongoing.

Monitoring:
Review infrastructure needs annually as part of the CIP program.

4. Evaluate opportunities to offset greenhouse gas emissions from City fleet and contracted service providers through green energy production or other offsets.

Target:
Offsets to achieve net carbon neutral goal for City fleet.

Actions:
1. Explore photovoltaic generation to offset electric charging demands and emissions of petroleum fueled vehicles: 2013/14
2. Consider whether city provision of alternative fuel infrastructure used by the general public may be counted as an offset: Part of Master Plan.

Monitoring:
Review infrastructure needs annually as part of the CIP program.

[1] Building a CNG refueling station - http://www.socalgas.com/innovation/natural-gas-vehicles/business/station-building.shtml; Exploring the Total Cost of CNG, Government Fleet http://www.government-fleet.com/article/print/story/2013/04/exploring-the-total-cost-of-cng.aspx

City of Hermosa Beach
Guidelines and Criteria for Vehicle Purchase and Replacement, 2013

1. **Review Existing Vehicle Replacement Schedule**
   a. Establish maximums for mileage (120k) and/or hours (varies by type of equipment).
   b. Consider years in service, suggest minimum of 8 years and maximum of 15 years.
   c. Do vehicle repairs exceed depreciated value, irrespective of age?
   d. Do repairs on a vehicle involved in accident(s) exceed 80 % of the depreciated value of the vehicle?
   e. Evaluate and finalize the justification for the replacement or extension of a vehicle's life.

2. **Review Vehicle Selection with Department Staff**
   a. Determine the necessary fleet functions and needs of the department.
   b. Determine if existing vehicles meet the need of staff and ensure new vehicle do not exceed requirements.
   c. Review requirements for Utility and Passenger vehicles, including cargo capacity, off road 4x4 capabilities, and towing capabilities.
   d. Assess vehicle usage: consider distance traveled and determine whether vehicle is driven home or out of town for training.

3. **Alternative Green Vehicle Implementation**
   a. Review each vehicle that has been approved for replacement and determine whether an alternative fuel vehicle is an option
   b. Review available green vehicles options including: electric vehicles, hybrids, CNGs, hydrogen, biodiesels, and any other emission reducing vehicles, and match with city needs
   c. Non alternative fuel vehicles shall be reviewed to determine lowest emission alternatives with equal performance.

4. **Purchasing, Maintenance and Environmental Considerations**
   a. Research available grants, dealer incentives, and organizational savings
   b. Review vehicle sales history, market sustainability, warranties and the history of mechanical and technical problems.
   c. Use of environmentally friendly materials.
   d. Review vehicle manufacturing environmental impact and environmental emission labels.
   e. Available dealer support and staff training for new technology.

5. **Fuel Support and Saving**
   a. Recognize and determine fueling needs.
   b. Apply for available charging station grants.
   c. Determine CNG fueling challenges and implement emergency procedures.
   d. Evaluate fuel cost savings that can be utilize for alterative fueling infrastructure.

6. **Police Department Considerations**

The Police Department researched alternative-fueled vehicles as options for vehicles utilized for police service. Based on current research, full electric vehicles and gasoline/electric hybrid vehicles were determined to be unsuitable to serve as either front-line police patrol vehicles or as unmarked detective vehicles.

Full electric vehicles: Full EVs are incompatible with needs of the department for the following reasons:

1. Certification – There currently are no electric vehicles that are certified by the manufacturer for use as police pursuit vehicles; the vehicle manufacturer will not endorse the use of any such vehicle as a police vehicle. Therefore, the utilization of such vehicles for use as front-line police patrol or detective vehicles presents several liability issues should they be operated in this capacity. The City would bear increased potential risk should the use of such vehicle in an enforcement action result in personal injury or property damage to either the public or to the City or City employee. The vehicle manufacturer will likely not honor any potential warranty claims due to the vehicle's operation outside of the parameters of its designed use.

2. Cost – Electric vehicles are considerably more expensive than gasoline-powered vehicles (or even hybrid vehicles, for that matter). AQMD funds are limited and may not fully offset the additional expense such that General Fund monies may be necessary. Although fuel costs would be lower, the savings would not be enough to offset the increased purchase expense.

3. Range – Electric vehicles do not have the necessary range to be utilized as either police patrol or detective vehicles. Police patrol vehicles (either front-line patrol or special service) are required to be driven or operated almost continuously throughout the officer's assigned work shift. This essentially requires the vehicle to endure from eight to twelve hours of near continuous heavy-duty operation. Currently, no electric vehicle exists that can perform this function without requiring significant (and time-consuming) recharging. In addition, officers (especially detectives) commonly have to venture out of the city to investigate cases and/or respond to incidents. Detectives can also be called upon to respond to remote locations at any time, day or night. This could result in these officers being potentially stranded in other areas where there are no charging facilities available.

4. Performance – It is sometimes necessary for front-line patrol or unmarked detective vehicles to engage in suspect pursuit or other similar activities (such as suspect vehicle surveillance or emergency response situations). Most electric vehicles simply lack the performance necessary to perform this function. The few electric vehicles that do possess the necessary performance capability are very expensive.

5. Size – Most electric vehicles are simply too small to adequately function as police vehicles. All police vehicles, whether marked or unmarked, require a certain amount of emergency lighting and safety equipment to be installed in them. In addition, detective vehicles must be of sufficient size to carry more than two persons in addition to the additional equipment carried by the individual detectives. Again, those few electric vehicles that are of sufficient size are prohibitively expensive.

6. Identification – Most electric vehicles are of unusual or uncommon design. As a result, they are highly recognizable and readily stand out from other vehicles. This inherent high visibility renders them useless by detectives as surveillance vehicles.

Gas/electric hybrid vehicles: These vehicles also incompatible as follows:

1. Certification – There currently are no gasoline/electric hybrid vehicles that are certified by the manufacturer for use as police pursuit vehicles; the vehicle manufacturer will not endorse the use of any such vehicle as a police vehicle. Therefore, the utilization of such vehicles for use as front-line police patrol or detective vehicles presents several liability issues should they be operated in this capacity. The City would bear increased potential risk should the use of such vehicle in an enforcement action result in personal injury or property damage to either the public or to the City or City employee. The vehicle manufacturer will likely not honor any potential warranty claims due to the vehicle's operation outside of the parameters of its designed use.

2. Cost – Hybrid vehicles are more expensive than gasoline-powered vehicles. AQMD funds are limited and may not fully offset the additional expense such that General Fund monies may be necessary. Although fuel costs would be lower, the savings would not be enough to offset the increased purchase expense.

3. Performance – It is sometimes necessary for front-line police patrol or unmarked detective vehicles to engage in suspect pursuit or other similar activities (such as suspect vehicle surveillance or emergency response situations). Most hybrid vehicles simply lack the performance necessary to perform this function. The few hybrid vehicles that do possess the necessary performance capability are more expensive.

4. Identification – Most hybrid vehicles are of unusual or uncommon design, or are given unique badges or other model-specific markings by the manufacturer in order to highlight their status as hybrid vehicles. As a result, they are highly recognizable and readily stand out from other vehicles. This inherent high visibility renders them useless by detectives as surveillance vehicles.

Full electric vehicles: These vehicles were also determined to be unsuitable to serve as police administrative vehicles or as special service patrol vehicles for the following reasons:

1. Cost – Electric vehicles are considerably more expensive than gasoline-powered vehicles (or even hybrid vehicles, for that matter). AQMD funds are limited and may not fully offset the additional expense such that General Fund monies may be necessary. Although fuel costs would be lower, the savings would not be enough to offset the increased purchase expense.

2. Range – Electric vehicles do not have the necessary range to be utilized as administration or special service vehicles. Police administrative officers commonly have to venture far out of the city to investigate cases, respond to incidents or for other administrative matters. In addition, these officers can be called upon to respond to such locations at any time, day or night. This could result in these officers being potentially stranded in other areas where there are no charging facilities available.

3. Size – Most electric vehicles are simply too small to adequately function as police vehicles. All police vehicles, whether marked or unmarked, require a certain amount of emergency lighting and safety equipment to be installed in them. In addition, administration and special service vehicles must be of sufficient size to carry more than two persons plus additional equipment carried by the individual officers. Again, those few electric vehicles that are of sufficient size are prohibitively expensive.

Gasoline/electric hybrid vehicles: Research has determined there are some gasoline/electric hybrid vehicle platforms that meet the Department's needs for use as administration and special service vehicles. Currently, however, there are not many gasoline/electric hybrid vehicle platforms from which to choose that meet these needs.

Despite constraints, the Police Department has been progressive in its use of alternative-fueled vehicles. The Department recently purchased an all-electric parking enforcement vehicle (Firefly) to replace a similar gasoline-powered vehicle (Go-4). It is the Department's intention to replace the other Go-4 vehicles with the Firefly vehicles as they are scheduled to be replaced. The Department employs a Ford Escape hybrid for use by the Volunteers-in-Policing (VIP) corps. The Department also employs two additional Ford Escape hybrids for use as general purpose beach patrol vehicles. (Unfortunately, Ford no longer manufactures the Escape SUV with a gasoline/electric hybrid powertrain. The Toyota Highlander is now the only option for use as an off-road capable special service vehicle available with a gasoline/

electric hybrid powertrain.) In addition, the Department utilizes two all-electric T3 personal mobility vehicles to supplement foot patrol operations.

_____
Viki Copeland, Finance Director

_____
Tom Bakaly, City Manager

Attachment 1
City Council – Strategic Plan – 2013 – 2018 – 2028

Carbon Neutral Goal: Directives Most Relevant to City Fleet Policy and Master Plan

HERMOSA BEACH VISION 2028

Principle 6: Commitment to Environmental Sustainability

2. Use of alternative energy sources within the City
6. Carbon neutral municipality as an example of "best practice"

HERMOSA BEACH MUNICIPAL CORP.: OUR MISSION

Principle 2: Be Environmentally Responsible

1. Incorporate environmental sustainability principles in city decisions, budgets, facilities and plans
3. Reduce the carbon footprint and become carbon neutral as a municipal corporation
6. Monitor the condition of the environment and evaluating the impacts of City decisions and actions
7. Evaluate the environmental return on City investments and decisions

PLAN 2013 – 2018

Goal 3. More Livable, Sustainable Beach City - Objectives

1. Reduce City carbon footprint
5. Increase use of alternative energy sources

Management Actions 2013

HIGH PRIORITY

- City Fleet Policy and Master Plan

Appenidix C – California EV Parking and Signage Resources

STATE OF CALIFORNIA• DEPARTMENT OF TRANSPORTATION

POLICY DIRECTIVE

TR-0011 (REV 9/2006)

TRAFFIC OPERATIONS POLICY DIRECTIVE	NUMBER: 13-01	PAGE: 1 of 17
DENNIS T. AGAR, DIVISION CHIEF (Signature)	DATE ISSUED: March 14, 2013	EFFECTIVE DATE: March 14, 2013

SUBJECT:

Zero Emission Vehicle Signs and Pavement Markings

DISTRIBUTION

- ☒ All District Directors
- ☒ All Deputy District Directors - Traffic Operations
- ☒ All Deputy District Directors - Maintenance
- ☒ All Deputy District Directors - Construction
- ☒ All Deputy District Directors - Design
- ☒ All Deputy District Directors - Transportation Planning
- ☐ Chief, Division of Engineering Services
- ☐ Chief Counsel, Legal Division
- ☒ Publications (California MUTCD Website) www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/ca_mutcd.htm
- ☒ Headquarters Division Chiefs for:

Construction, Maintenance, Design, Public Affairs, and, Transportation Planning

DOES THIS DIRECTIVE AFFECT OR SUPERSEDE ANOTHER DOCUMENT? ☐YES ☒NO	IF YES, DESCRIBE
WILL THIS DIRECTIVE BE INCORPORATED IN THE CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES ☒YES ☐NO	IF YES, DESCRIBE Adopt new sign and markings policy language in sections 2B.46, 2I.03, and 3B.20 of the CA MUTCD

DIRECTIVE

The Governor's Executive Order B-16-2012, dated March 23, 2012, requires all State entities under the governor's direction and control to support and facilitate the rapid commercialization of zero-emission vehicles (ZEV's). The California Department of Transportation (Caltrans), after consulting with local agencies, the public, and the Governor's Office of Planning and Research will amend the *California Manual on Uniform Traffic Control Devices* (CA MUTCD). Changes include six new signs, one new header plaque, two new optional pavement markings, deleting two existing signs, and updating content in various sections, figures and tables of the CA MUTCD. These policy and specification updates provide regulatory and general information signs and pavement markings to guide and regulate road users who operate ZEV's. The purpose of this directive is to implement Governor's Executive Order B-16-2012, update existing administrative law, and to provide detailed specifications for uniform use by State and local government agencies, as well as use by private entities at facilities open to public travel.

DIRECTIVE (continued)

Pursuant to the authority granted to Caltrans in section 21400 and 21401 of the California Vehicle Code (CVC), the following new signs and pavement markings shall be included (or deleted) in Parts 2 and 3 of the CA MUTCD, dated January 13, 2012.

California Code	MUTCD Code	Title of the sign, plaque or pavement markings	CA MUTCD Section
R112(CA)	None	Electric Vehicle Charging Station Tow-Away	2B.46
R113(CA)	None	No Parking EXCEPT FOR EV CHARGING	2B.46
R113A(CA)	None	No Parking EXCEPT FOR ELECTRIC VEHICLE CHARGING	2B.46
R114(CA)	None	__HOUR EV CHARGING - __AM TO __PM	2B.46
R114A(CA)	None	__HOUR ELECTRIC VEHICLE CHARGING - __AM TO __PM	2B.46
G66-21B(CA)	None	Electric Vehicle Charging Station symbol	2I.03
G66-21C(CA)	None	FAST Electric Vehicle Charging Station (header plaque)	2I.03
None	D9-11b	(DELETED) Electric Vehicle Charging	2I.02
None	D9-11bP	(DELETED) ELECTRIC VEHICLE CHARGING (plaque)	2I.02
Figure 3B-108(CA)	None	Electric Vehicle Charging Station Pavement Marking Details (optional for 12” and 6” high word messages)	3B.20

IMPLEMENTATION

In this section, for purposes of clarity, italic text is used to denote text that is being added to the CA MUTCD. All other formatting as defined under the Definitions section of this Policy Directive is still applicable.

The following policies shall be included in the CA MUTCD, as follows:

Section 2B.46 Parking, Standing, and Stopping Signs (R7 and R8 Series)
Electric Vehicle Charging Station Signs
Standard:
84 ***If used, the Electric Vehicle Charging Station Tow-Away (R112(CA)) sign shall be placed immediately adjacent to, and visible from, the charging station stall or space, or at each entrance to an off-street parking facility to inform motorists that their vehicles will be towed away if parked in designated stalls or spaces without being connected for electric charging purposes. The sign shall include the address where the towed vehicle can be reclaimed and the telephone number of the local traffic law enforcement agency. Refer to CVC 22511.***
Option:
85 *Local agencies may, at their discretion, include CVC Section 22511 or local municipal code section, or ordinance number on the Electric Vehicle Charging Station Tow-Away R112(CA) sign.*

IMPLEMENTATION (continued)

Section 2B.46 Parking, Standing, and Stopping Signs (R7 and R8 Series)
Electric Vehicle Charging Station Signs
Standard:

86 ***If used, the No Parking (symbol) EXCEPT FOR EV CHARGING (R113(CA)), or the No Parking (symbol) EXCEPT FOR ELECTRIC VEHICLE CHARGING (R113A(CA) sign shall be placed immediately adjacent to, and visible from, each charging station stall or space.***

87 ***If used, the __HOUR EV CHARGING __AM TO __PM (R114(CA)), or the __HOUR ELECTRIC VEHICLE CHARGING __AM TO __PM (R114A(CA)) sign shall be placed immediately adjacent to, and visible from, each charging station stall or space to identify the allowable time limit where electric vehicles may be connected, depending upon what time limitations for charging apply to each charging station.***

Section 2I.03 Section 2I.03 General Service Signs for Freeways and Expressways
Electric Vehicle Charging Station Signs (G66-21(CA), *G66-21A(CA), G66-21B(CA), G66-21C(CA)*)
Guidance:

34 To avoid misleading the road user, those services that are more than 0.5 mile from the access point on the major route to the service, should have a *Distance with Arrow (G66-21A(CA))* plaque installed below the service sign.

Option: (in Paragraph 41, subpart #13)

13. Where hydrogen (H*YD*) fuel is available, the Hydrogen (G66-22G(CA)) symbol sign and HYDROGEN (G66-22H(CA)) supplemental plaque may be used *within 3 miles of a State highway and be available to the public at least 16 hours a day,* in addition to the other appropriate signs.

Option:

43 The *Electric Vehicle Charging Station (G66-21B(CA) symbol sign, or the* ELECTRIC VEHICLE CHARGING STATION (G66-21(CA)) sign may be used for Electric Vehicle Charging Stations within 3 mile*s* of a State highway and be available to the public at least 16 hours a day.

Standard:

44 **Follow-up signing, if necessary, shall be placed by local agencies before signs are placed on the State highway.**

Option:

45 The Distance with Arrow (G66-21A(CA)) plaque may be used to supplement the G66-21(CA)*, or G66-21B(CA)* sign to provide distance and directional information to the motorist. *It may also be used with other general service signs (See Paragraph 34).*

45a The FAST (G66-21C(CA)) header plaque may be used to supplement the G66-21(CA), or G66-21B(CA) sign to indicate that a Fast Electric Vehicle Charging Station is located off the State highway.

Support:

45b A Fast Electric Vehicle Charging Station is where the rate of battery electric charging is at least 20 kWh in a 30-minute period. Fast charging stations include direct current (DC) fast charging and battery switching.

IMPLEMENTATION (continued)

Section 3B.20 Pavement Word, Symbol, and Arrow Markings
Electric Vehicle Charging Station Markings
Option:
18 *Electric vehicle charging stations in off-street locations may be marked with white EV CHARGING ONLY, or ELECTRIC VEHICLE CHARGING ONLY pavement markings (See details in Figure 3B-108(CA)) to supplement Electric Vehicle Charging Station signs in Section 2B.46 and 2I.03.*

For regulatory sign thumbnail graphics and sign codes added to Figure 2B-24(CA), and new entries to Table 2B-1(CA), see Attachment #1. For pavement markings Figure 3B.108(CA), see attachments #10 and #11.
The proposed changes will require deletion of two existing national MUTCD signs, shown in Figure 2I-1 and in Table 2I-1. Currently there is no existing policy language for these two signs. Figure 2I-1(CA) will be edited to include G66-21B(CA) and G66-21C(CA) thumbnail graphics and new sign codes, and Table 2I-1(CA) will be amended to include the following new entries:

Figure 2I-1. General Service Signs and Plaques

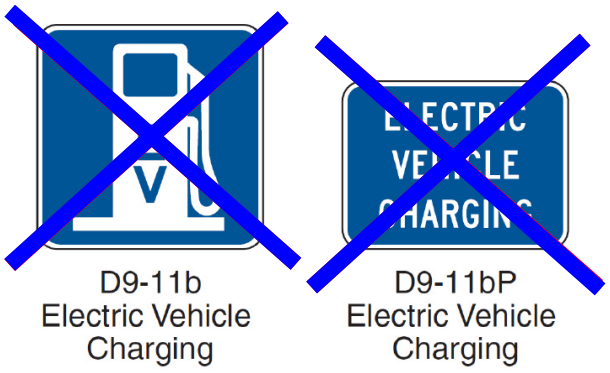


Figure 2I-1 (CA). General Service Signs and Plaques

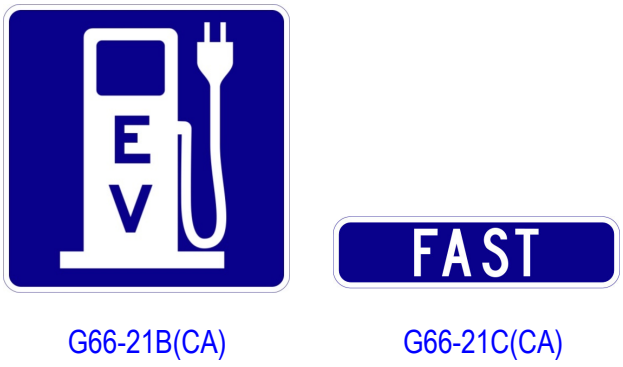


Table 2I-1. General Service Sign and Plaque Sizes (Sheet 1 of 2)

Sign or Plaque	Sign Designation	Section	Conventional Road	Freeway or Expressway
~~Electric Vehicle Charging~~	~~D9-11b~~	~~2I.02~~	~~24 x 24~~	~~30 x 30~~
~~Electric Vehicle Charging (plaque)~~	~~D9-11bP~~	~~2I.02~~	~~24 x 18~~	~~30 x 24~~

Table 2I-1 (CA). California General Service Sign and Plaque Sizes

Sign or Plaque	Sign Designation	Section	Conventional Road	Freeway or Expressway
Electric Vehicle Charging Station	G66-21B(CA)	2I.03	24 x 24	30 x 30
FAST (header plaque)	G66-21C(CA)	2I.03	24 x 6	30 x 8

DELEGATION

No new delegations of authority are created under this policy.

BACKGROUND

The revision of existing signs and inclusion of new signs and markings in the CA MUTCD is a common practice based upon need. Caltrans, pursuant to CVC Section 21400; must conduct public hearings before it can revise existing policies for traffic control devices and approve new signs for use on public roadways. The California Traffic Control Devices Committee (CTCDC) is the forum used to satisfy this requirement.

Governor Brown's Executive Order B-16-2012, dated March 23, 2012, found on the Web address, at <http://gov.ca.gov/news.php?id=17463>, per Governor Brown's Executive Order, Caltrans and Sonoma County, consulted with representatives of the public and California cities and counties to establish new sign and pavement marking policy standards, guidance, options, and support for Caltrans to include in the CA MUTCD 2012 edition.

Agenda Item 12-23, Zero Emission Vehicle Signs and Pavement Markings, was presented as an action item to the CTCDC on December 6, 2012 in Santa Cruz, California. Per discussion at the public hearing, the CTCDC recommended adoption of the electric vehicle signs as proposed in the agenda, with minor suggestions. First, make the use of these signs as optional, which means it is up to local agencies whether they want to install signs or not. The sign specification for the Tow-Away sign will list CVC 22511 or local ordinance on the sign. Second, spell out "ELECTRIC VEHICLE" so agencies have the option to use the "Acceptable Abbreviation" EV (per CA MUTCD, Table 1A-1) or ELECTRIC VEHICLE on both regulatory signs and optional pavement markings. The adopted new policy language provides both the abbreviated and spelled-out language on signs and pavement markings.

DEFINITIONS

When used in this Traffic Operations Policy Directive, the text shall be defined as follows:

1) **Standard** – a statement of required, mandatory or specifically prohibited practice. All standards text appears in **bold** type. The verb **shall** is typically used. Standards are sometimes modified by Options.

2) Guidance – a statement of recommended, but not mandatory, practice in typical situations, with deviations allowed if engineering judgment or engineering study indicates the deviation to be appropriate. All Guidance statements text appears in underline type. The verb should is typically used. Guidance statements are sometime modified by Options.

3) Option – a statement of practice that is a permissive condition and carries no requirement or recommendation. Options may contain allowable modifications to a Standard or Guidance. All Option statements text appears in normal type. The verb may is typically used.

4) Support – an informational statement that does not convey any degree of mandate, recommendation, authorization, prohibition, or enforceable condition. Support statements text appears in normal type. The verbs shall, should and may are not used in Support statements.

ATTACHMENTS

Attachment #1: 2012 CA MUTCD edits to include regulatory sign thumbnail graphics, sign codes & sizes:

Figure 2B-24(CA). Parking and Standing Signs and Plaques (R7 Series)

R112(CA)

R113(CA)

R113A(CA)

R114(CA)

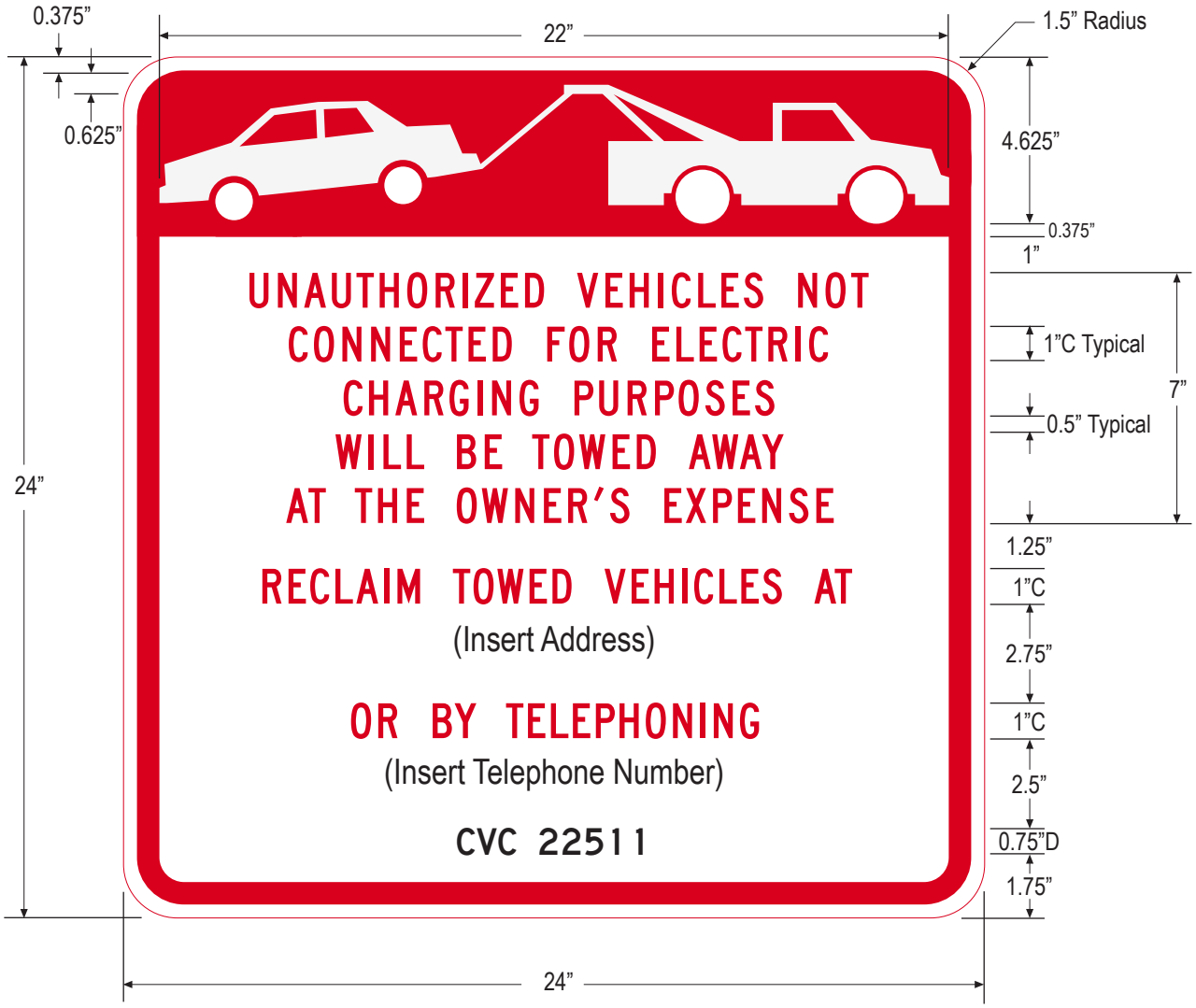
R114A(CA)

Table 2B-1(CA). California Regulatory Sign and Plaque Sizes

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Minimum	Oversized
			Single Lane	Multi-Lane				
Electric Vehicle Charging Station Tow-Away	R112(CA)	2B.46	*	*	-	-	24 x 24	-
No Parking EXCEPT FOR EV CHARGING	R113(CA)	2B.46	*	*	-	-	12 x 18	-
No Parking EXCEPT FOR ELECTRIC VEHICLE CHARGING	R113A(CA)	2B.46	*	*	-	-	12 x 18	-
__HOUR EV CHARGING __AM TO __PM	R114(CA)	2B.46	*	*	-	-	12 x 18	-
__HOUR ELECTRIC VEHICLE CHARGING __AM TO __PM	R114A(CA)	2B.46	*	*	-	-	12 x 21	-

* Note: Electric Vehicle (EV) Charging Station regulatory signs are for off-street EV charging station use, per CVC 22511 and local ordinance.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

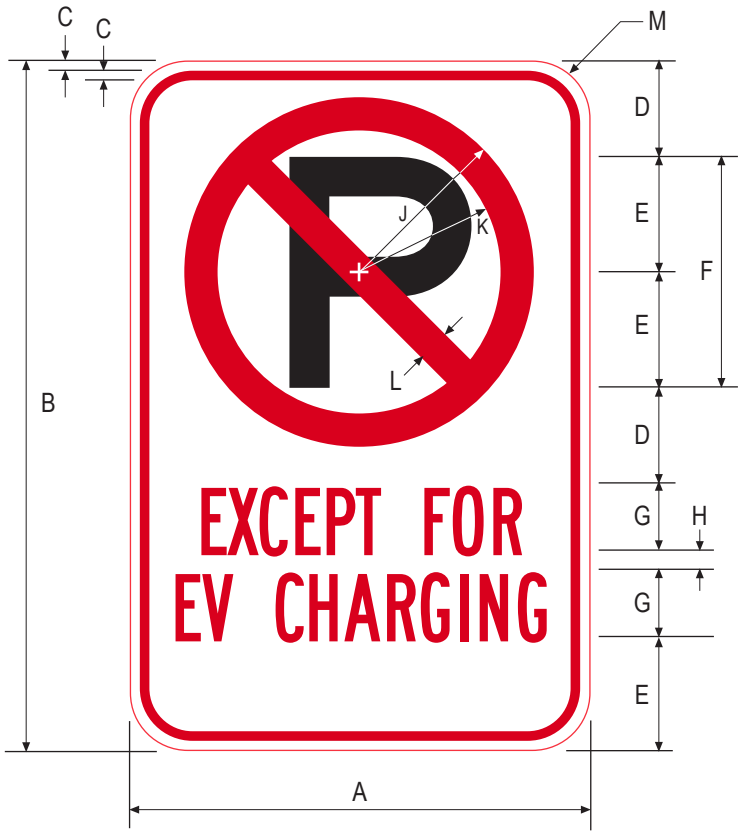


R112 (CA)

NOTES: Specify address, telephone number, and optional CVC/ordinance information when ordering.
Use R107 GRID (CA) for TOW AWAY symbol.

COLORS: BORDER & LEGEND - RED (RETROREFLECTIVE)
BACKGROUND - WHITE (RETROREFLECTIVE)
ADDRESS, TELEPHONE NUMBER, & OPTIONAL CVC/ORDINANCE LEGEND - BLACK

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



R113 (CA)

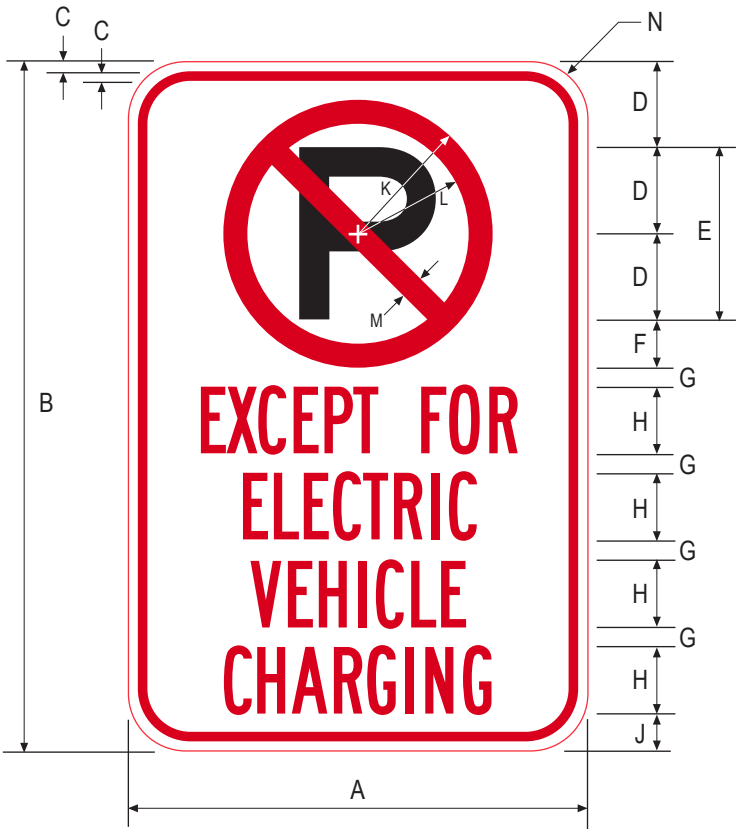
ENGLISH UNITS

A	B	C	D	E	F	G	H	J	K	L	M
12	18	.25	2.5	3	6E	1.75B	.5	4.5	3.625	.875	1.5

COLORS: BORDER, CIRCLE, DIAGONAL & LEGEND - RED (RETROREFLECTIVE)
LETTER - BLACK
BACKGROUND - WHITE (RETROREFLECTIVE)

3/14/13

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



R113A (CA)

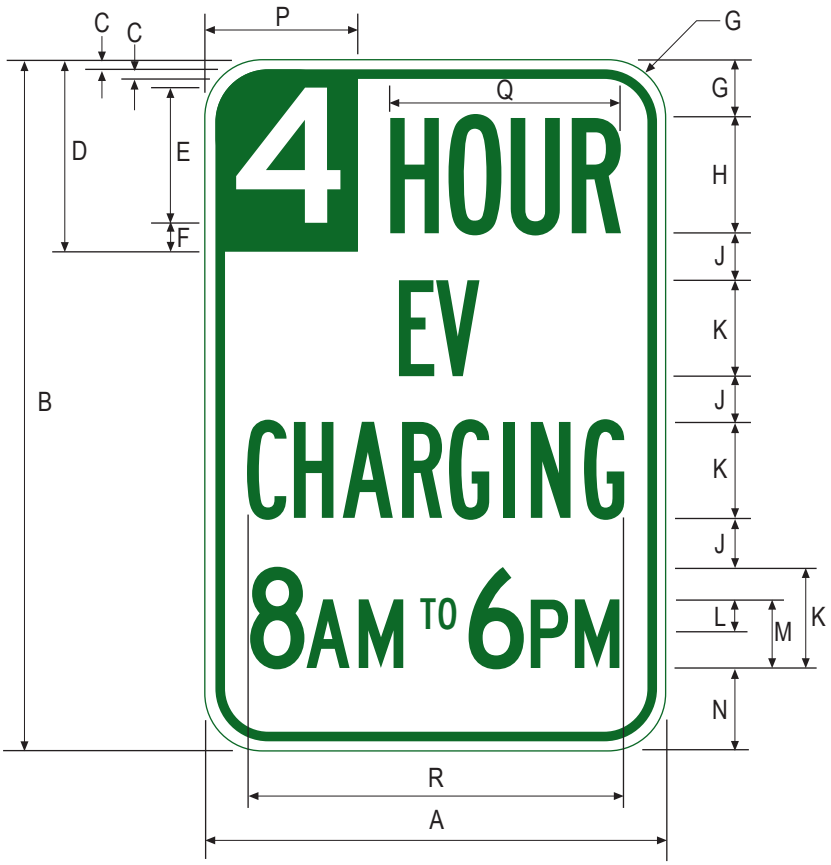
ENGLISH UNITS

A	B	C	D	E	F	G	H	J	K	L	M	N
12	18	.25	2.25	4.5E	1.25	.5	1.75B	1	3.5	2.875	.625	1.5

COLORS: BORDER, CIRCLE, DIAGONAL & LEGEND - RED (RETROREFLECTIVE)
LETTER - BLACK
BACKGROUND - WHITE (RETROREFLECTIVE)

3/14/13

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



NOTE: Specify number of hours and times when ordering.

R114 (CA)

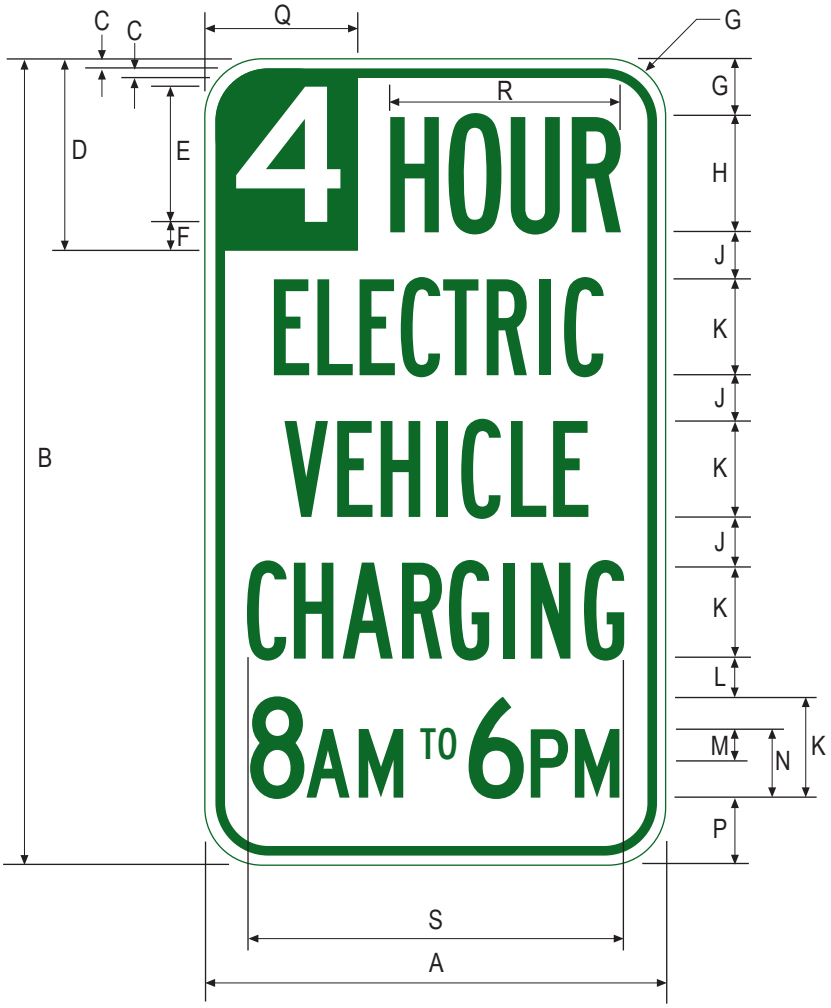
ENGLISH UNITS

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
12	18	.25	5	3.5D	.75	1.5	3B	1.25	2.5C	.75C	1.75C	2.25	4	6	9.75

COLORS: BORDER & LEGEND - GREEN (RETROREFLECTIVE)
BACKGROUND - WHITE (RETROREFLECTIVE)

3/14/13

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



NOTE: Specify number of hours and times when ordering.

R114A (CA)

ENGLISH UNITS

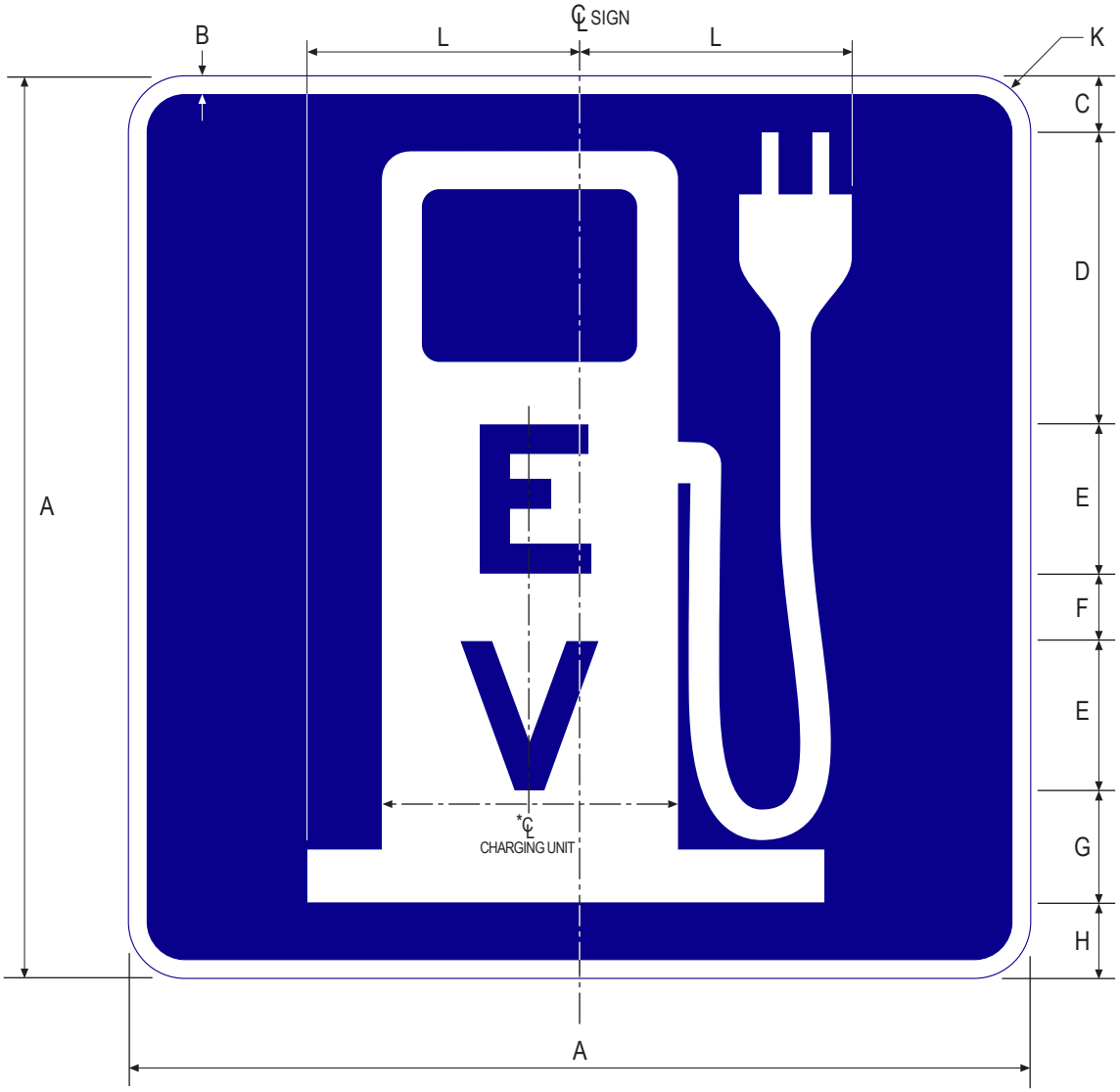
A	B	C	D	E	F	G	H	J	K	L	M	N
12	21	.25	5	3.5D	.75	1.5	3B	1.25	2.5C	1	.75C	1.75C

P	Q	R	S
1.75	4	6	9.75

COLORS: BORDER & LEGEND - GREEN (RETROREFLECTIVE)
BACKGROUND - WHITE (RETROREFLECTIVE)

3/14/13

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



* Optically space the “EV” letters vertically with the charging unit.

G66-21B (CA)

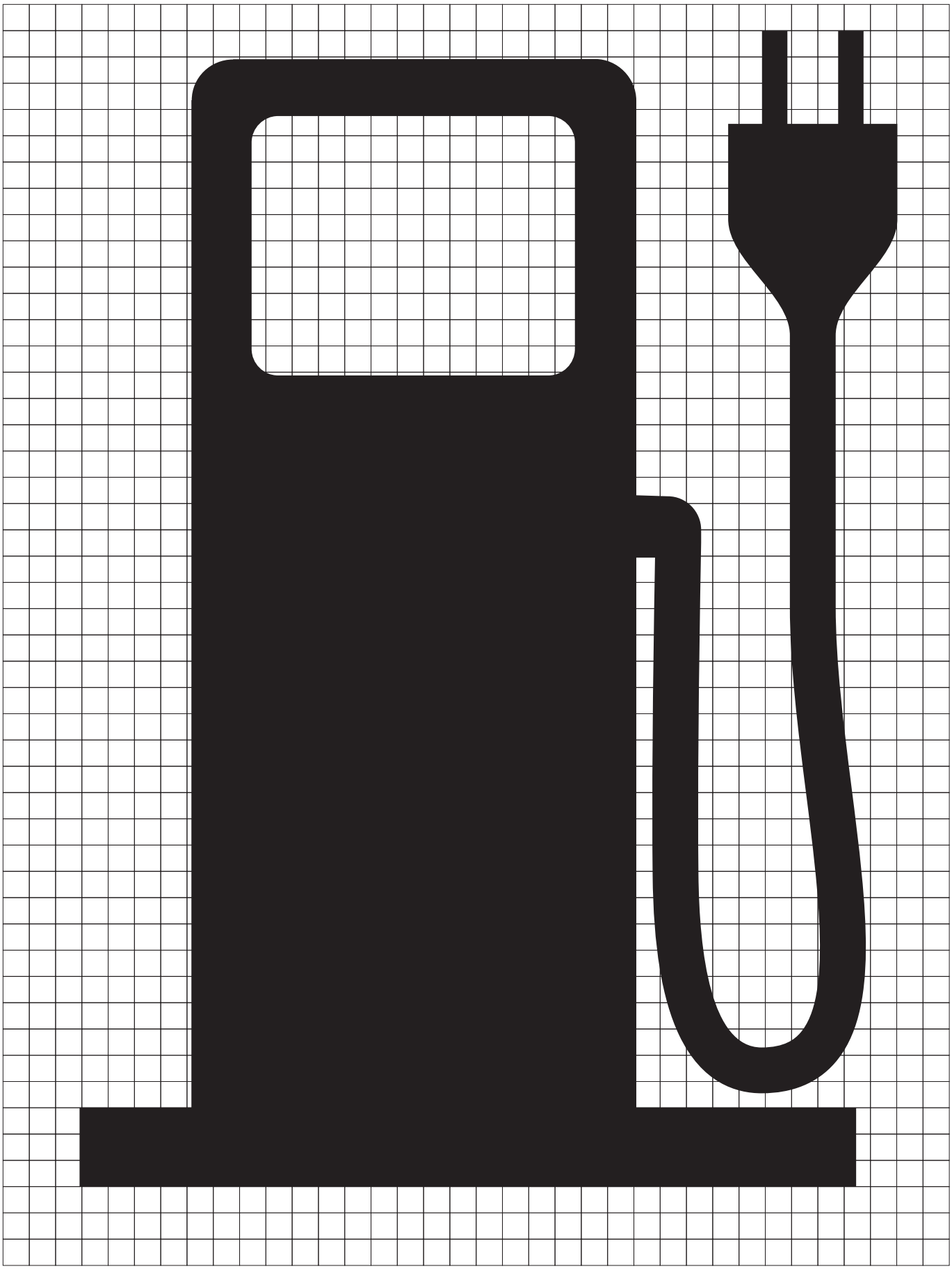
ENGLISH UNITS

A	B	C	D	E	F	G	H	J	K	L
12	.375	.75	3.875	2EM	.875	1.5	1	10.25	1.5	3.625
18	.375	1.125	5.75	3EM	1.375	2.25	1.5	15.375	1.5	5.1625
24	.5	1.5	7.75	4EM	1.75	3	2	20.5	1.5	7.25
30	.75	1.875	9.625	5EM	2	4	2.5	25.625	1.875	9.063

COLORS: BORDER & SYMBOL - WHITE (RETROREFLECTIVE)
LEGEND & BACKGROUND - BLUE (RETROREFLECTIVE)

3/14/13

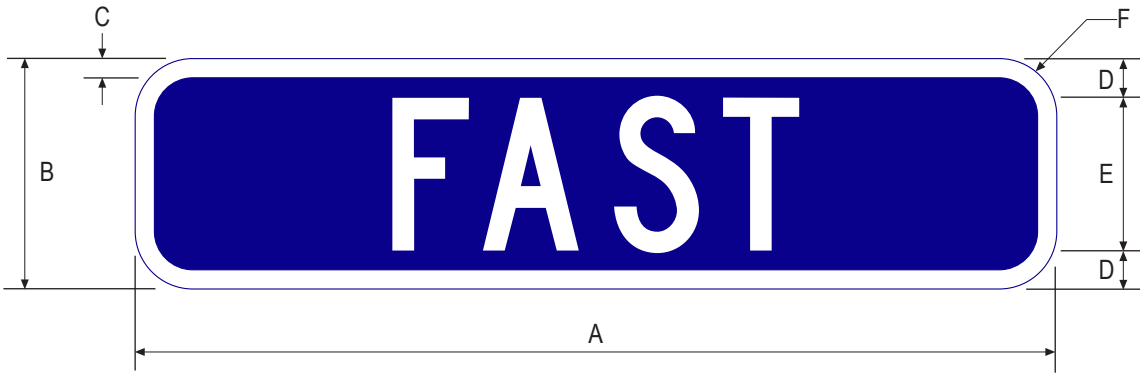
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



G66-12B (CA) Grid

3/14/13

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



G66-21C (CA)

ENGLISH UNITS

A	B	C	D	E	F
12	5	.375	1	3B	1.5
18	5	.375	1	3C	1.5
24	6	.5	1	4C	1.5
30	8	.75	1.5	5D	1.875

COLORS: BORDER & LEGEND - WHITE (RETROREFLECTIVE)
BACKGROUND - BLUE (RETROREFLECTIVE)

3/14/13

Figure 3B-108 (CA). Electric Vehicle Charging Station Pavement Marking Details (Sheet 1 of 2)

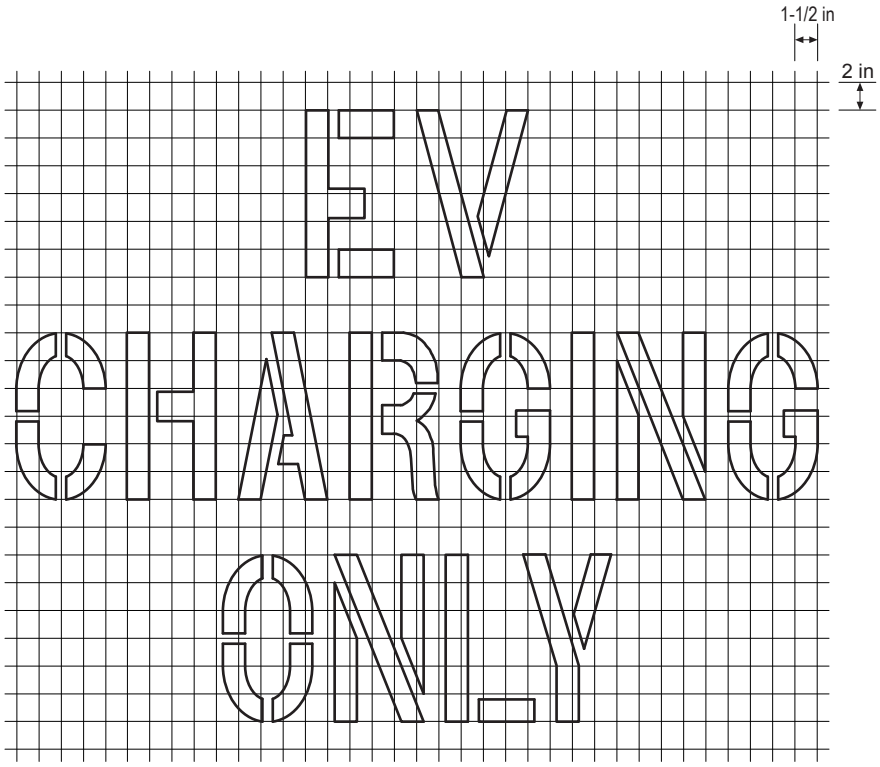
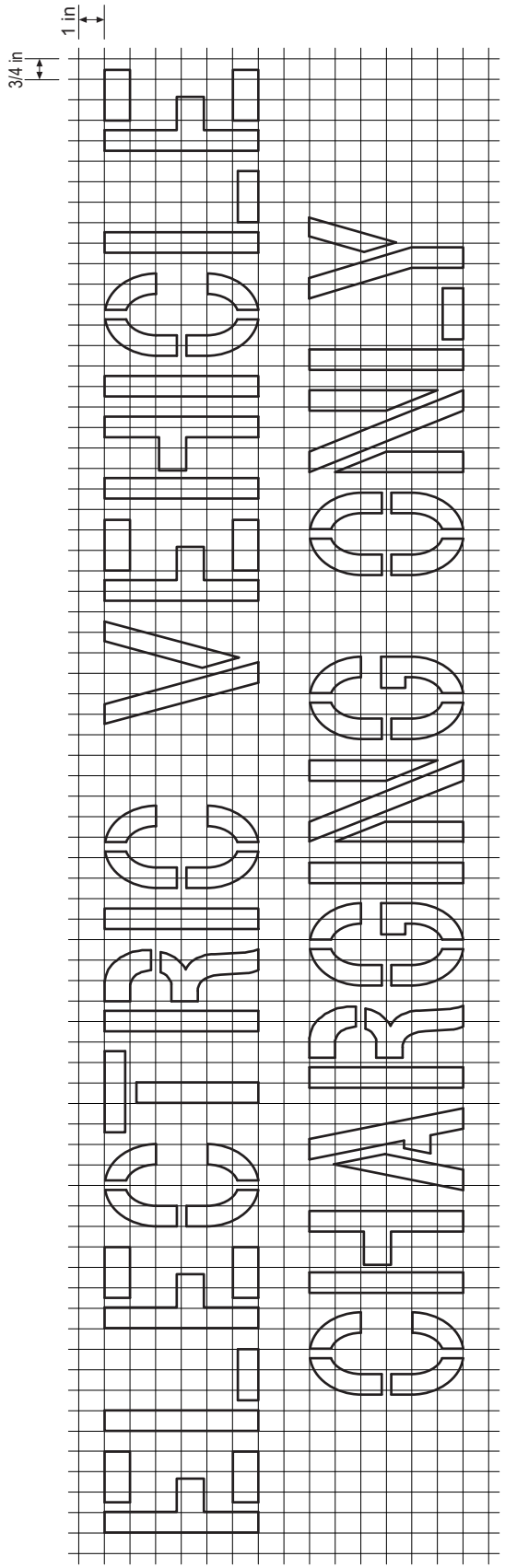


Figure 3B-108 (CA). Electric Vehicle Charging Station Pavement Marking Details (Sheet 2 of 2)



ACCESSIBILITY AND SIGNAGE FOR PLUG-IN ELECTRIC VEHICLE CHARGING INFRASTRUCTURE

Report and Recommendations
May 2012

CALIFORNIA
PLUG-IN ELECTRIC VEHICLE
COLLABORATIVE

This report was developed by the California Plug-In Electric Vehicle Collaborative, a multi-stakeholder partnership working to ensure a strong and enduring transition to a plug-in electric vehicle marketplace. Members played a guiding and consulting role in developing the report, although individual organizations may not formally endorse every recommendation.

The PEV Collaborative would like to thank Barbara Lee of the Northern Sonoma County Air Pollution Control District as the lead author of this report. The document was developed by volunteers of the Collaborative Working Groups and Collaborative staff. A special thanks to Dave Head of Sonoma County and Jim Helmer of LightMoves for their contributions.

California Plug-In Electric Vehicle Collaborative

James Boyd, *2012 Chairman*
California Plug-In Electric Vehicle Collaborative

Diane Wittenberg, *Executive Director*
California Plug-In Electric Vehicle Collaborative

Adrienne Alvord
Union of Concerned Scientists

Robert Babik
General Motors

Forrest Beanum
CODA Automotive

Janice Berman
Pacific Gas and Electric Company

John Boesel
CALSTART

Dan Bowermaster
Electric Power Research Institute

Elisabeth Brinton
Sacramento Municipal Utility District

Jack Broadbent
Bay Area Air Quality Management District

Dan Davids
Plug In America

Nancy Gioia
Ford Motor Company

Elmer Hardy
Honda Motor Company

Bonnie Holmes - Gen
American Lung Association in California

Roland Hwang
Natural Resources Defense Council

Enid Joffe
Clean Fuel Connection, Inc.

Christine Kehoe
California State Senate

Alex Kim
San Diego Gas and Electric

Doug Kim
Southern California Edison

Andreas Klugescheid
BMW Group Representative Office California

Barbara Lee
Northern Sonoma County Air Pollution Control District

Alan Lloyd
International Council on Clean Transportation

Bonnie Lowenthal
California State Assembly

Richard Lowenthal
Coulomb Technologies

Ron Mahabir
Greenlots

Marvin Moon
Los Angeles Department of Water and Power

Mary Nichols
California Air Resources Board

Diarmuid O'Connell
Tesla Motors, Inc.

Terry O'Day
NRG Energy

Alex Padilla
California State Senate

Colin Read
ECOtality

Clifford Rechtschaffen
Office of Governor Edmund G. Brown Jr.

Michael Peevey
California Public Utilities Commission

Carla Peterman
California Energy Commission

Nancy Skinner
California State Assembly

Tom Turrentine
Institute of Transportation Studies, UC Davis

Eileen Tutt
California Electric Transportation Coalition

Barry Wallerstein
South Coast Air Quality Management District

V. John White
CEERT

Jason Wolf
Better Place

Tracy Woodard
Nissan North America, Inc.

Toshio Yoshidome
Toyota North America

Table of Contents

Executive Summary

The California Plug-In Electric Vehicle (PEV) Collaborative provided recommendations and suggested actions to accomplish the six goals outlined for PEV market success in its 2010 report, *Taking Charge: Establishing California Leadership in the Plug-In Electric Vehicle Marketplace*. Two of these goals relate to vehicle charging infrastructure. The first is to simplify and prioritize home charging installations, and the second is to optimize the placement of non-residential charging infrastructure. To achieve these two goals, the PEV Collaborative suggested several actions that will benefit from early standardization on issues such as charging accessibility, and signage to locate, identify, and restrict the use of charging facilities. To advance these actions, the PEV Collaborative established a Working Group on Infrastructure Coordination to develop recommendations on accessibility and signage for plug-in electric vehicle charging infrastructure.

This report provides a clear delineation of the service provided by charging infrastructure and is intended to ensure that charging is accessible and complies with federal and state requirements. The report also endorses standard signs that comport with federal and state requirements for highway and street signs. The report does not provide any legal advice, however, and should not be construed to do so.

The PEV Collaborative recommends accessibility standards for charging infrastructure installed as part of the new construction of facilities, and also standards for installations at existing facilities. The recommended standards distinguish between charging that is publicly available and charging that is restricted in access (e.g., residential).

The PEV Collaborative also recommends standardized general purpose signs to identify charging stations and direct users to the stations, and regulatory signs to designate the permissible uses of the charging facilities and to prohibit certain uses where necessary. All regulatory signs must be supported by appropriate rules, ordinances, or policies.

To ensure that the intent of the main provisions of these recommendations is clearly understood, this report includes definitions of key terms used. The report includes additional definitions that could be incorporated into some of the supporting rules, ordinances, or policies that property owners or local jurisdictions would need to put in place to implement some of the recommendations.

Purpose of Report and Intended Use

This report has been prepared by members of California Plug-In Electric Vehicle (PEV) Collaborative. The recommendations in this report are intended to encourage and support the efficient and effective introduction of PEVs. In particular, this report recommends a consistent set of definitions of terms and infrastructure installation guidelines for accessibility and signage with the intent that these aspects of infrastructure installation will become more standardized and consistent across jurisdictions, making it more efficient and cost effective.

In preparing these recommendations, the PEV Collaborative considered the important work underway by several groups that have emerged into leadership roles in the early installation of PEV infrastructure. Among the efforts reviewed and incorporated are: the *County of Sonoma Electric Vehicle Charging Station Program and Installation Guidelines*,[1] and *Ready, Set, Charge, California! A Guide to EV-Ready Communities*[2] by the Bay Area Climate Collaborative. The PEV Collaborative members also consulted with subject matter experts, PEV users, fleet managers, architects, accessibility specialists, and labor organizations.

This report includes recommendations that can help standardize and streamline the installation of charging infrastructure for PEVs. These recommendations are not regulatory. The report does not provide legal advice, nor should it be construed to do so. It is also not intended to endorse any particular product.

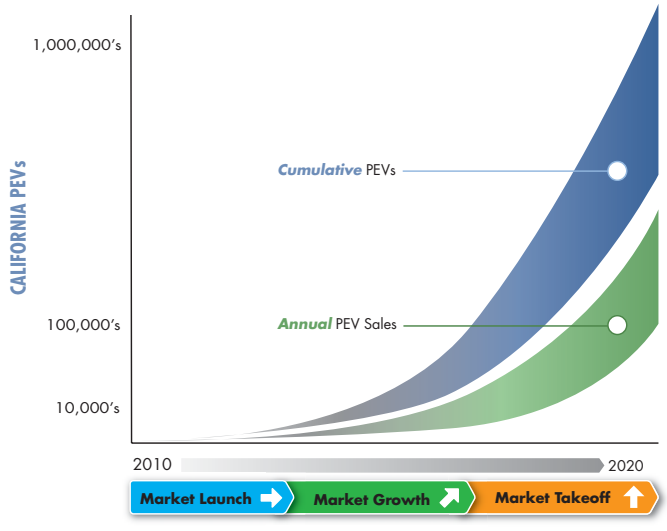
Background

To understand the importance and necessity of providing accessible PEV charging infrastructure and standardized signage to achieve PEV market success, it is valuable to examine the projected growth of the PEV market and supporting infrastructure in California, and the current state of accessible charging stations and signage. This section discusses the projected expansion of the PEV fleet and users, provides an overview of PEV infrastructure expansion, describes the concept of accessible charging, and provides information about the standardization of signage for charging stations.

Discussion of Projected PEV Fleet and Users

Currently, the California market accounts for 11% of annual new car sales nationally, at more than 1.1 million cars per year. By 2020, annual California car sales are expected to grow to 1.7 million. California also has a strong track record for early adoption of green vehicle technology, accounting for more than 20% of new hybrid electric vehicles sold in the

Figure 1: A vision for sustained market expansion in California



Source: California Plug-In Electric Vehicle Collaborative, *Taking Charge: Establishing California Leadership in the Plug-In Electric Vehicle Marketplace* (2010).

United States.[3] A number of firms and organizations have prepared analyses of the future California market for electric vehicles.

Estimates of market penetration in 2020 range from roughly 2% to almost 14%.[4] The California Air Resources Board estimates electric vehicles will make up approximately 5% of new vehicle sales in California by 2020.[5] As Figure 1 shows, if these projections for 2020 are borne out, annual sales of PEVs will be in the hundreds of thousands, and there may be more than a million PEVs on the road in California. The large majority of PEVs currently available and planned for introduction are passenger cars, with a small number of light duty trucks.

Overview of PEV Infrastructure Expansion

All of these PEVs will need opportunities to charge their batteries. In the late 1990s, about 1,300 public charging stations were installed throughout California in anticipation of the first wave of PEVs. Many of these stations have been or will be upgraded for compatibility with the new PEVs by the California Energy Commission, using funds from AB 118 under the Alternative and Renewable Fuel & Vehicle Technology Program. New public and residential charging also is being funded through AB 118 and grants from the U.S. Department of Energy (DOE), with a target of at least 4,000 combined charging points.[6] In addition, separate DOE grants will support the installation of between 500 and 700 charging stations in the Los Angeles and San Francisco Bay areas, and the Bay Area Air Quality Management District has program funds for 3,000 residential chargers, 2,000 public charging points, and up to 50 connections with fast charging capability.[7] It is important to bear in mind that onboard recharging of batteries is only one method of providing fuel to PEVs. The recommendations in this report address accessibility in the context of onboard battery recharging and not any other refueling method. This focus is in response to an immediate need for guidance and is not intended to endorse or reject any method of providing energy for PEV users.

Accessible Charging

The members of the PEV Collaborative are working toward the introduction of vehicles and infrastructure to enable PEVs to be used in the widest possible range of applications by anyone who wishes to use them. To that end, vehicles and infrastructure must be accessible to all users.

Unfortunately, because PEV use has been very limited until now, there is no broadly established public charging infrastructure. The focus, therefore, is to deploy an appropriate level of infrastructure to effectively meet the needs of new PEV owners. However, there also is no single, comprehensive guidance on what is needed to ensure that charging infrastructure is accessible to all users. This report attempts to fill that gap with guidance that includes standardized criteria for the placement of charging equipment. In preparing these recommendations, the PEV Collaborative relied on existing standards for

accessibility under the Americans with Disabilities Act (ADA)[8], and the California Building Code (CBC), Title 24[9]. These standards address, among other things, the accessibility of fueling infrastructure, card readers, and parking. The recommendations in this report bring together the applicable federal and state standards into a comprehensive resource, and provide additional clarity where needed specific to PEV charging.

In order to achieve the goal of providing accessible charging, the most important concept to keep in mind is that a PEV charging station provides a charging service, rather than parking. While some PEV charging facilities also may provide parking, *parking* and *charging* are two distinct services – in much the same way that *parking* and *fueling* are two distinct services. In fact, the CBC provides separate standards for accessible parking and accessible fueling; the current standard for accessible fueling stations specifically includes electricity as a fuel.[10] The accessible charging standards recommended in this report address accessibility of the charging infrastructure itself. When parking is specifically identified (for example with signage) as being part of the service provided, accessible parking standards also will need to be applied, in addition to the accessible charging standards. There are extensive standards, both federal and state, for accessibility of parking facilities.

Finally, it is important to recognize that individual organizations, whether public or private, may have their own internal policies regarding how they ensure that their services are accessible and meet federal and state accessibility standards. For example, the State of California has its own internal policy for the state's Department of General Services regarding accessibility of its PEV fleet and charging facilities.[11] Such policies may address aspects of access or related issues that are specific to an individual organization in addition to the broader elements that the members of the PEV Collaborative considered. The recommendations in this report do not constitute legal advice, and are not intended to alter or supplant any standards or policies that an organization already may have in place.

Identifying, Locating, and Designating Charging Stations

Users of PEVs naturally will want to know where they can charge their vehicles. While maps (including interactive, online maps) are an important tool to locate charging stations, it is also important to clearly identify the stations themselves, and to provide signs that direct users to the stations. In addition, signs are needed to delineate how the charging stations are to be used (e.g., may they be used by any vehicle or only PEVs, must the PEV be actively charging, how long may the spot remain occupied).

Signs that are posted on public streets or highways must meet certain requirements. This is especially true of signs that guide, warn, or regulate traffic. These types of signs are considered "traffic control devices" and are governed by the Code of Federal Regulations (CFR), in the Manual on Uniform Traffic Control Devices (MUTCD).[12]

The MUTCD establishes the colors for signs (the background as well as the border, and any letters, arrows, or other symbols) based on the intended function of the sign. This is why, for example, all stop signs are red with a white border and white letters. It also establishes standards for size, shape, and placement of signs to ensure they are visible, legible, and enforceable. The standards vary to ensure that motorists can read them whether they are on a high-speed freeway or on a slower surface street.

Each state may request approval from the Federal Highway Administration (FHWA) for alternative signs through what is called the "experimentation process," and each state may publish its own manual that specifies the signs used on roads of public travel in that state. In California, the CA MUTCD specifies standards for all traffic control signs, including any alternative signs approved by FHWA.[13]

States also have the option of requesting federal approval to use an alternative sign that FHWA already has approved for another state. Because the initial approval process is somewhat time consuming, this is a good option to expedite or streamline the introduction of a new sign, as well as to make signs more consistent and easier for motorists to recognize.

This report identifies the signs approved in the CA MUTCD related to PEV charging, and recommends additional signs (based on existing signs and guidelines) that will be needed to establish complete and enforceable standards of use for PEV charging stations. To the extent possible, where other jurisdictions have developed appropriate EV-related signs through their experimentation process with FHWA, this report recommends those signs be used uniformly in California.

Recommended Guidelines

The PEV Collaborative reviewed draft recommendations from ongoing efforts in local communities and regions within California to identify criteria for accessible charging infrastructure. Key efforts reviewed include the *County of Sonoma Electric Vehicle Charging Station Program and Installation Guidelines* and the Bay Area Climate Collaborative's *Ready, Set, Charge, California! A Guide to EV-Ready Communities*. Other materials considered include work done by the States of Oregon and Washington to standardize their own PEV infrastructure installations. The following recommended guidelines are consistent with, and in certain instances are based on, the standards recommended or adopted through these efforts. These guidelines are intended to ensure that PEV infrastructure is accessible to all users, and that signs used to identify, locate, and/or designate PEV charging sites are clear and easy to understand and meet all applicable federal and state standards.

The following recommended guidelines distinguish between PEV *parking* and PEV *charging*. PEV parking is a parking spot preferentially provided for users of PEVs. A PEV parking spot provides the location to park the vehicle and does not necessarily include charging. A PEV charging site provides the location where electric vehicle supply equipment (EVSE) is available for the purpose of charging the PEV. Because the services provided are different, the accessibility criteria for the spot will be different depending on whether the spot is for parking or charging. In order to distinguish between these PEV service sites, the site must be properly identified with clear and enforceable signs.

PEV parking and charging may be co-located in a single spot. If the spot provides both services, it must meet the minimum accessibility criteria for *both* parking and charging. There may be conflicts between the requirements, however. For example, accessible parking is required to be located on the shortest accessible route of travel to an accessible entrance to the building(s) served by the parking. However, at some sites the charging equipment, especially the cord when the equipment is in use, may impede the accessible route of travel to the building. In these circumstances the two services should not be co-located. If the EVSE, or the use of the EVSE, will interfere with the accessible parking, the EVSE should be installed in a separate space.

Accessible Electric Vehicle Parking

For the purposes of providing full and equal access, PEV parking should meet the same accessibility requirements as parking for other vehicles. The requirements for accessible parking are specified in the Americans with Disabilities Act (ADA) Accessibility Guidelines, by the California Building Code (CBC), and by local ordinance. The California Department of General Services (DGS) posted new requirements for accessible parking on May 2, 2011, including van-accessible parking ratios.[14] Requirements typically address minimum ratios of accessible-to-standard parking, issues of location (including an accessible route of travel to accessible building entrances and exits), the dimensions and allowable percent grade of accessible spaces, signage, vertical clearance, and passenger loading zones.

Newly constructed parking facilities, and existing parking facilities that undergo alteration, must meet requirements for accessibility unless otherwise exempted. There are no additional accessibility requirements that specifically address the designation of parking for PEV purposes.

Accessible Electric Vehicle Charging

As stated previously, the service provided by a PEV charging facility is the charging of the vehicle battery. Accessibility considerations address the use of the EVSE charging device, as well as an accessible route of travel from the vehicle to the EVSE. The following recommended standards are derived from the standards for accessible buildings and associated spaces (Section 11B) and accessible card readers at fueling stations (Section 11C) in Title 24 of the CBC.

The recommendations also incorporate enhancements to address electric van accessibility in anticipation of such vehicles being available to the public at some point in the future. The enhancements are based on an internal policy developed by the State Architect in 1997 as “interim guidelines” for facilities under direct control of the California Department of General Services.[15] The policy was never incorporated into the CBC, and explicitly provides that local jurisdictions may use it or they may develop their own “methods of administering current code requirements…or defining acceptable parameters when enforcing the California Building Standards Code.” The recommendations provided here are intended as a coherent interpretation and application of these different standards until such time as the CBC is changed to specifically address PEV charging.

The PEV Collaborative recommends standards for both newly constructed accessible charging, as well as the installation of chargers in existing facilities.

Installation with Construction of New Facilities

The following recommended standards would apply to PEV charging infrastructure that is installed at the time a new facility is constructed.

1. **Accessible Public Charging (New Construction)**
   Unless access is restricted, the charging is considered to be available to the public at large, even if there is a charge for the service. Examples include charging sites available curbside, in designated areas in parking facilities, or in other areas that may be used by the public. Public access charging may be under either public or private ownership; the key factor is that members of the public can use the service.

   a. **Accessible Curbside Charging (New Construction)** – Charging stations that are installed curbside, allowing access to vehicles adjacent to the flow of street traffic in the public right-of-way, are considered curbside charging. The following standards are recommended for new construction of streets with curbside charging stations. (Refer to Figures 2a and 2b). Charging stations that meet these criteria are considered to be accessible.

      i. **Location of charging station –** The charging station should be installed in the last space on the block (that is, the space immediately prior to the intersection in the direction of vehicle travel).

      ii. **Orientation of vehicle –** The vehicle should approach the charger on a diagonal or, if the street width and speed of traffic allows, perpendicular to the curb.

      iii. **Accessible aisle to EVSE –** An access aisle extending the full length of the charging station, with a minimum width of 3 feet (8 feet preferred), should be provided to the left of the diagonal or perpendicular space, between the charging space and the end of the block.

      iv. **Sidewalk clearance for pedestrian access –** A minimum of 4 feet of unobstructed pedestrian passage must be preserved between the EVSE and the nearest obstruction (building wall, fence, planter, vegetation, etc.).

      v. **Charger clearance –** The EVSE must be located a minimum of 24 inches clear from the face of the curb.

vi. **Charger protection –** The EVSE must be protected by guard posts (bollards), or an equivalent protection mechanism, when the vehicle will approach the equipment either on a diagonal or perpendicular to the curb.

vii. **Cord management –** Equipment with a retractable cord is preferred.

viii. **Lighting and signs –** The space should have adequate lighting to operate the EVSE and to minimize hazards. The charging site should be clearly identified with signage that includes any restrictions on use, as well as contact information to report problems with the equipment.

Consistent with implementation of curbside parking, there is no recommended minimum number of "accessible" curbside charging spaces. The ability to provide accessible curbside charging will be highly dependent on the nature of the adjacent roadway use. The decision to include it is to be made on a case-specific basis with primary consideration being the safety of both motorists and users of the charging facility.

Figure 2a - New Construction Curbside

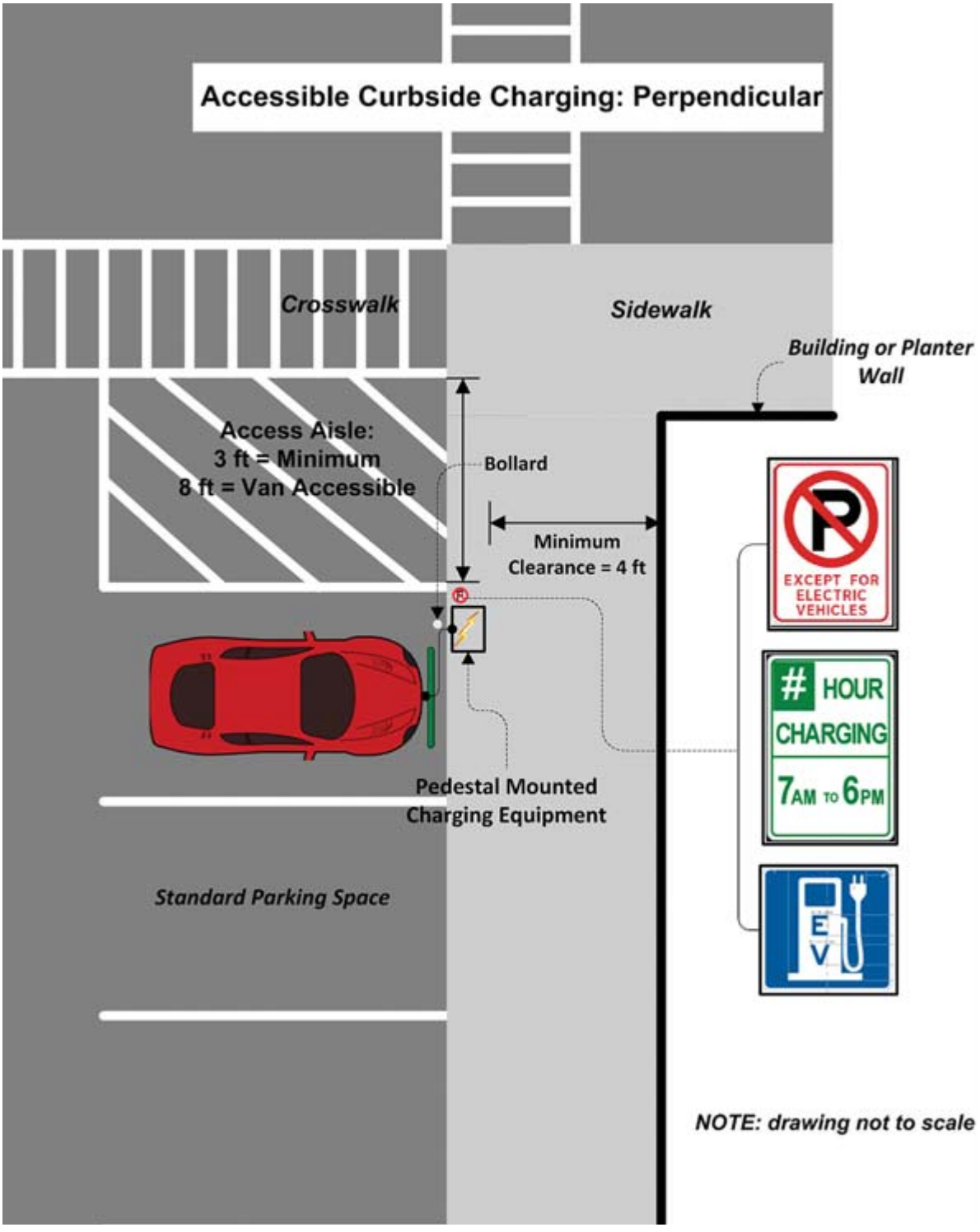
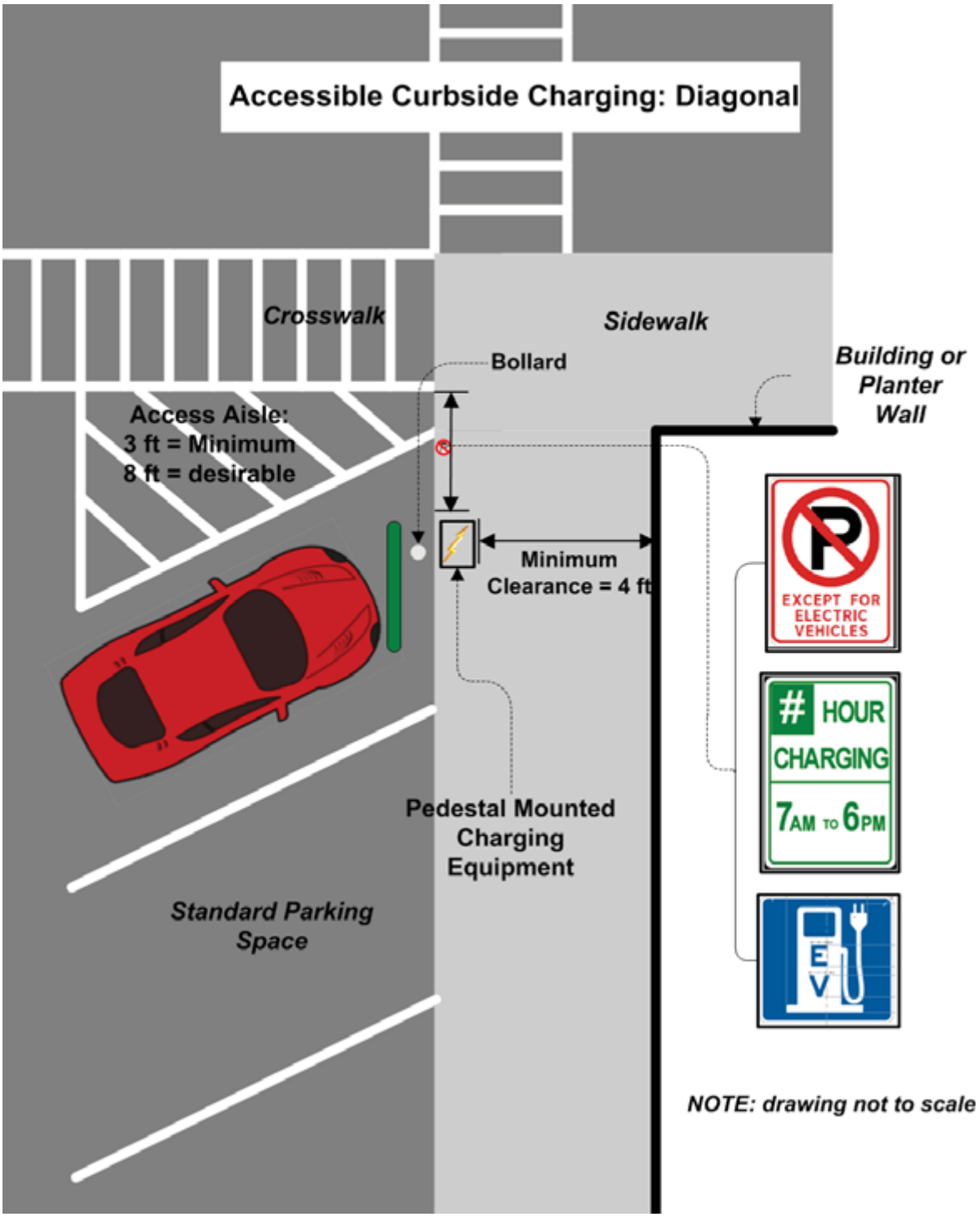


Figure 2b - New Construction Curbside



b. Accessible Offstreet Charging (New Construction)

Charging stations that are located in facilities that are not in the public right-of-way, such as designated fueling or parking facilities, are considered "offstreet charging." The following standards are recommended for new construction of offstreet facilities with charging stations. (Refer to Figures 3a and 3b).

i. **Location of EVSE –** Accessible charging stations should be installed in accordance with the requirements for accessible parking unless, due to inherent constraints of the site, the EVSE or its use will obstruct the accessible route of travel.

ii. **Orientation of vehicle –** The vehicle should approach the charger on a diagonal or perpendicular to the EVSE.

iii. **Accessible aisle to EVSE –** An access aisle, extending the full length of the charging station, with a minimum width of 3 feet should be provided on either side of the charging space, in addition to 9 feet required to accommodate the vehicle. The total width of accessible charging station space should be 12 feet.

iv. **Van-accessible aisle to EVSE –** An access aisle, extending the full length of the charging station, with a minimum width of 8 feet, should be provided on the right of the charging space, in addition to 9 feet required to accommodate the vehicle. The total width of van-accessible charging station space should be 17 feet.

v. **Accessible EVSE area –** The EVSE should be located within 9 inches of the center of a level, accessible area that is at least 30 inches by 48 inches (with the long side parallel to the face of the controls), and with a slope that does not exceed 2% grade in any direction.

vi. **Charger protection –** The EVSE should be protected by guard posts, or an equivalent protection mechanism, on the side from which the vehicle will approach.

vii. **Height of EVSE –** The highest operable part of the EVSE should not be more than 48 inches above the surface of the accessible EVSE Area.

viii. **Cord management –** Equipment with a retractable cord is preferred.

ix. **Lighting and signs –** The space should have adequate lighting to operate the EVSE and to minimize hazards. The charging site should be clearly identified with signage that includes any restrictions on use, as well as contact information to report problems with the equipment.

x. **Minimum number of accessible spaces –** the first of every 25 charging stations should provide accessible charging. The first of every six accessible charging stations should have a van-accessible aisle to the EVSE (see iv below, under Accessible Offstreet Charging (Existing Facilities)). The first two card readers should be accessible.

Figure 3a: New Construction – Offstreet

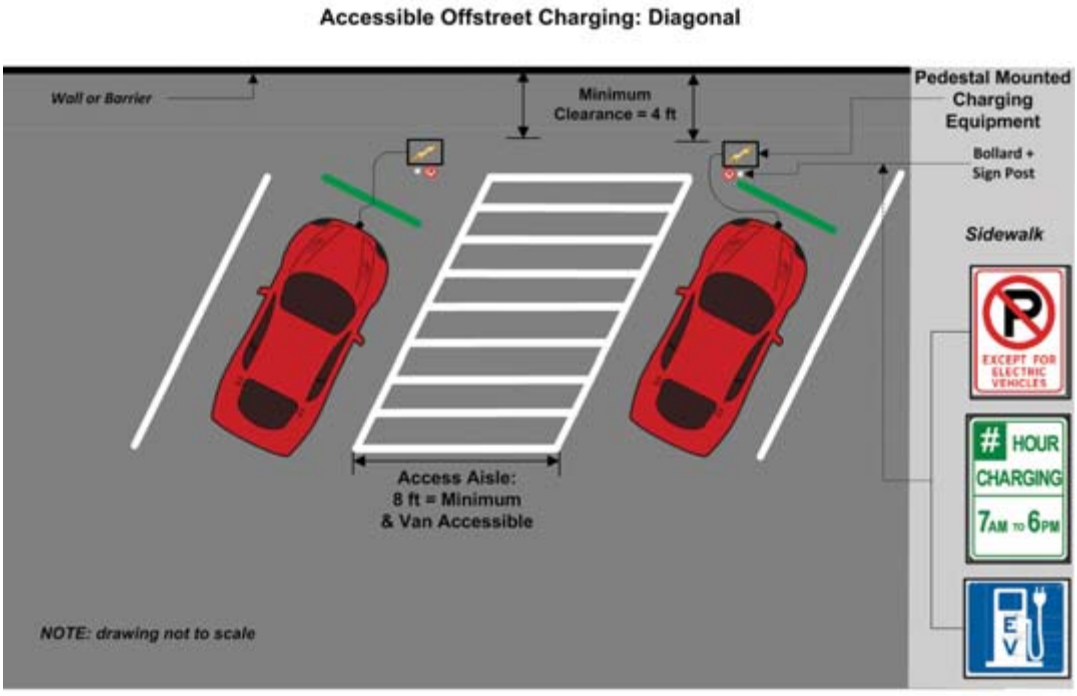
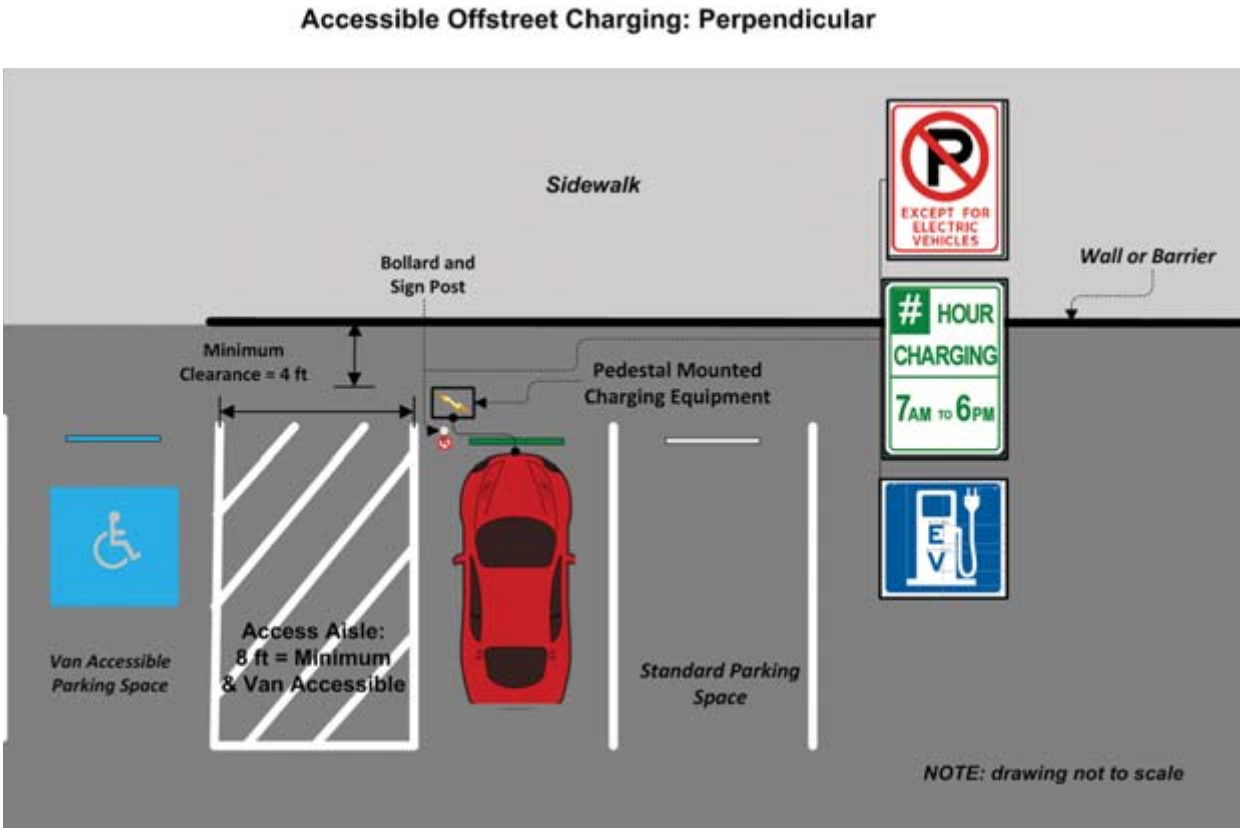


Figure 3b: New Construction – Offstreet



2. **Accessible Restricted Access Charging (New Construction)**
   Charging is considered restricted access if it is posted with appropriate signage to exclude general public access, or to permit access only to specified users. Examples include public or private fleets, reserved parking, or parking associated with a residential dwelling.

   a. **Fleets –** New construction of facilities that will include restricted access charging should conform to the recommended standards for new construction with public access charging wherever possible, unless the nature of the use of the fleet vehicles is such that no vehicle in the fleet will be used by a person requiring disabled access.

   b. **Designated use –** New construction of facilities where charging is by designated use only should conform to the recommended standards for new construction with public access charging wherever possible, unless the designated use is such that the charging station will not be used by a person requiring disabled access.

c. **Residential –** New construction of residential dwellings where PEV charging will be included may be required to provide accessible charging, for example in a multi-unit dwelling, as governed by Section 11A of the CBC. Installation of charging that conforms to the recommended standards for new construction with public access charging will ensure the new residential facilities have accessible charging stations.

Installation at Existing Facilities

1. **Accessible Public Charging (Existing Facilities)**

   Unless access is restricted, charging is considered to be available to the public at large even if there is a charge for the service. Examples include charging sites available curbside, in designated areas in parking facilities, or other areas that may be used by the public. Public access charging may be under either public or private ownership; the key factor is that members of the public can use the service.

   a. **Accessible Curbside Charging (Existing Facilities)**

      Charging stations that are installed curbside, allowing access to vehicles adjacent to the flow of street traffic in the public right-of-way, are considered "curbside charging." The following standards are recommended for installation of curbside charging stations on existing streets. Charging stations that meet these criteria are considered to be accessible. (Refer to Figures 4a, 4b, and 4c).

      i. **Location of charging station –** The charging station should be installed in the last space on the block (that is, the space immediately prior to the intersection in the direction of vehicle travel).

      ii. **Orientation of vehicle –** The approach of the vehicle will be determined by the orientation of the existing curbside parking. Diagonal or perpendicular spaces are preferred if they are available; however, parallel spaces may be used if other orientations are not available.

      iii. **Accessible aisle to EVSE –** An access aisle, extending the length of the space, with a minimum width of 3 feet should be provided to the left of the diagonal or perpendicular space, between the charging space and the end of the block. In a parallel orientation, if space is available, a 3-foot access aisle should be provided at either the front or rear of the space

iv. **Sidewalk clearance for pedestrian access –** A minimum of 4 feet of unobstructed pedestrian passage must be preserved between the EVSE and the nearest obstruction (building wall, fence, planter, vegetation, etc.).

v. **Charger clearance –** The EVSE must be located a minimum of 24 inches clear from the face of the curb.

vi. **Charger protection –** The EVSE must be protected by guard posts (bollards), or an equivalent protection mechanism, when the vehicle will approach the equipment either on a diagonal or perpendicular to the curb. When the vehicle will approach from a parallel position, protection by guard post(s) is advisable but not required.

vii. **Cord management –** Equipment with a retractable cord is preferred.

viii. **Lighting and signs –** The space should have adequate lighting to operate the EVSE and to minimize hazards. The charging site should be clearly identified with signage that includes any restrictions on use, as well as contact information to report problems with the equipment

Figure 4a: Existing Facilities – Curbside

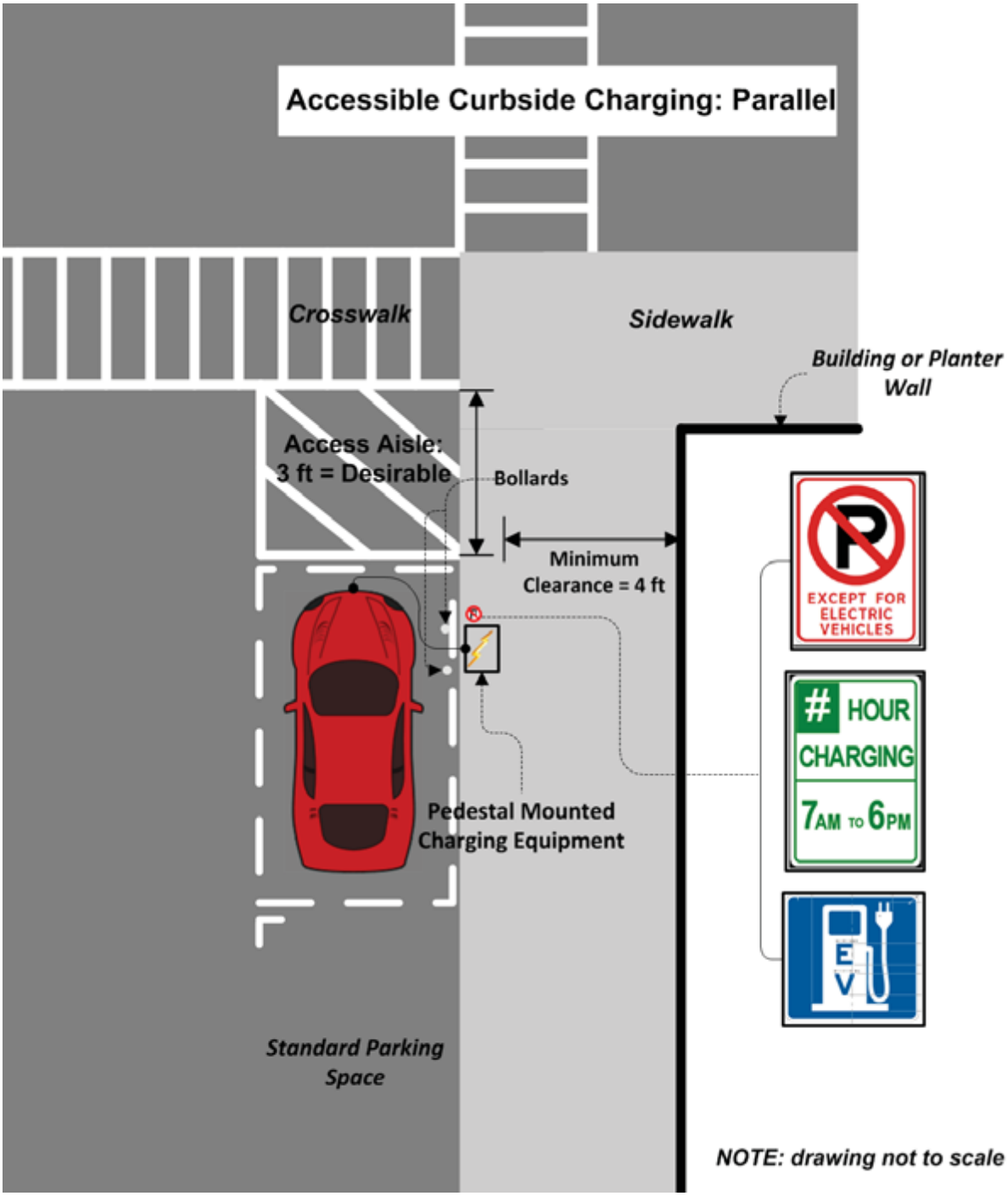


Figure 4b: Existing Facilities – Curbside

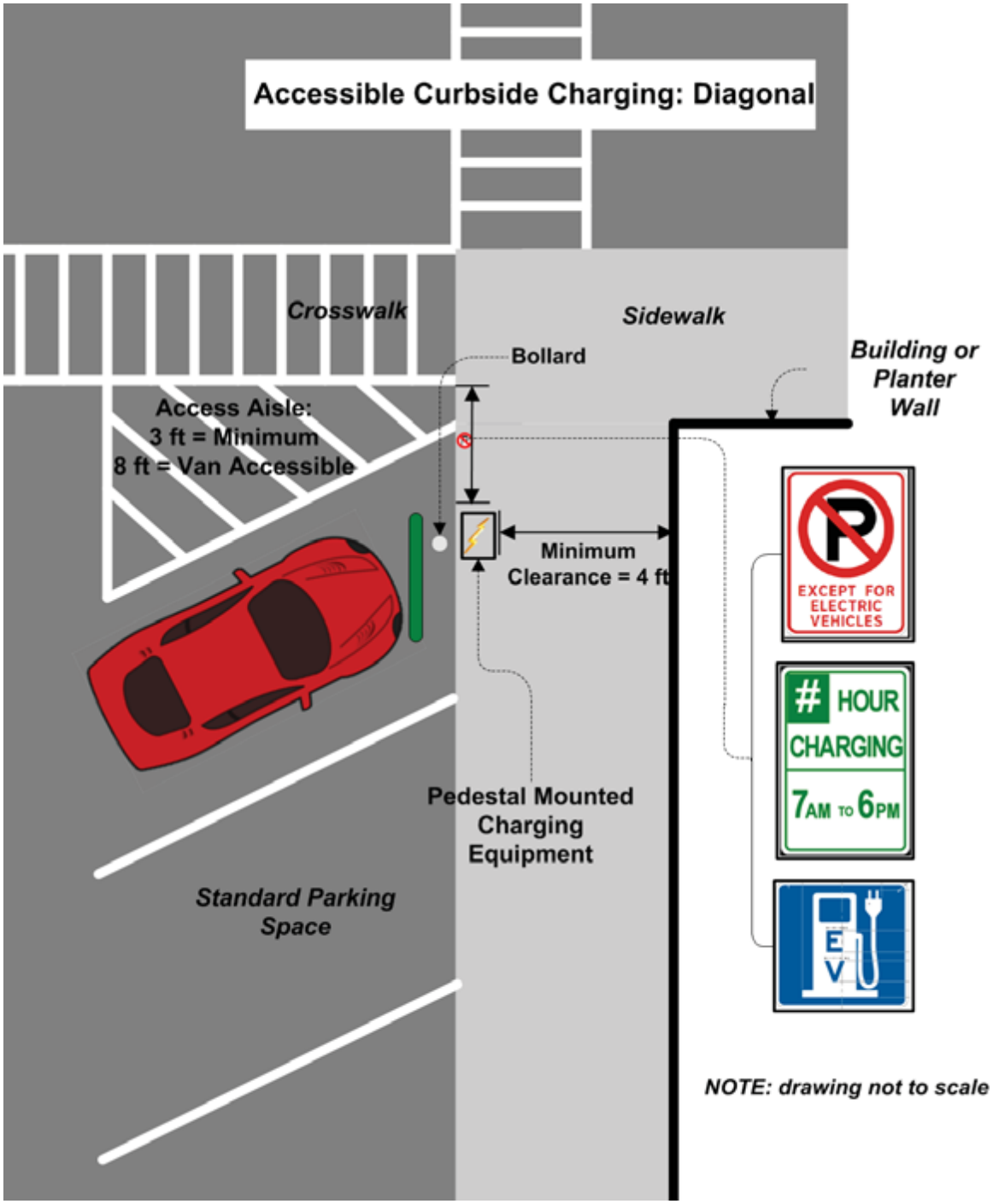
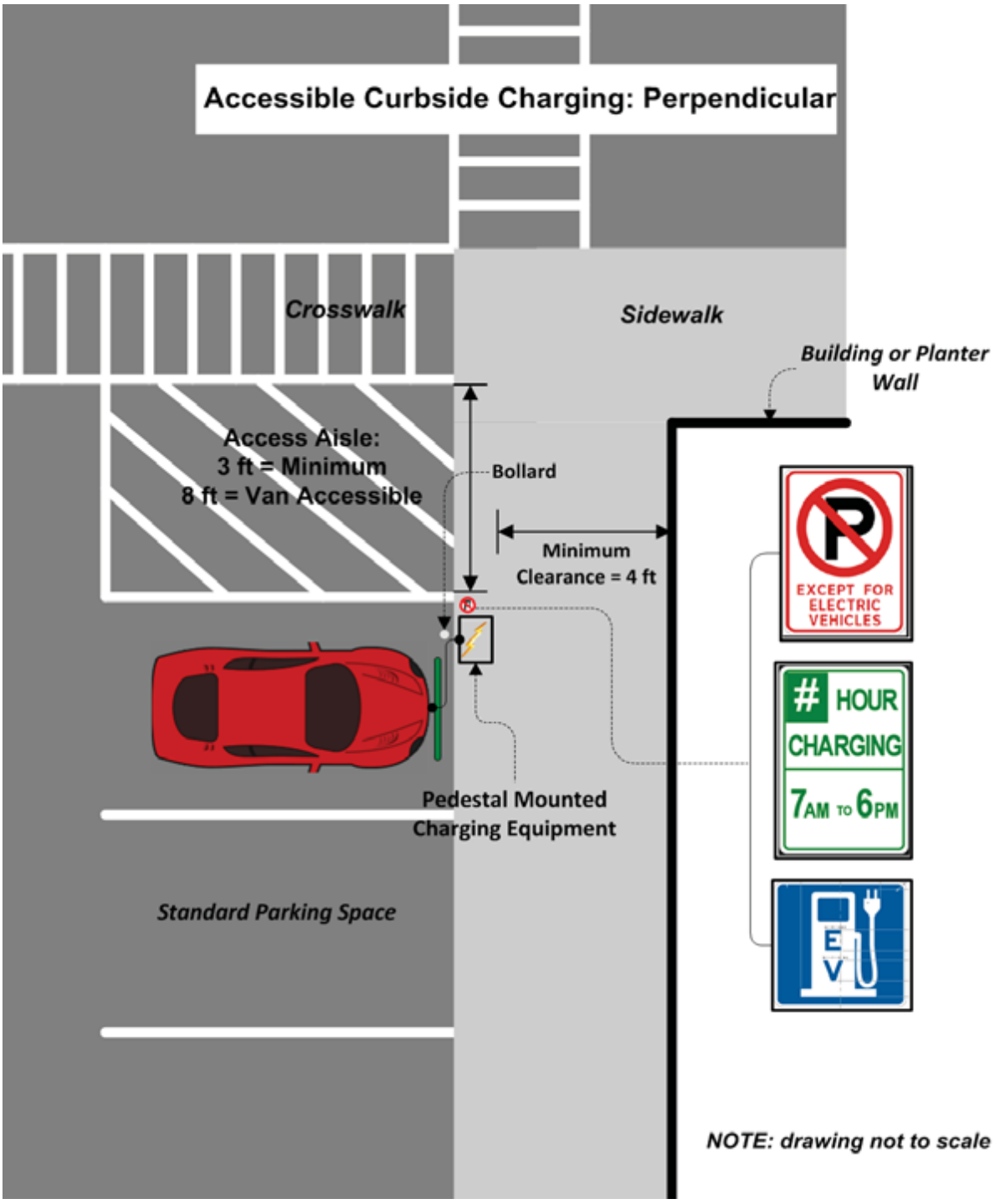


Figure 4c: Existing Facilities – Curbside



b. Accessible Offstreet Charging (Existing Facilities)

Charging stations that are located in facilities that are not in the public right-of-way, such as designated fueling or parking facilities, are considered "offstreet charging." The following standards are recommended for installation of charging stations in existing offstreet facilities. (Refer to Figures 5a, 5b, and 5c).

i. **Location of EVSE –** To the extent feasible, accessible charging stations should be installed in accordance with the requirements for accessible parking. Considerations to determine feasibility include the configuration or slope of the site, the location of the power supply, and the differential cost of incorporating fully accessible parking.

ii. **Orientation of vehicle –** Preferably, the vehicle should approach the charger on a diagonal or perpendicular to the EVSE; however, a parallel configuration may be used, as dictated by the constraints of the site.

iii. **Accessible aisle to EVSE –** An access aisle extending the length of the space from the vehicle to the EVSE, with a minimum width of 3 feet, should be provided on either side of the charging space. The total width of accessible charging station space should be 12 feet. The first of every 25 charging stations should have an accessible aisle to the EVSE.

iv. **Van-accessible aisle to EVSE –** If feasible, an access aisle with a minimum width of 8 feet should be provided on the right of the charging space, in addition to 9 feet required to accommodate the vehicle. The total width of van-accessible charging station space should be 17 feet. If feasible, the first of every six accessible charging stations should have a van-accessible aisle to the EVSE.

v. **Accessible EVSE area –** The EVSE should be located within 9 inches of the center of a level accessible area that is at least 30 inches by 48 inches (with the long side parallel to the face of the controls), and with a slope that does not exceed 2% grade in any direction.

vi. **Charger protection –** The EVSE should be protected by guard posts, or an equivalent protection mechanism, on the side from which the vehicle will approach.

vii. **Height of EVSE –** The highest operable part of the EVSE should not be more than 48 inches above the surface of the accessible EVSE area.

viii. **Cord management –** Equipment with a retractable cord is preferred.

ix. **Lighting and signs –** The space should have adequate lighting to operate the EVSE and to minimize hazards. The charging site should be clearly identified with signage that includes any restrictions on use as well as contact information to report problems with the equipment.

Figure 5a: Existing Facilities – Offstreet

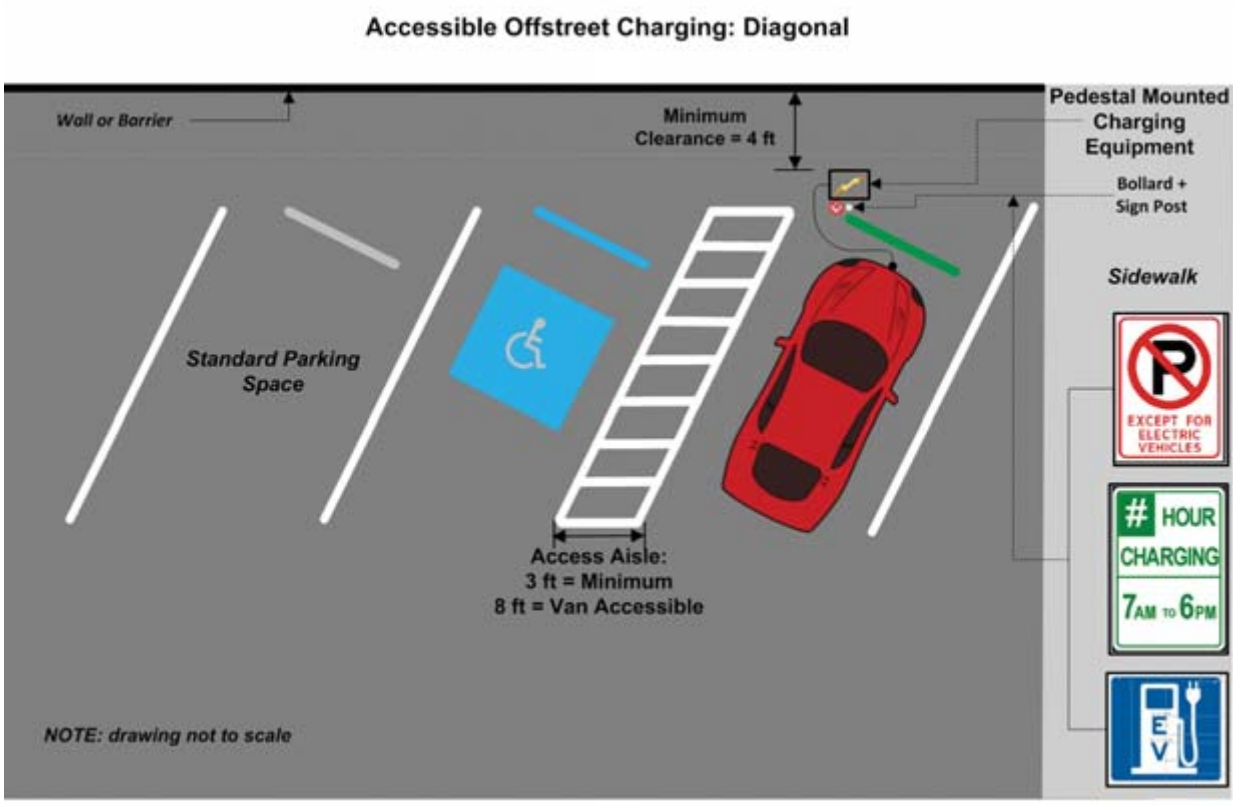


Figure 5b: Existing Facilities – Offstreet

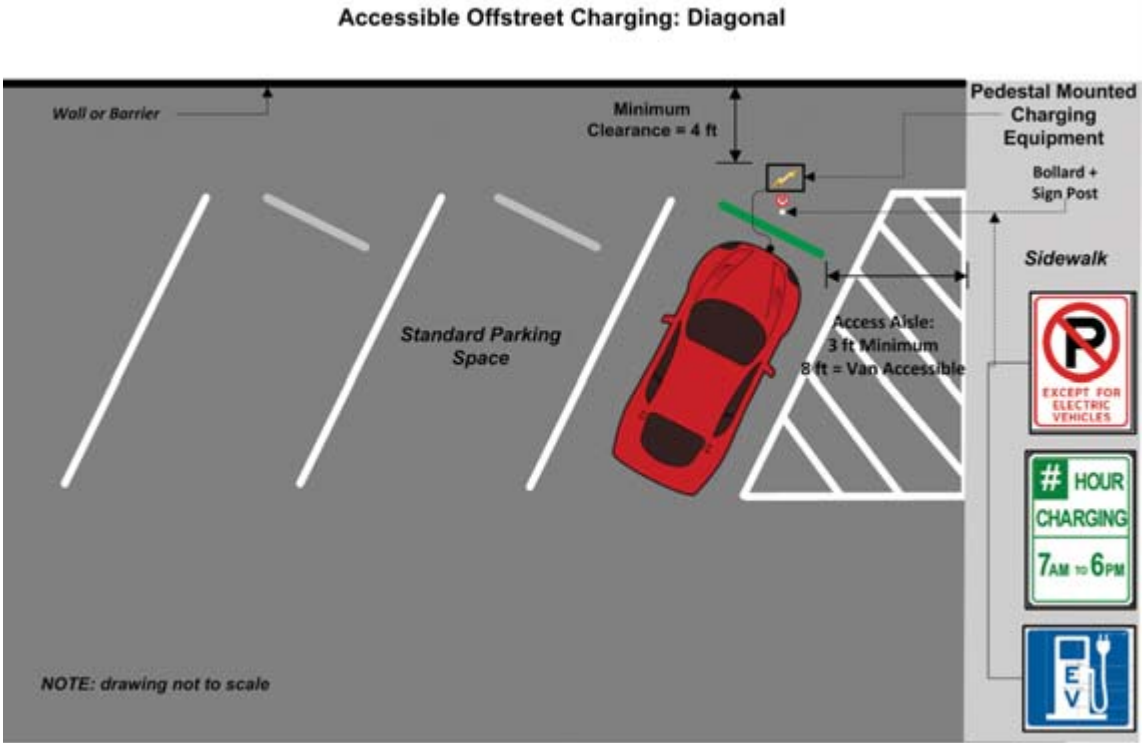
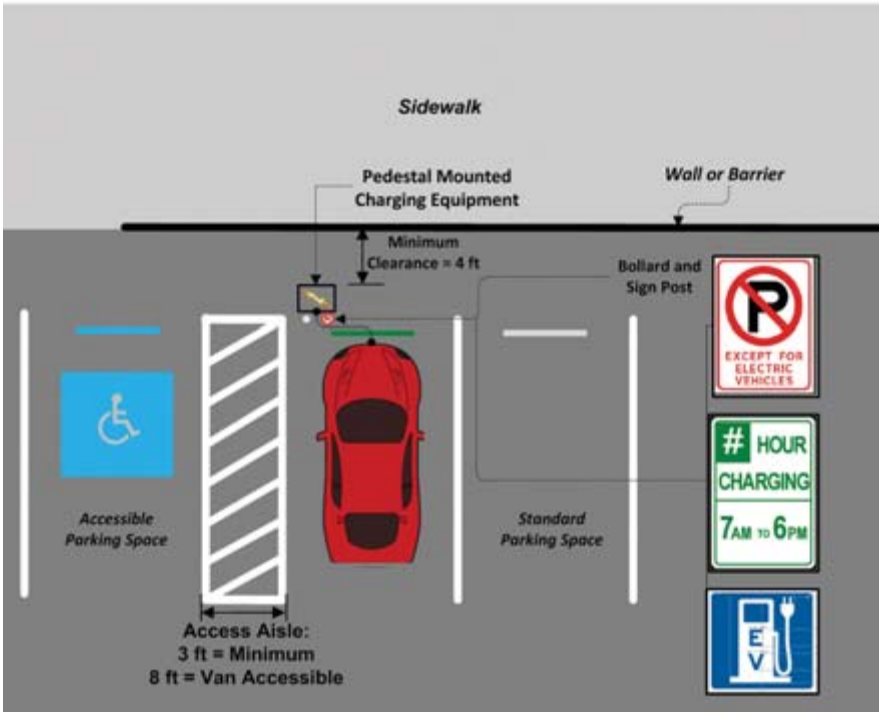


Figure 5c: Existing Facilities – Offstreet



2. **Accessible Restricted Access Charging (Existing Facilities)**
   Charging is considered restricted access if it is posted with appropriate signage to exclude general public access or to permit access only to specified users. Examples include public or private service fleets, reserved parking, or parking associated with a residential dwelling.

   a. **Fleets –** To the extent feasible, installation of restricted access charging in existing facilities should conform to the recommended standards for public access charging in existing facilities, unless the nature of the use of the fleet vehicles is such that no vehicle in the fleet will be used by a person requiring disabled access.

   b. **Designated Use –** To the extent feasible, installation of designated use charging in existing facilities should conform to the recommended standards for public access charging in existing facilities, unless the designated use is such that the charging station will not be used by a person requiring disabled access.

   c. **Residential –** Installation of PEV charging in residential dwellings may require accessible charging (for example in a multi-unit dwelling, as governed by Section 11A of the CBC). Installation of charging that conforms to the recommended standards for existing facilities with public access charging may satisfy such requirements.

Installation of Accessible Card-reading Devices

The recommendations for the installation of accessible card-reading devices are the same for both new construction and existing facilities. Card-reading devices may be installed on a separate pedestal, or co-located with the EVSE. (Refer to Figure 6).

1. **Height of card reader –** The card-reading control function should be no more than 54 inches above the surface of the accessible EVSE area, if co-located with the EVSE. If the card-reading device is installed separately from the EVSE, the card-reading function should be no more than 54 inches above the surface of the accessible card-reading area.

2. **Accessible card-reading area –** The card-reading device must be located within 9 inches of the center of a level accessible area that is at least 30 inches by 48 inches, and with a slope that does not exceed 2% grade in any direction, with the long side parallel to the face of the controls.

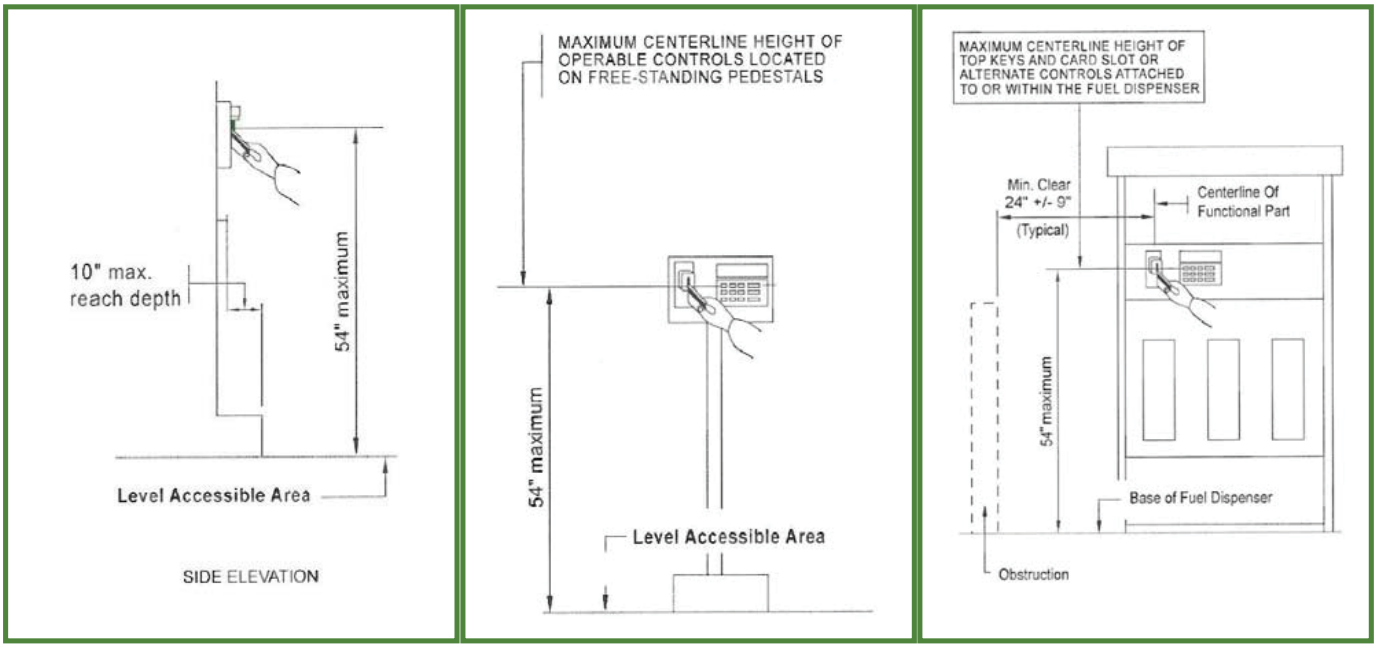
3. **Reach to card-reading device –** The face of the card-reading device should be no more than 10 inches in plain view from the edge of the accessible card-reading area.

4. **Clearance to obstructions –** The centerline of the card-reader should have a minimum clearance of 24 inches, plus or minus 9 inches, to the nearest obstruction, excluding the EVSE and associated cords.

5. **Accessible card-reading access aisle –** If the card-reading device is co-located with the EVSE, the accessible EVSE access aisle also serves the card reader. If the card reader is installed separately from the EVSE, an access aisle with a minimum width of 3 feet from the EVSE to the card-reading device should be installed.

6. **Minimum number of accessible card-reading devices –** The first two card-reading devices at a charging station site should be accessible card-reading devices.

Figure 6: Accessible Card Reading Devices



Electric Vehicle Signage

The PEV Collaborative has identified two types of signs that will be needed to appropriately identify and regulate PEV charging stations: general service signs, and regulatory signs. General service signs include signs that identify the charging station, as well as signs that direct a motorist to a charging station. Regulatory signs permit or restrict the use of the charging station, similar to signs that prohibit or limit time for parking.

The signs recommended here are generally available in federal guidelines, are already approved in the CA MUTCD, or have been developed and submitted for approval by California or another jurisdiction. Where the signs already exist in the CA MUTCD or at the federal level, the identification number of the sign is provided. If a provisional sign is being referenced, the citation is given.

All signs used for traffic control must meet all of the requirements of the CA MUTCD, including requirements for retro-reflectivity and illumination, as well as the sizing, placement, and orientation specified for the situation into which the sign is being installed. These standards ensure that motorists will be able to read the signs. In some instances, these recommendations include size, placement, etc., in the description of the sign standard. The CA MUTCD also provides more specific information if required. Traffic control signs also must "be supported by statute, ordinances, or regulations,"[16] and public agencies must ensure that appropriate underlying definitions and/or requirements are in place prior to placing these recommended signs. Some of these underlying provisions are or will be addressed in the CA MUTCD; others must be adopted at the local level.

Note: The PEV Collaborative submitted a comment letter to Caltrans committing to provide recommendations on signage for inclusion in the revisions to the 2010 CA MUTCD currently underway.[17] Final comments will be provided following the completion of this document.

General Service Signs

All general service signs must have white letters, arrows, symbols and borders on a blue background.[18] Standard sizes also are specified. Currently approved general service signs specifically related to electric vehicle charging are shown in Figure 7.

Figure 7: Approved General Service Signs for Electric Vehicle Charging

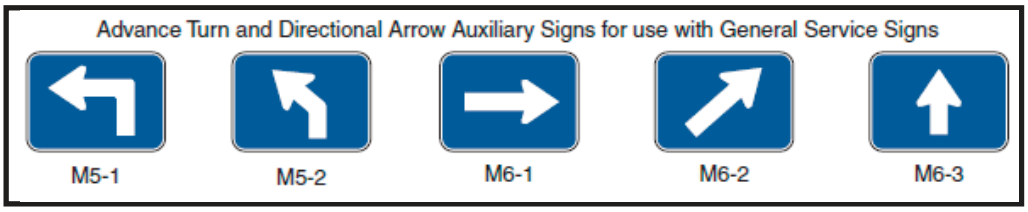
 G66-21 (CA)	 D9-11bP	 D9-11b
Site and Sizing *Charging Station 12" x 12"* *18" x 18"* *Conventional Road 24" x 24"*	Site and Sizing *Freeway 30" x 24"* *Expressway 30" x 24"* *Conventional Road 24" x 18"*	Site and Sizing *Freeway 30" x 30"* *Expressway 30" x 30"* *Conventional Road 24" x 24"*

In addition to the approved signs shown above, the FHWA has issued interim approval for an alternate general service sign identifying electric vehicle charging, version D9-11b (see Figure 8, below). This interim approval allows the States of Oregon and Washington to use the alternate sign. Other jurisdictions may request authorization from FHWA to use the alternate sign until such time as it is included in the federal MUTCD and becomes generally available for use. The dimensions of the alternate sign are the same as specified for sign D9-11b (see Figure 7).

Figure 8: D9-11b (Alternate) EV Charging Symbol with Interim FHWA Approval

General service signs also are needed to direct motorists to charging stations. There are approved advance directional arrows that can be posted in combination with one of the identification signs for charging. Approved directional arrows are shown in Figure 9.

Figure 9: Approved Directional Arrows



Regulatory Signs

Regulatory signs regulate the driving and parking of vehicles on roadways and in parking areas. These signs follow international conventions on color coding and use standardized symbols. Signs that are generally permissive in nature (such as signs that allow parking for a certain amount of time) are green and black on a white background. Signs that are prohibitory in nature (such as no parking signs) are red and black on a white background. Regulatory signs for electric vehicle charging are needed to restrict access to charging stations and parking areas, or to limit the time of use.

Currently, the CA MUTCD has not approved any regulatory signs for electric vehicle charging, nor has the FHWA given any interim approvals; however, the States of Oregon and Washington are testing candidate regulatory signs. The experimentation process described in the CA MUTCD allows a local jurisdiction to request approval to use a test sign.

The PEV Collaborative supports the use of standardized signs to minimize confusion and provide the greatest ease of use for EV drivers. To this end, the PEV Collaborative recommends the use of the candidate signs currently being tested in Oregon and Washington, and that local jurisdictions request the use of those signs during the test period with the expectation that they ultimately will be approved at the federal level and become the uniform standard nationally. Examples of these recommended regulatory signs for electric vehicle charging are shown in Figure 10.

Figure 10: Recommended Regulatory Signs for Electric Vehicle Charging

The first sample sign is permissive, while the other two are prohibitory. Both types of signs should be placed immediately adjacent to the electric vehicle charging station. They should be at least 12 inches in width and 18 inches in height and installed as prescribed in the CA MUTCD and Title 24 of the CBC. Where both types of signs are posted at the same location, the prohibitory sign should be posted above the permissive sign. Regulatory signs also may be placed in conjunction with non-regulatory signs; in such cases, the regulatory signs should be placed above the non-regulatory signs.

In a typical installation, we anticipate that at least one blue general service sign will be needed to identify the space for "EV Charging." Most spaces also will be designated "No Parking Except for Electric Vehicle Charging" with a red and black prohibitory sign. Many of the public charging spaces also will have a green sign permitting charging for some specified amount of time. The three signs should be arranged on a single signpost with the "No Parking" sign on top, the permissive time limit sign below it, and the "EV Charging" sign at the bottom. The jurisdiction also should post an informational sign on the EVSE that: 1) explains how to use the EVSE; 2) provides a number to call with problems; and 3) describes what constitutes "charging" for the purposes of using the space.

In order for the regulatory signs to be enforceable, they must be supported by local ordinances that specify any time limits, penalties, etc., and provide all of the necessary definitions. Key definitions include the terms "electric vehicle" and "charging." Examples of the types of information that should be included in these definitions include:

- *Can the station be used by scooters and bicycles with battery assistance?*
- *Does there have to be active charging underway or can a fully charged vehicle connect and occupy the site?*

In October 2011, the Governor of California signed AB 475 (Butler) that restricts the use of spaces designated for EV charging to only those vehicles that have established a connection for electric charging purposes. The new law requires that the space be properly identified with a sign, posted in a visible spot adjacent to the space or at the entrance to a privately owned offstreet parking facility. The new law also provides that the owner of the space may have illegally parked vehicles removed if the removal is posted in accordance with the law.

Private property owners are not restricted in their choice of signs placed on their property, provided those signs do not impact the public right-of-way, as set forth in the CA MUTCD, or unless the signs are otherwise regulated by the local jurisdiction.

The California Vehicle Code (CVC) allows a local jurisdiction or a property owner to have a vehicle removed if it occupies a space in violation of the posted regulations. The CVC requires proper notification of vehicle owners through posting, as well as notice to local law enforcement.

Conclusions and Next Steps

The recommendations outlined above to establish accessible charging facilities and to develop the official, standardized signs needed to appropriately identify and manage the use of charging infrastructure are presented here to support the deployment of infrastructure in the most clear, efficient and effective way. The PEV Collaborative continues to gather information on other issues related to infrastructure, and is developing additional guidance and training materials as well. To the extent the need exists, the PEV Collaborative is committed to prepare handbooks and/or case studies to further assist local governments, businesses, and the public as they undertake the installation and operation of electric vehicle infrastructure.

The PEV Collaborative fully anticipates that additional questions will arise regarding both accessibility and the types of signs that are needed. We are committed to revisit these questions as needed to support the overall goal of bringing the use of electric vehicles into the mainstream.

Definitions

The following definitions apply to key terms used in the recommendations in this report.

Access Aisle - An accessible pedestrian space adjacent to or between parking spaces that provides clearances in conformance with Chapters 11A and 11B of the California Building Code Title 24, Part 2, and the Americans with Disabilities Act.

Accessible Card-Reading Device - A card-reading device that meets the accessibility requirements of Chapter 11C of the California Building Code, and the Americans with Disabilities Act.

Accessible Electric Vehicle Charging Station - An electric vehicle charging station where the charger and vehicle inlet are approachable and usable by persons with disabilities in compliance with the California Building Code (Title 24), and the Americans with Disabilities Act, as set forth in the recommended standards in this report for installation of charging stations in new construction or in existing facilities.

Accessible Parking Space - A parking space where accessible parking is designated for vehicles displaying a Disabled Person (DP) placard or DP license plates in conformance with the California Building Code (Title 24), and the Americans with Disabilities Act.

Card-reading Device - A device installed to extract information from a magnetized strip on a card when the card is inserted into the device. The card may be a membership or identification card, a credit or debit card, or other card required to operate the EVSE. The card-reading device may be installed as part of the EVSE (co-located) or installed on a separate pillar.

Charger - An electrical component assembly or cluster of assemblies designed specifically to charge batteries or other energy storage devices on board an electric vehicle.

Charging - The connector from the charger is inserted into the electric vehicle inlet and electrical power is transferred for the purpose of recharging the batteries or other energy storage devices on board an electric vehicle. For the purposes of designating and limiting the use of charging stations, the entity with jurisdiction over the station must determine whether active transfer must be in progress, or whether the connection is sufficient.

Charging Levels - The standardized indicators of electrical force, or voltage, at which an electric vehicle's battery is recharged. Note that rated current (*) is 80% of circuit breaker size.

AC Level 1	120V AC single phase current (12 amp*); power 1.44kw current (16 amp*); power 1.92kw	DC Level 1	200-450V DC rated current ≤ 80 amp rated power ≤ 19.2 kw
AC Level 2	240V AC single phase rated current ≤ 80 amp* rated power ≤ 19.2 kw	DC Level 2	200-450V DC rated current ≤ 200 amp rated power ≤ 90kw
AC Level 3	To be determined AC single phase or three phase?	DC Level 3	To be determined 200-600V DC rated current ≤ 400 amp? rated power ≤ 240 kw?

Connector - A device that, by insertion into an electric vehicle inlet, establishes an electrical connection to the electric vehicle for the purpose of charging and information exchange. This device is part of the electric vehicle coupler. (Electric Vehicle Connector, California Electric Code, article 625).

Electric Vehicle (EV) - Any motor vehicle registered to operate on California public roadways and operates, either partially or exclusively, on electrical energy from the grid, or an off-board source, that is stored on board for motive purpose. An electric vehicle includes, but is not limited to: (1) a battery electric vehicle; (2) a fuel cell electric vehicle; (3) a plug-in hybrid electric vehicle; (4) and a neighborhood electric vehicle.

Electric Vehicle Charging Station (EVCS) - The public or restricted space serviced by a charger including all signs, information, pavement surfaces, surface markings and protective equipment, where the transfer of electric energy occurs by conductive or inductive means between the charger and the battery or other energy storage device on board a stationary electric vehicle.

Electric Vehicle Charging Station Location - One or more electric vehicle charging stations located within a parking lot, fuel dispensing facility, public garage or private property.

Electric Vehicle Infrastructure (EVI) - Structures, machinery, and equipment necessary and integral to support an electric vehicle, including, but not limited to electric vehicle charging stations, chargers, and battery exchange stations.

Electric Vehicle Supply Equipment (EVSE) - The conductors, including the ungrounded, grounded, and equipment grounding conductors and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of delivering energy from the premises wiring to the electric vehicle. (California Electric Code, article 625).

Public Access Charging Station - An electric vehicle charging station that is generally available for use by members of the public. It may be publicly or privately owned, the hours of use may be limited, and the electricity may be offered for a fee or free of charge.

Restricted Access Charging Station - An electric vehicle charging station that is not generally available for public use. To be considered restricted, the restrictions on use must be properly posted with appropriate signs, and the restrictions must be supported with ordinances, rules, or policies adopted by an authorized agent and uniformly enforced. Examples of restricted access include charging stations that are available for use only by vehicles in a public or private fleet, are designated for use by specified users, or are located in private residences.

The following definitions are not specifically used in the recommendations in this report; however, they may be useful to create policies or rules needed to implement some of the recommendations. For example, if the use of a charging station is to be restricted to certain types of vehicles, the following definitions may be useful to identify such vehicle types.

Battery Electric Vehicle (BEV) - Any vehicle that operates solely by use of a battery or battery pack, or that is powered primarily through the use of an electric battery or battery pack but uses a flywheel or capacitor that stores energy produced by the electric motor or through regenerative braking to assist in vehicle operation.

Clean Air Vehicle Sticker - California law allows use of High Occupancy Vehicle (HOV) lanes with only one occupant when the vehicle displays a Clean Air Vehicle Sticker. A list of qualifying vehicles is provided on the California EPA's Air Resources Board website (http://www.arb.ca.gov/msprog/carpool/carpool.htm).

Clean Air Vehicle Parking Space - Any posted and/or marked parking space that identifies the use to be exclusively for the parking of a clean fuel vehicle as defined by the California Air Resources Board.

Clean Vehicle - Any clean fuel vehicle identified by the State of California as qualifying for the California Clean Vehicle Incentives program. Effective January 2011, there are two types of vehicles that qualify: Zero Emission Vehicles (ZEV) and Plug-in Hybrid Electric Vehicles (PHEV) that qualify as Enhanced Advanced Technology, Partial Zero Emission Vehicles (AT PZEV).

Electric Motorcycle - A battery electric vehicle having a seat or saddle for the use of the rider, designed to travel on not more than three wheels in contact with the ground, and is powered by an electric motor and produces zero emissions or pollution when stationary or operating.

Hybrid Electric Vehicle (HEV) - A type of hybrid vehicle which combines a conventional internal combustion engine (ICE) propulsion system with an electric propulsion system. The presence of the electric drive motor is intended to achieve better fuel economy than a conventional ICE.

Internal Combustion Engine Vehicle (ICE) - A vehicle with an engine that burns fuel within itself as a means of developing power.

Motorized Bicycle - A device that has fully operative pedals for propulsion by human power and has an electric motor that has a power output of not more than 1,000 watts and is incapable of propelling the device at a speed of more than 20 miles per hour on ground level. (California Vehicle Code [CVC] section 406).

Motorized Electric Scooter - Any two-wheeled device that has handlebars, a floorboard that is designed to be stood upon when riding, and is powered by an electric motor and produces zero emissions or pollution when stationary or operating. (CVC section 407.5 “Motorized Scooters”).

Motorized Quadricycle and Motorized Tricycle - A motorized quadricycle is a four-wheeled device, and a motorized tricycle is a three-wheeled device, designed to carry not more than two persons, including the driver, and having either an electric motor or a motor with an automatic transmission developing less than two gross brake horsepower and capable of propelling the device at a maximum speed of not more than 30 miles per hour on level ground. The device shall be utilized only by a person who by reason of physical disability is otherwise unable to move about as a pedestrian or by a senior citizen as defined in section 13000 of the CVC. (CVC section 407).

Neighborhood Electric Vehicle (NEV) - An electrically powered, four-wheeled, self-propelled, low-speed vehicle whose speed attainable in one mile is more than 20 miles per hour and not more than 25 miles per hour on a paved level surface and has a gross vehicle weight of less than 3,000 pounds. (CVC section 385.5).

Non-Electric Vehicle - Any motor vehicle that does not meet the definition of “electric vehicle.”

Plug-in Electric Vehicle (PEV) - A type of an electric vehicle, as defined above, that has the capability to plug-in and charge its battery from the electric grid. This includes both battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEV).

Plug-In Hybrid Electric Vehicle (PHEV) - A hybrid electric vehicle with the capability to charge a battery from an off-vehicle electric energy source that cannot be connected or coupled to the vehicle in any manner while the vehicle is being driven.

Endnotes

[1] County of Sonoma, *Electric Vehicle Charging Station Program and Installation Guidelines* (2011), accessed January 18, 2012, http://www.sonoma-county.org/prmd/docs/misc/ev_prog_guidelines.pdf

[2] Bay Area Climate Collaborative, *Ready, Set, Charge, California! A Guide to EV-Ready Communities* (2011), accessed January 18, 2012, http://baclimate.org/images/stories/actionareas/ev/readysetcharge_evguidelines.pdf

[3] California Plug-In Electric Vehicle Collaborative, *Taking Charge: Establishing California Leadership in the Plug-in Electric Vehicle Marketplace* (2010), 13, accessed January 18, 2012, http://www.evcollaborative.org/sites/all/themes/pev/files/docs/Taking_Charge_final2.pdf

[4] Ibid., 17.

[5] California Air Resources Board: Based on proposed staff changes to the ZEV Regulation, November 2010.

[6] California PEV Collaborative, *Taking Charge,* 21.

[7] Ibid., 21.

[8] 28 C.F.R. Part 36.

[9] See California Building Code (CBC) Title 24 chapters 11B and 11C.

[10] CBC chapter 11C.

[11] Cal. Dept. of General Services, DSA Access Compliance Policies, "97-03: Interim Disabled Access Guidelines for Electric Vehicle Charging Stations" (2011).

[12] Federal Highway Administration, *Manual on Uniform Traffic Control Devices* (2009 edition), accessed January 18, 2012, http://mutcd.fhwa.dot.gov/

[13] "California Manual on Uniform Traffic Control Devices Branch," Cal. Dept. of Transportation, accessed January 18, 2012, http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/

[14] See "Initial Statement of Reasons for Proposed Building Standards of the State Architect – Access Compliance Concerning 2010 California Building Code (CBC) California Code of Regulations, Title 24, Part 2," Cal. Dept. of General Services, DSA-AC-01-10-ISOR-45d-Pt2.doc, available on the DGS website.

[15] Cal. Dept. of General Services, DSA Access Compliance Policies, "97-03: Interim Disabled Access Guidelines for Electric Vehicle Charging Stations" (2011).

[16] Cal. Dept. of Transportation, CA MUTCD 2010, chapter 2, section 1A.08.

[17] "California MUTCD 2011 Draft Revisions," Cal. Dept. of Transportation, accessed January 18, 2012, http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/ca_mutcd2011_draftrevisions.htm

[18] Ibid., section 2I.02.

www.PEVCollaborative.org