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Research Notes

Evaluating the Effectiveness of "Smart Pedal" Systems for Vehicle Fleets

Evaluate the effectiveness of different "Smart Pedal" systems in reducing fuel consumption and GHG emissions.

Equipment

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Project Title:
Evaluating the Effectiveness of "Smart Pedal" Systems for Vehicle Fleets

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Task Manager:
Azzeddine Benouar
Transportation Engineer, Electrical
Azzeddine.Benouar@dot.ca.gov

WHAT IS THE NEED?

California has major initiatives for reducing greenhouse gas (GHG) emissions by 40% below 1990 levels by 2030, and 80% reduction below 1990 levels by 2050. In recent years, there have been a number of "Smart Pedal" systems that emerged, both as automotive original equipment manufacturer (OEM) equipment and as third-party hardware. These "Smart Pedal" systems can be installed in vehicles with the potential to reduce fuel consumption and GHG emissions by smoothing a driver's acceleration and deceleration patterns, with little effect on travel time or safety. This research task order will catalog and evaluate the effectiveness of different "Smart Pedal" systems in reducing fuel consumption and GHG emissions.

WHAT ARE WE DOING?

The research team will initially review existing "Smart Pedal" technologies and characterize the cost, installation, components, vehicle applicability, and expected effectiveness. The research team will collaborate closely with Caltrans and the technology provider to determine five (5) candidate vehicles on which to test the selected technology. Following the collaborative identification of five (5) demonstration vehicles, the research team will install data loggers (1 Hz data rate) to monitor vehicle operating parameters (fuel, throttle, speed, acceleration, and location). An existing baseline vehicle activity data set will then be established using drivers of these instrumented vehicles. The research team will then coordinate with Caltrans staff to facilitate the installation of the "Smart Pedal" technology by Caltrans staff on the five (5) demonstration vehicles. The research team will then conduct another similar vehicle activity dataset, this time with the use of the "Smart Pedal" technology. Finally, the research team will be able to characterize the physical impacts of the technology on vehicle operation by comparing physical

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operating conditions (speed, acceleration, fuel) between the datasets. The research team will utilize the before/after "Smart Pedal" data to conduct a cost/benefit analysis of the top 2% of Caltrans Fleet vehicles which would benefit from "Smart Pedal" technology installation, projecting on to a large-scale deployment in Caltrans fleet vehicles. Future phases may include a much larger pilot program, covering a larger number of vehicles in the fleet over longer periods of time.

WHAT IS OUR GOAL?

This research will test and evaluate the effectiveness of the SmartPedal system in reducing fuel consumption and improving fuel economy in Caltrans fleet vehicles. The system will be tested both in a controlled testing environment and real-world conditions to determine the effectiveness, benefits, issues, and potential savings offered by the system.

WHAT IS THE BENEFIT?

Based on the observations and testing, a cost benefit analysis will be conducted to determine the economic feasibility of large-scale deployment in Caltrans fleet vehicles.

WHAT IS THE PROGRESS TO DATE?

The research team at UC Riverside tested the Hydraulic Electrical Mechanical (HEM) data logger prior to installation in the field and troubleshooted the data logger broadcasting functionality. The team contacted SmartPedal to inquire about which vehicle models and years are supported, and about testing of prototype SmartPedal device for Chevrolet electric vehicles. The researchers identified specific vehicles in Caltrans' fleet for testing and started working on coordinating installation. Meetings were held to discuss project status and data collection methods and issues

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