

EV Charging Infrastructure Training

Part 5: Site Design, Energization & Operation



Los Angeles County hosted a five-part training series on electric vehicle (EV) infrastructure. Part 5: Site Design, Energization & Operation guides EV charging installers toward best practices in standardizing their sites. This will help ensure strategic charger placement enhance safety, accessibility, and user satisfaction for EV charging.

The California Energy Commission funded the series.

Site Design Best Practices

Thoughtful site design makes EV charging safer, more convenient, and cost-effective. Placing chargers in well-lit, visible areas enhances safety and makes them easier to locate, while positioning them near amenities such as restrooms, cafés, or shops encourages drivers to utilize nearby services. Providing adequate space for maneuvering also helps reduce congestion and ensures the site works for a variety of vehicle types.

User-friendly design features build confidence and comfort. Clear, consistent signage with simple instructions makes charging straightforward, while weather protection, such as canopies or shelters, improves usability year-round. In curbside settings, retractable cables or user-provided cords can reduce clutter and deter vandalism, making the site easier to maintain over time.

Behind the scenes, efficient electrical integration ensures projects are both affordable and reliable. Leveraging existing service, minimizing trenching, and placing panels close to chargers all reduce construction costs. Pre-testing connectivity ensures chargers stay online, while repeaters or Ethernet can boost weak signals. For fleets and heavy-duty vehicles, right-sizing charger power, utilizing pull-through lanes, and incorporating on-site storage further enhance efficiency, safety, and long-term energy management.

Grid Connection and Resiliency

A dependable power supply is essential for EV charging, making early utility coordination a top priority. Engaging providers at the outset helps confirm grid capacity, clarifies technical requirements, and streamlines permitting, allowing projects to move forward without costly delays.

Resiliency features ensure charging remains available when disruptions occur. Backup systems, such as batteries or generators, redundant feeds, and documented response protocols, all strengthen reliability.

Pairing grid connections with solar and storage can further reduce dependence on the utility, cut peak costs, and provide continued service during outages. Hybrid designs that combine these resources deliver the greatest flexibility and long-term reliability.



Construction and Signage Guidelines

Hiring EV Infrastructure Training Program-trained contractors, adhering to codes, and coordinating utility reviews ensures safe and compliant installations. Clear, branded signage with instructions and support contacts makes chargers easy to find and use, while highway wayfinding signs guide drivers to nearby stations.

Commissioning

Thorough commissioning ensures chargers are safe, compliant, and ready for use. This includes completing contractor punch lists, performing electrical testing, and integrating chargers with monitoring platforms that flag issues in real-time. A commissioning report should document all inspections and approvals, while staff training prepares teams to handle operations, troubleshooting, and emergencies.

Operations and Maintenance

Proactive operations and maintenance keep chargers reliable and available. Regular inspections, preventive servicing, and a stock of spare parts help minimize downtime, while clear protocols ensure quick repairs when issues arise. Automated alerts and performance dashboards enable real-time monitoring, accompanied by troubleshooting guides that efficiently address common errors.

Continuous improvement strengthens long-term performance. Collecting user feedback and analyzing usage data highlights reliability trends, while ongoing staff training ensures teams stay current with new technologies and best practices. Together, these strategies create a charging network that drivers can depend on.

Case Study: Logistics Yard Design and Resiliency

A logistics company partnered with its utility to develop a charging yard for medium- and heavy-duty trucks. Early coordination confirmed grid capacity and supported the integration of resiliency features.



The challenge was to electrify part of the fleet while designing a yard that could handle large trucks, meet tight schedules, and manage electricity demand without increasing costs.



The solution was a pull-through design that eliminated reversing, while charger power was right-sized for 20 electric trucks based on route lengths and dwell times. A 1 MWh battery integrated with 14 dual-port DCFCs lowered energy costs and created a scalable model.

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Resources

View the five-part training series and get downloadable resources at: isd.lacounty.gov/electric-vehicles-and-charging-stations/.

Contact the LA County Internal Services Department of Clean Transportation & Energy at evprogram@isd.lacounty.gov.

Important websites:

- NREL Data Analytics and Infrastructure: nrel.gov/transportation/data-tools
- CALTRANS Highway Signage: bit.ly/3HKVUuJ
- US Access Board Design Recommendations For Accessible Electric Vehicle Charging Stations: access-board.gov/tad/ev