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

Research Notes

Extended Evaluation of Semi-Permanent DC Fast Charging Infrastructure

This project evaluates mobile and semi-permanent charging solutions that can provide near-term support until permanent infrastructure is fully established.

Equipment

May 2026

Project Title: Extended Evaluation of Semi-Permanent DC Fast Charging Infrastructure

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WHAT IS THE NEED?

California's zero-emission vehicle (ZEV) mandate has created an urgent need for Caltrans to expand and deploy reliable electric vehicle (EV) charging infrastructure to support the transition of its fleet to zero-emission technologies. However, the planning, permitting, utility coordination, and installation needed for permanent grid-tied charging infrastructure are complex and time-intensive, making it difficult to complete them quickly enough to meet the aggressive EV-deployment timeline. This gap between vehicle deployment and infrastructure readiness could impact Caltrans' ability to maintain efficient operations while complying with state requirements and electrification targets. To help address this issue, Caltrans must evaluate mobile and semi-permanent charging solutions that can provide flexible and near-term charging capability while permanent infrastructure is being developed. In addition, Caltrans needs comprehensive information on the long-term performance, reliability, operational compatibility, maintenance requirements, and overall cost-effectiveness of these temporary charging solutions. This information will support informed infrastructure investment decisions and help develop practical strategies for large-scale fleet electrification across Caltrans' statewide facilities and operations.

WHAT ARE WE DOING?

The research project will conduct a comprehensive assessment of the FreeWire Boost 200, focusing on its performance, reliability, and integration into Caltrans' fleet operations. The study will evaluate its impact on operational efficiency, including its ability to support diverse vehicle types and duty cycles, while developing best practices and

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recommendations for the deployment of semi-permanent DC fast charging infrastructure. The project will also assess the scalability and long-term viability of this charging solution to support Caltrans' evolving fleet electrification needs.

WHAT IS OUR GOAL?

The primary goal of this research project is to evaluate the FreeWire Boost Charger 200 under real-world fleet operating conditions and determine its overall feasibility for broader deployment across Caltrans facilities. The study will assess charger performance under varying operational demands, charging patterns, environmental conditions, and fleet utilization scenarios. Additional focus areas include system reliability, energy delivery capability, ease of deployment, user interaction, operational limitations, maintenance considerations, and integration with existing facility electrical infrastructure.

WHAT IS THE BENEFIT?

The findings from this research will equip Caltrans with essential data and valuable operational insights that are crucial for shaping the future of electric vehicle (EV) charging infrastructure. These insights will inform both immediate strategies for deploying charging stations and long-term objectives related to fleet electrification. By understanding usage patterns, technological advancements, and infrastructure needs, Caltrans will be better positioned to make informed decisions that support the statewide transition to EVs, ensuring reliable access to charging and efficient transportation operations. In addition, the outcomes of this project will serve as a comprehensive guide for identifying the most cost-efficient approaches to charging Caltrans' fleet vehicles. This guidance aims to maximize the effectiveness of investment decisions while actively supporting California's ambitious goal of transitioning to zero-emission vehicles by 2035. By evaluating innovative technologies and assessing their impacts, the project will help ensure that the highway transportation system remains efficient and environmentally responsible.

WHAT IS THE PROGRESS TO DATE?

The project team held its kick-off meeting on March 10, 2026. Data collection resumed after FreeWire completed maintenance on April 20, and preliminary analysis is now underway.