DRISI
Caltrans Division of Research, Innovation and System Information

Research Results

Parking Utilization and Site Level Vehicle Miles Traveled (VMT) Database

This project collected data to quantify how changing parking supply at different types of developments impacts the use of motorized vehicles.

Planning, Policy and Programming

JUNE 2022

Project Title:
Parking Utilization and Site Level VMT Database

Task Number: 3291

Start Date: August 21, 2019

Completion Date: June 29, 2022

Task Manager:
Tyler Monson
Senior Transportation Planner
Tyler.monson@dot.ca.gov

WHAT WAS THE NEED?

Caltrans' Local Development Review (LDR) program often references parking reduction in formal comment letters as an appropriate Transportation Demand Management (TDM) measure to support infill development. The program relies on prior statewide and nationwide research that documents how lack of parking can be a primary decision point to make a trip via transit, rail, bicycle, or pedestrian modes, rather than an automobile. Local jurisdictions such as cities use parking research to make policy decisions about minimum and/or maximum parking requirements for developments, and provision of on-street and off-street parking in neighborhoods and around destination centers (a central business district, arena, tourist attraction, etc.). More information was needed about correlations between reduced parking supply and total vehicular travel.

WHAT WAS OUR GOAL?

The goal of this study was to establish a data-driven link between parking supply at a development-level and vehicle miles traveled (VMT).

WHAT DID WE DO?

The research team used a combination of literature review, information from the California Household Travel Survey, existing information from major cities in California, and an extensive phone survey to determine the impact of off-street residential

Caltrans

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

parking supply on travel choices. Two major outcomes of this project include a vehicle-miles traveled (VMT) and parking database and a corresponding tool that includes a model that allows practitioners and agencies to estimate how changing parking supply at a development level impacts VMT with different parking assumptions, controlling for other relevant contextual characteristics. The tool is derived from data collected during this project and provided in the VMT/Parking database, in addition to any additional existing information found, in four California cities.

WHAT WAS THE OUTCOME?

Despite the established relationship between parking and vehicle use, there has not been sufficient research to establish a nexus between parking and VMT; subsequently, there has not been a clear framework for establishing this relationship in practice.

In this study, we offer an initial framework to address this issue. Our two-step model framework helps establish the relationship between parking and VMT. Our framework and analysis suggest that off-street residential parking influences vehicle use through vehicle ownership. The regression equations derived from our models can be used to build a user-friendly, practical tool for practitioners, where inputs can be adjusted to control for local context to establish the relationship between parking and VMT for a particular study area or development. Such a tool can be extended to include our scenarios analysis to examine the proportionality between off-street parking and vehicle use such that the effect of the imposed condition of constrained parking can be not only demonstrated but quantified.

Key Findings:

- Households with constrained parking (less than or equal to one space per dwelling) own fewer vehicles compared to those with unconstrained parking (more than one space per dwelling). On average, those households own approximately 7-26% fewer vehicles than comparable households without constrained parking. Vehicle ownership (predicted) was significantly and positively related to stated frequency of vehicle use. For each additional vehicles owned, the average California Household Travel Survey household's frequency of vehicle use increased by a factor of 2, while our UArizona survey indicated an increase in likelihood by a factor of about 1.3.
- For each additional estimated vehicle owned, a household is expected to generate roughly 14 greater miles of total VMT and 3 greater miles of home-based work (HBW)VMT.
- Those that 100% telecommute—are expected to generate approximately 7 fewer total VMT miles and 11 fewer HBW VMT.

WHAT IS THE BENEFIT?

Caltrans' LDR program, cities and counties, developers, and others can use the parking database and tool to estimate parking's effect on vehicle miles traveled. This can help inform policy decisions such as how much parking to require of local development projects and provide insights for the use of parking reduction strategies as a method of reducing vehicular travel. During the study, the technical advisory committee identified a longer-term goal of expanding the database to link vehicle demand beyond parking supply to other TDM strategies and policy levers to be able to quantify the amount of 'credit' to be given for specific strategies.

LEARN MORE

https://link.springer.com/article/10.1007/s11116-022-10306-8

IMAGES

Image 1: An aerial view of a parking lot adjacent to a shopping center shows vehicles parked and people walking around. This is a stock photo.