Wrong-Way Driving Program

By Florida Department of Transportation

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Benefits Statement

The Florida Department of Transportation's (FDOT) Wrong-Way Driving (WWD) Program saves lives by reducing WWD crashes through detection systems that alert drivers and law enforcement, preventing over 95% of potential incidents. It saves time by enabling quick interventions, minimizing traffic disruptions. By preventing crashes, FDOT also saves money on emergency response, medical costs, and infrastructure repairs, while promoting safer and more efficient roadways.

In this case study you will learn:

1. How FDOT addressed wrong-way driving crashes through systemic countermeasures.
2. How FDOT used a multifaceted approach, combining engineering, education, and enforcement, to mitigate wrong-way driving.
3. How FDOT fostered collaboration with stakeholders like law enforcement to acheive an over 95% reduction of wrong-way crashes.

Case Study #191

Version Number: 1

BACKGROUND

Wrong-way driving (WWD) crashes can occur when a driver enters a roadway in the wrong direction. Though infrequent, wrong way driving crashes come at extraordinary physical and emotional costs from serious injuries and fatalities. In Florida, six out of ten arterial WWD crashes, and seven out of ten freeway WWD crashes, result in at least one person being harmed. Also in Florida, a fatality is three times more likely to occur during a freeway WWD crash than during an arterial WWD crash.

Florida Department of Transportation's (FDOT) WWD Program is a solid demonstration that supports FDOT's commitment to achieving zero fatalities and serious injuries on the State Highway System. FDOT's safety enhancements and WWD countermeasures aid in correcting driving errors most often associated with wrong-way crashes.

The essential feature of FDOT's WWD Program is that, in addition to engineering, education, and enforcement, a fourth 'E' – evolution - has been employed to mitigate WWD. The hallmark of creating FDOT's innovative, ongoing WWD effort is established on continual consultation, coordination, and communication across the agency.

Undergirded by research by Florida's top academic institutions, FDOT's WWD Initiative explored and continues in the evolution of WWD countermeasure systems used to warn the wrong-way drivers, to alert other motorists, and to notify law enforcement. By 2019, FDOT had embarked on a systematic deployment of enhanced design standards beyond MUTCD minimum requirements and has been continually improving FDOT's manuals, standard plans, standard specifications, and approved product lists. Focus on WWD prevention is present in all phases of the FDOT project lifecycle - from design and engineering through the operation and maintenance of the Intelligent Transportation Systems (ITS). FDOT's WWD prevention countermeasures have not been limited just to pilot sites, rather FDOT's deployments have grown into a systemic statewide deployment approach recognized by the AASHTO Innovative Initiative and are held up as a model for other agencies. Because of this recognition, FDOT has participated and facilitated numerous lessons learned and information sharing sessions to organizations and agencies across the nation.

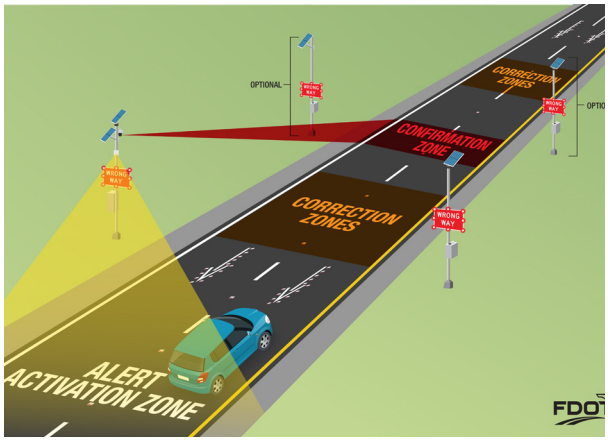
TSMO PLANNING, STRATEGIES AND DEPLOYMENT

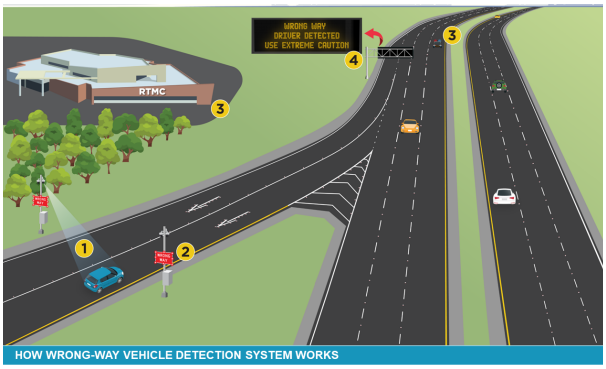
FDOT conducted statewide studies and research projects to analyze WWD contributing factors and evaluate the effectiveness of various countermeasures. FDOT also studied various technologies to determine the most effective system to detect wrong-way activities while minimizing false alerts to Regional Transportation Management Center (RTMC)operators. FDOT conducted studies and identified demographic factors that could affect WWD incidents which included: impaired drivers, drivers aged 65 years and older, and tourists. These findings were used to develop guidance to proactively deploy WWD countermeasures at all the exit ramps in Florida.

Wrong-way signs and pavement markings exceeding the MUTCD standards have been developed and are found in the FDOT Design Manual (FDM) since 2021 in Section 230.4.

Previous Bulletins communicating these and other countermeasures:

- Signing and Pavement Marking Standards at Ramp Intersections: TEO Bulletin 03- 15.
- Wrong-Way Driving Advanced Countermeasures at Interchange Exit Ramps: TEO Bulletin 19-03.
- Wrong-Way Driving Countermeasures for Arterials and Collectors: TEO Bulletin 21-03 FDOT's Wrong-Way Vehicle Detection Systems (WWVDS) provides immediate alerts when a vehicle is detected entering an exit ramp.





HOW WRONG-WAY VEHICLE DETECTION SYSTEM WORKS

1. **Detects Vehicle:** Signs located on the exit ramps use system to detect vehicle traveling the wrong way.
2. **Triggers lights:** Flashing lights are turned on along sign border to alert the driver he/she is traveling in the wrong direction.
3. **Notifies officials:** Detection system sends alert immediately to operators at an FDOT Regional Transportation Management Center (RTMC) and law enforcement officials.
4. **Alerts other drivers:** RTMC system broadcasts a wrong-way driver alert on message boards along the freeway.

FDOT's Wrong-Way Vehicle Detection Systems (WWVDS) provides immediate alerts when a vehicle is detected entering an exit ramp. Components of WWVDS include:

1. Flashing "WRONG WAY" signs only visible by a wrong-way driver
2. Sensors send images to nearby RTMC
3. TMC operators and dispatchers alert first responders
4. First responders who can locate and intercept wrong-way driver
5. Dynamic Message Signs to warn motorists of a wrong-way driver

COMMUNICATIONS PLANNING AND EXECUTION

Since WWD countermeasure systems involve many components ranging from signing and marking to software systems like Florida ATMS (SunGuide), many stakeholders must-collaborate for the successful operation of the system. To address this, FDOT formed the statewide WWD Working Group comprised of multiple functional Offices. This group has been tasked with mainstreaming the WWD countermeasures statewide. FDOT partners closely with Florida Highway Patrol (FHP) since FDOT closely coordinates with them when responding to WWD events. FDOT's Safe Mobility for Life program undertook focused efforts to educate older drivers on how to react to WWD signs alerting them when they are the wrong-way drivers and how to react to DMS messages when alerted of a wrong-way driver.

FDOT underscores the coordination needed among the device vendors, consultants, and contractors by continuously sharing best practices and lessons learned with stakeholders. A GIS WWD Safety Countermeasures Dashboard provides data on freeway and arterial WWD statewide crashes, with over a decade of data processed specific to WWD. The Dashboard also provides the deployment status of signing and pavement marking and Highlighted WRONG WAY Signing and ITS countermeasures.

FDOT developed consistent and efficient practices with statewide Standard Operating

Guidelines (SOGs) and district-specific Standard Operating Procedures (SOPs) for responding to WWD events. RTMC Operators manage WWD events through the SunGuide software, which has the WWVDS directly integrated into the system. RTMC Operators send out notifications, called executive alerts, as part of their operating processes to keep FDOT's leadership and FHWA officials aware of WWD crashes.

For public outreach, FDOT uses media outlets and social media posts to educate the public about how to avoid wrong-way drivers and respond to traffic control devices. Also, content is shared on the crash history and the deployment of engineering countermeasures and how they function.

Communication streams include:

- Television and newspaper interviews with media
- FDOT WWD Website (fdot.tips/wrongway)
- Public Service Announcements
- Print and digital educational materials

OUTCOME, BENEFITS AND LEARNINGS

FDOT has reported significant effectiveness of the WWVDS since the pilot deployments began in 2014 and with ongoing systematic statewide deployments. FDOT has documented that an average of more than 80% wrong-way drivers would self-correct and turn around upon the activation of the detection-triggered WRONG WAY signs. If the other mitigations are included (traveler information messaging using dynamic message signs, law enforcement and service patrol interventions), then over 95% of the vehicles that enter from exit ramps equipped with WWVDS do not result in a wrong-way crash.