



Physical Safety and Security at Electric Vehicle Charging Sites

As the demand for electric vehicles (EVs) continues to grow, physical safety and security at EV charging stations becomes an increasingly important topic. EV charging station site hosts should be aware of design elements that can increase safety and security, resulting in driver and passenger confidence when plugging in.

This help sheet provides an overview of physical safety and security design elements for public EV charging stations and general best practices that can be considered for the safety and comfort of charging station customers. The cost and maintenance of safety and security design elements are typically the responsibility of the site host. While these elements may contribute to higher project costs, they can improve the driver and passenger experience during charging sessions, resulting in repeat customers.

What Are Some Common Design Elements To Support Safety and Security at EV Charging Stations?

The following design elements should be considered when designing public EV charging stations. Consider updating local or state laws, regulations and policies, zoning ordinances, building and fire codes, and/or permitting processes so that physical site safety design elements are required for project approval.

When planning an EV charging station, the context and location will help determine which physical safety and security design elements are best suited for the project. A site may not need all design elements listed below to provide a safer user experience. These elements will also likely add to the project costs, so allowing flexibility in the design to prioritize what is needed for the unique site and project is an important part of the process.

Accessibility: Provide accessible EV charging station spaces and building access routes. Refer to the [U.S. Access Board's Design Recommendations for Accessible Electric Vehicle Charging Stations](#) for standards and minimum requirements when designing and building accessibly. Refer to state and local codes for additional minimum requirements, if applicable.

Lighting: Install additional lighting, if there is not enough proximal lighting, to ensure the EV charging station area is well lit. Consider installing pedestrian-scale LED lighting.

Station placement: Locate charging stations in areas with high pedestrian and/or vehicular traffic with open lines of sight to provide natural surveillance. Avoid placing EV charging stations behind a building or in a location without high visibility. Also consider locating charging stations under a canopy structure to provide coverage when charging during adverse weather, such as heavy rain or snow.

Surveillance: Install surveillance cameras to help drivers feel safe and monitor equipment for vandalism. This is more effective when signage is added to the area noting that the EV charging stations are under 24/7 surveillance.

Amenities: Placing EV charging stations in a location with amenities that are staffed and open when the station is available for charging provides another layer of comfort and safety for the user.

Emergency call box: Make emergency call boxes available to users in the event of emergencies, particularly in areas with limited cellular service. Alternatively, provide Wi-Fi or enhanced cellular service to the site to allow for emergency calling.

Fencing around electrical equipment: Help keep unauthorized individuals away from the electrical infrastructure that supports the EV charging stations (e.g., transformers, switch gear service panels) by adding fencing with a locked access to provide a deterrence.

Tamper-resistant equipment: Select features rendering charging equipment resistant to tampering and vandalism. This can include tamper-resistant screws, anti-vandalism hardware, locked enclosures, and graffiti-resistant coating or paint.



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Landscaping: Improve visibility by keeping ground vegetation like shrubs and bushes near the charging stations a maximum of 2 feet high. Make sure vegetation management is included in charging station maintenance plans to ensure shrubs and bushes are well kept, and be thoughtful about landscaping to ensure visibility is not reduced.

Cleanliness: Keep the site clean and reduce trash around the EV charging station site. In addition to being unsightly, trash can attract wildlife, creating an unsafe user experience.

Secure payment: Secure users' credit card information by providing contactless payment options and either an automated toll-free phone number or a Short Message/Messaging Service (SMS) that provides the EV charging customer with the option to initiate a charging session and submit payment.

Training: Train on-site staff how to respond to an emergency and what to look out for or monitor at EV charging stations to support user safety.



Concrete-filled bollards to help prevent vehicles from hitting charging equipment.

What Are Some Additional Points To Consider When Selecting and Installing EV Charging Equipment?

These considerations can help a site owner ensure that the selected EV charging equipment, equipment placement, and installation support a safe and secure charging experience.

Emergency shut-off (E-stop): Installing an external disconnect for each charger allows the site host to disconnect power to the EV charging stations in an emergency. In some jurisdictions, fire marshals may require that these be installed prior to project approval.

Electrical safety: Charging equipment should have a charge circuit interrupting device (CCID) or ground fault circuit interrupter (GFCI) to shut off the flow of electric power to reduce the risk of electric shock.

Fire prevention safety: Install charging equipment as per the latest National Electric Code (NEC) and National Fire Protection Association (NFPA) standards. NFPA 70 Article 625, Electric Vehicle Power Transfer System, and NFPA 88A, Standard for Parking Structures, address

safety considerations to follow for EV charging station design in parking garages to ensure safe electrical design and installation. Adhere to all building codes and NFPA standards for placement of hydrants, standpipe systems, etc.

Cord placement/management: Provide cord management and be mindful of cord placement so cords do not become a tripping hazard for users or pedestrians in the area.

Equipment protection: Equipment should be protected by wheel stops or concrete-filled bollards to help prevent vehicles from hitting the charging equipment.

How Can I Incorporate These Design Elements Into EV Charging Station Design?

If local and state governments want to require some physical site safety elements for EV charging station sites, they can leverage the following mechanisms:

Permit approval: For EV charging station projects requiring a permit, ensure safety and security design elements are a stipulation of the permitting checklist. For example, refer to the “Plug-In Electric Vehicle Infrastructure Permitting Checklist” in the [Zero-Emission Vehicles in California: Community Readiness Guidebook](#).

Requirements and incentives: Require that applicants who are responding to a grant or request for proposals for EV charging station construction provide specific safety and security design elements as part of the project, and clearly outline what elements are included as part of the scoring criteria when evaluating proposals. For example:

- Include physical safety requirements in the scoring criteria when reviewing site selection and proposals for EV charging station installation.
- For third-party agreements, require that physical security be the responsibility of the third party, and specifically call out what design elements are required. Outline the requirements in procurement documents and contracts.
- For better data tracking, require that an annual physical security plan be submitted by the site host or third party operating the EV charging station, where the site needs to provide an update on what physical security measures are in place at each location.

Please note that this list is not exhaustive, and other safety considerations and/or contracting mechanisms may be appropriate for your project.



What Are Some Additional Resources?

- [Alternative Fuels Data Center State and Local Planning for Electric Vehicle Charging Infrastructure.](#)
- [Public Electric Vehicle Charging Infrastructure Playbook.](#)

How Can Joint Office Technical Assistance Help?

The Joint Office provides [technical assistance](#) to communities at all stages of interest, planning, and deployment of electric mobility technologies. The Joint Office supports stakeholders and programs that seek to deploy zero-emission fueling infrastructure and zero-emission transit and school buses. We are dedicated to partnering with communities to ensure a successful transition to a clean transportation infrastructure, and in doing so, have created a one-stop-shop for stakeholders to get free, customized support. Contact us at driveelectric.gov/contact to request assistance with your EV charging questions!



Learn more about Joint Office technical assistance.



About the Joint Office of Energy and Transportation

The Joint Office provides technical assistance on planning and implementation of a national network of electric vehicle chargers and zero-emission fueling infrastructure, as well as zero-emission transit and school buses. For more technical assistance resources, please review [DriveElectric.gov/transit-agencies](https://driveelectric.gov/transit-agencies). If you would like detailed help or assistance, please contact the Clean School Bus Technical Assistance team at [DriveElectric.gov/contact](https://driveelectric.gov/contact).

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