

Saving Lives with Connectivity: Accelerating Vehicle to Everything (V2X) Deployment

USE CASE #14 Wrong-Way Driving Detection



WHAT IS VEHICLE-TO-EVERYTHING (V2X)?

V2X functions like a group chat for the road. It allows cars, traffic lights, and other road users to communicate in real-time by sending messages to each other, and each message can carry different safety and roadway information.



A car drives the wrong way onto roadway past large "Do Not Enter" and "Wrong Way" signs. (source TTI)

USE CASE #14 DESCRIPTION

Driving the wrong way on the road puts everyone at risk. It can happen when a driver is impaired, distracted, or unfamiliar with the area. This use case uses V2X technology to help prevent dangerous situations by alerting nearby drivers of confirmed wrong-way drivers, reducing the risk of a crash.

WHAT CAN I EXPECT FROM THIS USE CASE?

At select freeway sections, wrong-way events are verified before alerts are sent to nearby drivers through their mobile navigation app. These real-time alerts provide advance warning, helping drivers stay alert, slow down, change lanes, and respond safely.

HOW DOES IT WORK?

Detection equipment identifies a potential wrong-way driver and sends the information to the traffic management center for verification. Once confirmed, the traffic management center generates a V2X message that is broadcast to nearby vehicles, warning drivers of the wrong-way vehicle.



USER STORY

The Challenge: You and your family are driving home late at night when you suddenly see headlights approaching on the highway. A wrong-way driver has entered the road, creating a dangerous situation for everyone nearby.

V2X Solution: Once a wrong-way driver is detected and confirmed, V2X technology sends a real-time alert to nearby drivers through their mobile navigation apps

Outcomes & Benefits: You safely steer your family out of harm, and the roadway is cleared before a crash can happen.

Wrong-Way Driving Detection

TEXAS TRUST PROJECT

The Transforming Roads: Unleashing Smart Technologies (TRUST) project is a federally funded initiative led by the Texas A&M Transportation Institute (TTI).

TTI, in partnership with state, local, and industry partners, is implementing V2X technology in Houston and Bryan-College Station through 15 real-world use cases that demonstrate how V2X can enhance safety, mobility, efficiency, and economic growth. TRUST aims to develop solutions that work across different technologies and regions, while sharing insights to help create a national blueprint to accelerate V2X adoption and implementation nationwide.

USE CASES

LOCATION:

GREATER HOUSTON AREA

- 10. Roadway Flood Warning
- 11. SPaT-Enabled Intersections
- 12. Right Turn on Red Warning
- 13. Red Light Violation Warning
- 14. Wrong Way Driving Detection**
- 15. Emergency Vehicle Response Time and Safety



LEARN MORE ABOUT TEXAS TRUST & V2X

For more information on Texas TRUST and to explore V2X educational resources, project updates, and use cases, please visit: <https://v2xtexastrust.com/>

For a list of supporting references used in these materials, visit: [V2X Use Case Sources](#).



Robert Brydia, PMP
Division Head
System Operations and Technologies
Texas A&M Transportation Institute



Questions? Email us at v2xtexastrust@tti.tamu.edu