

## Traffic Operations

NOVEMBER 2024

**Project Title:**

Caltrans Traffic Operations Data  
Standards Implementation  
Recommendations

**Task Number:** 4085

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## Caltrans Traffic Operations Data Standards Implementation Recommendations

Provide guidance for the California Department of Transportation (Caltrans) within the state to improve data and system interoperability across the transportation system. The project will focus on improving standardization of traffic operations data communications across California's transportation infrastructure.

### WHAT IS THE NEED?

Transportation data standards are an increasingly complex topic, particularly as the types and volume of data becoming available is exploding. New data sources, private data providers, and uses for data are exploding. Data standards can provide significant benefits, including the ability to integrate different systems and different vendor products, improve and ease data analysis, and enable Transportation Systems Management and Operations (TSMO) and many cross-jurisdictional and cooperative solutions and strategies. Without data standards, these benefits cannot be realized.

However, data standards are not always universal, are constantly evolving with transportation technology and information technology advances and are not always implemented universally and in the same manner across the vendor community. Resulting patchwork solutions increase costs, undermine integration efforts, and invite opportunities for wasted effort.

California needs a roadmap for data standardization, ensuring that it has a universal set of standards for all its contractual systems integration efforts and that those standards are implemented in the same manner across its vendor community.

### WHAT ARE WE DOING?

This project will review the current information technology and standards landscape, currently used by Caltrans Division of Traffic Operations, and provide practical guidance. Analysis



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and recommendations will address the following:

- A list of data standards and their usage to be applied to various information technology related projects.
- An analysis, where information is available, of implementation of selected standards across multiple vendor products, identifying similarities and differences in implementations.
- Roadblocks to standardizing the implementation of selected data standards.
- Review of various data semantics, temporal differences, and other data characteristics that can hinder standardization.

## WHAT IS OUR GOAL?

Provide guidance for Caltrans within the state to improve data and system interoperability across the transportation system. The project will focus on improving standardization of traffic operations data communications across California's transportation infrastructure.

## WHAT IS THE BENEFIT?

The project will focus on improving standardization of traffic operations data communications across California's transportation infrastructure with the following benefits:

- Improve systems integration effort success and reduce integration costs.
- Improved ability to access, analyze, and utilize data.
- Increase opportunities for new systems capabilities and related benefits.
- Improve the ability to connect all elements of the California transportation system.
- Cultivate a marketplace where vendors develop compatible components according to a public set of common data standards and common implementation of those standards.

## WHAT IS THE PROGRESS TO DATE?

The Principal Investigator (PI) and contract manager successfully obtained a No-Cost Time Extension (NCTE) for this project, with final approval from the Department of General Services (DGS) granted on October 30, 2024. This extension pushes the project's end date to June 30, 2025, allowing additional time to complete ongoing tasks and objectives.

The project emphasizes the importance of understanding the ecosystem surrounding work zones and applications related to them. Significant progress has been made in gathering documentation and resources that describe this ecosystem. Key findings include the Connected Vehicle Applications Standard Operating Principles from DriveOhio, which aim to standardize application-supporting messages, and the Crash Avoidance Metrics Partners (CAMP) Toolchain designed to map work zone geometries. Additionally, the OmniAir Consortium promotes interoperability for connected vehicles and transportation systems.

A detailed comparison of data fields used in various formats to express lane closures and work zone events was also completed. This analysis included the Caltrans Lane Closure System, Work Zone Data Exchange (WZDx) versions 4.1 and 4.2, and the Society of Automotive Engineers (SAE) J2945/4 Road Safety Message (RSM) format. The comparison was delivered on September 19 and will be integrated into the Task 3 memo, providing essential insights for stakeholders involved in managing work zone data effectively.

Under Task 1, a student completed basic investigations of the California Open Data Portal (<https://lab.data.ca.gov/>).