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CALTRANS DIVISION OF RESEARCH, INNOVATION AND SYSTEM INFORMATION
TRANSFORMING IDEAS INTO SOLUTIONS

Research Notes

TPF-5(539) Establishment of a Public-Private Transportation Data Exchange Center

Develop framework for improving users' equitable access to, and experience of, payment across all modes of transportation.

Modal

November 2025

Project Title: Survey: Establishment of a Public-Private Transportation Data Exchange Center

Task Number: 4512

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WHAT IS THE NEED?

State Department of Transportations (DOT) across the country are paying third-party vendors to provide traffic data from their own roadways. The data is costly, and the source of the data is not verifiable. An entire industry is emerging that increasingly perceives DOTs as their primary financial source. Currently a significant number of vehicles are equipped with sensors, cameras, and in some cases lidar technology, which have the capability to provide DOTs accurate information pertaining to vehicular movements on our roadways. This information is currently retained by the Original Equipment Manufacturers (OEMs). If this information was shared with the departments of transportation, it could lead to a safer and more efficient system for their users. Cooperative efforts by a consortium of State entities to facilitate this data exchange could yield substantial benefits for the DOT, the OEMs, but most importantly the people driving on the roadways.

In funding this project, Caltrans will be an advocate for industry standardization of data which will make data more available and accessible. This should result in more interoperable data being available for Caltrans that should save costs of procuring complex custom solutions.

WHAT ARE WE DOING?

The project will have two phases. The final scope of work will be determined by the member states.

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Phase 1-duration 1 year: At the core of this phase is the development of a shared computing infrastructure that will be used to demonstrate the ability to securely ingest, integrate, store, and analyze multi-sourced data to support the safe and reliable operations of the US highway system. This phase is intended to build rapport and trust for seamless exchange of data and information between DOTs and OEMs. Three main tasks will occur during phase 1.

1. Explore existing DOT Infrastructure and data to identify potential opportunities that could create value for OEMs and their customers.
2. Develop a shared computing platform that can be used to securely load, store, and analyze datasets streaming from vehicular and infrastructure-mounted sensors.
3. Organize forums and focused group meetings that will showcase products resulting from pilot projects and gather feedback from OEMs to improve these products.

The initial set of data identified as being of primary interest includes geometry data detailing areas with sharp turns and increased inertia, hard-breaking locations, road condition data highlighting irregularities like potholes, environmental data indicative of weather conditions (e.g., usage of windshield wipers) and videos capturing retro-reflectivity of markers and signs, among others. To ensure the collection of the most pertinent data, a brainstorming session will be held with member states to identify the most valuable data to request.

Phase 2-duration 3 years: Phase 2 will begin with the strategic engagement and recruitment of OEMs, with an aim to collaborate with 2 to 3 partner OEMs. This phase will involve a series of focused tasks designed to enhance the collaboration and efficacy of the data exchange between all parties involved. The key activities planned include:

Organize regular meetings with all stakeholders including agencies, academia, industry/OEMs and an advisory panel to ensure cohesive communication and alignment of project objectives.

Propose, select, and launch projects will be proposed, selected, and initiated with a focus on those areas that would benefit most from this new data exchange. These projects will serve as testbeds for applying the new insights derived from the shared data.

Build and make accessible a suite of data analytics tools and models that permit data sharing, integration, and analysis, ensuring privacy preservation and providing verifiable provenance information.

Develop the framework for an ongoing data exchange system, however ongoing maintenance of the system will not be part of this pooled fund.

WHAT IS OUR GOAL?

The goal of the project is to develop a secure computing, data analytics, and storage infrastructure with a data repository (data warehouse or data lake) that will collect all relevant vehicle data as well as other types of data (including environment data, weather data, among other sources) and share the data with DOTs for data analyses without any identifying information attached to improve transportation decision-making. In supporting this project, Caltrans may be able to access data in a standardized manner that would otherwise require a costly customized solution.

WHAT IS THE BENEFIT?

This will work towards increasing the availability and accessibility of various types of data that state DOTs are interested in using. In doing so, it may reduce the cost to State DOTs due to standardized data and products.

WHAT IS THE PROGRESS TO DATE?

This quarter, the research team continued advancing the goals of the Public-Private Transportation Data Exchange Center, with a focus on strengthening Original Equipment Manufacturers (OEM) engagement, expanding third-party data-sharing partnerships, and enhancing data exploration capabilities.

- **OEM Engagement:** Outreach efforts with **Stellantis** and **NIRA Dynamics** continued, though overall OEM engagement has slowed. Stellantis is preparing to release True Near Miss (Safety) telemetry data later this fall, and discussions are ongoing regarding direct engagement

opportunities with DOTs. **A data-sharing agreement with NIRA Dynamics** was finalized this quarter, enabling access to real-time tire grip and road surface condition data collected across 1,000 miles during the winter-season pilot in New Jersey.

- **Third-Party Pilots:** A four-month **pilot project in Missouri** was launched through **Compass IOT**, providing access to all Compass web applications and supporting data exploration for the City of St. Louis. **A formal data-sharing agreement with Compass IOT** was also completed, and we **began developing a platform for exploring large datasets** shared through this partnership, which will enhance our ability to analyze and visualize transportation data at scale.

Overall Progress: While OEM engagement has progressed more slowly than anticipated, the team achieved significant milestones by finalizing data-sharing agreements, expanding pilot activities, and initiating the development of a scalable data exploration platform to support future analysis and integration efforts