

INNOVATION / TECHNOLOGY DEPLOYMENT SUMMARY

Next-Generation Wrong-Way Driving Countermeasures

CHALLENGE



Figure 1. TransGuide WWD event and DMS alert.

Wrong-way driving (WWD) alerts in San Antonio currently consist of messages posted to dynamic message signs (DMS) located approximately every two miles along most freeways (Figure 1) in the district. The alerts are posted by TransGuide traffic management operators when either a San Antonio Police Department 911 WWD emergency tone is issued or when one of the ramp WWD detection systems senses a wrong-way vehicle, triggering an email alert which must then be processed by a TransGuide operator. There is a lag in both the time it takes operators to post WWD alerts on the DMS and the amount of WWD travel time before right-way drivers see the alert message.

WWD detection systems are currently found at many freeway exit ramps around San Antonio. These systems are effective at identifying vehicles going the wrong way on the ramp and communicating the hazard to TransGuide operators. However, these systems detect any vehicle or object approaching the sensor as a WWD, even if there is a legitimate reason for the vehicle to be there (e.g., law enforcement, maintenance). In addition, these sensors can detect bicyclists, pedestrians, and even animals and set off a WWD warning.

SOLUTION

TransGuide managers are currently working with vendors and consultants to install systems along I-35 South in San Antonio that will work with existing WWD detection equipment and provide, via cloud communications, the ability to send smartphone users with the TravelSafely™ application a WWD alert when a wrong-way driver is detected in the corridor. The alerts will be geofenced, meaning that only right-way drivers where the WWD is detected will receive the warning.

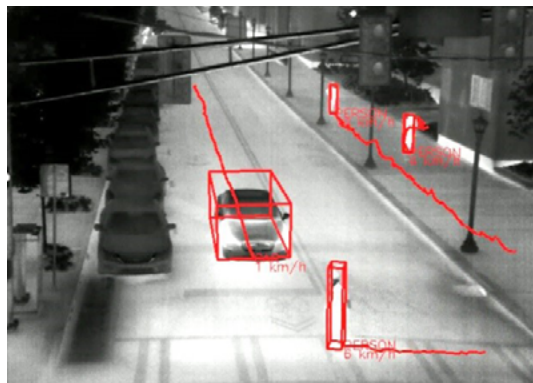


Figure 2. Thermal camera independent detection of vehicles and pedestrians.

TxDOT GOALS



Deliver the right projects



Focus on the customer



Foster stewardship



Optimize system performance



Preserve our assets



Promote safety



Value our employees



Next-Generation Wrong-Way Driving Countermeasures

Additional improvements are being made to WWD detection systems to use artificial intelligence (AI)-enhanced video processing to filter out detections that are not WWD related, resulting in alerts only being sent when genuine WWD threats exist (Figure 2).

PROACTIVE APPROACH

The San Antonio District's current innovations will increase the timeliness of safety/threat alerts to right-way motorists when a WWD is detected along I-35 South and improve the accuracy and efficiency of WWD detection in the corridor.

BENEFITS

This innovation will allow timely WWD threat alerts to reach right-way drivers along the I-35 South implementation corridor via their smartphone. Improvements in the detection accuracy of WWD systems will result in alerts being sent only when a WWD threat exists.

KEY TASKS

- Install field equipment to connect with existing wrong-way detection systems and enable cloud communications that ultimately send alerts to right-way drivers via their smartphones in corridors where a wrong-way vehicle is detected.
- Install AI-enhanced thermal camera systems to improve filtering of WWD detection events so that alerts are only generated when a true WWD event occurs.
- Monitor both types of WWD countermeasure system improvements.

DATA SOURCES

For over a decade, TransGuide staff and the Texas A&M Transportation Institute (TTI) have partnered with the City of San Antonio Police Department to maintain logs of WWD activity and related crashes. These information resources allow long-term evaluation of WWD countermeasures and treatments, including the innovative alerts going directly to right-way drivers and AI enhancements to WWD detection equipment.

Resources

[San Antonio District \(txdot.gov\)](https://www.txdot.gov/san-antonio-district)

[ITS Map: San Antonio District incidents](#)

[Crash reports and records \(txdot.gov\)](https://www.txdot.gov/crash-reports-and-records)

[Texas Transportation Researcher: Do Not Enter! You're Driving the Wrong Way \(tamu.edu\)](https://www.txdot.gov/researcher/do-not-enter-youre-driving-the-wrong-way)

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