



Caltrans Division of Research,  
Innovation and System Information

# Research



# Results



Planning, Policy,  
and System  
Information

## September 2013

**Project Title:**  
Mobile Survey

**Task Number:** 2243

**Completion Date:** July 30, 2013

**Task Manager:**  
Bob Justice,  
Associate Transportation Planner  
bob.justice@dot.ca.gov

## Spatially Focused Travel Data and Analysis

Pilot test spatially focused travel data collection. This is not a GPS data collection pilot per se, but an attempt to develop methods to collect spatially focused travel data.

### WHAT IS THE NEED?

To help close a crucial data gap in land use – travel behavior studies. Current estimates of land use – travel behavior relationships are based on average effects for metropolitan areas or larger geographies. That gives little insight into the effect of small-area land use policies such as targeted infill development, transit-oriented land uses near stations, or similarly localized policies.

In California, Senate Bill (SB) 375 requires that metropolitan planning organizations incorporate land use – transportation planning, but existing travel diary surveys have very few observations in areas of policy interest. This research helped to pioneer methods to obtain travel data with sufficient spatial focus to inform current debates about how land use influences vehicle miles of travel.

### WHAT WAS OUR GOAL?

The goal of this research was to pilot test spatially focused travel data collection. This was not a GPS data collection pilot per se, but an attempt to develop methods to collect spatially focused travel data. The GPS pilot test assessed how well a web-based survey can record vehicle-miles-traveled (VMT). Depending on the outcome and research needs, final survey data collection was to be via a single method or may be through multiple methods that might include web-based or other travel surveys, GPS loggers, or cell phone applications.

Most importantly, the goal of the research was to obtain enough travel surveys to analyze land use – travel impacts within the study areas for purposes of understanding departures from regional average land use –travel impacts. Electronic data collection (i.e. GPS loggers or cell phones) are a tool and the



Caltrans provides a safe, sustainable,  
integrated and efficient transportation  
system to enhance California's  
economy and livability.

research goal was not to innovate in the use of electronic travel data collection methods.

## WHAT DID WE DO?

A target of 100 to 200 travel diary surveys was obtained in small neighborhoods within the Southern California Association of Governments (SCAG) region. Approximately four neighborhoods were targeted for inclusion in this study. The methods developed in this research advanced efforts toward low-cost, rapid travel data collection that can be used in before-and-after transportation program evaluations in the future.

Unfortunately, available data are not sufficient to measure or model the localized land use policies (e.g. transit oriented development, infill densities, or land use mix) that will be important for development. This research collected and analyzed spatially focused data that can help close the existing gap between travel data, knowledge, and policy. The regional travel surveys conducted by each of the four large MPOs in California about once every ten years lack sufficient spatial resolution to measure the impact of highly localized land use strategies on household vehicle miles traveled (VMT).

## WHAT WAS THE OUTCOME?

Results suggested differences in walking, transit, and passenger vehicle travel behavior associated with residing in areas with different built environment, land use, and transit access characteristics. Based on the countywide sample, households in areas with higher employment accessibility tended to have more walking travel and lower VMT.

Households within 1.5 miles of a rail transit station tended to have more transit ridership, and this relationship was strongest for households within 0.5 miles of a rail transit station. Households within 0.5 – 1.0 miles of a rail transit station tended to have more walking travel, while households with higher levels of transit service were associated with lower

household VMT.

Results expanded our understanding of the land use-travel relationships and inform policies which aim to more closely integrate transportation and land use planning and target housing and job growth into transit-oriented, mixed-use, and compact communities. Understanding how the characteristics of these communities influence travel behavior is particularly important given a pilot study in California suggests that areas with certain infill-related land use characteristics may be associated with lower trip generation rates than Institute of Transportation Engineers (ITE) trip generation rates.

## WHAT IS THE BENEFIT?

Minimizes user burden during household travel surveys, while providing accurate and reliable traveler behavior information at a significantly reduced cost. This improved information enhances travel demand modeling, and transportation. This research also pioneered methods to obtain travel data with sufficient spatial focus to inform current debates about how land use influences vehicle miles of travel. The methods developed in this research advanced efforts toward low-cost, rapid travel data collection that can be used in before-and-after transportation program evaluations in the future.

The study was not designed to estimate infill or near-transit trip generation rates. Findings of the study do reiterate the need for more localized data collection in areas targeted for infill and densification which can inform trip generation assumptions in regional transportation models. The study was also not designed to identify transferrable parameters for transportation models.

## LEARN MORE

### Final Report

<https://bit.ly/3f9l9mP>

**IMAGE**

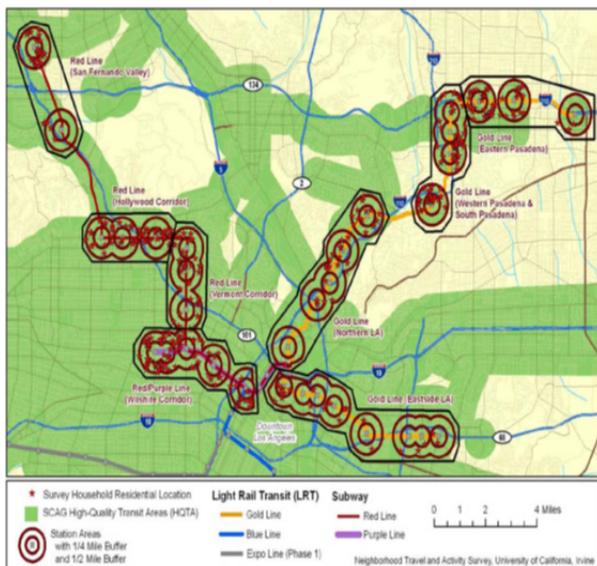


Image 1: Study Areas and Location of Households Who Completed Travel Diary Survey

The contents of this document reflect the views of the authors, who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the California Department of Transportation, the State of California, or the Federal Highway Administration. This document does not constitute a standard, specification, or regulation. No part of this publication should be construed as an endorsement for a commercial product, manufacturer, contractor, or consultant. Any trade names or photos of commercial products appearing in this document are for clarity only.