

# Connected Vehicle Data Framework: A Cloud-Based Public-Private Data Exchange

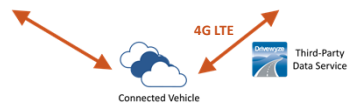
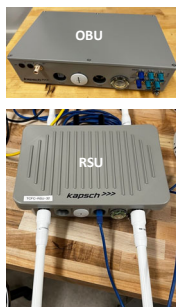
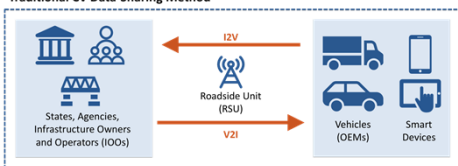
Presenters: Anna McAuley and Kristie Chin (UT Austin CTR), Eric Thorn (SwRI)

Connected Vehicle (CV) technology can be used to improve safety and mobility on public roads. Data can be shared through physical CV infrastructure; however, large gaps in coverage will exist until deployment of CV equipment is more ubiquitous. To overcome this, the Texas Connected Freight Corridors (TCFC) project has developed the Connected Vehicle Data Framework (CVDF), a cloud-based data exchange that relies only on cellular coverage and existing third-party services.

## Connected Vehicle Infrastructure





Typically, CV data is transmitted through field radios called Roadside Units (RSUs) and in-cab radios called On-Board Units (OBUs). This data-sharing method requires agencies and drivers/fleets to install and/or maintain equipment. The Connected Vehicle Data Framework (CVDF) provides an alternative communication method. The CVDF is a cloud-based data exchange where third-parties can access infrastructure data, alerts, notifications, etc. and deliver this information to their users. The TCFC team has partnered with Drivewyze, a third-party data service, to disseminate the CVDF data to TCFC project vehicles. Drivewyze has an app that can be installed on Electronic Logging Devices (ELDs), tablets that are federally mandated in each freight cab, so there is no additional hardware required by either the public or private sector.

Traditional CV Data-Sharing Method



## Supported Applications

Currently, the CVDF supports four applications that are being deployed as part of the TCFC project. In the future, additional applications such as Road Weather Warning and Bridge Height Warning could be supported.

<b>Work Zone Warning</b>		Data and alerts related to work zones, including lane closures and speed reductions. Data is sourced from TxDOT's Lonestar™ traffic management software.
<b>Wrong Way Driver</b>		Alerts about an impending vehicle traveling the wrong direction on the roadway in the vicinity of the driver. Data is sourced from field sensors, 911 calls, and CV data.
<b>Queue Warning</b>		Alerts about slow-moving or stopped traffic on the roadway, particularly if unexpected. Data is sourced from TxDOT's Lonestar™, INRIX, and Traffic Management Centers (TMCs).
<b>Advanced Traveler Information System (ATIS)</b>		General traveler information including collisions, road debris, stalled or disabled vehicles, and amber, silver, and blue alerts. Data is sourced from TxDOT's Lonestar™ traffic management software, 911 calls, and TMCs.

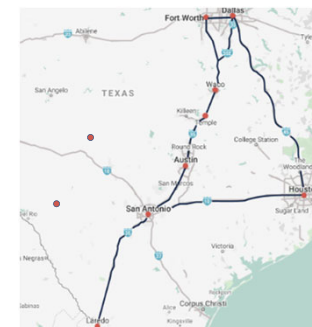
Data can originate from any format; the CVDF establishes a common interface for third parties to access the data. Data is aggregated from various data sources such as:

- Lonestar™ (TxDOT's Advanced Traffic Management System)
- INRIX
- National Weather Service

The CVDF currently only ingests position and heading information from vehicles through Basic Safety Messages (BSMs). In the future, the CVDF can be expanded to ingest additional informative CV data from vehicles, such as hard braking or windshield wiper activation.

## What's next?

- The TCFC project is piloting OBUs, RSUs, and the CVDF along the Texas Triangle. The two data-sharing methods (OBU-RSU versus CVDF) will be evaluated and compared in performance.
- TxDOT has funded RTI project 0-7164: Expand CVDF Data Sources to Increase Applications and Use on Texas Roadways. This project will develop bi-directional CVDF communication, build additional applications, and identify data partners.



## Summary and Key Takeaways

- The CVDF provides an alternative data-sharing method that is cloud-based and requires less hardware.
- The CVDF establishes a common data exchange interface, encourages data standards, and prioritizes security.
- Partnering with Drivewyze has allowed the TCFC project to disseminate information to more drivers and vehicles.

## Acknowledgements

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