DRISI

CALTRANS DIVISION OF RESEARCH, INNOVATION AND SYSTEM INFORMATION

TRANSFORMING IDEAS INTO SOLUTIONS

Research Notes

Guidance for Operational Improvement Alternatives

Guidance for Operational Improvement Alternatives before Adding a New Lane.

Traffic Operations

May 2025

Project Title: Guidance for Operational Improvement Alternatives

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WHAT IS THE NEED?

The California Department of Transportation (Caltrans) policy and practice are changing, with a shift to considering the addition of new State Highway System (SHS) lane-miles as a "solution of last resort" rather than a standard response to operational and safety problems. The Department's implementation of SB 743 reflects one aspect of this shift, bringing a change in the California Environmental Quality Act transportation analysis metric from vehicular traffic's level of service to vehicle miles traveled (VMT), highlighting the impact of SHS capacity increases on stimulating additional vehicle travel. Governor Newsom's EO N-19-19 also articulates the Administration's objective of reducing overall vehicle use. The draft Climate Action Plan for Transportation Infrastructure (CAPTI) reflects the Executive Order's mandates. The Caltrans Executive Board is discussing a set of "talking points" to communicate this change, recognizing Administration policy and the phenomenon of induced travel.

These changes point to the need to identify processes to address highway operational safety and efficiency issues without stimulating additional vehicle travel. The existing operational improvement strategies such as part-time shoulder lanes, auxiliary lanes, enhanced freeway service patrols, conversion from High Occupancy Vehicle lanes to High Occupancy Toll/Managed Lanes, ramp metering and related ITS technology applications should be reviewed through the VMT lens as alternatives to adding new lane miles. Research is needed to inform guidance and help practitioners fully explore operational improvement alternatives and make capacity expansion the last resort in the project planning and delivery process.

Caltrans

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WHAT ARE WE DOING?

The research team at the University of California at Berkeley will develop Project results and implement through the publication of a guidance document describing when to use VMT as an evaluation criterion and how to estimate VMT in various circumstances.

The research will progress in three parts and will attempt to identify:

- Document and characterize the safety / operational problems to be addressed, through interviews and review of document purpose and need.
- Identify strategies used by Caltrans and other Department of Transportations, cited in manuals, professional and academic literature, etc.
- Identify and document processes and approaches that could be provided to Project Initiation Document unit / Project Development teams to assess interventions addressing the stated mobility or safety issues.

Case studies will also be developed in this research through direct interactions with interested districts.

WHAT IS OUR GOAL?

The primary goal is to provide guidance on when and how to use VMT as an evaluation criterion for transportation projects. A secondary goal is to provide methodologies for estimating VMT for off-freeway projects and projects involving multiple modes of transportation.

The research is intended to support the production of a guidance document to be used throughout the Department, guiding practitioners in various project development processes. The case study development process is a trial application, in fact. The implementation will continue after the final report is delivered through guidance development, training and project-delivery support processes.

WHAT IS THE BENEFIT?

The guidance document will help the Department fully align with executive orders and state laws to develop projects considering VMT reduction. Adding a new lane might be the last resort, and not the first choice. This is a cultural shift in California. The guidance document will facilitate such a cultural shift.

WHAT IS THE PROGRESS TO DATE?

The META-Analysis of Alternative Solutions task was completed. The analysis focused on a literature review and analysis of two types of studies: (1) safety studies, and (2) operational analysis studies. The latter mostly consisted of simulations.

In addition, The Simulation of Strategies work has been accelerated. The I-210 Aimsun model was modified to simulate a number of scenarios including the addition or removal of auxiliary lanes at five different locations. Simulations have been performed, and initial results have been analyzed.

Initial work has begun on the Synthesize Practical Guidance task.