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

Research Notes

Calculation Factors and Methodology for Electric Construction Equipment Rental Rates

Studying costs of electric construction equipment to set accurate rental rates.

Design/ Construction

May 2026

Project Title: Calculation Factors and Methodology for Electric Construction Equipment Rental Rates

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WHAT IS THE NEED?

The California Department of Transportation (Caltrans) is working to meet state and federal clean energy goals by studying the costs of electric construction equipment. Currently, there is limited real-world data on battery performance, charging needs, equipment longevity, efficiency, and maintenance compared to diesel-powered machines. Without this information, establishing accurate rental rates is difficult, which may discourage contractors from using electric equipment. This research will collect and analyze real-world data to develop standard cost benchmarks. The results will help Caltrans promote the use of electric construction equipment while maintaining project efficiency and cost-effectiveness.

WHAT ARE WE DOING?

This research collects and analyzes data from various types of electric construction equipment, including excavators, loaders, trucks, grinders, and aerial platforms. The study focuses on battery performance, charging time, power efficiency, maintenance needs, and equipment lifespan compared to diesel-powered equipment.

The research begins with the development of detailed surveys for heavy construction contractors and equipment manufacturers in coordination with Caltrans stakeholders. Online surveys and follow-up interviews are then conducted to validate cost and performance information.

The collected information supports the development of new calculation factors for ownership and operating costs within Caltrans' equipment rental rate framework. The project also produces a final report summarizing the collected data,

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research methodology, proposed rental rate calculation factors for electric-powered equipment, and comparisons with similar diesel- and gasoline-powered models.

WHAT IS OUR GOAL?

This research provides data-driven insights into electric construction equipment costs to support Caltrans in establishing accurate rental rates. The project develops a framework for evaluating cost and performance metrics, helping support broader adoption of electric equipment in construction projects.

WHAT IS THE BENEFIT?

This research supports Caltrans' efforts to reduce emissions and promote sustainable construction practices by providing data on the cost and performance of electric construction equipment. Improved cost models help establish fair reimbursement rates for contractors using electric equipment, making environmentally friendly options more practical for construction projects. The findings support future equipment planning, clean energy initiatives, and Caltrans' broader sustainability objectives.

WHAT IS THE PROGRESS TO DATE?

The contract package is undergoing final review, and execution is anticipated in Fall 2026.