

Planning, Policy,  
and Programming

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**Project Title:**

Government Incentives on Ownership of  
Alternative Fuel Vehicles

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**Task Manager:**

Lauren Iacobucci  
Transportation Planner  
lauren.iacobucci@dot.ca.gov

## Government Incentives on Ownership of Alternative Fuel Vehicles

Understanding the effectiveness of various government incentives on household ownership of alternative fuel vehicles using generalized path analysis and structural equation models (SEM).

### WHAT IS THE NEED?

The purpose of this project is to analyze the impact of state and local incentives on household ownership of alternative fuel vehicles (AFVs) and hybrid electric vehicles (HEVs) using generalized path analysis and structural equation models (SEM) while accounting for residential self-selection and demographic characteristics. Limited refueling infrastructure, costs, and range anxiety have hampered the adoption of AFVs. Since alternative technologies are initially more expensive than conventional technologies that benefit from economies of scale and installed infrastructure, incentives are needed to boost demand for AFVs and to subsidize new infrastructure until the number of early adopters is large enough for commercial viability. However, subsidizing new transportation technologies can lead to costly failures, so understanding their effectiveness is critical. To promote HEVs, government at all levels has provided various incentives, such as parking privileges, HOV access exemption, income tax credit, sales tax, and rebates. The effectiveness of these incentives, however, has not yet been analyzed systematically. The purpose of this research is to bridge the gap and to quantify the effectiveness of various incentives on the adoption of HEVs and AFVs using the most recent national and statewide transportation surveys. Understanding the effectiveness of various government policies is important at a time when there is increased interest in promoting AFVs/HEVs to address our dependence on foreign oil, air pollution and global warming.

### WHAT WAS OUR GOAL?

This study led to a journal paper that was submitted for publication to the Transportation Research Board and a summary article in Access Magazine.



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system to enhance California's  
economy and livability.

## WHAT DID WE DO?

This research analyzed two national datasets complemented by other datasets (e.g., land use, incentives): the 2009 National Household Travel Survey (NHTS) and the 2012 California Household Travel Survey (CHTS). Both datasets offered rich household and per person socio-economic characteristics with a high spatial resolution that allowed adding land use and neighborhood characteristics, which was necessary to properly account for household's residential self-selection. To correctly account for incentive impacts, this analysis was restricted to households who purchased a vehicle during the year when either survey was conducted.

## WHAT WAS THE OUTCOME?

Results from this research are of interest to inform regional targets for Green House Gas (GHG) emissions reduction from passenger vehicle use under the Sustainable Communities and Climate Protection Act of 2008 (SB 375), which aims at reducing GHG emissions through coordinating transportation and land use planning.

## WHAT IS THE BENEFIT?

This study informs policymakers about the relative efficiency of various incentives to foster the adoption by households of AFVs and HEVs. AFVs and HEVs play an important role for reducing California's emissions of GHG, which is a key policy goal in California since Assembly Bill 32 (signed into law in 2005). AB 32 aims at reducing GHG emissions to 1990 levels by 2020, and then to cut GHG emissions 80 percent below 1990 levels by 2050. Strategies for implementing GHG emission reduction programs and the state's Climate Adaptation Strategy are coordinated by the Senate's Climate Action Team, which includes the

heads of state agencies, boards and departments, led by the Secretary of California Environmental Protection Act.

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