WHAT WAS THE NEED?

Managed lanes—high-occupancy vehicle (HOV) lanes, express lanes, and high-occupancy toll (HOT) lanes—are an integral part of California's highway system, with over 1,500 lane miles either in operation or under construction and hundreds of more lane miles proposed. The goals of HOV lanes are to relieve congestion, conserve fuel, and improve the air quality in metropolitan areas. It is necessary to ensure that existing, converted, and new managed lane projects are meeting the purpose of improving air quality. Based on the results from previous tasks, this project developed a modeling toolset to provide reliable estimates of the air quality impacts of HOV lanes.

WHAT WAS THE GOAL?

The goal was to enhance analysis tools developed in previous tasks to evaluate the emission impacts of different types of managed lanes.
WHAT DID WE DO?
Caltrans, in partnership with the University of California, Riverside Center for Environmental Research and Technology, had previously completed research on the effectiveness of HOV lanes in improving air quality. As part of that study, the researchers had developed analysis tools to evaluate the emission impact of limited-access HOV lanes, which are commonly found in Southern California. This project expanded the capability of the developed tools to incorporate vehicle activity data collection, traffic simulation, and emission modeling to enable evaluation of other types of managed lanes, including continuous-access HOV lanes, generally used in Northern California, and HOT lanes. The researchers defined the mandatory and optional data inputs as well as the corresponding outputs. They then implemented the analysis steps and data flow in Microsoft Excel.

WHAT WAS THE OUTCOME?
The analysis tools are compatible with California’s EMission FACtors (EMFAC) model, using a spreadsheet platform that is easy to use by Caltrans technical staff. The deployment was supported with a user guide and training conducted to ensure effective knowledge and technology transfer.

WHAT IS THE BENEFIT?
HOV lanes produce less pollutant emissions per lane as compared to adjacent general-purpose lanes. The enhanced tools help quantify the air quality benefits of the various types of HOV lanes, allowing Caltrans to set appropriate operation policies based on sound scientific findings. Caltrans can also use these measurements to quickly prepare environmental review documents to ensure timely delivery of managed lane projects.

LEARN MORE
To view the complete report: www.dot.ca.gov/research/researchreports/reports/2014/final_report_task_2329.pdf

Data collection sites in Northern California

Configurations of HOV lanes in California