ASSESSMENT OF OPTIONS FOR QUANTIFYING REDUCTION IN VEHICLE MILES TRAVELED (VMT) FROM MITIGATION MEASURES

Susan Handy
Jamey Volker
University of California, Davis
slhandy@ucdavis.edu

Project Objective

The purpose of this study is to provide an overview of possible methods for estimating reductions in vehicle miles traveled (VMT) for 45 measures for mitigating increases in VMT stemming from highway expansion projects. The study provides recommendations on the most appropriate estimation method for each measure.

Problem Statement

Guidelines for the California Environmental Quality Act require the mitigation of projected increases in vehicle miles traveled (VMT) stemming from highway expansion projects. Quantifying the likely effects of proposed mitigation measures enables an assessment of the degree to which the mitigation program offsets the estimated increase in VMT for a project. Standardized methods for estimating the effects of mitigation measures are not currently available.

Research Methodology

The development of the recommended estimation methods drew on available reviews of the empirical evidence on the effect size for each of the strategies as well as original literature reviews as needed. The methods outlined in the *California Air Pollution Control Officers Association (CAPCOA) Handbook* also informed the development of the recommended methods.

Results

This study provides recommendations for methods for estimating the reduction in the number of miles of vehicle travel that could be expected to result from the implementation of a specific measure. The methods take into account the extent of the measure but may not account for the specific context. In general, two types of methods are available: travel demand forecasting models, and effect-size approaches.

The recommended methods will produce estimates of VMT reductions with a high degree of uncertainty. The estimates will generally reflect a typical or average effect, rather than one that reflects the specific local context in which it is implemented. Other considerations are spelled out in the study report.

For several measures, this study concludes that the reduction in VMT cannot be estimated based on the available evidence. This does not mean that the measures will not reduce VMT or should not be incorporated into a mitigation program. Even when the evidence is insufficient for quantifying the effect of a measure, it may be sufficient to be confident that the measure will reduce VMT some amount.

Table 1. Summary of Recommendations for Quantifying Mitigation Measures

	Quantification Recommendation
Public transportation measures	
Transit service headways/frequency	Use effect size estimate or travel demand model
First/last mile connectivity	Do not quantify
Transit service coverage	Use effect-size approach or travel demand model
Transit-supportive roadway design	Do not quantify or use travel demand model
Transit fares	Use effect-size approach or travel demand model
Transit reliability	Do not quantify
Mobility hubs	Do not quantify
TNC/transit partnership	Do not quantify
Transit stop amenities	Do not quantify
Transit vehicle amenities	Use effect-size approach
Park-and-ride lots	Do not quantify
Marketing transit	Do not quantify
On-demand transit	Use effect-size approach
Commuter/regional rail	Use effect-size approach or travel demand model
Travel demand management measures	
Telecommuting	Use effect-size approach
Employer-based Commute Trip Reduction programs	Use effect-size approach
Transit pass subsidies	Use effect-size approach
Ridesharing Programs	Use effect-size approach
Car-sharing programs	Do not quantify
Community-based travel planning	Use effect-size approach
Safe Routes to School and other school-based programs	Do not quantify
Broadband improvements	Do not quantify
Land use measures	
Transit-Oriented Development (TOD)	Use effect-size approach or travel demand model
Residential density	Use effect-size approach or travel demand model
Employment density	Use travel demand model or do not quantify
Affordable housing	Use effect-size approach
Land preservation as growth management	Use travel demand model or do not quantify
Land-use mix	Use travel demand model or do not quantify
Delivery Hubs	Do not quantify
Jobs/housing balance	Use travel demand model or do not quantify

	Quantification Recommendation
Road management measures	
Congestion pricing	Use effect-size approach or travel demand model
Road diets/ complete streets	Do not quantify
Local network connectivity	Use effect-size approach or travel demand model
Traffic calming	Do not quantify
Curb management	Do not quantify
Active transportation measures	
Bicycle facilities	Use effect-size approach
Pedestrian facilities	Use CAPCOA approach
E-bike incentive programs	Use effect-size approach
Bike share and scooter share	Use effect-size approach
Parking management measures	
Parking workplace pricing	Use effect-size approach
Parking cash-out programs	Use effect-size approach
Pricing on-street parking	Use effect-size approach
Adaptive parking pricing	Do not quantify
Residential parking restrictions	Use effect-size approach
Unbundling parking costs	Do not quantify