



Caltrans Division of Research,
Innovation and System Information

Research

Notes

Planning, Policy
and
Programming

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Project Title:
Assessment Of Requirements, Costs,
And Benefits Of Providing Battery
Charging For Battery Electric Heavy-
Duty Trucks At Safety Roadside Rest
Areas Facilities

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Task Manager:
Lee Provost
Sr. Transportation Engineer
lee.provost@dot.ca.gov

Assessment Of Requirements, Costs, And Benefits Of Providing Battery Charging For Battery Electric Heavy- Duty Trucks At Safety Roadside Rest Areas Facilities

Define possibilities for and barriers to the provision of battery charging infrastructure for heavy-duty electric trucks at roadside rest areas along main highways in California.

WHAT IS THE NEED?

California Department of Transportation (Caltrans) maintains an extensive series of roadside rest areas throughout California that are widely used by long-haul trucks. By 2030 it is expected that a significant fraction of those trucks will be electrified and some of them will have the need for recharging their batteries away from their home base. It needs to be determined whether charging at roadside rest areas, especially those along interstate highways, is likely to meet the needs of the trucks that have multi-day trips; and whether it is likely that the truck companies and drivers whom will have multiple options for recharging their batteries will utilize charging at rest areas. Caltrans needs to know the design requirements and costs of the battery charging facilities for heavy-duty (HD) trucks likely to be on the road in 2025-2030 and whether it will make sense for them to consider providing that capability at roadside rest areas.

WHAT ARE WE DOING?

The study will be performed in terms of the six (6) tasks listed below.

1. Battery requirements for medium- and heavy-duty (MD/HD) trucks and buses in 2025-2030.
2. Use patterns of MD/HD vehicles in roadside rest areas in California.



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3. Infrastructure design requirements and costs for battery charging facilities in roadside rest areas for likely electric vehicle use in 2025-2030.
4. Trucking industry and driver options for multi-day long-haul trips with battery-electric trucks requiring along highway battery recharging.
5. Assessment of the likely choice/use of roadside rest areas by long-haul electric trucks.
6. Assessment of how Caltrans can best serve the needs of the trucking industry as it transitions to electrified vehicles.

In order to perform these tasks, it will be necessary for the researchers to consult with Caltrans personnel, who are familiar with how the rest areas are currently being used and the trucking companies concerning how they think the rest areas will be used by electric HD trucks.

It will also be necessary to consult with HD truck manufacturers regarding the charging requirements of the batteries in their trucks and battery charger suppliers regarding the specifications and cost of the chargers available. The research team will also have to consult with electric utilities regarding how the high power required to operate the battery chargers at the rest areas would be made available and at what cost and what would be the likely cost (\$/kWh) of the electricity to charge the batteries.

Finally, after discussions with Caltrans personnel, the researchers would have to propose a plan for the construction and operation of the battery charging facilities at the rest areas and consider whether it would make sense for Caltrans to consider doing it.

WHAT IS OUR GOAL?

The goal of the project is to gain a better understanding of the operation of battery-electric long-haul trucks using interstate highways in California and how they will utilize the series of rest areas provided by Caltrans. Furthermore, the research team want to determine if providing battery charging facilities at the rest stops makes sense to the trucking companies and Caltrans as the trucking industry converts to electric trucks in place of diesel trucks.

The conclusions of the study will be summarized in a final report of value to Caltrans and other state agencies as well as the truck manufacturers and trucking companies.

WHAT IS THE BENEFIT?

At the present time, there is very little information available on actual or projected use of battery-electric long-haul trucks for multi-day operation requiring battery charging awhile from the home terminal of the truck. The goal of this project is to begin to generate some of the information needed for the successful operation of battery-electric long-haul trucks and the battery charging infrastructure to support them.

The final report should provide Caltrans with the information they need to consider the role they might serve in the conversion of highway trucking to electric vehicles.

WHAT IS THE PROGRESS TO DATE?

This is new project and has not started yet.