DRISI

Caltrans Division of Research, Innovation and System Information

Research Results

Synergistic Integration of Transportation Demand Management Strategies with New Technologies and Services to Enhance Reductions in VMT and GHG

This study is to illustrate and understand how new transportation technologies (i.e., dynamic ridesharing and electric vehicles) may have synergistic interactions with land use, transit, and auto pricing policies.

Planning/ Policy & Programming

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Project Title:
Transportation Futures for Deep Greenhouse Gas Reductions: Synergistic Interactions of New Transportation Technologies and Services with Land Use, Transit, and Auto Pricing Policies.

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WHAT WAS THE NEED?

It is widely recognized that new vehicle and fuel technology is necessary, but not sufficient, to meet deep greenhouse gas (GHG) reductions goals for both the U.S. and the state of California. Demand management strategies (such as land use, transit, and auto pricing) are also needed to reduce passenger vehicle miles traveled (VMT) and related GHG emissions.

WHAT WAS OUR GOAL?

The goal of this study provides Caltrans with a greater understanding of the connections between advancing vehicle technology as it relates to land use and public policy decisions. This linkage is critical in assessing how transportation impacts air quality and how technology can help reach the goals of legislation that mandates reduction in GHGs, as per California's landmark AB (Assembly Bill) 32.

Caltrans

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

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WHAT DID WE DO?

In this study, we explored how demand management strategies may be combined with new vehicle technology (battery electric vehicles or BEVs) and services (dynamic ridesharing) to enhance VMT and GHG reductions. Owning a BEV or using a dynamic ridesharing service may be more feasible when distances to destinations are made shorter and alternative modes of travel are provided by demand management strategies. To examine potential markets, we used the San Francisco Bay Area activity based travel demand model to simulate business-as-usual, transit oriented development, and auto pricing policies with and without high, medium, and low dynamic ridesharing participation rates and BEV daily driving distance ranges

WHAT WAS THE OUTCOME?

The results of this study suggest that dynamic ridesharing has the potential to significantly reduce VMT and related GHG emissions. These reductions may be greater than demand management measures typically included in Sustainable Community Strategies (under California Senate Bill 375), if travelers are willing pay with both time and money to use the dynamic ridesharing system. However, in general, large synergistic effects between ridesharing and transit-oriented development or auto pricing policies were not found in this study. The results of the BEV simulations suggest that TODs may increase the market for BEVs by less than one percent in the Bay Area and that auto pricing policies may increase the market by as much as seven percent. However, it is possible that larger changes are possible over time in faster growing regions where development is currently at low density levels (for example, the Central Valley in California).

The VMT Fee scenarios show larger increases in the potential market for BEV (as much as seven percent). Future research should explore the factors associated with higher dynamic ridesharing and BEV use including individual attributes, characteristics of tours and trips, and time and cost benefits. In addition, the travel effects of dynamic ridesharing systems should be simulated explicitly, including auto ownership, mode choice, destination, and taxi-sharing pick up VMT.

This research effort included a presentation of results that were part of the DRISI "Research Connection" series, which is a webinar-based presentation of research studies that are broadcasted to a wide audience of Caltrans' research partners and professionals. The Principal Investigator, Ms. Caroline Rodier, presented her preliminary findings on May 28th, 2015. A presentation was also made to the San Francisco Chapter of ITE and will be presented at the Podcar City conference (November 5th, 2015) and the Transportation Research Board's Annual Meeting (January 2016).

WHAT IS THE BENEFIT?

Caltrans, along with technology professionals, will gain insight into the relative importance of land use and transportation decisions on their ability to implement new technologies and services. These organizations and individuals will also gain an understanding of how emerging modeling tools can be used to gauge markets for new services. Transportation and land use professionals can also use the results to evaluate and advocate for methods to achieve deeper GHG reductions from land use and transportation scenarios.

LEARN MORE

http://transweb.sjsu.edu/project/1207.html