

Maintenance

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Project Title:
Compressed Natural Gas (CNG)
Fuel Cell, and Gasoline Powered
Sweepers Evaluation

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Evaluation of Hybrid Electric Street Sweepers

Finding a better alternative to using compressed natural gas or diesel-powered sweepers.

WHAT IS THE NEED?

The South Coast Air Quality Management District (SCAQMD) regulations prevent the California Department of Transportation (Caltrans) from acquiring new diesel street sweepers for use in SCAQMD jurisdiction. As a result, Caltrans began using compressed natural gas (CNG) sweepers. The CNG units are not as reliable as diesel sweepers and have lower production rates. The Divisions of Equipment (DOE) and Maintenance want to determine if there are better alternatives to using CNG-powered sweepers.

WHAT ARE WE DOING?

This research entails a review and evaluation of street sweepers in several combinations of drivetrain and fuel type. Each sweeper drivetrain configuration will be subjected to an identical test cycle to allow direct comparison of fuel use, efficiency, and emissions. The research team will perform chassis dynamometer and Portable Emissions Measurement System (PEMS) tests for all five street sweepers.

WHAT IS OUR GOAL?

The goal of this research is to determine if hybrid electric street sweepers powered by gasoline, diesel, or fuel cells are a better alternative to using CNG or diesel-powered sweepers. Researchers will compare diesel, CNG, diesel hybrid, gasoline hybrid, and hybrid fuel cell sweepers to make this determination.



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WHAT IS THE BENEFIT?

This research will identify the best equipment and methods to meet sweeping needs while minimizing costs and satisfying all regulatory mandates and laws.

WHAT IS THE PROGRESS TO DATE?

The University of California, Riverside (UCR) research team continued to collect and process activity data from several sweepers. The team also sourced and acquired time-lapse cameras to monitor activity during PEMS testing. The team identified two compressed natural gas sweeper units for testing.

The research team contacted US Hybrid regarding additional parameters to evaluate the energy consumption of individual components on the hydrogen sweeper. Additionally, the team scheduled the installation of the PEMS platform and PEMS equipment for inspection and final approval by Caltrans.

The UCR team presented the first iteration of operator and maintenance surveys to Caltrans.