SAN DIEGO REGIONAL ELECTRIC VEHICLE INFRASTRUCTURE WORKING GROUP

MEETING NOTICE AND AGENDA

Date: **Thursday, April 18, 2013**

Time: **1:00 p.m. to 2:30 p.m.**

Location: **San Diego Gas & Electric Energy Innovation Center**
4760 Clairemont Mesa Blvd.
San Diego, CA 92117

Staff Contact: **Tyler Petersen**
Tel: (858) 244-4876
Email: tyler.petersen@energycenter.org

AGENDA HIGHLIGHTS

- **THE EV PROJECT: INITIAL FINDINGS ON CHARGING BEHAVIOR**
- **SDG&E MULTI-UNIT DWELLING CASE STUDY**
- **ZONING AND PARKING ISSUES FOR PEVS**

In compliance with the Americans with Disabilities Act (ADA), CCSE will accommodate persons who require assistance in order to participate in San Diego REVI meetings. If such assistance is required, please contact CCSE at (858) 244-1177 at least 72 hours in advance of the meeting.

SANDAG Center for Sustainable Energy CALIFORNIA SAN DIEGO REGIONAL CLEAN CITIES COALITION

www.energycenter.org/pluginready

SAN DIEGO REVI

Thursday, April 18, 2013

ITEM # **RECOMMENDATION**

1. WELCOME AND INTRODUCTIONS

2. ANNOUNCEMENTS

Members of the public shall have the opportunity to address San Diego Regional Electric Vehicle Infrastructure Working Group (REVI) on any plug-in electric vehicle (PEV) issue that is not on this agenda. Public speakers are limited to three minutes or less per person. REVI members may provide information and announcements under this item.

+3. MEETING SUMMARY **APPROVE**

The REVI is asked to review and approve the March 21, 2013 meeting summary.

CONSENT ITEM

+4. REGIONAL PEV BARRIERS PROGRESS REPORT **INFORMATION**

The REVI barriers table is attached.

REPORT ITEMS

5. THE EV PROJECT: INITIAL FINDINGS ON CHARGING BEHAVIOR **INFORMATION**

Last month, the REVI heard about regional planning undertaken to site public EVSE through The EV Project (REVI Barrier 7). Andy Hoskinson, Ecotality, will present a summary of the San Diego planning compared to actual placement of EVSE through the EV Project, as well as other early findings that can help inform local and regional planning.

+6. BARRIER 6: EVSE AT MULTI UNIT DWELLINGS (MUDS) **DISCUSSION**

SDG&E and CityFront Terrace, a downtown condominium, partnered to develop the first nationally published case study on EV charger installations at a multi-unit dwelling (MUD). The case study (attached) highlights a community's collaborative process to find charging solutions for their tenants. Representatives from SDG&E and CityFront will present an overview of the project, considerations for EVSE at MUDs, and lessons learned. Based on the case study and existing SDG&E fact sheets (attached), REVI will discuss what types of supplemental materials are needed to further enable EVSE installations.

+7. BARRIER 3: ZONING AND PARKING ISSUES FOR PEVS **DISCUSSION**

A. Zoning and parking policies include accessibility, street and parking space signage and designs, and parking facility restrictions. The Caltrans Policy Directive on Zero Emission Vehicle Signs and Pavement Markings (attached) includes new signs, plaques and pavement markings that will be in the update to the California Manual on Uniform Traffic Control Devices (CA MUTCD). Also, CCSE's PEV readiness assessment for DOE on zoning and parking is provided.

In addition to these parking guidelines, experience of some EVSE providers has uncovered unintended barriers to installing EVSE at commercial and multi-unit properties. Andy Hoskinson, Ecotality and James Tillman, eVgo have offered to share their experiences on this issue. Additional EVSE provider input is welcomed. The REVI is asked to discuss real and/or perceived issues in parking rules and possible solutions. Once appropriate responses are agreed to by REVI, they will be shared with all jurisdictions and included in our region's PEV readiness plan.

B. The Governor's Office of Planning and Research (OPR) and the Division of the State Architect (DSA) are seeking input on the public review draft of "Plug-In Electric Vehicles: Universal Charging Access Guidelines and Best Practices." These draft guidelines (attached) have been developed by DSA to assist OPR with physical accessibility standards and design guidelines for the installation of PEV charging stations throughout California. The voluntary guidelines address accessible PEV charging stations on both public and private sites and within public rights of way. The REVI will receive an overview of the document and discuss possible next steps. Comments are due to OPR by Friday, May 24, 2013.

8. MATTERS FROM MEMBERS **INFORMATION**

Time permitting, REVI members are encouraged to discuss additional topics of general interest.

9. NEXT MEETING **INFORMATION**

The next REVI meeting is scheduled for Thursday, May 16, 2013, at the SDG&E Energy Innovation Center, 4760 Clairemont Mesa Blvd., San Diego, CA 92117.

10. ADJOURNMENT

+ next to an item indicates an attachment

Agenda Item 3

March 21, 2013 MEETING SUMMARY

ITEM #1: WELCOME AND INTRODUCTIONS

Chair Susan Freedman, San Diego Association of Governments (SANDAG), called the meeting to order at 1:07 p.m. and welcomed everyone to the San Diego Regional Electric Vehicle Infrastructure Working Group (REVI).

ITEM #2: SUMMARY OF THE FEBRUARY 21, 2013 MEETING

Mike Grim, City of Carlsbad, motioned to approve the meeting summary from February 21, 2013. Jenny Lybeck, Unified Port District of San Diego, seconded the motion. Motion carried without opposition.

ITEM #3: ANNOUNCEMENTS AND PUBLIC COMMENTS

Masao Nishikawa, VLI-EV, introduced himself and provided a brief summary of his company. He announced that VLI-EV offers energy management, storage, variable load integration and network solutions that help to reduce demand charge impacts. Mr. Nishikawa also announced that his company installed a "Fast EV charger" with battery storage at SDG&E's Energy Innovation Center (EIC) (not available to the public). Ms. Freedman encouraged REVI members and attendees to accompany Mr. Nishikawa for a brief demonstration of the DC fast charger in the EIC parking lot after the meeting.

Joel Pointon, San Diego Gas and Electric (SDG&E), announced that SDG&E and CityFront Terrace, a mid-rise luxury condominium complex downtown, partnered to find charging solutions for multi-unit dwelling (MUD) EV charging. A case study developed by SDG&E has been published and is available on the CCSE *Plug-in & Get Ready* blog, available at: http://energycenter.org/index.php/outreach-a-education/plug-in-a-get-ready/lessons-learned/3417-multi-unit-dwelling-vehicle-charging-case-study

Agnus Clark, EVOasis, announced that his company, which produces DC fast charging stations, has recently completed its 500th fast charge at their DC fast charge site in San Juan Capistrano, California.

ITEM #4: REGIONAL PEV ACTIVITIES SINCE LAST REVI MEETING INFORMATION

Ms. Freedman commented that the PEV barriers table has been updated to reflect the group's progress on addressing the barriers to PEV deployment in the San Diego region. Tyler Petersen, California Center for Sustainable Energy (CCSE), added that he would distribute the updated PEV infrastructure numbers shortly after the meeting.

Mr. Pointon requested that anyone working on Electric Vehicle Supply Equipment (EVSE) installations at MUD sites, contact him directly because SDG&E would like to develop a case study documenting the installation. Mr. Grim recommended that eVgo projects in the San Diego region also be included in SDG&E's reporting of EVSE installations at MUDs.

ITEM #5: RESIDENTIAL EVSE PERMIT AND INSPECTION TEMPLATE

Mr. Petersen noted that the *Residential Permit and Inspection Template* had been updated per REVI feedback and comments. He encouraged REVI members to amend the template per their specific agency requirements and distribute it to the appropriate parties for implementation. The template will be sent to REVI members in Microsoft Word format so it can be edited as needed.

REVI members provided the following comments:

- Mr. Grim commented that the final version of the residential permit and inspection template looks good and he appreciates the additional information in the document.

- Anthony Williams, member of the public, requested that information on the Tesla Model S be included in the charging level information table.

- Randy Walsh, San Diego EV Network, commented that despite this document being designed for jurisdictions, REVI should consider distributing this document to local dealerships. Mr. Pointon recommended that this information be presented at a board meeting of the new car dealership association.

Ms. Freedman described the additional resources section of the document, which includes a load calculation worksheet, an EVSE inspection checklist and an electrician's guidebook for EVSE installations produced by Southern California Edison. Chris Schmidt, Caltrans, motioned to approve the *Residential Permit and Inspection Template* with the understanding that this is a dynamic process and the document will be updated as necessary. Motion carried without opposition. The document was accepted as a regional best practice.

ITEM #6: REQUEST FOR EVSE PROPOSALS TEMPLATE

Mr. Petersen explained that the *Draft Request for Proposal (RFP) Template* for the installation and operation of electric vehicle charging stations had been updated based on feedback from last month's meeting. Ms. Freedman added that additional resources on evaluation criteria for scoring proposals were included. Mr. Walsh asked if this RFP model could be used by the commercial sector. Ms. Freedman replied that it could be used by anyone, including commercial entities. Mr. Schmidt added that this type of RFP model could be used by public agencies that wish to solicit bids.

Mr. Grim motioned to approve the RFP Template. Motion carried without opposition. The document was accepted as a regional best practice.

ITEM #7: REGIONAL PEV READINESS PLAN DEVELOPMENT

A. Barrier 7: Regional Planning for Public EVSE Siting

Ms. Freedman presented information on the regional PEV planning process through the EV Project. The presentation was made available on the Plug-in & Get Ready website after the meeting: http://energycenter.org/index.php/outreach-a-education/plug-in-a-get-ready/sd-revi. Ms. Freedman's presentation covered the following aspects:

1. EV Project regional planning components
2. San Diego's regional approach
    a. What made an "optimal" charging site?
    b. GIS modeling and mapping
3. Long-term goals and near-term needs
4. From planning to implementation

Ms. Freedman described how public infrastructure is necessary to deploy the PEV market and that infrastructure planning was undertaken by regional stakeholders for the EV Project. She described how the regional planning efforts were led by Ecotality, as the EV Project manager, and a Stakeholder Advisory Committee (SAC) that began in early 2010. The SAC had representatives from local and regional governments, higher education, public agencies, and companies including SDG&E, Nissan and Qualcomm.

The group concluded that optimal sites for Level 2 PEV chargers included places such as movie theatres, medical centers or shopping malls where people would be visiting for approximately one to four hours. Ms. Freedman noted that consistent accessibility was important for siting. For instance, Qualcomm Stadium would be a great charging site during football season but would not experience the same utilization levels off-season. Optimal locations for DC fast charging (DCFC) sites would allow PEV drivers the ability to charge quickly; from five to 30 minutes and in locations along a typical driver's daily commute.

The land use characteristics and scoring criteria for siting Level 2 public charging were analyzed using GIS modeling. Potential charging locations were mapped and measured based on daily and yearly availability, the number of trip attractors and employment density. Ms. Freedman stated that the EV Project and the SAC underwent this multi-month planning process in anticipation of a large outpouring of interest by businesses in hosting an EV charger(s). As it turned out, this was not the case for many reasons.

Ms. Freedman asked Andy Hoskinson, Ecotality, to provide any supplemental information on the regional planning efforts. Mr. Hoskinson manages the EV Project for the San Diego region and led the SAC meetings. . Mr. Hoskinson commented that additional variables could have been included in the original infrastructure plan. For instance, flood plain analysis and utility factors were not included. The original analysis provided a high-level scope for infrastructure siting and did not identify exact charging locations (e.g. potential business hosts). Ecotality is developing a white paper that will comparatively analyze the various EV Project regions throughout the country. Mr. Hoskinson anticipates that the white paper will be available for public comment in late April 2013.

REVI members provided the following comments:

- Mr. Pointon commended Mr. Hoskinson for his work in the San Diego region. Mr. Pointon stated that there were a number of regional workshops and individual meetings that took place as follow up to the initial EV Project planning discussions.

- Paul Manasjan, San Diego Regional Airport Authority, commented that Assembly Bill (AB) 1092 was introduced to the California State legislature on February 22, 2013. AB 1092, if adopted, would require new construction projects to include one electric vehicle charge station per every four off-street parking spaces.

The full version of AB 1092 is available at:
http://www.leginfo.ca.gov/pub/13-14/bill/asm/ab_10511100/ab_1092_bill_20130222_introduced.html

- Mr. Grim asked if the GIS data and land-use weighted scores for the EVSE siting will be available to local jurisdictions. Ms. Freedman responded that SANDAG would provide this information to REVI. Mr. Schmidt suggested offering a workshop for local jurisdictions to share the GIS and land-use data.

- Mr. Walsh asked how similar the current EVSE installation results match the original plan. Mr. Hoskinson responded that The EV Project was performing initial analysis of charging behavior and the siting of EVSE, which would be shared with REVI once available. Mr. Pointon added that the PEV Research Center at UC Davis would produce a siting study that may benefit REVI and future regional planning for public EVSE too.

B. Barrier 10: Commercial and Workplace Charging

Mr. Petersen explained that CCSE is in the process of completing a study on the value proposition to local businesses and public agencies that invest in EVSE. The preliminary results were included in the *San Diego PEV Readiness Assessment*, published in December 2012. The goal of the study was to understand the motivation of the site host for providing PEV infrastructure. Melanie McCutchan, a Senior Analyst at CCSE, and study author presented the following:

1. What are the costs of hosting Level 2 EVSE?
2. Are PEV owners willing to pay user fees sufficient enough to cover the costs incurred by the host?
3. What is the value of non-revenue benefits to site hosts?

Ms. McCutchan described the three methods used in examining the regional charging information; a regional non-resident EVSE host survey, cash flow modeling of project economics, and the PEV owner survey (source: Clean Vehicle Rebate Project PEV owner survey: http://energycenter.org/index.php/incentive-programs/clean-vehicle-rebate-project/vehicle-owner-survey).

REVI members provided the following comments:

- Mr. Hoskinson commented on the information of EV owners' willingness to pay for public charging. He stated that the price point at which EV owners' are willing to pay for public charging is less than the breakeven price that potential hosts will have to charge for providing infrastructure. Mr. Hoskinson noted that faced with this scenario, it is difficult to promote public charging services to local businesses.

- Mr. Walsh mentioned that he attended an earlier presentation on workplace charging produced by SDG&E, where similar results on workplace charging tendencies and pricing was presented. Ms. McCutchan noted that these results were both concluded independently.

- Mr. Hoskinson commented that studies of this nature can be perceived as very critical of EVSE hosts and hoped that an update will be done to this study in the near future.

- Mr. Walsh asked Ms. McCutchan if she had any major revelations from this study. She responded that she was surprised to find during her research and analysis that plug-in hybrid electric vehicle (e.g. Chevy Volt) drivers displayed more demand for public charging infrastructure than all-electric drivers (e.g. Nissan LEAF).

- Mr. Pointon added that the Electric Power Research Institute (EPRI) has conducted a similar study in order to understand PEV driver needs and how each vehicle option can meet consumer demands. The study is available here: http://www.epri.com/abstracts/pages/productabstract.aspx?ProductID=000000000001023161

- Mr. Pointon continued that the main issue for PEV charging is that the market has not delivered what the customers want in regards to cost. A winning business model has yet to be established.

- Mr. Schmidt asked the group if a study exists that examines consumers' willingness to pay for DC fast charging.

- Mr. Clark commented that EVOasis' DC fast charging site in San Juan Capistrano was free for PEV drivers for the first two months and then a charge was implemented. Once the fee was implemented, the usage went down to roughly 2-3 charging events per day. He stated that their business model isn't great, but if the tax credit remains and the cost of the DCFC continues to decrease, there is a chance that it will become profitable.

Mr. Petersen announced that Ms. McCutchan's presentation will be available on the Plug-in & Get Ready website at: http://energycenter.org/index.php/outreach-a-education/plug-in-a-get-ready/sd-revi

Mr. Petersen encouraged REVI to distribute the study to interested parties.

ITEM #8: MATTERS FROM MEMBERS

A member of the public asked for a response to an editorial on PEVs that was published on March 23, 2013, in the San Diego Union Tribune. The editorial stated that the environmental impacts of manufacturing PEV batteries were worse than driving an internal combustion engine vehicle for a year.

Mr. Pointon responded that the editorial was misleading and a rebuttal article existed that refuted its conclusion. Mr. Pointon shared the web links with staff, which are provided here. The editorial is found at: www.utsandiego.com/news/2013/mar/23/electric-cars-kirk/. An appropriate response appears on the Electric Drive Transportation Association website, entitled, "Checking the Skeptics Fuzzy Math," at: www.multibriefs.com/briefs/edta/edta031513.php.

ITEM #9: NEXT MEETING INFORMATION

The next REVI meeting is scheduled for Thursday, April 18, 2013 from 1:00 p.m. to 2:30 p.m. at the SDG&E Energy Innovation Center 4760 Clairemont Mesa Blvd. San Diego, CA 92117.

ITEM #10: ADJOURMENT

The meeting was adjourned at 2:42 p.m.

REVI Voting Member Attendance March 21, 2013

REPRESENTATION		NAME	MEMBER / ALTERNATE	ATTENDING
South County Subregion	City of Chula Vista	Brendan Reed	Member	NO
	City of Imperial Beach	Chris Helmer	Alternate	NO
North County Coastal Subregion	City of Del Mar	Ramsey Helson	Member	NO
	City of Carlsbad	Mike Grim	Alternate	YES
North County Inland Subregion	City of Escondido	Kathy Winn	Member	NO
	Vacant	Vacant	Alternate	-
East County Subregion	City of Santee	Kathy Valverde	Member	NO
	City of La Mesa	Scott Munzenmaier	Alternate	NO
City of San Diego		Jacques Chirazi	Member	NO
		Vacant	Alternate	-
County of San Diego		Peter Livingston	Member	NO
		Vacant	Alternate	-
San Diego Association of Governments		Susan Freedman, Chair	Member	YES
		Allison King	Alternate	NO
San Diego Regional Airport Authority		Paul Manasjan	Member	YES
		Brett Caldwell	Alternate	NO
Caltans, District 11		Chris Schmidt	Member	YES
		Vacant	Alternate	-
Unified Port District of San Diego		Michelle White	Member	NO
		Jenny Lybeck	Alternate	YES
San Diego Gas & Electric		Joel Pointon	Member	YES
		Randy Shimka	Alternate	YES
California Center for Sustainable Energy		Mike Ferry, Vice Chair	Member	NO
		Colin Santulli	Alternate	NO
University of California, San Diego		Dave Weil	Member	NO
		Jim Ruby	Alternate	NO
Miramar College, Advanced Transportation Technology and Energy Program		Greg Newhouse	Member	NO
		Vacant	Alternate	-
San Diego Electric Vehicle Network		Randy Walsh	Member	YES
		Vacant	Alternate	-
National Electrical Contractors Association		Karen Prescott	Member	YES
		Tim Dudek	Alternate	YES
International Brotherhood of Electrical Workers Local 569		Micah Mitrosky	Member	NO
		Vacant	Alternate	-

REVI Advisory Members

Nick Cormier, San Diego Air Pollution Control District

Others in Attendance

Justin Alvord, public member
Nicole Appenzeller, CCSE
Dan Chappell, land developer
Angus Clark, EVOasis
Patrick DePriest, public member
Jamie Edmonds, EV Owner, Firefighter
Lawrence Emerson, public member
Anna Lowe, SANDAG
Jim Mandler, public member
Mill Miao, public member
Tyler Petersen, CCSE
Rebecca Robinson, City of Chula Vista
Jessica Thoma, CCSE
Anthony Williams, Quick Charge Power
Reginald Womack, public member

Progress on Regional Plug-in Electric Vehicle (PEV) Barriers

Barrier	Progress on Solutions – Preparation of Guidance Materials	Action Items
1. Permitting/Inspection Lack of streamlined permitting and inspection processes and inconsistent (high) costs across jurisdictions.	• Residential permit and inspection guidelines accepted by REVI on 3/21/13. • Residential guidelines distributed to REVI and jurisdictions in 3/13, and posted online at www.energycenter.org/pluginready. • City of San Diego and Oceanside permitting guidelines served as examples.	• Drafting commercial guidelines for late spring REVI meeting
2. Building Codes Lack of standard building codes that accommodate charging infrastructure or dedicate circuits for charging infrastructure in new construction and major renovations.	• REVI feedback on codes incorporated into CCSE's regional readiness assessment (DOE project), Nov-Dec. 2012.	• Locally adopted building codes to be reviewed for unintended barriers to installing EVSE in parking structures.
3. Zoning and Parking Rules Lack of standard regional ordinances that facilitate the installation and access to publicly available charging infrastructure.	• REVI topic at 4/18/13 meeting. • REVI feedback on parking incorporated into CCSE's regional readiness assessment (DOE project), Nov-Dec. 2012. • City of San Diego Technical Policy on addressing accessibility to EV charging stations presented/ distributed at May 2012 REVI.	• Stakeholders to review state guidance on EV charging station accessibility. Comments due to OPR by 5/24/13.
4. Training and Education for Municipal Staff and Electrical Contractors Lack of knowledge about PEVs and EVSE	• Training provided for municipal staff on PEV infrastructure on 1/29/13 at SDG&E EIC. • REVI feedback on training incorporated into CCSE's regional readiness assessment (DOE project), Nov-Dec. 2012.	• Use California PEV Collaborative's Toolkit to further address this item. • Greg Newhouse (Miramar College ATTE) to hold EV and AFV training for SANDAG's Freeway Service Patrol (tow-truck drivers) and CHP 6/29/13.
5. Lack of Public Knowledge of PEV and EVSE Municipal outreach to Local Residents and Businesses	• Discussed locally at PEV Workshop at CCSE on 6/14/12. • CVRP PEV owner survey conducted. Results at 9/20/12 REVI. • REVI feedback on public outreach incorporated into CCSE's regional readiness assessment (DOE project).	• Not high priority for REVI, which must focus on barriers caused or influenced by public agencies.
6. EVSE at Multi Unit Dwellings Consumer lack of knowledge regarding EVSE installation in these buildings. Need to educate and work with HOAs to identify and find solutions to unique building challenges.	*Region is recognized leader on this issue.* • REVI topic at 4/18/13 meeting. • SDG&E published case study in March 2013. • SDG&E published fact sheet on EVSE install process for MUDs. • SDG&E holds quarterly MUD workshops at EIC. • REVI discussed MUD issues at May and July 2012 meetings.	• Showcase SDG&E MUD activities and barrier busting in Readiness Plan. • Develop complementary materials (if needed) for MUD owners/ occupants that fill information gaps in what SDG&E can provide under CPUC rules.

Barrier	Progress on Solutions – Preparation of Guidance Materials	Action Items
7. Regional Planning for Public EVSE Siting Regional land use and transportation plans served as a basis to identify optimal public EVSE sites. In rollout of EV Project, experience was different from planning. Alternate approaches have been taken to increase public EVSE hosts and sites.	*Region is recognized innovator on this issue.* • REVI topic at 3/21/13 meeting. • SANDAG produced report on The EV Project's approach to identifying optimal sites for public EVSE based on local land uses and transportation network. • CCSE presented initials findings of CVRP survey and interviews with EVSE commercial/agency hosts. To release report at some point.	• SANDAG (1) producing fact sheet on regional EVSE planning from EV Project, (2) preparing maps of optimal Level 2 and DCFC EVSE sites for each local jurisdiction, and (3) preparing public agency guidelines for including EVSE in new construction. • CCSE (1) producing fact sheet on value proposition to host EVSE and (2) to release full report on same topic.
8. On Peak Charging – TOU Utility Rates A. Need to discourage charging when electricity supplies are in high demand and cost more. Support of time of use (TOU) pricing. B. High demand charges that impact EVSE host utility bills. Expensive metering options to access TOU rates.	*Region is recognized leader on TOU PEV rates.* • Local standout area for solution/ use of TOU rates that encourage off-peak charging. SDG&E holds regular workshops on EVSE hosting and PEV Rates.	• Obtain findings from SDG&E and EV Project to include (and showcase) in Readiness Plan.
9. Public Agency EVSE Installations Contracting issues have stalled many public agencies from taking part in The EV Project. Need to identify common project barriers and find solutions.	• RFP template for public agencies (and commercial entities) accepted by REVI at 3/21/13 meeting. • RFP template distributed to REVI stakeholders and uploaded to REVI website at www.energycenter.org/pluginready.	• Track progress of agencies/ institutions to site and install EVSE.
10. Commercial and Workplace Charging Lack of understanding regarding benefits and approaches to understanding workplace charging.	• REVI topic at 3/21/13 meeting and focus of CCSE analysis of value proposition of hosting EVSE. (see barrier 7)	• Ecotality to share initial EV Project findings on public and workplace charging. • CCSE to produce fact sheet (see barrier 7)
11. PEVs in Government Fleets Procurement justification needed for local public fleets. Need to describe PEV benefits, including role in reducing municipal GHGs for Climate Action Plans.	• CCSE reviewing local government CAPs for policies to support fleet purchases for local governments (spring 2013).	• Tbd.




Case Study: CityFront Terrace Plug-In Electric Vehicle Charging

CityFront Terrace Profile:

CityFront Terrace is a mid-rise luxury condominium community in the Marina District of downtown San Diego, just blocks from the waterfront, restaurants and shopping areas.

- Built in 1993 with 13 stories and over 300 condominium residences.
- Amenities include, 2 pools a 3500 square foot fitness center, conference room and the expansive “Citrus Room” available for private events.
- Secure underground resident assigned parking, optional valet parking and a 24-hour lobby attendant.
- With 400,000 bricks this is the largest brick building ever built on the West Coast, and designed to incorporate the 1920s-era Citrus Soap Factory.

Plug-in Electric Vehicle Charging Need:

Residents of CityFront Terrace began to inquire about their charging station options for electric vehicles they were planning to purchase in 2011. A variety of all-electric and plug-in hybrid vehicles, and charging stations, were being considered by residents. Property management and residents were seeking a billing solution that would allow residents to pay for their energy usage directly without the property managers having to track usage or collect payments.

With assigned underground parking spaces far from the residents’ individual living unit electric meters located on upper floors and common area meters on commercial rates subject to demand and time-of-use impacts, this project proved to be a challenge. The property and facility managers, home owners association and residents all worked together to identify a solution that allowed for lower cost electric vehicle charging rates, individual billing and flexibility of charging units for each resident. Management also knew that vehicle charging would allow their community to market it as an important new green amenity.

Technical Situation

During early evaluation, CityFront Terrace uncovered many technical challenges. Solutions were needed for wiring the parking spaces with different brands of 208-volt charging stations as well as for individual user billing. Facilities management suggested the installation of individual meters for each charging unit, therefore using San Diego Gas & Electric's billing direct to each resident installing and using a vehicle charger. By not having vehicle charging electricity being metered by common area meters the property manager is removed as middle man in billing and disputes.

By wiring new individual meters directly to electrical service in the underground meter room in the garage, the additional cost of trying to wire to residential meters on upper floors was eliminated. By assigning the accounts to individuals, lower cost electric vehicle time-of-use (EV TOU) could be applied and each user would see the benefit for off peak charging. This approach also negated the need to rearrange the previously assigned resident parking spaces by wiring directly to the user's space and installing the resident's preferred brand of vehicle charger.

Solution

After working together on a compromise to the design, installation and billing plan, CityFront Terrace agreed they would install 20 individual meters wired directly to the utility side of the building electrical supply via one of the main buses. Wiring hubs on each floor of the parking garage would allow for wiring to individual parking places. Each individual requesting vehicle charging would pay an equal portion of the upfront capital expenditure for the project and purchase/own their own charging unit for installation in their space. Each resident secures the required liability insurance referenced under SB 880 in California for potential liability that may occur from these units being located within a "common area".

Under this arrangement each resident receives their monthly bill directly from San Diego Gas & Electric and sees first hand their individual time-of-use behavior and resulting cost savings from the utility's special low electric vehicle rates. Although the project was capital intensive up-front – an estimated $80,000 – the consensus among the stakeholders was that it was worth making an investment that would be returned over time – an estimated $4,000 for each resident requesting charging – to have a program that allowed for individual flexibility for charging units, reinforced off-peak charging advantages and removed property management from additional responsibilities relating to vehicle charging. The costs are therefore passed on directly to the user and the community investment is paid back for its up-front support of a solution.

Benefits

This thoughtful electric vehicle charging solution project brought about many benefits for both the residents and property management. They included:

- Creating a sense of community and consensus among the residents and property managers by taking time to develop a solution that was agreeable to all and able to recoup costs over time.
- Removing additional work for the property managers by having billings going directly from the utility to the residents.
- Being able to market the property as a facility that caters to forward-thinking electric vehicle drivers that supports a cleaner transportation options.
- The ability for residents to have a choice over charging station vendors.
- The project that is scalable over time, and does not have to be "sold out" right away.
- The project allows for either removal of the charging unit if the condominium is sold or moving it to another parking spot.

Future metering technology could allow wireless sub-metering in the car or charging station and industry and regulators are currently working on this effort. Pending state policy decisions will determine the spectrum of possible solutions for the future.

Products and Services

- Billing: Cost recovery billing through the HOA
- Metering: San Diego Gas & Electric
- Engineering: MPE Consulting, Pacific Electric Inc.
- Installing Contractor: California Southwest Electric
- Electric Vehicle Rates: www.sdge.com/ev
- CityFront Terrace Contact: info@cityfrontterrace.org

Prepping for plug-in vehicles

AT CONDOS, TOWNHOMES AND APARTMENTS

Quick facts

Technologies for charging stations range from simple "plug and charge" standalone units that are open to all users, to networked units with automated user ID and payment systems.

If you own, rent or manage multi-family housing, installing plug-in vehicle charging equipment is a community project. Here are some suggested steps to help get multi-unit residential communities – such as condos, townhomes, apartment complexes and manufactured/mobile home parks – plug-in ready for electric vehicles.

1. Take a poll

See how many people in your residential community are interested in plug-in vehicles and when they might actually be in the market to buy one.

2. Explore your options

SDG&E® offers periodic workshops to help you learn about your options, including the types of plug-in vehicles and charging technologies that are available, the costs, and business models for plug-in charging. Visit *seminars.sdge.com* or email *MultiUnit@sdge.com* for information about upcoming workshops.

Technologies for **electric vehicle supply equipment – also referred to as "EVSE" or "charging stations"** – range from simple "plug and charge" standalone units that are open to all users, to networked units with automated user ID and payment systems. Electric vehicle supply equipment with more advanced communicating and scheduling features may offer: metering capabilities to track users' use; access control; user-specific billing and service fee options; and remote control and monitoring capabilities. Single or multiple cord sets may be housed in a box mounted to a wall, pole, ceiling or floor, depending on site-specific needs.

To get an idea of the wide array of EVSE options that are available for residential and

commercial charging, visit Plug In America at *www.pluginamerica.org/accessories,* Advanced Energy at *www.advancedenergy.org/transportation/evse* or GoElectricDrive at *GoElectricDrive.com*.

3. List the challenges

To pave the way for charging stations where electric vehicles can plug in, each multi-family development has its own unique set of circumstances and challenges to address. For example:

- How well will the property layout – including the location and type of electric metering, wiring and parking spaces – accommodate the desired charging equipment?
- What existing rules in the covenants, conditions and restrictions ("CC&Rs") would affect the installation of charging stations in common areas and private areas?
- Which assigned and unassigned parking spaces could accommodate EV charging equipment?
- What state or local regulations relate to common area use of charging infrastructure?

continued on back ▸

- Will some charging units, sidewalks, parking spaces need to meet Americans with Disabilities Act (ADA) standards for accessibility?
- How should property owners deal with initial equipment and service costs versus future tenant demands and needs?

4. Come to a consensus on the scope

The installation of EV charging equipment in a multi-unit development involves shared decisions by property owners, property managers and residents. Those affected need to reach a consensus on the basic questions of who, what, when, where and how it will be paid for. The scope of your vehicle charging project gives potential contractors a starting point and should include:

- Estimated number of spaces.
- Electric vehicle supply equipment preferences (networked/not networked).
- Suggested location(s).

5. Choose a qualified contractor

When selecting an installer for charging equipment, consider the contractor's experience, licensing, insurance and training, such as the EVSE installation training offered through organizations like the National Electrical Contractors Association, International Brotherhood of Electrical Workers and Underwriters Laboratories.

6. Coordinate on-site evaluation

Your contractor will need to visit the site to answer any remaining questions about project requirements before designing it and providing estimates.

As part of the evaluation, the contractor should calculate power loads with the added charging stations, decide whether existing electric panels need to be upgraded or replaced, and see whether SDG&E needs to upgrade electric service or install new electric meters. The contractor should coordinate with SDG&E's Project Management group for review of the project design and, if necessary, an on-site visit.

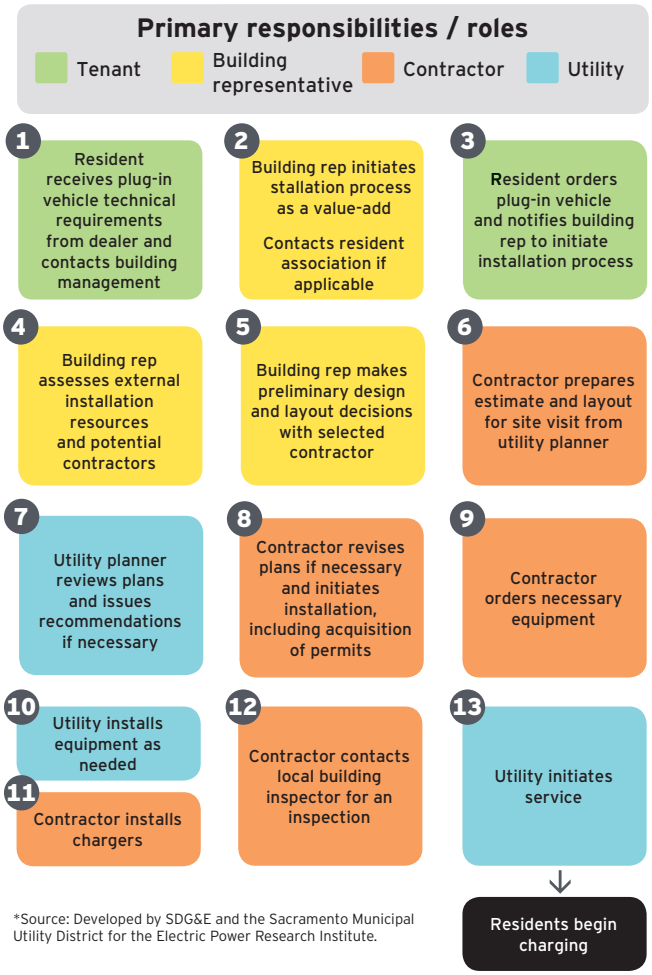
7. Let the installation begin

Once the contractor's price quote is approved, the contractor will order the selected charging stations, obtain any necessary permits, place the utility service order, schedule installation, coordinate the project and arrange for any required inspections by SDG&E and the city.

8. Spread the news

Let residents know where, when and how to use the new charging stations for plug-in electric vehicles.

How to set up plug-in charging at your condo, townhome or apartment*



*Source: Developed by SDG&E and the Sacramento Municipal Utility District for the Electric Power Research Institute.

Connect with more information about plug-in vehicles at *sdge.com/ev* or email *MultiUnit@sdge.com* with your questions, stories and comments about getting multi-unit communities plug-in ready.

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

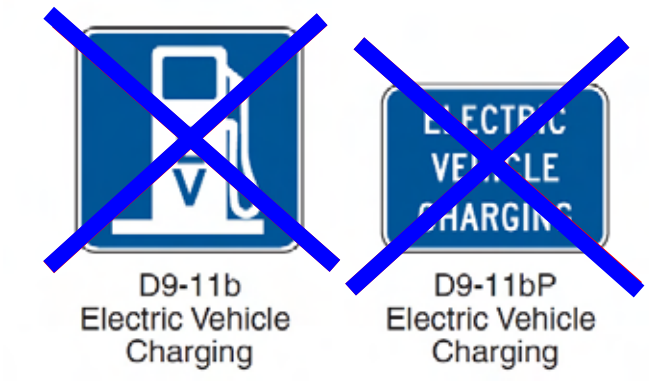


Figure 2I-1 (CA). General Service Signs and Plaques

G66-21B(CA) G66-21C(CA)

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)

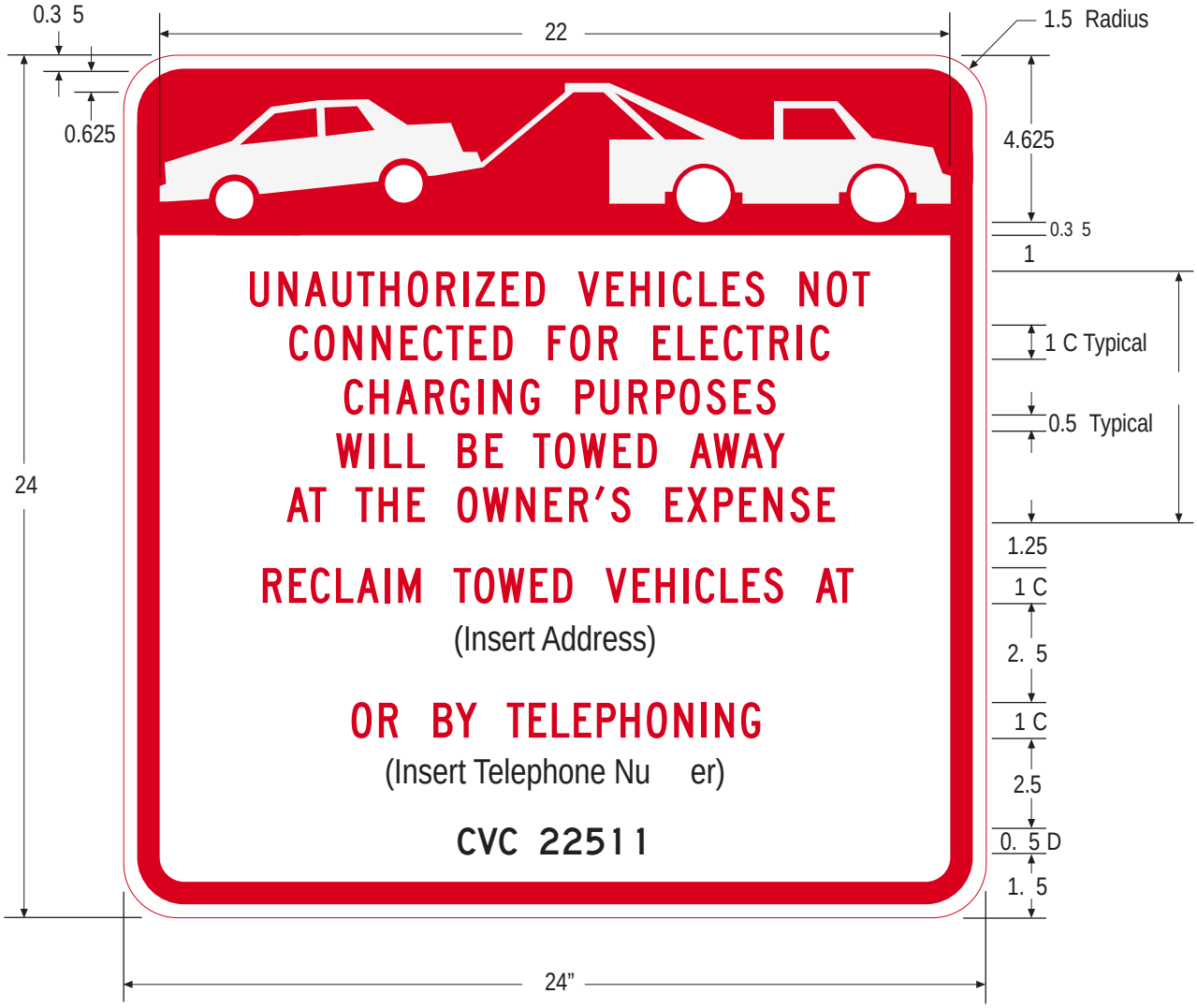
R114A(CA)

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



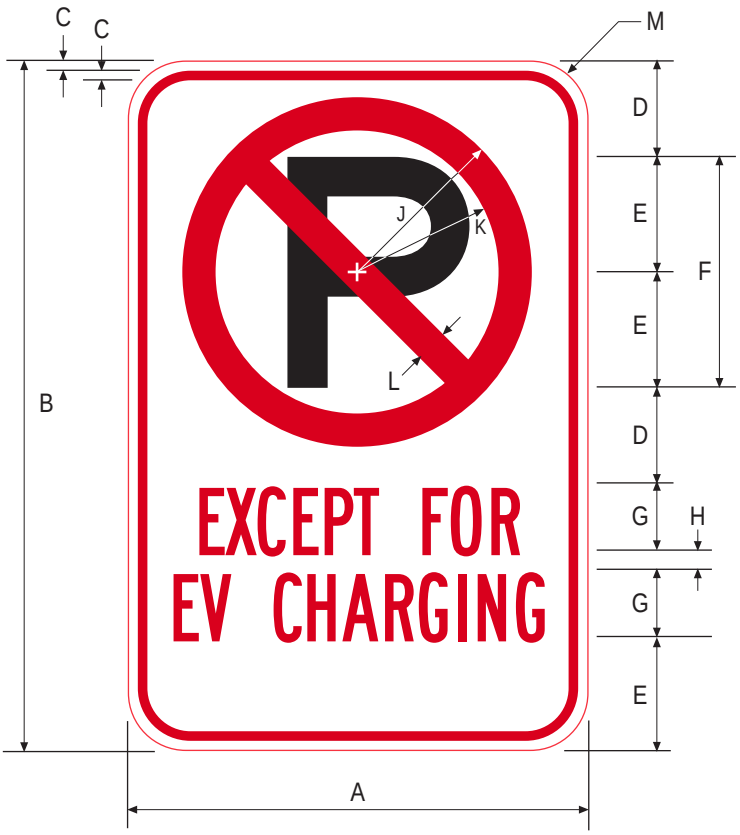
R112 (CA)

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

3/**14**/13

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



R113 (CA)

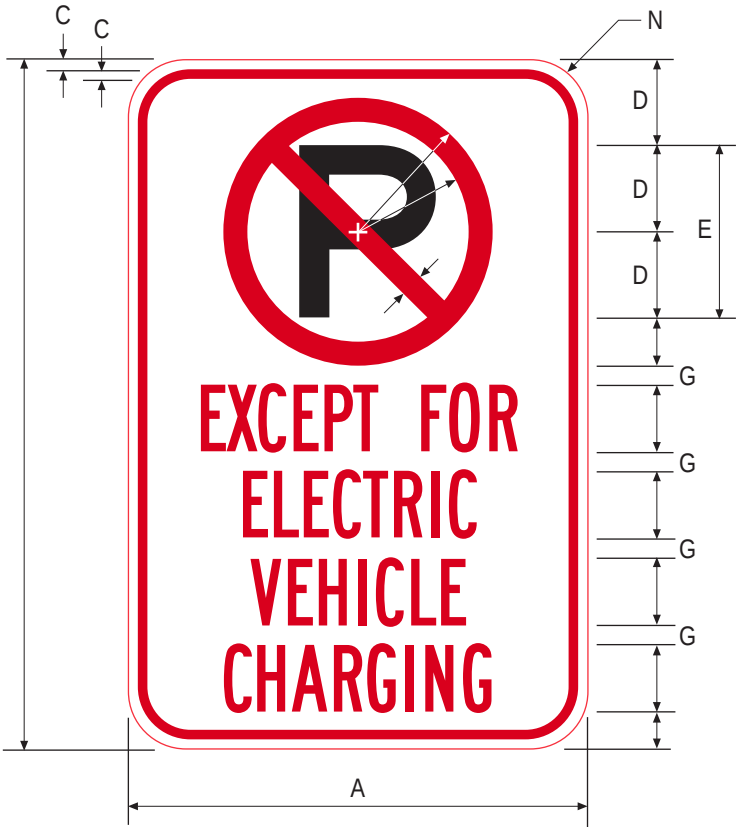
ENGLISH UNITS

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 ORDER C RCLE D A O AL LE E D - RED (RE ROREFLEC E)
LE ER - LAC
AC RO D - E (RE ROREFLEC E)

3 **14** 13

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



R113A (CA)

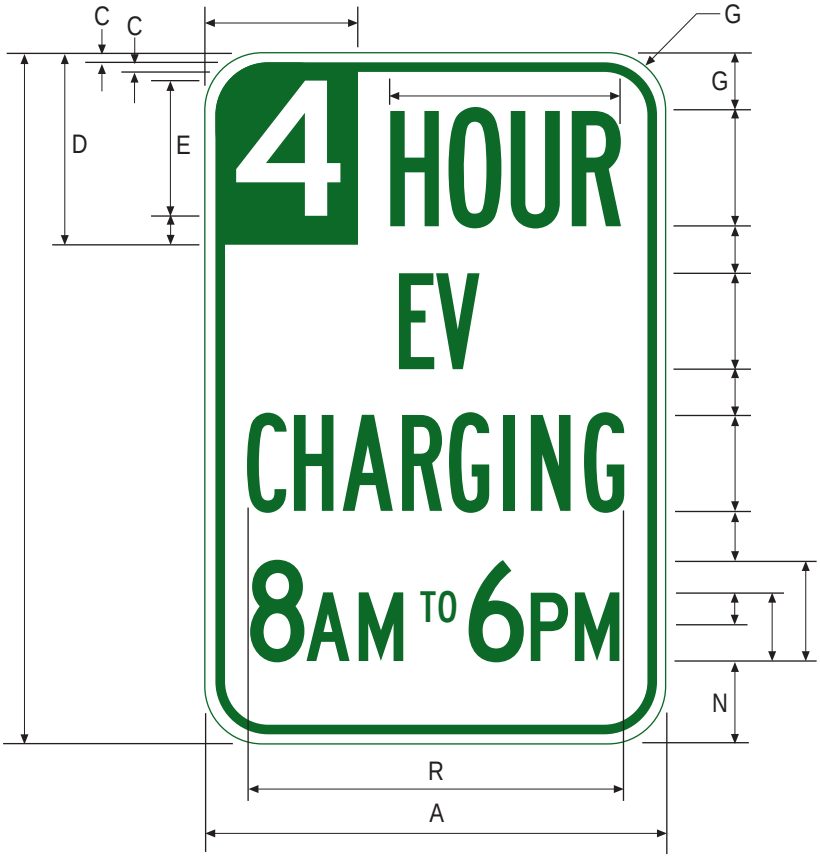
ENG IS UNITS

A		C	D	E		G						N
12	1	.25	2.25	4.5E	1.25	.5	1.75	1	3.5	2. 75	.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.

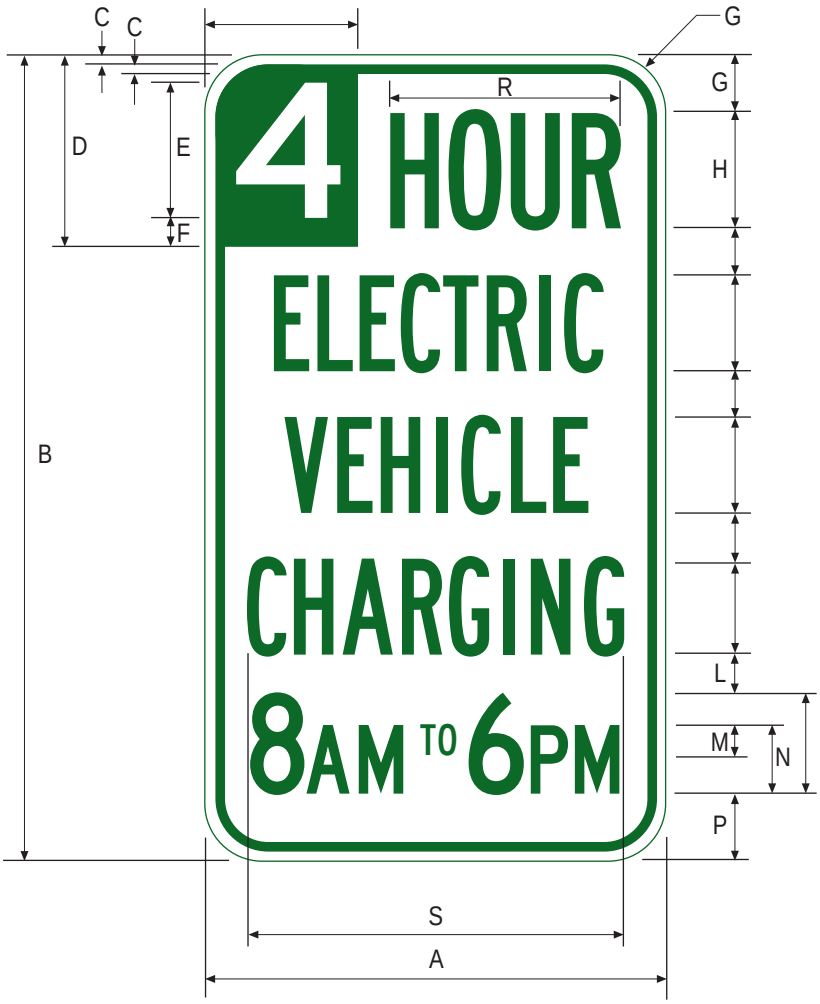
R11 (CA)

ENG IS UNITS

A		C	D	E		G						N			R
12	1	.25	5	3.5D	.75	1.5	3	1.25	2.5C	.75C	1.75C	2.25	4	6	.75

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

3/**14**/13



NOTE: Specify nu er of hours and ti es when ordering.

R11 A (CA)

ENGLISH UNITS

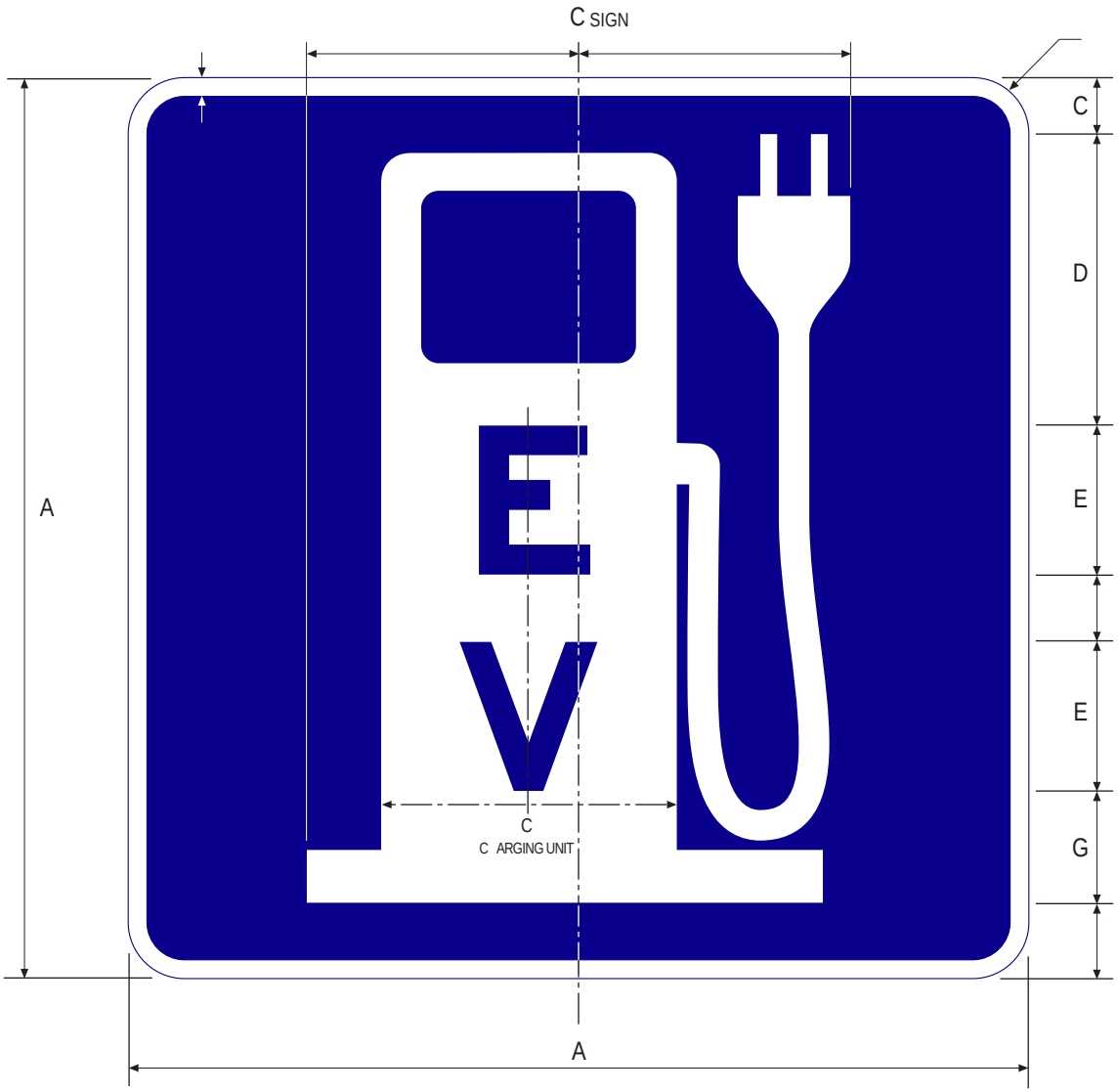
A	B	C	D	E	F	G	H			L	M	N
12	21	.25	5	3.5D	. 5	1.5	3B	1.25	2.5C	1	. 5C	1. 5C

P		R	S
1. 5	4	6	. 5

COLORS ORDER LE E D - REE (RE ROREFLEC E)
AC RO D - E (RE ROREFLEC E)

3 **14** 13

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



Optically space the EV" letters ertically with the charging unit.

- 1 (CA)

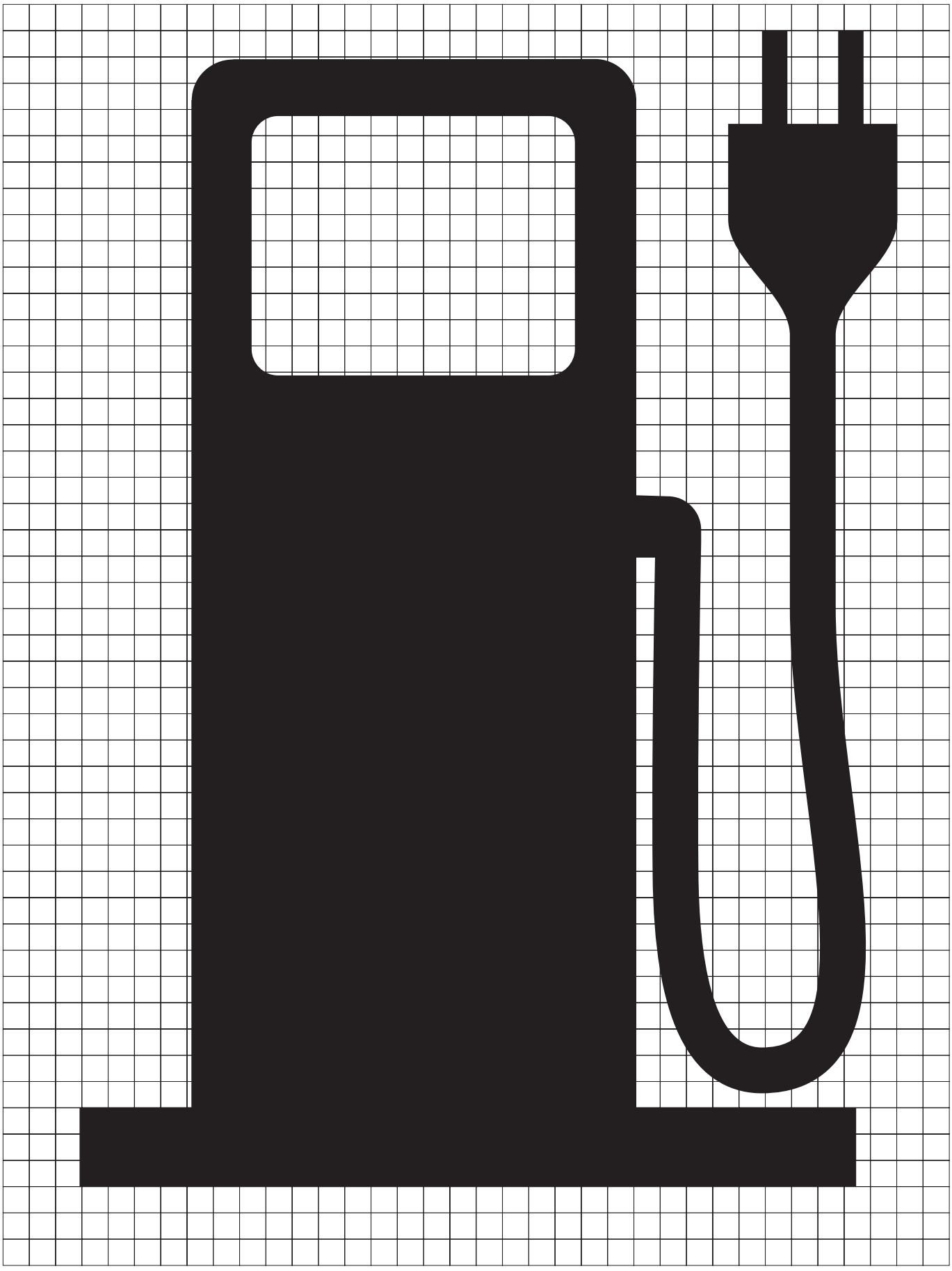
ENG IS UNITS

A		C	D	E		G				
12	.375	.75	3. 75	2E	. 75	1.5	1	10.25	1.5	3.625
1	.375	1.125	5.75	3E	1.375	2.25	1.5	15.375	1.5	5.1625
24	.5	1.5	7.75	4E	1.75	3	2	20.5	1.5	7.25
30	.75	1. 75	.625	5E	2	4	2.5	25.625	1. 75	.063

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

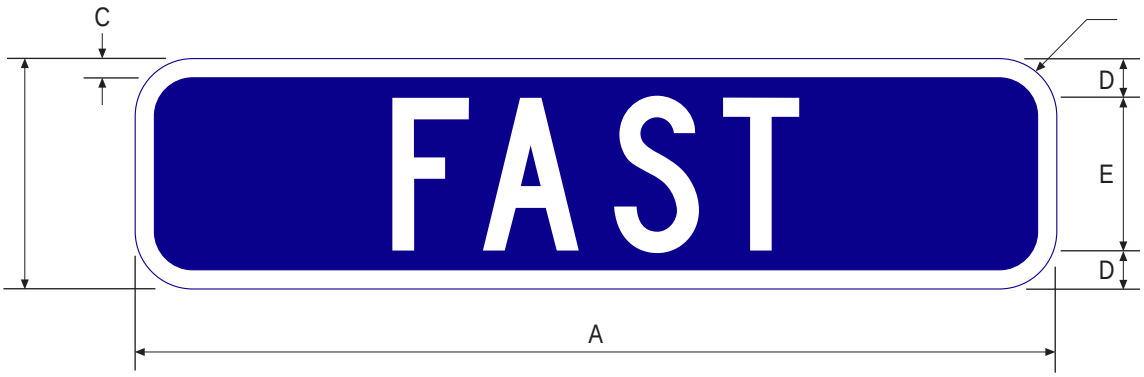
3/**14**/13

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



G66-12B (CA) Grid

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



- 1C (CA)

ENG IS UNITS

A		C	D	E	
12	5	.375	1	3	1.5
1	5	.375	1	3C	1.5
24	6	.5	1	4C	1.5
30		.75	1.5	5D	1. 75

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)

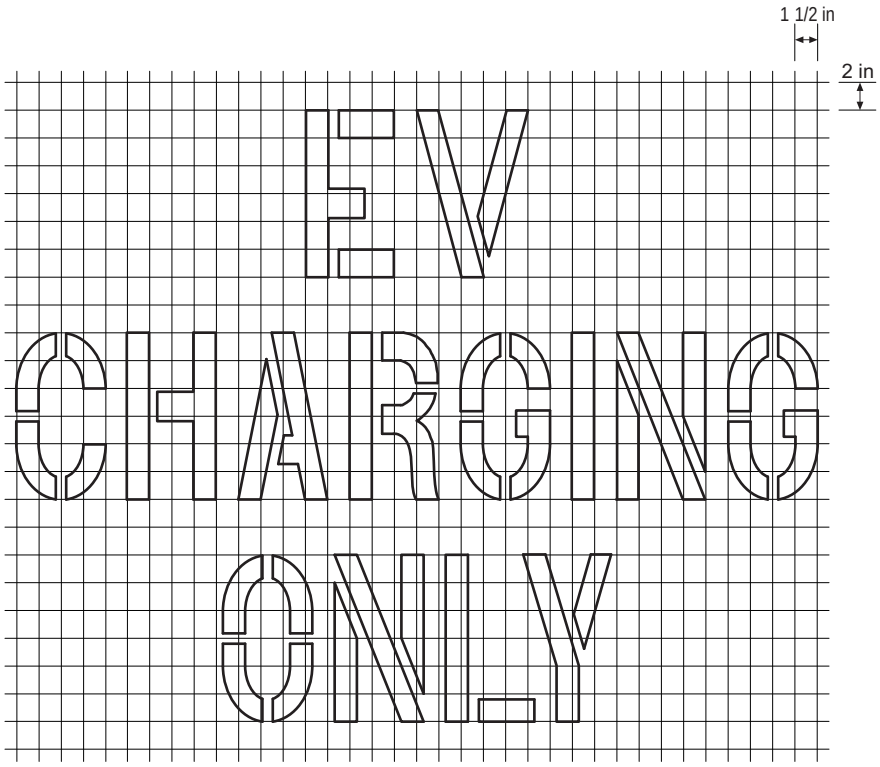
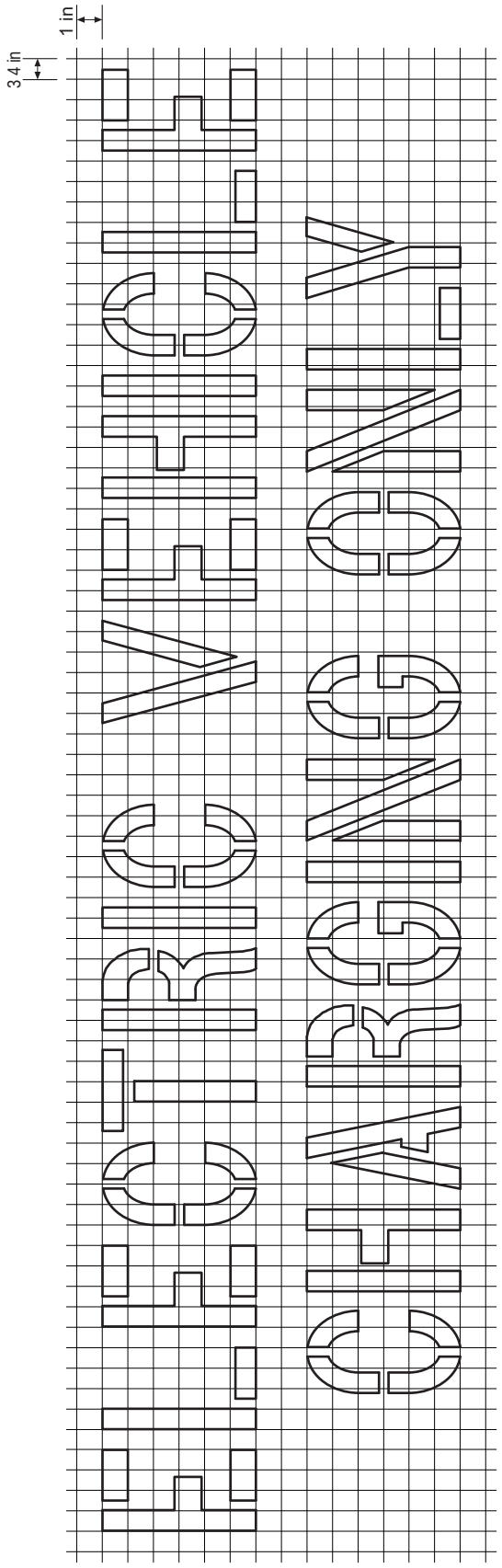


Figure 3B-108 (CA). Electric Vehicle Charging Station Pavement Marking Details (Sheet 2 of 2)



San Diego Regional

PLUG-IN ELECTRIC VEHICLE (PEV) READINESS PLAN

Phase One Regional PEV Assessment

California Center for Sustainable Energy

SECTION 4: ZONING AND PARKING

This section focuses on how zoning and parking ordinances and policies relate to the installation of residential and public PEV charging infrastructure in the San Diego region. The first section identifies potential gaps and areas for improvement in local zoning and parking policies for EVSE from the results the San Diego PEV readiness survey. The next section provides a summary of the actions taken to date regarding addressing accessibility and parking guidelines for PEVs in the San Diego region. The final section provides concise recommendations for zoning and parking polices in the San Diego region based on lessons learned since 2010.

Policy Gaps and Areas for Improvement

Fifteen of the nineteen jurisdictions in the San Diego region completed the zoning and parking section of the PEV readiness survey. Based on the results on this section, we have identified that most of the agencies in the region lack clear zoning and parking policies for EVSE. The table below highlights the results, but it is important to note that only 6% of jurisdictions are in the process of adopting zoning and parking requirements for EVSE.

Participating Jurisdictions in the San Diego Region: **Santee**, **Carlsbad**, **Encinitas**, **Lemon Grove**, **Coronado**, **San Marcos**, **National City**, **Chula Vista**, **Del Mar**, **Poway**, **El Cajon**, **Imperial Beach**, **Oceanside**, **City of San Diego** and **County of San Diego**

Note: The cities of **Encinitas**, **Santee** and **Carlsbad** each had two individuals provide separate responses for their respective jurisdiction. Each of their responses was credited and as such, sometimes municipal staff from the same jurisdiction provided different answers to the same question.

Assessing Zoning and Parking Requirements for EVSE and PEVs

Percent*	Agency Assessment
6%	Agency has already adopted requirements for EVSE that we feel would be a best practice example for the state of California (**City of San Diego**)
6%	Agency is in the process of adopting requirements for EVSE (**Coronado**)
11%	Agency is looking at other agencies' requirements for EVSE to determine what is best for their jurisdiction (**Chula Vista**, **Imperial Beach**)
11%	Agency requires further information to determine requirements for EVSE (**Carlsbad**, **Lemon Grove**)
44%	Agency has only started to consider how to adapt requirements for EVSE (**Encinitas**, **Santee**, **San Marcos**, **Carlsbad**, **Poway**, **Oceanside**, **County of San Diego**)
22%	Agency has not started to look at how to adapt requirements for EVSE (**Santee**, **National City**, **Del Mar**, **El Cajon**)

*All percentages are rounded to the nearest whole number

In addition, it is important to note that most (72%) of the jurisdictions surveyed indicated that current zoning and parking ordinances for EVSE installations do not consider ADA compliance issues. The **City of San Diego**, **Lemon Grove** and separate responses for the cities of **Encinitas** and **Santee** stated that they are considering ADA compliance in current zoning and parking ordinances. Overwhelmingly (89%), jurisdictions said that it would be helpful to have other best practice zoning and parking ordinances available for reference. The **City of Imperial Beach** expressed that a best practice wouldn't be useful because of the lack of public demand for PEV infrastructure to warrant inclusion of zoning and parking requirements for EVSE in the city's municipal code.

Again, while none of the jurisdictions responding to the survey have developed zoning and parking ordinances for EVSE installation, the **City of Santee's** planning department responded that EVSE installations are accommodated by existing ordinances. In addition, the **City of San Marcos** is in the process of conducting a comprehensive zoning ordinance update by the end of 2012 in which zoning and parking ordinances will be amended for EVSE. The **City of Chula Vista** indicated that they were three months from adopting revised zoning and parking ordinances for EVSE, while the **City of Poway** is six months away from implementation. Further, the **City of San Diego** indicated a preference to modify existing zoning and parking ordinances over developing new ordinances specifically for EVSE installations. As a result, they are in the process of updating existing ordinances to reflect any changes that will assist in the deployment of EVSE.

The **City of Imperial Beach** cited that there are too few staff currently employed to include new zoning and parking ordinance for EVSE, but responded that any adopted zoning and parking ordinance for EVSE would likely take one year. Likewise, the **City of Oceanside** stated that any ordinance adoption would take six months to a year. This timeline is highly dependent, however, in that any installation would be contingent on the type of environmental review the project requires. If the public installation is deemed to cause any environmental issues based on the review, the process generally takes up to a year. Otherwise, the typical process will be for the planning commission to submit a proposal to city council that requires approval, which is approximately two months.

Addressing Policy Gaps and Areas for Improvement

While the region lacks consistent PEV zoning and parking policies, there have been two jurisdictions working on developing internal policies. The section below describes the **City of San Diego's** work to address accessibility at PEV charging stations as well as parking guidelines currently under development by the **County of San Diego**. Additionally, this section describes efforts on the state level to develop consistent directional and regulatory signage for PEVs and EVSE.

Addressing Accessibility

On April 19, 2012, the **City of San Diego** released *Technical Policy 11B-1: Accessibility to EV charging stations*, which provides accessibility guidelines for EVSE installations in the city. The guidelines originated with a previous document prepared by the Division of the State Architect developed in 1997 titled *Interim Disabled Access Guidelines for Electrical Vehicle Charging Stations* (see Appendix).

Technical Policy 11B-1 was developed to ensure uniform and consistent enforcement by review and inspection staff. This policy applies to the installation of EVSE in both new and existing construction within the **City of San Diego**. According to the policy, EVSE in nonpublic areas, such as rental car agencies, car dealerships with EVSE, etc., are not required to be accessible.

The results of the San Diego regional PEV readiness survey showed that 89% of jurisdictions polled indicated it would be helpful to have other city or agency PEV infrastructure requirements available for reference. As a result, this policy was distributed to regional PEV stakeholders, including all 19 jurisdictions within the San Diego region.

In May 2012, CCSE contacted each jurisdiction with a call to action to implement the EVSE accessibility guidelines. The overarching goal of distributing these guidelines was to reduce duplicative efforts and catalyze the development of policies that reduce barriers to PEV infrastructure deployment. That said, CCSE personally shared the San Diego Technical Policy 11B-1 with the following municipalities and PEV stakeholders: the City of Long Beach, City of Santa Monica, City of Riverside, PEV Collaborative and the Colorado Clean Cities organization. Additionally, the National Clean Cities Coordinator

distributed the San Diego Technical Policy 11B-1, along with CCSE's recommendations for municipality implementation to Clean Cities groups across the country.

Parking Guidelines

The **County of San Diego** is in the process of updating their parking design guidelines to the county planning commission. A subsection of the document speaks to the Clean Air Vehicle Parking standard for new nonresidential uses as it complies with the California Green Building Standards Code (CGBSC). The ordinance strictly refers to the CGBSC for guidance. In addition, the PEVC toolkit, developed through collaboration between the California PEV Collaborative and six regions across the state, also references the CGBSC code as a best practice that jurisdictions should follow. Specifically, the CGBSC states that new construction should provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles, including PEVs for up to 10% of total designated parking spaces.

EVSE Signage

While not regional, it is important to recognize an effort on the state level to develop more consistent signage for PEVs. In an effort to accomplish this goal, the California Department of Transportation, Sonoma County Department of General Services and the California PEV Collaborative have developed a proposal to add five signs, one plaque and an optional pavement marking to the 2012 edition of the *California Manual on Uniform Traffic Control Devices* (CA MUTCD). This effort is tied directly to Governor Brown's Zero Emission Vehicle Executive Order, which has a goal of reaching 1.5 million PEVs and fuel cell vehicles by 2025.

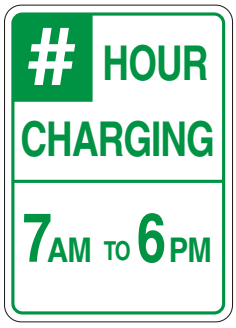
These signs are categorized into regulatory and general service signs. Examples of the new signs and are included to the right.

Regulatory Signs

PEV Tow-Away Symbol: This sign indicates that vehicles will be towed if not utilizing the available charging station (per CVC 21511). This sign will include the tow-away symbol with the following language "UNAUTHORIZED VEHICLES NOT CONNECTED FOR ELECTRIC CHARGING PURPOSES WILL BE TOWED AWAY AT THE OWNER'S EXPENSE . . ." with red text on a white background and be 24" x 24".

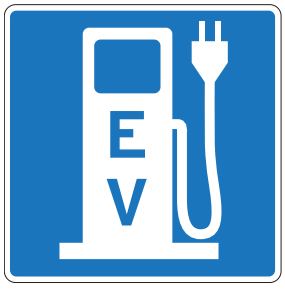
No Parking Symbol: This sign indicates no parking unless for charging a PEV. This will include the following language "EXCEPT FOR ELECTRIC VEHICLE CHARGING" with red text on a white background and be 12" x 18".

Permissive Charging Symbol: This sign indicates the time that charging will be available and will include the following language "[Electric Vehicle] __ HOUR CHARGING - __AM TO __PM" with green text on a white background and be 12" x 18".

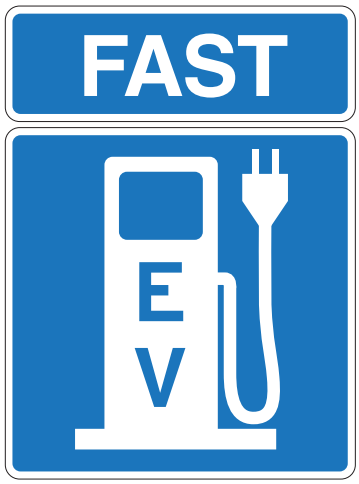


General Directional Signs

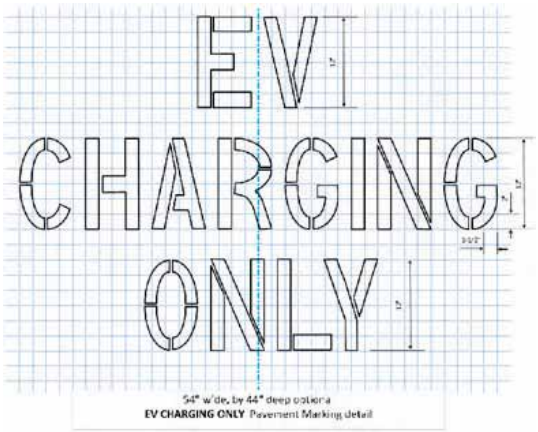
Electric Vehicle Charging Station Symbol and Word Message Signs: These signs will assist in directing PEV drivers to charging stations from the freeway, local streets and at charging locations. The sign includes the EV charging station symbol (shown) or the following text "ELECTRIC VEHICLE CHARGING STATION" with white text on blue background. Sign sizes should be 30" x 30" for freeway or major arterial highway application, 24" x 24" for local streets, and 18" x 18" off-street parking application.



FAST Electric Vehicle Charging Station: This plaque indicates the charging station is capable of a charge in less than one hour (faster charge compared to a Level 2 station). The sign will include the language "FAST" in white text on a blue background and be 24" x 6" or 30" x 8". This plaque is for use only with the Electric Vehicle Charging station symbol and word message.



Optional EV charging Pavement Marking: This pavement marking will indicate a parking space is for EV charging only for on- and off-street electric vehicle charging station stalls. The pavement marking will include the following language "EV CHARGING ONLY" in white text.



54" wide, by 44" deep optional
EV CHARGING ONLY Pavement Marking detail

Recommendations for Regional Next Steps

Based on feedback from the PEV readiness survey, we have identified that there is a lack of clear policies focused on zoning and parking for EVSE. Further, jurisdictions across the region are interested in receiving information on how other agencies have developed these policies. During the past year, regional stakeholders have begun to address some of the issues that are highlighted in the previous section. However, there are additional areas where clear guidance is needed.

Through the lessons learned in San Diego and a review of national and state best practices, we have identified a concise list of zoning and parking policies for jurisdictions to implement throughout the San Diego region. These recommendations are focused on parking accessibility, signage and enforcement. Please note that a complete list of best practices reviewed in preparation of this plan is included in the zoning and parking section of the Appendix.

EVSE Parking Accessibility

Recommendation: Utilize the City of San Diego *Technical Policy 11B-1* as policy for installing accessible charging equipment.

Benefits: Provides a simple template for adopting accessible zoning and parking guidelines for PEVs and EVSE. This makes available three options that will ultimately lower the cost of installation for installers and EVSE hosts. This policy also leverages guidelines developed by the Division of the State Architect and 2010 California Building Code (CBC) that requires accommodations and services to be made accessible to persons with disabilities.

As mentioned previously, a complete description of City of San Diego Technical Policy 11B-1 specifications for disabled accessible EV charging stations and requirements can be found in the Appendix.

Consistent General Service and Regulatory Signage

Recommendation: Collectively adopt across the San Diego region, the general service and regulatory PEV signage recommended by the California Department of Transportation, the California Plug-in Electric Vehicle Collaborative and the County of Sonoma amendments to the 2012 edition of the *California Manual on Uniform Traffic Control Devices*.

Benefits: Standardizing signs for PEV parking across the San Diego region will decrease costs, create uniformity and align the region. This signage was based on signage currently endorsed by the state and the U.S. Department of Transportation Federal Highway Administration (FHWA). Aligning regional signage policy with state and federal efforts, allows for more consistent signage and less confusion for PEV drivers.

Update Municipal Zoning Language for Dedicated PEV Parking

Recommendation: Incorporate PEV parking requirements in public, private and government facilities based on market growth of PEVs in the region. Further, municipalities should leverage "Hawaii State Plug-in Electric Vehicle Parking Requirement" and update their zoning ordinances to reflect the following language.

Updated zoning language to be adopted:

All public, private and government parking facilities that are available for use by the general public and that include at least 100 parking spaces must designate at least the number of parking spaces outlined in the table below specifically for the use of PEVs. The spaces designated for PEVs will continue to increase by 1% for each additional 5,000 registered PEVs until the percentage reaches 10%.[14]

Total Number of Parking Spaces	Number of Required PEV Spaces
1 – 50	1
51 – 200	2
201 and over	4

[14] Alternative Fuels & Advanced Vehicles Data Center. (2011 June 15). Hawaii Incentives and Laws for EVs. Retrieved from http://www.afdc.energy.gov/afdc/laws/laws/HI/tech/3270

Benefits: Provides certainty in the marketplace that there will be dedicated parking spaces for PEVs. The addition of the market threshold provision ensures that enforcement policies are enacted when there is sufficient demand for public charging in the region.

Regional Parking Enforcement Policy for PEVs

Recommendation: Leverage the City of Santa Monica's parking enforcement policy as amended in 2002 to develop a PEV parking enforcement policy in all PEV-designated spots for jurisdictions in the San Diego region. However, enforcement of PEV charging should begin once the number of registered PEVs reaches 5,000 throughout the San Diego region.

Code language to be adopted:

No person shall park or leave standing any nonelectric vehicle in any parking space equipped with an electric vehicle charger. (Based on City of Santa Monica 3.12.835 Electric vehicle parking: Amended by Ordinance 2037CCS §1, adopted 2/26/02.)

Benefits: Provides certainty in the marketplace that PEV charging stations will be reserved for PEV drivers. The addition of the market threshold provision ensures that enforcement policies are enacted when there is sufficient demand for public charging in the region.

APPENDIX

Plug-in Electric Vehicle (PEV) Readiness Planning Best Practices

Complied by the California Center for Sustainable Energy (CCSE)

Zoning and Parking

Throughout California, the US and Canada, a number of cities have implemented electric vehicle supply equipment (EVSE) installation zoning ordinances in an effort to promote the deployment of PEVs and charging infrastructure. The following section provides a brief description of policies and mandates that other cities and states have implemented in regards to parking capacity regulations for PEVs and other alternative-fuel vehicles, parking enforcement procedures for spaces with electric vehicle infrastructure and accessibility standards for PEV parking.

Best Practices

Parking Capacity

Los Angeles County
Designated parking 8% for any combination of low emitting, fuel-efficient, and carpool/van pool vehicles. The parking provider must make available appropriate marking or signs.

California Green Building Standards Code
A5.106.6 Parking Capacity. Design parking capacity to meet but not exceed minimum local zoning requirements.

A5.106.6.1 Reduce parking capacity. With the approval of the enforcement authority, employ strategies to reduce on-site parking area by

1) Use of on street parking or compact spaces, illustrated on the site plan or
2) Implementation and documentation of programs that encourage occupants to carpool ride share or use alternate transportation.

California Green Building Standards Code
Nonresidential Mandatory Measures
5.106.5.2 Designated parking. Provide designated parking for any combination of low emitting, fuel-efficient and carpool/van pool vehicles, including PEVs for up to 10% of total designated parking spaces.
5.106.5.2.1 Parking stall marking. Paint, in the paint used for stall striping, the following characters such that the lower edge of the last word aligns with the end of the stall striping and is visible beneath a parked vehicle.

City of Vancouver, British Columbia, Canada
13.2.1. Electric Vehicle Charging
13.2.1.1. Parking Stalls
1) Each one of the 20% of the parking stalls that are for use by owners or occupiers of dwelling units in a multi-family building that includes three or more dwelling units, or in the multi-family component of a mixed use building that includes three or more dwelling units must include a receptacle to accommodate use by electric vehicle charging equipment.

State of Hawaii
Hawaii State Legislature passed Act 156, the "Hawaii State Plug-in Electric Vehicle Parking Requirement."
The law states:

All public, private, and government parking facilities that are available for use by the general public and that include at least one hundred parking spaces must designate at least 1% of the spaces specifically for EVs by December 31, 2011. The spaces

designated for EVs will continue to increase by 1% for each additional 5,000 registered EVs until the percentage reaches 10%.[1]

This law was revised in 2012 to Act 089 or SB 2747 to require that:

Places of public accommodation with at least 100 parking spaces available for use by the general public designate at least one space for the exclusive use of EVs, and are equipped with an EV charging system by July 1, 2012.[2]

Parking Enforcement

City of Santa Monica
3.12.835 Electric vehicle parking: The Director of Planning and Community Development, or his or her designee, is authorized to designate parking spaces or stalls in an off-street parking facility owned and operated by the City of Santa Monica or the Parking Authority of the City of Santa Monica for the exclusive purpose of charging and parking a vehicle that is connected for electric charging purposes. (Adopted at City Council Meeting 07/24/2012)[3]

Accessibility

The City of San Diego
Technical Policy 11B-1: Accessibility to Electric Vehicle Charging Stations: The City of San Diego requires public accommodations and services be made accessible to persons with disabilities. Technical Policy 11B-1 requires that a ratio of parking spaces with EVSE in existing or new construction be accessible. A full detail of the specifications for disabled accessible EV charging stations and requirements can be found below.

County of Sonoma
Electric Vehicle Charging Station Program and Installation Guidelines[4]
Existing Parking Facilities
The first charger may also be installed at an existing accessible parking space that is also part of the required number of accessible stalls for that parking lot; provided signage clarifies that this stall can be used for accessible parking and/or electric vehicle charging by vehicles displaying a DP placard or license plate.

New Buildings, Site Construction or Redevelopment
When EVSE are planned as part of a new building, a redevelopment or major site reconstruction at least one EVSE in ten (10) shall comply with the accessibility requirements in the C.B.C. Title 24 and A.D.A. The one in ten ratio is not an A.D.A. requirement, but one developed by the County of Sonoma "Permit and Resource Management Department." When equipped with card readers, the C.B.C. requires the first two EVSE to be accessible.

Signage for PEV Parking

U.S. Department of Transportation Federal Highway Administration (FHWA)
EV Charging General Service Symbol Sign: The United States FHWA adopted the General Service symbol at the request of the Oregon and Washington Departments of Transportation. The PEV Collaborative supports the use of standardized signs to minimize confusion and provide the greatest ease of use for PEV drivers. To this end, the Collaborative recommends that Cal Trans adopt 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 will ultimately be approved at the federal level and become the uniform standard nationally.

Proposal to the California Manual on Uniform Traffic Control Devices

[1] Alternative Fuels & Advanced Vehicles Data Center. (2011 June 15). Hawaii Incentives and Laws for EVs. Retrieved from http://www.afdc.energy.gov/afdc/laws/laws/HI/tech/3270
[2] Ibid
[3] http://www.smgov.net/departments/council/agendas/2012/20120724/s2012072407-A-1.htm
[4] http://www.sonoma-county.org/prmd/docs/misc/ev_prog_guidelines.pdf

The California Department of Transportation, Sonoma County Department of General Services, and, the California Plug-In Electric Vehicle Collaborative requested that the following 5 new signs, 2 updated sign codes for existing signs; and, optional pavement markings be considered for the *California Manual on Uniform Traffic Control Devices, 2012 edition* (CA MUTCD) for Electric Vehicle Charging Station locations. Examples of the new signs and updates are included below:

Regulatory Signs

PEV Tow-Away Symbol: This sign indicates that vehicles will be towed if not utilizing the available charging station (per CVC 21511). This sign will include the tow-away symbol with the following language "UNAUTHORIZED VEHICLES NOT CONNECTED FOR ELECTRIC CHARGING PURPOSES WILL BE TOWED AWAY AT THE OWNER'S EXPENSE . . ." with red text on a white background and be 24" x 24".

No Parking Symbol: This sign indicates no parking unless for charging a PEV. This will include the following language "EXCEPT FOR ELECTRIC VEHICLE CHARGING" with red text on a white background and be 12" x 18".

Permissive Charging Symbol: This sign indicates the time that charging will be available and will include the following language "[Electric Vehicle] __ HOUR CHARGING - __AM TO __PM" with green text on a white background and be 12" x 18".

General Directional

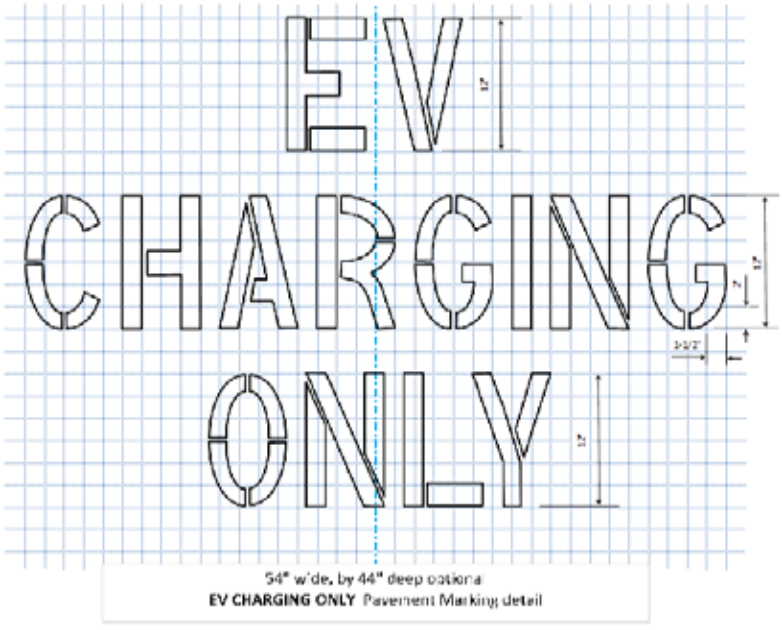
Electric Vehicle Charging Station symbol and word message signs: These signs will assist in directing PEV drivers to charging stations from the freeway, local streets and at charging locations. The sign includes the EV charging station symbol (shown) or the following text "ELECTRIC VEHICLE CHARGING STATION" with white text on blue background. Sign sizes should be 30" x 30" for freeway or major arterial highway application, 24" x 24" for local streets, and 18" x 18" off-street parking application.

Electric Vehicle Charging Station
Symbol Sign

ELECTRIC VEHICLE CHARGING STATION
Word Message Sign

FAST Electric Vehicle Charging Station: This plaque indicates the charging station is capable of a charge in less than one hour (faster charge compared to a Level 2 station). The sign will include the language "FAST" in white text on a blue background and be 24" x 6" or 30" x 8". This plague is for use only with the Electric Vehicle Charging station symbol and word message.

Optional EV charging Pavement Marking**:** This pavement marking will indicate a parking space is for EV charging only for on- and off-street electric vehicle charging station stalls. The pavement marking will include the following language "EV CHARGING ONLY" in white text



City of San Diego Technical Policy 11B-1 Specifications and Requirements:

New Construction: The accessible EV charging station(s) must be located in close proximity (DSA recommends within 200 ft.) to a major facility, public way or a major path of travel on the site. This policy is in conjunction with new buildings or parking facilities such as surface parking lots or parking garages.

Existing Sites: An accessible path of travel connecting the accessible EV charging station to a major facility, public way or major path of travel on the site is required to the extent that the cost of providing such path does not exceed 20% of the cost of the EV equipment and installation of all EV charging stations at the site over a three-year period.

Number of Accessible EV Charging Stations Required: When the number of EV charging stations proposed exceeds 25, they shall be provided at a rate of one accessible EV charging station for every 25 stations proposed. Not more than a total of 4 accessible EV charging stations are required on the same site.

Identification for Accessible EV Charging Stations: To identify an accessible EV charging station an informational sign must be posted which reads, "Parking for EV Charging Only; This Space Designed for Disabled Access; Use Last." When an EV charging station is placed in conjunction with an accessible parking space this sign shall be omitted.

Dimensions for Accessible EV Charging Stations: The charging equipment, and when applicable card readers, must meet all applicable reach range provisions of CBC Section 1118B and Ch. 11C for a 30 by 48 inch wheelchair space used for side or front approach. (ii) A clear path of travel measuring not less than 36 inches in clear width shall be provided to access the charging equipment.

The EV charging station shall include a space to place the electric vehicle that is not less than 9 foot wide by 18 feet deep to accommodate the vehicle. The space shall also include a 5 ft. wide access aisle that extends the full depth of the vehicular space and located on the passenger side of the vehicle. Alternatively, the access aisle can be located between an accessible parking space and an accessible EV charging station. See figures 1, 2 and 3 for possible configurations.

Figure 1. Diagram of an EV charging station in an ADA accessible spot and a regular space.

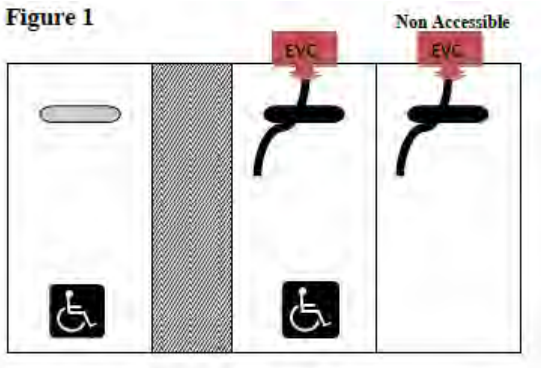


Figure 2. Diagram of an EV charging station installed in the ADA accessible spot, but with charging access in the ADA space and regular space.

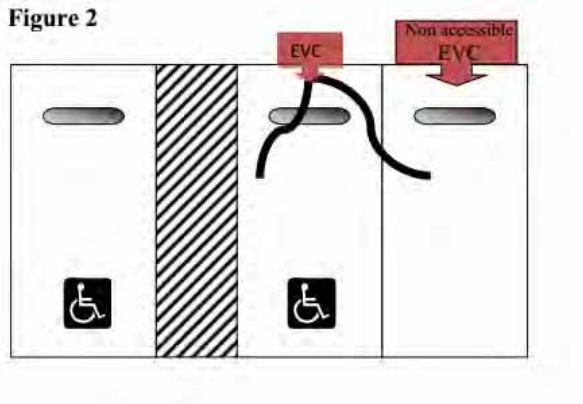
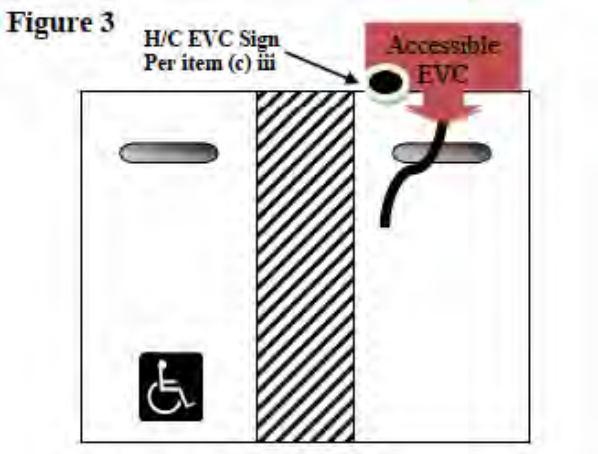


Figure 3. Diagram of one accessible EV charging station that is not designated as an ADA spot but designed to accommodate ADA requirements. In this case there needs to be signage that states "Parking for EV Charging Only; This Space Designed for Disabled Access; Use Last."



Issue Date: April 19, 2012
http://www.sandiego.gov/development-services/industry/pdf/tpolicy11b1.pdf
City of San Diego Development Services, Division of Building, Construction & Safety

STATE OF CALIFORNIA
GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

EDMUND G. BROWN JR.
GOVERNOR

KEN ALEX
DIRECTOR

Plug-In Electric Vehicles: Universal Charging Access Guidelines and Best Practices

These draft guidelines have been developed in conjunction with the Division of the State Architect (DSA) to assist the Governor's Office of Planning and Research with physical accessibility standards and design guidelines for the installation of plug-in electric vehicle charging stations throughout California. This initiative supports the Governor's Zero Emission Vehicle Executive Order, B-16-2012, which establishes a target of 1.5 million ZEVs in California by 2025.

These guidelines are intended to supersede and expand upon the current DSA "Interim Disabled Access Guidelines for Electric Vehicle Charging Stations 97-03", dated 5 June 1997. While 97-03 is a policy statement and only applicable to facilities under DSA's regulatory jurisdiction, it is possible that these voluntary 2013 guidelines will eventually become regulations within *California Building Code Chapter 11B Accessibility to Public Buildings, Public Accommodations, Commercial Buildings and Public Housing*.

For clarity and usability, the guidelines and any subsequent regulations should reflect the format and organization of the California Building Code. The 2013 Chapter 11B accessibility provisions use the Americans with Disabilities Act Guidelines as their model code with amendments to implement more stringent California specific requirements. These draft guidelines use the same format and are organized with separate scoping and technical provisions. The designation EVG (for Electric Vehicle Guidelines) is used as a prefix for the guideline provisions and the prefix 11B is used before sections from the 2013 California Building Code's accessibility provisions. These Guidelines are focused on physical accessibility standards and information about Section 508 of the Rehabilitation Act for Self-Contained Closed System Products will be provided in future guidance.

The guidelines address accessible plug-in electric vehicle charging stations on both public and private sites and within public rights of way. Making charging stations within public rights-of-way fully accessible can be challenging, as illustrated by the examples in the Plug-in Electric Vehicle Collaborative's "Accessibility and Signage for Plug-in Electric Vehicle Charging Infrastructure Report and Recommendations" of May 2012. Similar provisions from the proposed federal Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way related to parking have been adapted as the basis for on-street installations. Signage and identification of the accessible electric vehicle charging stations is raised but not yet fully resolved in this public draft.

Dennis J. Corelis, Deputy State Architect
Division of the State Architect

Table of Contents

Guidelines for the Provision of Electric Vehicle Charging Stations

The following scoping sections of these guidelines are designed to present best practices for electric vehicle charging station accessibility and eventually may become part of the California Building Code's Chapter 11B Division 2: Scoping Requirements.

ADVISORY: EVG-250 Electric Vehicle Charging Stations. A reasonable portion of Electric Vehicle Charging Stations are required to be accessible. If provided by a state or local government on public property or on-street within the public right of way, vehicle charging is considered a program or service that must be accessible to and useable by individuals with disabilities. Accessibility covers not just the physical dimensions of the charging station, and operable parts of the device, but also the functionality of the 'self-contained, closed product' charging system. If provided at privately owned or operated public accommodations they must also be accessible as a service provided to the general public.

EVG-250 Electric Vehicle Charging Stations

ADVISORY: EVG-250.1 General. While there is no positive requirement to provide electric vehicle charging stations, when they are provided a portion of them should be accessible. When co-located with parking spaces, electric vehicle charging is considered the primary function of these stations, not parking. Accessible electric vehicle charging stations are not to be reserved exclusively for the use of persons with disabilities. They should not be identified with signage that would mistakenly indicate their use is only for vehicles with placards or license plates for individuals with disabilities.

EVG-250.1 General

Where provided, electric vehicle charging stations shall comply with EVG-250.

EXCEPTION: Restricted Electric Vehicle Charging Stations not available to the general public and intended for use by a designated vehicle or driver, such as public or private fleet vehicles, vehicles assigned to an employee or by an electric vehicle owner at home may but shall not be required to comply with EVG-250 and EVG-812.

ADVISORY: EVG-250.1 General. Existing conditions, terrain, electric infrastructure and other factors dictate that not every electric vehicle charging station can be fully accessible. With electric vehicle charging stations being functionally similar to and usually integrated with parking, the ratios of accessible to standard electric vehicle charging stations in these guidelines are the same as those for accessible to standard parking in the 2010 ADA standards and the 2013 California Building Code. The numbers of required accessible electric vehicle charging stations for both on-site and public rights-of-way locations are shown in Tables EVG-250.2 On-site Electric Vehicle Charging Stations and EVG-250.3 On-street Electric Vehicle Charging Stations.

EVG-250.2 Minimum Number for On-site Locations
On publically owned or privately owned sites electric vehicle charging stations complying with EVG-812 shall be provided in accordance with Table EVG-250.2.

Table EVG-250.2 On-Site Electric Vehicle Charging Stations

Total Number of Electric Vehicle Charging Stations Provided at a Site	Minimum Number of Required Physically Accessible Electric Vehicle Charging Stations
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 and over	4, plus 2 for each 100, or fraction thereof, over 100

EVG-250.2.1 Minimum Number for Residential Facilities
Electric vehicle charging stations to serve residential facilities and sites shall comply with EVG-250.2.1.

EVG-250.2.1.1 Electric Vehicle Charging Stations for Residents
Where at least one parking space is provided for each residential dwelling unit and electric vehicle charging services are provided in conjunction with that parking, five percent, but no less than one, of the electric vehicle charging stations provided shall comply with EVG-812.

EVG-250.2.1.2 Additional Electric Vehicle Charging Stations for Residents
Where additional parking spaces beyond one for each residential dwelling unit is provided and electric vehicle charging services are provided in conjunction with that parking, two percent of the additional parking spaces, but no fewer than one, of the additional electric vehicle charging stations provided shall comply with EVG-812.

EVG-250.2.1.3 Electric Vehicle Charging Stations for Guests, Employees and Other Non-Residents
Where parking spaces are provided for persons other than residents and electric vehicle charging services are provided in conjunction with that parking, electric vehicle charging stations for guests, employees and other non-residents shall be provided in accordance with Table EVG-250.2 and shall comply with EVG-812.

EVG-250.3 Minimum Number for On-Street Locations
Within the public right-of-way of a state or local government jurisdiction on-street electric vehicle charging stations complying with EVG-812 shall be provided in accordance with Table EVG-250.3.

Table EVG-250.3 On-Street Electric Vehicle Charging Stations

Total Number of Electric Vehicle Charging Stations Provided within a Jurisdiction's Public Right of Way	Minimum Number of Required Physically Accessible Electric Vehicle Charging Stations
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 and over	4, plus 2 for each 100, or fraction thereof, over 100

EVG-250.4 Electric Vehicle Charging Stations for Vans. Reserved.

ADVISORY: EVG-250.4 Electric Vehicle Charging Stations for Vans. The guidelines do not include provisions for van accessible electric vehicle charging stations. As of the date of these guidelines there are no plug-in electric vans being manufactured and providers of electric plug-in vehicle conversions indicate that van style vehicles are not currently available due to technical and cost factors. When future developments make electric plug-in vans feasible, provisions for van accessible electric vehicle charging stations can be included in the guidelines.

EVG-250.5 Locations

Electric Vehicle Charging Stations shall be located in compliance with EVG-250.5.

ADVISORY: EVG-250.5 Location. For new construction, accessible electric vehicle charging stations should be close to a major facility, public way or accessible route on the site, with 200 feet recommended as a maximum distance. However, electric vehicle charging stations need not be provided immediately adjacent to the facility since charging services, not parking, is their primary purpose. For installations at existing sites and locations, the accessible electric vehicle charging stations may not be located in close proximity to other services due to technical factors such as the availability of electric power or terrain, but they should be on an accessible route to the maximum extent feasible.

EVG-250.5.1 On-Site Locations

Electric vehicle charging stations on public and private sites shall be dispersed within each separate type of parking facility providing electric vehicle charging to the maximum extent feasible.

EVG-250.5.1.1 Proximity to Buildings, Facilities or Sites Served

Electric vehicle charging stations complying with EVG-812 that serve a particular building, facility or site shall be located in close proximity to the facility, public way or major circulation path on the site.

EVG-250.5.1.2 Proximity to Accessible Routes
Electric vehicle charging stations complying with EVG-812 that serve a particular building, facility or site shall be on an accessible route to an entrance complying with 11B-206.4 of the current edition of the California Building Code. Electric vehicle charging stations that do not serve a particular building or facility shall be on an accessible route to an accessible pedestrian entrance to the functional area within which they are located.

ADVISORY: EVG-250.5.2 On-Street Locations. Provision of fully accessible on-street electric vehicle charging stations within the public right of way can be very difficult due to constraints posed by terrain, available right of way and other factors. The technical requirements for accessible parking, when applied electric vehicle charging stations, can be in direct conflict with roadway and sidewalk grades, right-of–way widths, and functional requirements for curbs, gutters and other right of way improvements. While many of these issues can be addressed during new construction or re-construction of the public improvements, solutions providing full accessibility may not be possible. EVG-250.5.2 allows a public entity to provide accessible electric vehicle charging on a programmatic basis. This involves using additional on-site accessible electric vehicle charging stations to meet the combined requirements for the number of both on-street and on-site locations within the public entity's jurisdiction.

EVG-250.5.2 On-Street Locations Within a Public Right-of-Way
The required total number of electric vehicle charging stations complying with EVG-250.2 and EVG-250.3 may be provided on a combined basis using both on-site locations and on-street locations within a public right-of-way owned or controlled by a state or local governmental jurisdiction. On-street **e**lectric vehicle charging stations within the public right of way shall be integrated with on street parking to the maximum extent feasible.

EVG-250.5.3 Accessible Route Between Vehicle Space and Charging Equipment
An accessible route complying with the California Building Code Chapter 11B Division 4 Accessible Routes shall connect the electric vehicle charging station vehicle space to the electric vehicle charging equipment.

EVG-250.6 Electric Vehicle Charging Stations at Existing Facilities

Alterations solely for the purpose of installing electric vehicle charging stations shall be limited to the actual scope of work of the project and shall not be required to comply with section 11B-202.4 of the current edition of the California Building Code.

EXCEPTION: Alterations solely for the purpose of installing electric vehicle charging stations at sites where vehicle parking or storage is the sole and primary use of the facility shall comply with the 2013 California Building Code section 11B-202.4 Path of Travel Requirements in Alterations, Additions and Structural Repairs to the maximum extent feasible. The cost of compliance with 11B-202.4 shall be limited to twenty percent of the cost of the work directly associated with the installation of the electric vehicle charging equipment.

ADVISORY: EVG-250.6 Electric Vehicle Charging Stations at Existing Facilities. The majority of electric vehicle charging stations being installed in the foreseeable future will occur at existing on-site or on-street parking facilities where the source of electric power, location of accessible parking, natural terrain, landscaping and other features are existing. Under the California Building Code these projects would be considered alterations. Alteration projects generally require accessibility improvements, if needed to comply with current requirements, to certain "path of travel" elements serving the area of alteration. The California Building Code provides exceptions to the "path of travel" upgrade requirements for projects that do not affect the usability or accessibility of the facility. It also recognizes the inherent difficulty in altering certain existing facilities for full compliance with the accessibility requirements through provisions for situations where strict compliance is technically infeasible.

EVCS installations at existing facilities fall into three categories:

1. Within an existing public right-of-way – With no specific "path of travel" elements serving the area being altered there would be no accessibility upgrades outside the area of work.

2. On building and facility sites where parking / vehicle storage is incidental to the primary function – Under the federal 2010 ADA Standards these projects would be alterations not affecting a primary function area and "path of travel" upgrades would not be required. This is the approach used in the prior DSA Access Policy Statement 97-03 and is most probably based upon classification of electric vehicle charging stations as electrical projects not involving the placement of receptacles or switches. These proposed guidelines continue the same approach as the prior DSA policy.

3. Installations of electric vehicle charging stations at sites where vehicle parking or storage is the sole or primary use of the facility are alterations affecting the usability of or access to a primary function area. The 2010 ADA Standards require that, to the maximum extent feasible, the path of travel to the altered area, including restrooms, telephones, and drinking

fountains, is readily accessible to and usable by individuals with disabilities. Additional alterations to upgrade non-compliant path of travel elements outside of the project's area of work are required, unless those alterations are disproportionate to the overall alterations in terms of cost and scope, which is defined as exceeding twenty percent (20%) of the cost of the primary alterations. When the cost of full compliance for path of travel elements would exceed twenty percent (20%), compliance is required to the greatest extent possible within the twenty percent (20%) limitation. California law prohibits the State Architect's regulations and building standards from prescribing a lesser standard of accessibility or usability than that provided by the 2010 ADA Standards. 2013 California Building Code section 11B-202.4 reflects similar requirements with the addition of signage to the designated path of travel elements. For projects with basic costs above the CBC valuation threshold of $139,964, the cost above which path of travel alterations would become disproportionate has been aligned with the federal requirements of twenty percent (20%).

The following technical sections for the electric vehicle charging station guidelines are designed to eventually be located within the California Building Code's Chapter 11B Division 8: Special Rooms, Spaces and Elements.

EVG-812 On-Site Electric Vehicle Charging Stations

EVG-812.1 General

On-site electric vehicle charging stations shall comply with EVG-812.

EVG-812.2 Electric Vehicle Charging Station Spaces

The vehicle space designated for on-site electric vehicle charging stations shall be 216 inches (5486 mm) long minimum and 108 inches (2743 mm) wide minimum and shall have an adjacent access aisle complying with EVG-812.3.

EVG-812.2.1 Vehicle Space Marking

Car and van electric vehicle charging stations shall be marked to define their width, Where Electric Vehicle Charging Stations are marked with lines, width measurements of electric vehicle charging stations and access aisles shall be made from the centerline of the markings.

EXCEPTION: Where electric vehicle charging stations or access aisles are not adjacent to another parking space or access aisle, measurements shall be permitted to include the full width of the line defining the parking space or access aisle.

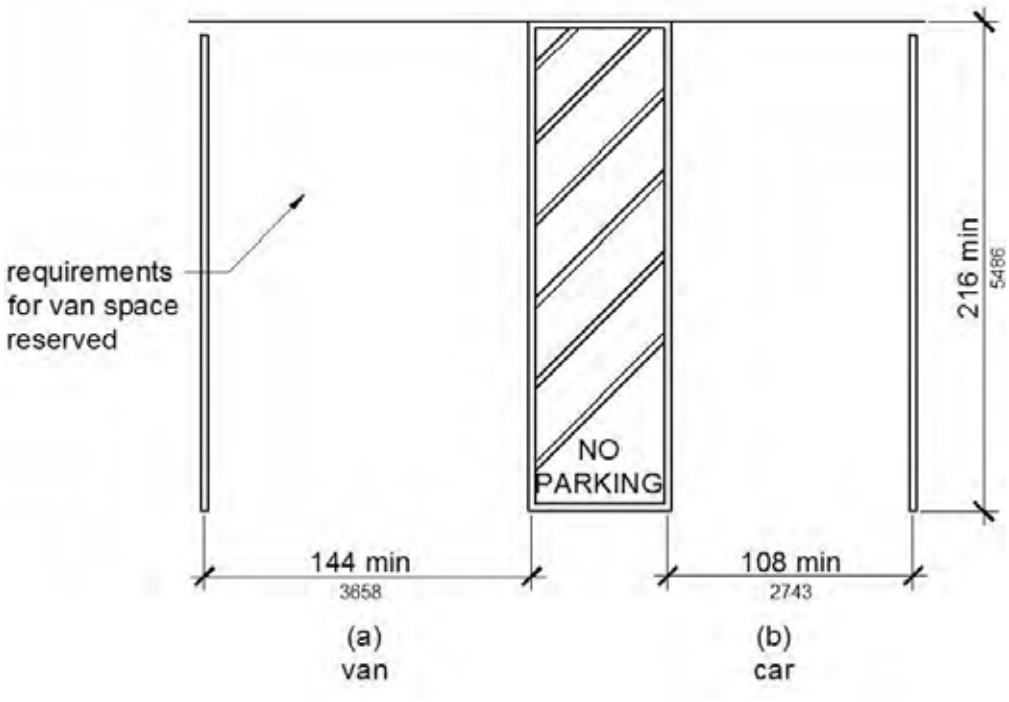


Figure EVG-812.2
On-site Electric Vehicle Charging Station Spaces Dimensions

EVG-812.2.2 Electric Vehicle Charging Only Lettering
The words "ELECTRIC VEHICLE CHARGING ONLY" or “EV CHARGING ONLY” may be painted on the surface within each charging space letters a minimum of 12 inches (305 mm) in height and located to be visible from the adjacent vehicular way.

EVG-812.3 Access Aisle

Access aisles serving vehicle spaces at on-site electric vehicle charging stations shall comply with EVG-812.3. Access aisles shall adjoin an accessible route. Two electric vehicles charging stations or one electric vehicle charging station and one accessible parking space shall be permitted to share a common access aisle.

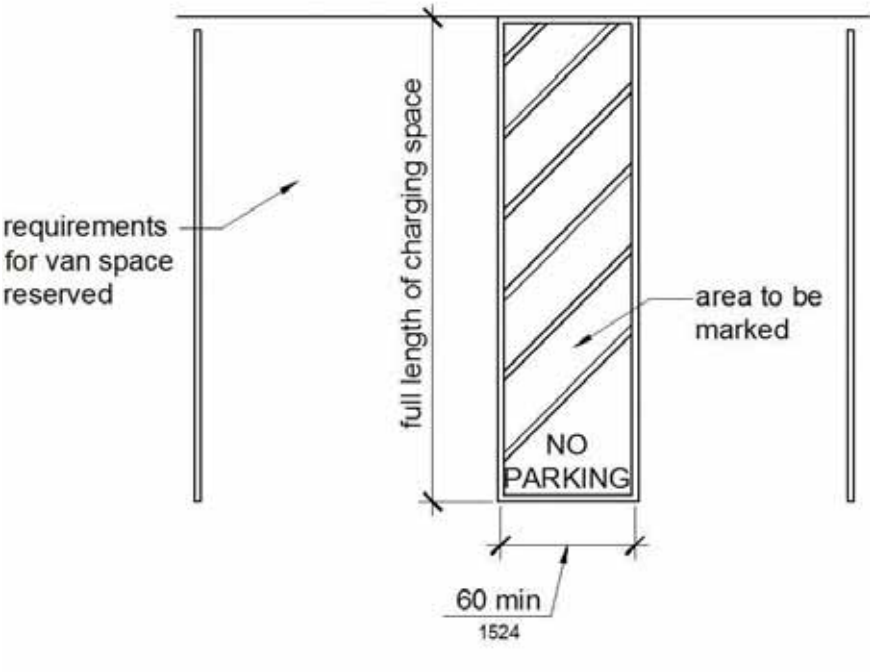


Figure EVG-812.3
Electric Vehicle Charging Station Space Access Aisle

EVG-812.3.1 Width

Access aisles serving on-site electric vehicle charging station car spaces at shall be 60 inches (1524 mm) wide minimum.

EVG-812.3.2 Length

Access aisles at on-site electric vehicle charging stations shall extend the full required length of the vehicle spaces they serve.

EVG-812.3.3 Marking

Access aisles at electric vehicle charging stations shall be marked with a painted borderline around their perimeter. The area within the borderlines shall be marked with hatched lines a maximum of 36 inches (914 mm) on center. The color of the borderlines, hatched lines, and letters shall contrast with that of the surface of the access aisle, with white being the preferred color. The blue color required for the identification of access aisles for accessible parking shall not be used.

EVG-812.3.4 No Parking Lettering

The words "NO PARKING" shall be painted on the surface within each access aisle in letters a minimum of 12 inches (305 mm) in height and located to be visible from the adjacent vehicular way.

EVG-812.3.5 Location
Access aisles at on-site electric vehicle charging station spaces shall not overlap the vehicular way and may be placed on either side of the vehicle space they serve.

EVG-812.4 Floor or Ground Surface
On-site electric vehicle charging station spaces and access aisles serving them shall comply with 11B-302 Floor and Ground Surfaces. Access aisles shall be at the same level as the electric vehicle charging station space they serve. Changes in level or slopes exceeding 1:48 are not permitted.

EVG-812.5 Vertical Clearance
On-site Electric vehicle charging station spaces, access aisles and vehicular routes serving them shall provide a vertical clearance of 98 inches (2489 mm) minimum.

EVG-812.6 Identification
On-site electric vehicle charging stations shall be identified with a sign complying with EVG-812.6 and shall not be identified as or provided with signage required for accessible parking spaces.

EVG-812.6.1 Language
Provide a sign containing language stating “Designed for Disabled Access - Use Last” in addition to the signage identifying standard electrical vehicle charging stations. Where only one electric vehicle charging station is provided the sign shall contain language stating “Designed for Disabled Access”.

EVG-812.6.2 Mounting Height
Signs shall be 60 inches (1524 mm) minimum above the finish floor or ground surface measured to the bottom of the sign and shall be the uppermost sign when co-located with “No Parking except for Electric Vehicle Charging” and “Parking Time Limit” word message signs or electric vehicle charging symbol signs.

EXCEPTION: Signs located within an accessible route shall be a minimum of 80 inches (2032 mm) above the finish floor or ground surface measured to the bottom of the lowest sign.

EVG-812.6.3 Size and Finish
Signs shall be reflectorized with a minimum area of 70 square inches (45161 mm^2).

EVG-812.6.4 Color
Signs shall be white symbols and letters on a blue background.

EVG-812.6.5 Location
Signs shall be permanently posted immediately adjacent to and visible from each space, and shall be located within the projected width of the vehicle space.

EVG-812.7 Relationship to Accessible Routes
Electric vehicle charging station vehicle spaces and access aisles shall be designed so that when occupied the required clear width of adjacent accessible routes is not obstructed.

EVG-812.7.1 Arrangement
Electric vehicle charging stations and access aisles shall be designed so that persons using them are not required to travel behind electric vehicle charging stations other than to pass behind the vehicle space in which their vehicle has been left to charge.

EXCEPTION: Electric vehicle charging stations installed in existing facilities shall comply with EVG-812.7.1 to the maximum extent feasible.

EVG-812.7.2 Accessible Route Encroachment
A curb, wheel stop, bollards or other device shall be provided if required to prevent encroachment of vehicles over the required clear width of adjacent accessible routes.

ADVISORY: EVG-813 General. EVG-250.3 specifies how many accessible electric vehicle charging stations must be provided within the public right of way of a state or local governmental entity's area of jurisdiction. Accessible electric vehicle charging stations are not parking for purposes of accessibility and should be identified by signs that do not create the impression they are reserved for vehicles displaying disabled persons license plates or placards. While accessible electric vehicle charging stations are ideally located where the street has the least crown and grade and close to key destinations, other factors, such as proximity to electric service and connections, may control their location.

EVG-813 On-Street Electric Vehicle Charging Stations

EVG-813.1 General
On-street electric vehicle charging stations shall comply with EVG-813.

EVG-813.2 Parallel Electric Vehicle Charging Stations
Parallel Electric vehicle charging station spaces shall comply with EVG-813.2.

ADVISORY: EVG-813.2 Parallel Electric Vehicle Charging Stations. The sidewalk adjacent to accessible parallel electric vehicle charging station spaces should be free of signs, street furniture, and other obstructions to permit deployment of a van side-lift or ramp or the vehicle occupant to transfer to a wheelchair or scooter. Accessible parallel electrical vehicle charging stations located at the end of the block face are usable by vans that have rear lifts and cars that have scooter platforms.

EVG-813.2.1 Parallel Electric Vehicle Charging Stations at Wide Sidewalks Where the width of the adjacent sidewalk or available right-of-way exceeds 4.3 m (14.0 ft), an access aisle 1.5 m (5.0 ft) wide minimum shall be provided at street level the full length of the electric vehicle charging station, shall connect to a pedestrian access route and shall not encroach on the vehicular travel lane. The access aisle shall comply with EVG-812.3.1, EVG-812.3.2 and EVG-812.3.

EXCEPTION: Alterations. In alterations where the street or sidewalk adjacent to the electric vehicle charging station space is not altered, an access aisle shall not be required**,** provided the Electric Vehicle Charging Stations space is located at the end of the block face.

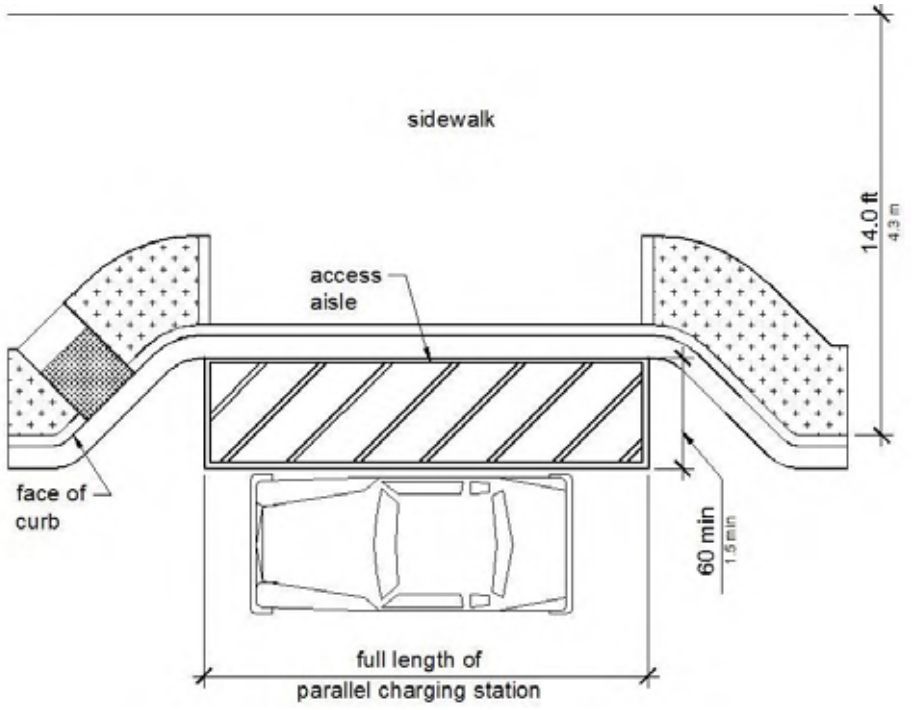


Figure 1 EVG-813.2.1 Parallel Electric Vehicle Charging Stations at Wide Sidewalks

ADVISORY: EVG-813.2.1 Wide Sidewalks. Vehicles may be positioned at the curb or at the parking lane boundary and use the space required by EVG-813.2.1 on either the driver or passenger side of the vehicle to serve as the access aisle.

EVG-813.2.2 Parallel Electric Vehicle Charging Stations at Narrow Sidewalks

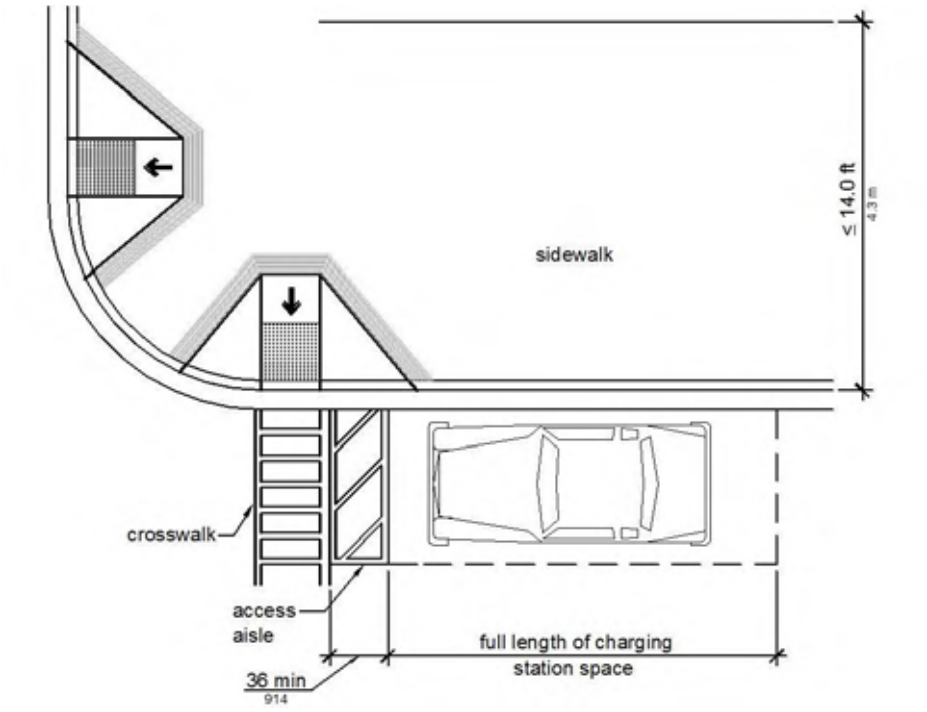


Figure EVG-813.2.2 Parallel Electric Vehicle Charging Stations at Narrow Sidewalks

An access aisle with a direct connection to the adjacent sidewalk is not required where the width of the adjacent sidewalk or the available right-of-way is less than or equal to 14.0 feet (4.3 m). When an access aisle is not provided, the Electric Vehicle Charging Stations spaces shall be located at the end of the block face to the maximum extent feasible.

> **ADVISORY:** EVG-813.2.2 Narrow Sidewalks. At parallel electric vehicle charging stations vehicle lifts or ramps can be deployed on an 8.0 feet (2.4 m) wide sidewalk if there are no obstructions.

EVG-813.3 Perpendicular or Angled Electric Vehicle Charging Stations

Where perpendicular or angled electric vehicle charging stations are provided, an access aisle 8.0 feet (2.4 m) wide minimum shall be provided at street level the full length of the electric vehicle charging station space and shall connect to a pedestrian access route. The access aisle shall comply with EVG-812.3 and shall be marked so as to discourage parking in the access aisle. Two electric vehicles charging stations or one electric vehicle charging stations and one accessible parking space shall be permitted to share a common access aisle.

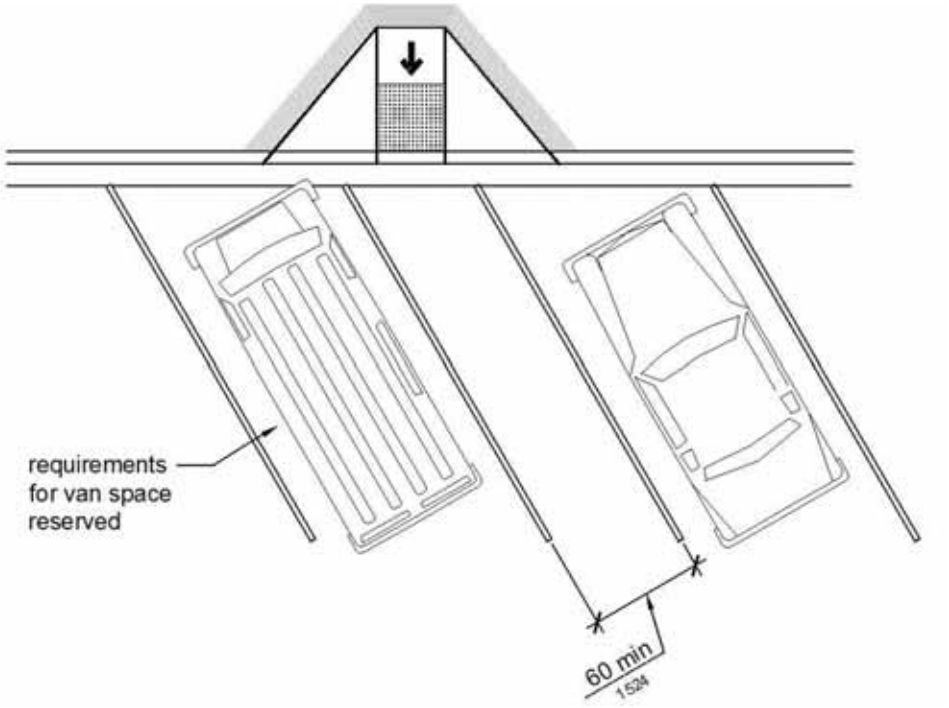


Figure EVG-813.3 Perpendicular or Angled Electric Vehicle Charging Stations

ADVISORY: EVG-813.3 Perpendicular or Angled Electric Vehicle Charging Stations Spaces. Perpendicular and angled parking spaces permit the deployment of a van side-lift or ramp.

EVG-813.4 Curb Ramps or Blended Transitions

Curb ramps or blended transitions shall connect the access aisle to the pedestrian access route. Curb ramps shall not be located within the access aisle.

ADVISORY: EVG-813.4 Curb Ramps or Blended Transitions. At parallel electric vehicle charging stations spaces, curb ramps and blended transitions should be located so that a van side-lift or ramp can be deployed to the sidewalk and the vehicle occupant can transfer to a wheelchair or scooter. Electric vehicle charging station spaces at the end of the block face can be served by curb ramps or blended transitions at the pedestrian street crossing.

EVG-813.5 Marking

On-street electric vehicle charging station spaces may be marked with Electric Vehicle Charging Only Lettering in compliance with EVG-812.2.2 Electric Vehicle Charging Only Lettering.

EVG-814 Electric Vehicle Charging Station Equipment

EVG-814.1 Electric Vehicle Charging Station Equipment

Equipment pedestals and pay stations that serve electric vehicle charging stations shall comply with EVG-814.1.

EVG-814.1.1 Location
Equipment pedestals and pay stations shall comply with EVG-814.1.1.

EVG-814.1.1.1 Parallel Locations
At parallel electric vehicle charging station spaces, equipment pedestals and pay stations shall be on the immediately adjacent sidewalk or ground surface and located 36 inches maximum from the head end or foot end of the projected length of the space.

EVG-814.1.1.2 Perpendicular or Angled Locations
At perpendicular or angled Electric Vehicle Charging Station spaces, equipment pedestals and pay stations shall be located on the immediately adjacent sidewalk or ground surface at the head end within the projected width of the electric vehicle charging station space.

EXCEPTION: For alterations at existing facilities when an accessible route or general circulation path is not provided adjacent to the head end of the space or access aisle, the equipment pedestal and pay station may be located within the projected width of the access aisle 36 inches maximum from the head end of the space.

ADVISORY: EVG-814.1.1 Location. Locating equipment pedestals and pay stations at the head or foot of the electric vehicle charging station permits deployment of a van side-lift or ramp or the vehicle occupant to transfer to a wheelchair or scooter.

EVG-814.1.2 Charging Station Equipment Operable Parts
Operable parts and charging cord stowage locations shall comply with 11B-309 Operable Parts.

EVG-814.2 Displays and Information
Displays and information shall be visible from a point located 3.3 feet (1.0 m) maximum above the center of the clear floor or ground space in front of the equipment pedestal and pay station.

EVG-814.3. Charging Station Equipment Clear Floor Space
Clear floor space at electric vehicle charging stations shall comply with 11B-305 Clear Floor Space and shall be centered on the display and information side of the electric vehicle charging station equipment.

Related 2013 California Building Code
Chapter 11B Accessibility Regulations

2013 CBC Path of Travel Provisions for Alterations

11B-202.4 Path of Travel Requirements in Alterations, Additions and Structural Repairs

When alterations or additions are made to existing buildings or facilities, an accessible path of travel to the specific area of alteration or addition shall be provided. The primary accessible path of travel shall include:

1. A primary entrance to the building or facility,
2. Toilet and bathing facilities serving the area,
3. Drinking fountains serving the area,
4. Public telephones serving the area, and
5. Signs.

EXCEPTIONS:

1. Residential dwelling units shall comply with 11B-233.3.4.2.

2. If the following elements of a path of travel have been constructed or altered in compliance with the accessibility requirements of the 2010 California Building Code, it shall not be required to retrofit such elements to reflect the incremental changes in this code solely because of an alteration to an area served by those elements of the path of travel:

   1. A primary entrance to the building or facility,

   2. Toilet and bathing facilities serving the area,

   3. Drinking fountains serving the area,

   4. Public telephones serving the area, and

   5. Signs.

3. Additions or alterations to meet accessibility requirements consisting of one or more of the following items shall be limited to the actual scope of work of the project and shall not be required to comply with 11B-202.4:

   1. Altering one building entrance.

   2. Altering one existing toilet facility.

3. Altering existing elevators.

4. Altering existing steps.

5. Altering existing handrails.

4. Alterations solely for the purpose of barrier removal undertaken pursuant to the requirements of the Americans with Disabilities Act (Public Law 101-336, 28 C.F.R., Section 36.304) or the accessibility requirements of this code as those requirements or regulations now exist or are hereafter amended consisting of one or more of the following items shall be limited to the actual scope of work of the project and shall not be required to comply with 11B-202.4:

    1. Installing ramps.

    2. Making curb cuts in sidewalks and entrance.

    3. Repositioning shelves.

    4. Rearranging tables, chairs, vending machines, display racks, and other furniture.

    5. Repositioning telephones.

    6. Adding raised markings on elevator control buttons.

    7. Installing flashing alarm lights.

    8. Widening doors.

    9. Installing offset hinges to widen doorways.

    10. Eliminating a turnstile or providing an alternative accessible route.

    11. Installing accessible door hardware.

    12. Installing grab bars in toilet stalls.

    13. Rearranging toilet partitions to increase maneuvering space.

    14. Insulating lavatory pipes under sinks to prevent burns.

    15. Installing a raised toilet seat.

    16. Installing a full-length bathroom mirror.

17. Repositioning the paper towel dispenser in a bathroom.

18. Creating designated accessible parking spaces.

19. Removing high-pile, low-density carpeting.

5. Alterations of existing parking lots by resurfacing and/or restriping shall be limited to the actual scope of work of the project and shall not be required to comply with 11B-202.4.

6. The addition or replacement of signs and/or identification devices shall be limited to the actual scope of work of the project and shall not be required to comply with 11B-202.4.

7. Projects consisting only of heating, ventilation, air conditioning, reroofing, electrical work not involving placement of switches and receptacles, cosmetic work that does not affect items regulated by this code, such as painting, equipment not considered to be a part of the architecture of the building or area, such as computer terminals and office equipment shall not be required to comply with 11B-202.4. unless they affect the usability of the building or facility.

8. When the adjusted construction cost is less than or equal to the current valuation threshold, as defined in Chapter 2, Section 202, the cost of compliance with 11B-202.4 shall be limited to 20 percent of the adjusted construction cost of alterations, structural repairs or additions. When the cost of full compliance with 11B-202.4 would exceed 20 percent, compliance shall be provided to the greatest extent possible without exceeding 20 percent.

When the adjusted construction cost exceeds the current valuation threshold, as defined in Chapter 2, Section 202, and the enforcing agency determines the cost of compliance with 11B-202.4 is an unreasonable hardship, as defined in Chapter 2, Section 202, full compliance with 11B-202.4 shall not be required. Compliance shall be provided by equivalent facilitation or to the greatest extent possible without creating an unreasonable hardship; but in no case shall the cost of compliance be less than 20 percent of the adjusted construction cost of alterations, structural repairs or additions. The details of the finding of unreasonable hardship shall be recorded and entered into the files of the enforcing agency and shall be subject to Chapter 1, Section 1.9.1.5, Special Conditions for Persons with Disabilities Requiring Appeals Action Ratification.

For the purposes of this exception, the adjusted construction cost of alterations, structural repairs or additions shall not include the cost of alterations to path of travel elements required to comply with 11B-202.4.

In choosing which accessible elements to provide, priority should be given to those elements that will provide the greatest access in the following order:

1. An accessible entrance;

2. An accessible route to the altered area;

3. At least one accessible restroom for each sex;

4. Accessible telephones;

5. Accessible drinking fountains; and

6. When possible, additional accessible elements such as parking, storage and alarms.

If an area has been altered without providing an accessible path of travel to that area, and subsequent alterations of that area or a different area on the same path of travel are undertaken within three years of the original alteration, the total cost of alterations to the areas on that path of travel during the preceding three-year period shall be considered in determining whether the cost of making that path of travel accessible is disproportionate.

9. Certain types of privately funded, multistory buildings and facilities were formerly exempt from accessibility requirements above and below the first floor under this code, but as of, April 1, 1994, are no longer exempt due to more restrictive provisions in the federal Americans with Disabilities Act. In alteration projects involving buildings and facilities previously approved and built without elevators, areas above and below the ground floor are subject to the 20-percent disproportionality provisions described in Exception 8, above, even if the value of the project exceeds the valuation threshold in Exception 8. The types of buildings and facilities are:

1. Office buildings and passenger vehicle service stations of three stories or more and 3,000 or more square feet (279 m^2) per floor.

2. Offices of physicians and surgeons.

3. Shopping centers.

4. Other buildings and facilities three stories or more and 3,000 or more square feet (279 m^2) per floor if a reasonable portion of services sought and used by the public is available on the accessible level.

For the general privately funded multistory building exception applicable to new construction and alterations, see Division 11B-206.2.3, Exception 1.

The elevator exception set forth in this section does not obviate or limit in any way the obligation to comply with the other accessibility requirements in this code. For example, floors above or below the accessible ground floor must meet the requirements of this section except for elevator service. If toilet or bathing facilities are provided on a level not served by an elevator, then toilet or bathing facilities must be provided on the accessible ground floor.

2013 CBC reference from EVG-814.1.2 Electric Vehicle Charging Stations Pedestals and Pay Stations

11B-309 Operable Parts

11B-309.1 General
Operable parts shall comply with 11B-309.

11B-309.2 Clear Floor Space
A clear floor or ground space complying with 11B-305 shall be provided.

11B-309.3 Height
Operable parts shall be placed within one or more of the reach ranges specified in 11B-308.

11B-309.4 Operation
Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 pounds (22.2 N) maximum.

> **EXCEPTION:** Gas pump nozzles shall not be required to provide operable parts that have an activating force of 5 pounds (22.2 N) maximum.

Reference from 11B-309 Operable Parts to 11B-305 Clear Floor or Ground Space

11B-305 Clear Floor or Ground Space

11B-305.1 General
Clear floor or ground space shall comply with 11B-305.

11B-305.2 Floor or Ground Surfaces
Floor or ground surfaces of a clear floor or ground space shall comply with 11B-302. Changes in level are not permitted.

> **EXCEPTION:** Slopes not steeper than 1:48 shall be permitted.

11B-305.3 Size

The clear floor or ground space shall be 30 inches (762 mm) minimum by 48 inches (1219 mm) minimum.

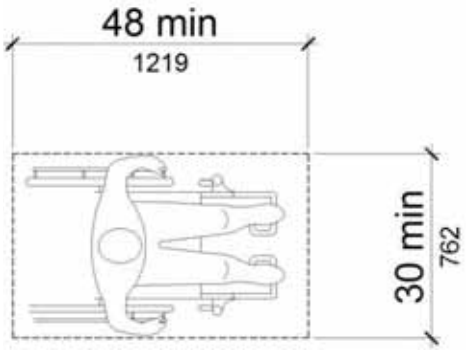


Figure 11B-305.3
Clear Floor or Ground Space

11B-305.4 Knee and Toe Clearance

Unless otherwise specified, clear floor or ground space shall be permitted to include knee and toe clearance complying with 11B-306.

11B-305.5 Position

Unless otherwise specified, clear floor or ground space shall be positioned for either forward or parallel approach to an element.

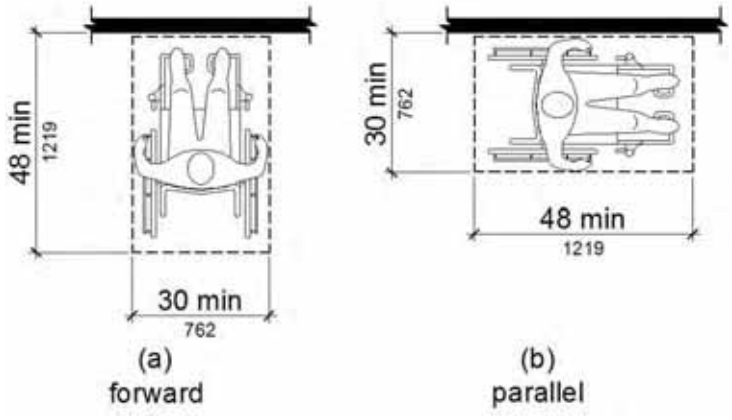


Figure 11B-305.5
Position of Clear Floor or Ground Space

11B-305.6 Approach

One full unobstructed side of the clear floor or ground space shall adjoin an accessible route or adjoin another clear floor or ground space.

Reference from 11B-305 Clear Floor or Ground Space to 11B-302 Floor or Ground Surfaces

11B-302 Floor or Ground Surfaces

11B-302.1 General
Floor and ground surfaces shall be stable, firm, and slip resistant and shall comply with 11B-302.

EXCEPTIONS: 1. Within . . .

11B-302.3 Openings
Openings in floor or ground surfaces shall not allow passage of a sphere more than ½ inch (12.7 mm) diameter except as allowed in 11B-407.4.3, 11B-409.4.3, 11B-410.4, 11B-810.5.3 and 11B-810.10. Elongated openings shall be placed so that the long dimension is perpendicular to the dominant direction of travel.

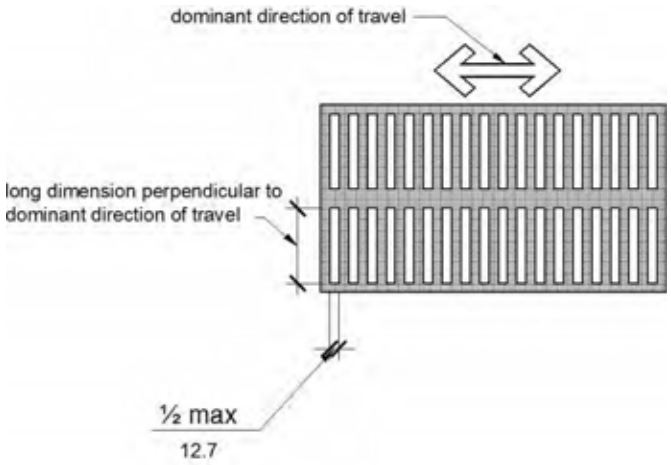


Figure 11B-302.3
Elongated Openings in Floor or Ground Surfaces

Reference from 11B-707 Automatic Teller Machine, and Fare Machines and Point-of-Sale Devices

11B-707.1 General.
Automatic teller machines and fare machines shall comply with 11B-707.