

Traffic Operations

May 2026

Project Title: Use of Third-Party Data and Emerging Technologies to Enhance Traffic Monitoring

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Use of Third-Party Data and Emerging Technologies to Enhance Traffic Monitoring

This project will evaluate whether vehicle tracking data collected by third-party vendors could effectively be used to analyze truck movements in high-traffic urban/suburban networks.

WHAT IS THE NEED?

Determine how traffic data offered by third-party vendors and emerging detection technologies could effectively be used to support California Department of Transportation (Caltrans) traffic monitoring operations, either as an addition to the existing data collection infrastructure or as a replacement source for the data currently collected. Also, this is to establish recommendations for when to use new detection technologies, such as Light Detection and Ranging (LiDAR) sensors and camera-based machine vision and analytics.

WHAT ARE WE DOING?

- Develop performance-based data specifications defining the key parameters needed by Caltrans from third-party vendors to ensure that the data being acquired reliably represents traffic conditions at sites of interest.
- Assess how third-party data offerings can be used to fill in gaps in Caltrans's current traffic data collection approach and even replace traditional detection methods where relevant.
- Develop an approach for identifying new traffic monitoring locations and selecting an effective data collection method for these locations in an environment in which traditional detection methods and reliable third-party data are both available.
- Develop updated guidelines for the selection of traffic detection technology to favor in various situations considering recent new technologies, such as LiDAR and camera-based machine vision and analytics.



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- Develop a method for assessing whether data continuously collected from freeway mainline Performance Measurement System (PeMS) sensors could be used to augment, or even replace, data collected manually for the Census program and for performing, if necessary, adjustments to the PeMS data being used to account for identified data collection issues.

WHAT IS OUR GOAL?

The general objective of the project is to evaluate how third-party traffic data and emerging technologies could be used to enhance Caltrans traffic monitoring capabilities. Since different vendors may rely on different data sources or technologies, as well as provide platforms with different analytical capabilities, the evaluations are not meant to provide how-to guides on how to use data from a specific vendor or specific detection technologies. The objective is to conduct generic evaluations and develop generic guidelines and methods highlighting how third-party data or emerging detection technologies can be effectively leveraged to benefit Caltrans traffic monitoring operations.

WHAT IS THE BENEFIT?

Results from this study will be immediately applicable for network performance assessment and project evaluation tasks. They will allow Caltrans staff to better utilize third-party data and emerging detection technologies to expand general traffic and trucking monitoring capabilities within the state, more efficiently analyze traffic demand and traffic movements, and allow them to conduct more rigorous evaluations of how proposed projects may be affected by changes in general traffic or may conversely influence traffic patterns, vehicle-miles traveled (VMT), and vehicle emissions. More robust assessments of traffic activities may also lead to better estimates of safety risks associated with transportation activities.

By determining whether some analyses could be done with third-party data or emerging roadside detection technologies, this project could further justify the use of fewer in-pavement sensors. In turn, the use of fewer sensors could reduce the need for traffic-disruptive maintenance work on these sensors and accident risks for both Caltrans staff and the general traffic.

WHAT IS THE PROGRESS TO DATE?

Task 1: Project Management

A new task manager is assigned and first meeting with him was held on February 26, 2026. Information was received from the new task manager about a technical problem with the No Cost Extension that had been approved for the project. As a result, a new extension for the period from June 2026 to June 2027 is in-process. Multiple discussions have been held with the new task manager in March 2026 on how to bring the project to a successful end if the June 2026 end date error cannot be rectified. This includes putting Task 6 on hold (and possibly remitting related funds) until a corrected June 2027 extension could be obtained.

Task 2: Develop Performance-Based Specifications

Completed the identification of user cases and related data requirements based on the results of the various interviews that were conducted during the last quarter. Developed a summary list of the main categories of specifications to be considered, with an explanation of what each category considers. Started developing a generic template of specifications for the procurement of 3rd party data.

Task 3: Reimagining Caltrans's Existing Traffic Data Collection Infrastructure

Started the development of a summary of key data gaps in Caltrans's data collection infrastructure. Started the identification of key benefits potentially provided by 3rd-party data.

Task 4: Develop Hybrid Detection Deployment Model

Started to assess how 3rd-party data could be

integrated into the existing network of fixed sensors. Continued reviewing data collection capabilities offered by vendors Streetlight, INRIX, and other 3rd-party platforms, adding an assessment of truck-related data provided by Altitude.

Task 5: Develop New Traffic Detection Use Recommendations

Started evaluating the potential use of select new traffic detection technologies, such as portable camera systems, inductive loop signature identification, and lidar.

Task 6: Develop Performance Measurement System (PeMS) Census Data Substitution Model

Task currently on hold. PeMS is Caltrans' Freeway Performance Measurement System

Task 7: Final Project Documentation and Training

Started documenting all project activities in a draft report.