

Improve Traffic Census and Highway Performance Monitoring Programs

Evaluating Caltrans Highway Performance Monitoring Programs (HPMS) and Census program traffic (count) data collection practices, recommendations to improve efficiency and better meet the data and reporting needs of the HPMS and Census programs.

Identifying the Need

After initial discussions with Caltrans HQ and the Census and HPMS program managers, three areas of concern regarding the Caltrans traffic data collection practices were identified:

Currently, Caltrans does not have any year-round count stations for the off-system roadway sections. And for past 10 years or so, Caltrans has not been collecting data on local roadways due to a lack of resources. One of Caltrans main concerns regarding HPMS data collection and reporting is the lack of traffic data on the 119,142 miles of local roadways in California. Even with that, Caltrans is still required to report the vehicle miles travelled (VMT) for these local roadways to Federal Highway Administration (FHWA).

Caltrans is potentially underutilizing web-based traffic data Performance Measurement System (PeMS) for meeting the needs of their Traffic Census Program.

Caltrans has expressed a need to evaluate on the feasibility of integrating one or more of the commercially available “big-data” solutions into their current data collection practices.

What is the goal?

The objective of this research study was to support the Traffic Census and HPMS Programs by 1) evaluating the need for additional HPMS (motorized traffic) count locations on public roads in California, 2) evaluate the appropriateness of utilizing PeMS data to meet Census program needs, and 3) to assess the feasibility of integrating commercial “big-data” traffic counts into Caltrans HPMS and Census program’s data collection practices.

Project Description

For the HPMS program, this research identified and evaluated count locations for motorized traffic data collection on non-State Highway System Routes to help meet FHWA requirements for the HPMS program. Additionally, we developed a data collection implementation plan that contained data collection methods, data collection cycles, sampling site selection, and estimated costs for the local roadways in California. For the Census program, this study evaluated the traffic census count locations for each District to determine at which Census count locations the automated and continuously collected Caltrans PeMS data could be used in lieu of manual traffic counts. Lastly, this research reviewed and summarized the emerging traffic data collection technologies and data sources appropriate for Caltrans HPMS and/or Census reporting purposes.

Projected Benefits to California

This research identified the need for 304 additional HPMS motorized traffic count locations on minor collector and local public roads in California, along with a recommended HPMS count schedule and budget estimates. These newly identified HPMS count data are needed to meet the HPMS program reporting requirements.

Currently, Caltrans Districts and the Census program only nominally leverage PeMS data for meeting their annual traffic count obligations. This research identified 882 locations (state-wide) where PeMS freeway vehicle detector stations could most probably be utilized to meet HPMS and Census data requirements, and an additional 164 plausible locations.

This research also concluded that commercial data providers show considerable promise as a non-traditional, yet pragmatic and cost-efficient addition to Caltrans data collection practices. Recommendations included conducting a pilot study using commercial big-data to fulfill HPMS/Census traffic volume requirements.

modeling. Additionally, Dr. Mauch supervises and mentors junior researchers and graduate student researchers.

What is the progress to date?

This project has been completed. All final deliverables have been reviewed and accepted by Caltrans.

This study has found that PeMS can be used to fulfill the HPMS/Census traffic volume requirement. This research identified and evaluated count locations for motorized traffic data collection on non-State Highway System Routes to help meet FHWA requirements for the Caltrans HPMS program. We reviewed and summarized the emerging traffic data collection technologies and data sources appropriate for Caltrans HPMS and/or Census reporting purposes.

Recommendations include adding the 304 newly identified count stations to the HPMS count locations. Caltrans should select a small subset of the off-system count locations in each District and install year-round count stations at these locations.

Final Report

[Improving the Traffic Census and Highway Performance Monitoring System \(HPMS\) Programs \(escholarship.org\)](https://escholarship.org/uc/item/9kz8z)

About the Authors

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