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CALTRANS DIVISION OF RESEARCH, INNOVATION AND SYSTEM INFORMATION
TRANSFORMING IDEAS INTO SOLUTIONS

Research Results

Mobile Electric Vehicle DCFC Infrastructure Deployment Opportunities

To evaluate the use of mobile or semi-permanent electric vehicle (EV) charging systems for operations in the California Department of Transportation (Caltrans).

Equipment

November 2025

Project Title: Mobile Electric Vehicle DCFC Infrastructure Deployment Opportunities

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WHAT WAS THE NEED?

Due to the increase in zero-emission vehicle implementation required by ongoing fleet regulations, the California Department of Transportation (Caltrans) will need to install adequate electric vehicle (EV) chargers to support the incoming electric vehicles. Currently, the installation of permanent, grid-tied, infrastructure is a long process and cannot be fully established before these vehicles arrive. Caltrans needs mobile or semi-permanent charging infrastructure that can be implemented in a similar timeframe as the mandated EV vehicle deployments. The systems must be able to trickle-charge from the existing site infrastructure and rapidly charge multiple heavy EVs on demand.

WHAT WAS OUR GOAL?

The goal of this project was to evaluate the commercially available mobile or semi-permanent EV charging systems and see if they can provide accessibility to the Direct Current Fast Charging (DCFC) units, to meet the mandated EV deployment in Caltrans fleet.

WHAT DID WE DO?

In this project, the research team from the Advanced Highway Maintenance and Construction Technology (AHMCT) Research Center at the University of California, Davis worked with the project panel, including representatives from the Caltrans Division of Equipment (DOE), to identify candidate commercially available mobile or semi-permanent electric vehicle (EV) charging systems. The team obtained the selected systems (by purchasing, leasing, or renting), documented the installation and/or setup for each system,

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and evaluated the applicability and feasibility of each mobile or semi-permanent EV charging system for Caltrans activities. The assessment addressed questions regarding system suitability, maintenance requirements, integration challenges, necessary staff training, and potential benefits of adoption for Caltrans. The contractor also prepared a final report summarizing the evaluation results and future recommendations.

WHAT WAS THE OUTCOME?

The research successfully evaluated both mobile charging systems in performance and potential for implementation in Caltrans' operations. However, FreeWire Boost Charger 200 testing was limited by permitting delays, necessitating the use of historical data from three existing units. Despite this adaptation, the analysis provided valuable insights into performance patterns and battery degradation over time. This evaluation shows that mobile charging solutions can effectively support Caltrans' transition to an EV fleet.

WHAT IS THE BENEFIT?

The research provides significant operational benefits to Caltrans by identifying mobile and semi-permanent EV charging solutions that can improve fleet efficiency and reduce delays caused by inadequate charging infrastructure. Testing the EVESCO EVES-6060-NA and FreeWire Boost Charger 200 under real-world conditions demonstrated which systems are most compatible with the fleet, how to optimize charging performance, and what infrastructure or operational requirements are necessary. This enables Caltrans to deploy solutions that minimize downtime, ensure reliable vehicle availability, and address potential issues such as cold weather performance or battery degradation.

Additionally, the findings offer strategic and cost-saving benefits by providing actionable deployment recommendations and guidance for future research. By understanding system limitations, infrastructure needs, and usage patterns, Caltrans can plan installations more effectively, reduce underutilization, and extend equipment lifespan. The study also identifies opportunities for improving operational protocols, data collection, and battery management, which together enhance overall fleet readiness and support a smoother transition to electric vehicles across the department.

LEARN MORE

In the process of closing the contract. No available link yet.

IMAGES

Image 1: FreeWire Boost Charger 200.

Image 2: Testing FreeWire Boost Charger 200 during final commissioning process.

Image 3: Chevrolet Bolt being charged by EVES-6060-NA charger.

Image 4: Tesla Model 3 being charged by EVES-6060-NA charger.