

Planning/Policy/ Programming

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Project Title: Pathways to Powering Caltrans with Zero-Carbon Renewable Energy

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Pathways to Powering Caltrans with Zero-Carbon Renewable Energy

This research examines how complete streets projects influence travel choices, local business activity, and patterns of land use in communities across California. Using a combination of data analysis and community perspectives, the study will assess how changes to street design affect walking, biking, transit use, and economic conditions near project sites. It will also explore how agencies view complete streets initiatives and how differing policies shape planning and development decisions. The findings will provide a clearer understanding of the broader impacts of complete streets and offer guidance for future transportation and economic planning efforts.

WHAT IS THE NEED?

In 2022, California passed Senate Bill (SB) 1020, which requires all state agencies to use electricity from 100% zero-carbon or renewable sources by 2035. The California Department of Transportation (Caltrans) relies on more than 25,000 electricity accounts statewide to power the State Highway System, so meeting this mandate will require major planning and coordination. To comply with the law, Caltrans needs a clear strategy for how it will generate or purchase clean electricity across the state. This research will help fill that need by providing the information and guidance necessary for Caltrans to plan a reliable, cost-effective path toward meeting the 2035 zero-carbon requirement.

WHAT ARE WE DOING?

To understand how Caltrans can transition all of its electricity use to zero-carbon sources by 2035, the research team will follow a structured set of activities. They will begin by reviewing existing studies, policies, and past Caltrans work to establish a clear baseline. Next, they will interview a wide range of stakeholders—including Caltrans staff, utility companies, renewable-energy providers, and other state agencies—to identify practical constraints, opportunities, and lessons learned from across the state.



DRISI provides solutions and knowledge that improves California's transportation system.

The team will then analyze Caltrans' electricity consumption data, Environmental Geographic Information System (GIS) information, and property characteristics to project future energy needs and assess which renewable-energy options are feasible for different types of sites. This technical analysis will be supported through collaboration among the University of California, Merced, the Texas A&M Transportation Institute, and external partners, ensuring access to the data and expertise needed for a comprehensive assessment.

All of these efforts will come together in a strategic plan and final research report that outline realistic pathways for Caltrans to generate or procure zero-carbon electricity statewide and meet the requirements of SB 1020.

WHAT IS OUR GOAL?

Caltrans is working with researchers to better understand how much electricity the department will need in the future and to identify realistic ways to transition to 100% zero-carbon power. The project will review current policies, gather insights from experts and stakeholders across the state, and analyze Caltrans' own data to determine what renewable-energy options are most practical and cost-effective. By the end of the study, the research team will outline clear strategies, potential scenarios, and implementation pathways that can help guide Caltrans' long-term planning for clean energy.

WHAT IS THE BENEFIT?

This research will give Caltrans a clearer picture of how it can reliably transition all of its operations to clean, zero-carbon electricity. By identifying realistic options for producing or purchasing renewable energy, the project will help the department meet state mandates while making smarter long-term investments. The findings will show which strategies are most cost-effective, where renewable-energy generation is feasible on Caltrans property, and how different approaches could reduce greenhouse-gas emissions across the transportation system.

Because the project includes input from utility companies, renewable-energy providers, and public-sector partners, it will also strengthen coordination among the organizations responsible for California's energy transition. Beyond supporting Caltrans directly, the research will offer insights that other agencies can use as they work toward their own zero-carbon requirements, contributing to statewide climate and sustainability goals.

WHAT IS THE PROGRESS TO DATE?

The project has kicked off and the research team and customers are working closely to make sure the project meets their needs. We are expecting a quarterly meeting sometime in July of 2026.

IMAGES



Image 1: A Caltrans electric vehicle is parked and charging under a solar panel (Source: <https://dot.ca.gov/programs/equipment/greening-the-fleet>)