Texas Department of Transportation

CENTER FOR TRANSPORTATION RESEARCH

PROJECT SUMMARY REPORT

0-7164: Expanding Connected Vehicle Data Framework (CVDF) Data Sources to Increase Applications and Use on Texas Roadways

Background

As connected freight and passenger vehicles become increasingly present on Texas roadways, the need for real-time, accurate, and cohesive data is growing. In some cases, this data is reliable and readily available to public agencies. In other cases, there are gaps in data availability or quality. A connected vehicle data framework (CVDF) enables the meaningful exchange of information between the Texas Department of Transportation (TxDOT), other public agencies, and third-party data providers who can be valuable assets in improving roadway safety, maintenance, and mobility. Project 0-7164 aims to leverage the existing CVDF developed through the Texas Connected Freight Corridors (TCFC) project to establish an understanding of data needs for connected vehicle (CV) applications and expand availability of that data from public agencies and third-party data providers.

What the Researchers Did

The University of Texas at Austin Center for Transportation Research (CTR) worked in tandem with Texas public transportation agencies, private sector stakeholders, and Southwest Research Institute to identify applications, data sources, and corridors to expand the CVDF. Ultimately, the research team developed, tested, and deployed Road Weather Warning alerts through the CVDF.

The research team first conducted a literature review and gap analysis to understand current CV capabilities, strengths and limitations of the existing CVDF, and expansion opportunities. The research team then coordinated with public and private sector stakeholders to conduct key person interviews. The interviews aimed to understand current related efforts by TxDOT and peer agencies, identify CV infrastructure needs and potential opportunities for the CVDF, prioritize CV applications, and develop fleet, agency, and data partnerships.

Based on the feedback from stakeholders, the project team identified potential CVDF expansion applications. Each application was assessed for feasibility, data needs, and expected benefits. Additionally, each application was assigned a criteria ranking that represented the feasibility determined by the research team when considering technology maturity, resource intensity, data needs, goal alignment, and expected impacts. The priority applications identified included: Road Weather Warning, Low Clearance Warning, Responder-to-Vehicle, Pedestrian Detection Warning, Truck Parking Availability, and Cloud-based Signal Preemption.

For each potential application, the research team analyzed opportunities for partnerships with third- party data services to augment supported applications, data quality, and data availability. Additionally, the research team developed data

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standards and specifications, formatting and reporting guidelines, and data sharing needs.

Together with Southwest Research Institute, the project team developed the Road Weather Warning application to incorporate into the CVDF. This application leverages data from Environmental Sensor Stations to alert drivers of adverse weather conditions. The application was successfully tested and integrated into CVDF operations.

What They Found

Project 0-7164 identified opportunities to leverage the existing CVDF to encourage effective, expanded use in the public and private sectors.

In the initial gap analysis and stakeholder interviews, the research team uncovered six CV applications that can be supported by the CVDF and are a high priority for both the public sector and the private sector.

Through this effort, the research team developed the Road Weather Warning application, which alerts drivers to adverse weather conditions. These alerts can be disseminated to drivers through the CVDF. Stakeholder input and industry development indicated strong interest and maturity for a number of other CV applications. To support expanded use of the CVDF, TxDOT should consider additional applications that were identified as priorities.

Additionally, the research team found that expanding CVDF integration to other third-party data provers will increase the impact. Drivewyze is currently disseminating CVDF alerts, but, there is an opportunity to scale third-party integration to include mapping providers, electronic logging device (ELD) solutions, and other in-cab alert providers in the commercial vehicle sector.

Many of the mature CV applications greatly benefit commercial drivers and can lead to safer freight operations. Texas' roadways have heavy freight traffic, and these corridors provide an opportunity to improve operations through CV applications. Focusing on the Texas Triangle and freight routes in other parts of the state on I-10, I-20, and I-30 will help target high-impact corridors for the deployment of CV technology.

What This Means

The goal of Project 0-7164 was to identify applications, data sources, and corridor strategies to expand the use of the CVDF. The research team developed and deployed the Road Weather Warning application and captured other strategic growth opportunities for future CVDF expansions. The CVDF establishes a standardized interface through which third-party data providers and infrastructure owners and operators can share their data and support CV applications. The CVDF provides a strong foundation for TxDOT to build on. Digital infrastructure such as the CVDF is central to enabling CV applications focused on advancing safe and efficient roadway operations.

For More Information

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