



Caltrans Division of Research,
Innovation and System Information

Research

Notes

Planning
Policy
Programming

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Project Title:
UTC - From Trend Spotting to Trend Setting:
Modeling the Impact of Major Technological
and Infrastructural Changes on Travel Demand

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Modeling the Impact of Major Technological and Infrastructural Changes on Travel Demand

Integrate models of technology diffusion (Prof Zilberman's expertise) and travel demand models (Prof Walker's expertise) to predict trends in travel and activity behavior.

WHAT IS THE NEED?

Major technological and infrastructural changes over the next several decades, such as the introduction of autonomous vehicles and the implementation of mileage-based fees, are expected to have a profound impact on lifestyles, modality styles and travel behavior.

Travel demand models currently in practice are not equipped to predict long-range trends in travel behavior, such as the recently observed saturation in car use (peak auto). Studies in the past that have examined trends in travel behavior have done so retrospectively, and a framework for predicting future trends remains lacking.

We propose integrating models of technology adoption with models of travel demand in an attempt to develop a dynamic framework of disaggregate decision making that can be used to understand and predict long-range trends in travel behavior, and offer insights to planners and policy makers on what can be done to influence possible outcomes. The framework will be estimated and evaluated using longitudinal travel diary datasets from Santiago, Chile and the Puget Sound Region, United States.

WHAT ARE WE DOING?

The project will consist of the following four tasks:

- 1) The procurement and preparation of datasets in a format that can subsequently be used for model estimation
- 2) The development of models of technology and service adoption
- 3) The development of models of travel and activity behavior
- 4) The joint application of these model systems to understand and predict the implications of major technological and infrastructural changes in the transportation and land use system on the demand for travel.



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

WHAT IS OUR GOAL?

Integrate models of technology diffusion (Prof Zilberman's expertise) and travel demand models (Prof Walker's expertise) to predict trends in travel and activity behavior in response to major changes in the transportation system (highway capacity expansion, carsharing, bikesharing and bike infrastructure, high speed rail, mileage--based fees, autonomous vehicles).

WHAT IS THE BENEFIT?

Instead of reacting to trends as they happen, we can plan for trends and potentially influence the outcome with policy, technology, and infrastructure decisions.

WHAT IS THE PROGRESS TO DATE?

The kickoff meeting was held on April 23, 2015. We performed exploratory data analysis (EDA). We are working on Model formulation and coding up the models.

The following tasks were in progress as of June 30, 2015:

- Exploratory data analysis (EDA)
- Model formulation and coding up the models

The next quarter's tasks/deliverables are listed below:

- Finalizing model estimation and results.
- Assessing policy implications.