Evaluate Zero-Emission Vehicle Charging Stations at Caltrans Facilities

Research Direct Current Fast Charging (DCFC) installation cost, challenges, and opportunities for process improvements for future installations.

WHAT IS THE NEED?

Governor’s Executive Order B-16-2012 mandates to reduce greenhouse gas emission. Electric vehicles (EV) offer a clean fuel alternative to meet above mandate. However, range anxiety and charging frequency and gaps between existing charging stations challenges adoption.

California Department of Transportation (Caltrans) is deploying charging stations to fill in gaps between existing charging stations. This effort will provide the data needed for planning process improvement for future installment.

WHAT ARE WE DOING?

The research team will:

1. Identify the types of data to be collected, including usage patterns, vandalism, concerns by the public, non-recoverable electricity costs, and maintenance and operations costs.
2. Monitor the usage monthly and collect and summarize data of the charging stations for a period of two years after construction.

WHAT IS OUR GOAL?

This research will collect data on the implementation, maintenance, and utilization of new charging facilities being deployed to increase the charging coverage throughout California. This information will assist Caltrans to develop policy and procedures regarding the deployment of future charging stations.
WHAT IS THE BENEFIT?

This project will measure the use of the charger stations and help identify user needs. The demonstrated user demand will validate continued infill of EV service gaps and reduce inconvenience to highway system users. With the information obtained, encouraging movement towards EV infrastructure will provide business opportunity for future providers of charging stations and services.

One of the limitations of zero-emission vehicles is the time required to charge them. Expanded EV infrastructure featuring DCFCs will make EV a practical option for long-distance travel and encourage consumers to move away from internal combustion engines. Usage patterns revealed in this study will help direct future development of facilities in convenient locations, improving the availability of services and quality of travel for EV users.

WHAT IS THE PROGRESS TO DATE?

University of California, Davis (UCD), Institute of Transportation Studies (ITS) team continued to reach out to the California Department of Transportation teams on the sites and ascertain the progress of the project construction and launch remotely. As an update to the previous Progress Report, the ITS team received new cost information pertaining to the utility costs of new electrical interconnection to the sites from Caltrans Personnel. The ITS team has been analyzing and compiling this new information. ITS team will add this cost information to the final costs so that the Draft Installation Report will reflect the total costs of Project launch and construction phase.

Table 1 below is a summary of the status of the construction and launch phase of each site.
Task 2: Charger Operation Data and Analysis

The ITS team and team from Caltrans HQ arranged a meeting in November 2020 to discuss and plan for charger usage data sharing mechanisms between Caltrans and ITS when the DC Fast chargers are installed and operational. As per the discussion, ITS team received preliminary Charger usage data as of 06-15-2021. ITS team is in the process of organizing the information and analyzing the usage session data.

Task 3: Maintenance and Operation Phase
The research team will begin maintenance and operations analysis after chargers are operational, and site visits once it is safe to do so.