

WRONG WAY CRASH DETECTION & NOTIFICATION

*Improvements &
Innovations to
Identify &
Reduce Crashes*

**October 29, 2014
Nashville, TN**

**2014
Tennessee
Highway
Safety and
Operations
Conference**

Robert Murphy
AECOM

SUMMARY

- **Wrong Way Driving Facts**
- **Highway/Ramp Configurations**
- **Incidents**
- **Improvements**
- **Detection Equipment**
- **Resources**

BACKGROUND

- Robert Murphy
 - Traffic Incident Management
 - ITS Operations
 - Traffic Reporting
 - Media/TV News



go patrol

Wrong Way Crash Facts & Figures

- Documented since 1950s
- NTSB first addressed 1968
- 1700+ fatalities 1996-2000
- 300-400 per year nationwide
- Wrong Way incidents only 3% of crashes but often fatal
- Time of day/week similarities
- Usually left lane (Lane #1)
- Impaired Drivers
- DUI laws impact
- Highway Design/Signing
- Reporting systems vary

WRONG WAY FACTS

Possible Causes: Interchange Design



“Trumpet” Ramps



Adjacent On/Off Ramps

WRONG WAY FACTS

Possible Causes - Parallel Ramps



Adjacent On/Off Ramp Confusion

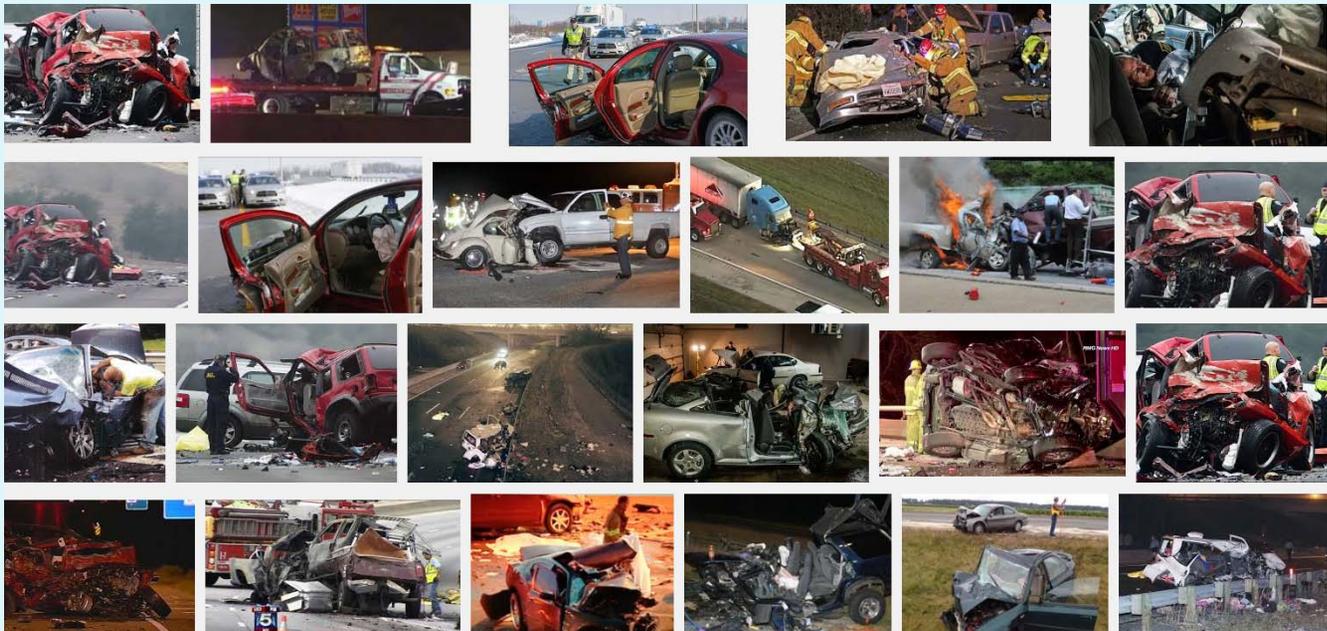
WRONG WAY INCIDENTS

TENNESSEE

- **September 24, 2014: I-24 Orlinda TN**
- **July 13, 2014: I-24 Manchester TN**

NATIONWIDE

- **October 1-2, 2014: I-75 Tampa FL (two separate wrong way drivers arrested)**
- **September 2014: I-96 Grand Rapids MI**
- **February 2014: 60 Freeway, Los Angeles CA (6 dead)**
- **November 2013: Sawgrass Expressway, Fort Lauderdale**
- **July 2009 - Taconic State Parkway - NY (8 killed)**



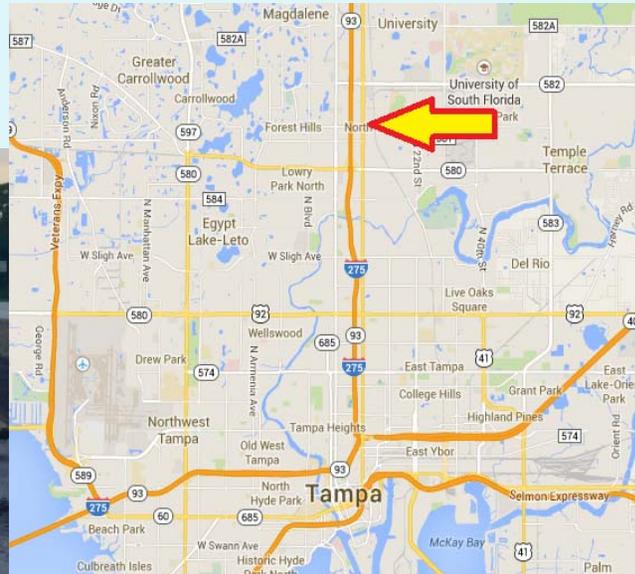
INCIDENTS

Four Wrong Way Crashes in 2014 Interstate 275, Tampa, Florida

- 10 fatalities
- Sunday, September 7 – 6:10am; Three Killed; wrong-way Honda hits Tractor-Trailer
- Friday, August 15 – One Killed; ambulance struck
- Friday, February 21 – 2:45am; One Killed; box truck hit
- Sunday, February 9 – Five killed; DUI



Courtesy – Tampa Bay Times



Four Wrong Way Crashes in Two Weeks

- Atlanta, GA - August 2012
- I-85 & I-285 – Two Fatalities
- GA Route 316 - Five Hurt
- GA Route 400 – One Fatality
- GA Route 400 – Two Fatalities



Wrong Way Driver

- I-95 Southbound - Chester PA
- October 29, 2010
- 84yr old Female Driver



Courtesy - WPVI-TV

INCIDENTS

Wrong Way Crash “Epidemic”

- San Antonio, Texas
- 6 crashes – March-May 2011
- US 281 near Interstate 35



Courtesy – WOIA-TV

INCIDENTS

Wrong Way Crashes

■ Orlando, Florida

- February 26, 2012
 - SR 520 Brevard County (12:40 AM)
 - Florida's Turnpike north of Winter Garden (MM274 - 4:10 AM)

■ Miami, Florida

- October 20, 2012 4:49 AM
 - Florida's Turnpike at Exit 34 - 106th Street
- August 27, 2012 6:30 AM
 - Florida's Turnpike NW 74th Street

Wrong Way Crash

- SR924 Gratigny Parkway
- Hialeah FL
- Miami Dade Expressway Authority
- March 18, 2012 - 3:39 AM
- 4 Fatalities
- WB lanes closed 5+ hours



924W 80 03/18/2012 03:26:39



Florida SR 924 – GRATIGNY PKWY

Wrong Way Collision Avoidance



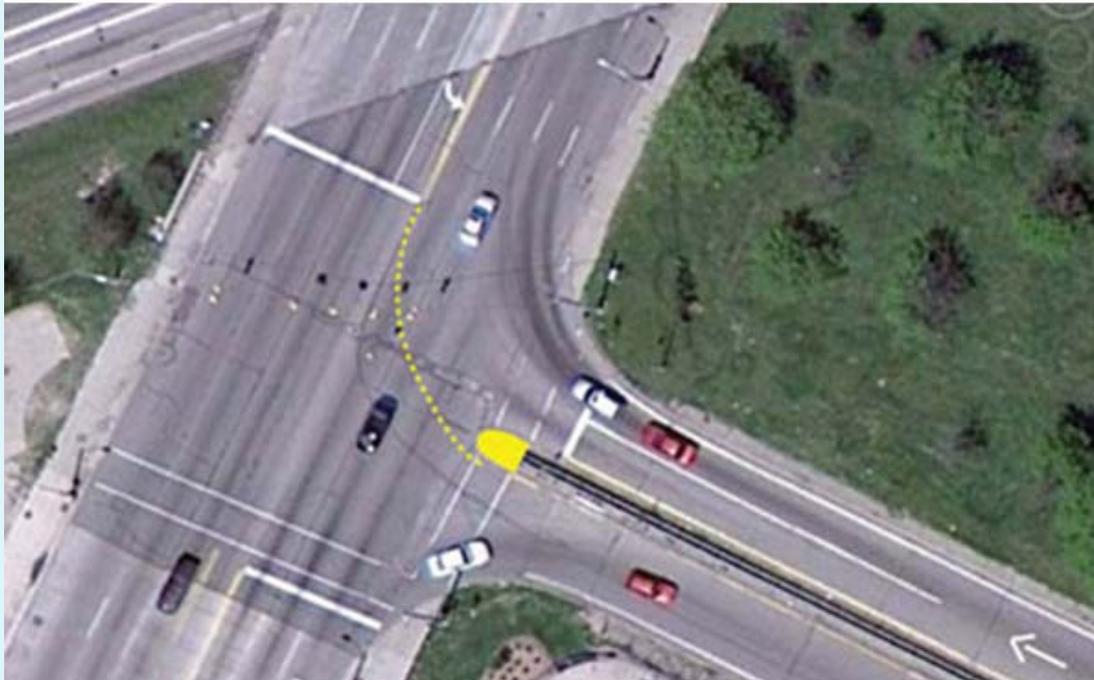
IMPROVEMENTS

- Place red delineators (ground/guard rail) along the exit ramp to discourage wrong-way vehicles that are headed up the exit ramp.



Wrong Way Ramp Entry Improvements

- Line Painting
- Median enhancements



IMPROVEMENTS

SIGN/PAVEMENT MARKINGS

- Install reflective sheeting on the sign supports of DO NOT ENTER and WRONG WAY signs.
- Pavement stop bars at exit ramps.
- Install wrong-way pavement marking arrows at exit ramps.
- Paint the island between the exit and entrance ramp for a sufficient distance up the ramp.
- Reduce off-ramp “throat” opening

Wrong Way Driver Task Force created – North Texas/TTI

- Logging all 911 wrong-way driver calls
- Radar detectors now installed to alert TMC & law enforcement
- 14 incidents stopped by ITS > TMC > Police notification in 2011

- **Houston/Harris County (TX)
Toll Road Authority**
 - **Westpark Toll Road**
 - **14 miles opened 2004**
 - **Wrong Way Ramp Detection
Sensors**



- San Antonio TX
- US 281
- Radar Detector Installation



Reducing wrecks on U.S. 281

As part of a \$500,000 test project to combat wrong-way driving, the Texas Department of Transportation will outfit a 15-mile stretch of U.S. 281 with a series of radar detectors and illuminated wrong-way signs. Last year, this portion of U.S. 281 had the highest number of reported wrong-way-driving incidents in the San Antonio area, with the most problems reported near Airport Boulevard. Of those wrong-way drivers involved in crashes in San Antonio, most of them were intoxicated or thought to be intoxicated.

MAP KEY

- 1 wrong-way-detection device and 2 LED illuminated wrong-way signs to be installed on exit ramp (32 total)
- Detector-activated LED illuminated wrong-way signs and electronic signs on both shoulders in each direction to be installed (4 total)

Lights (8 locations)



Example of LED illuminated wrong-way sign

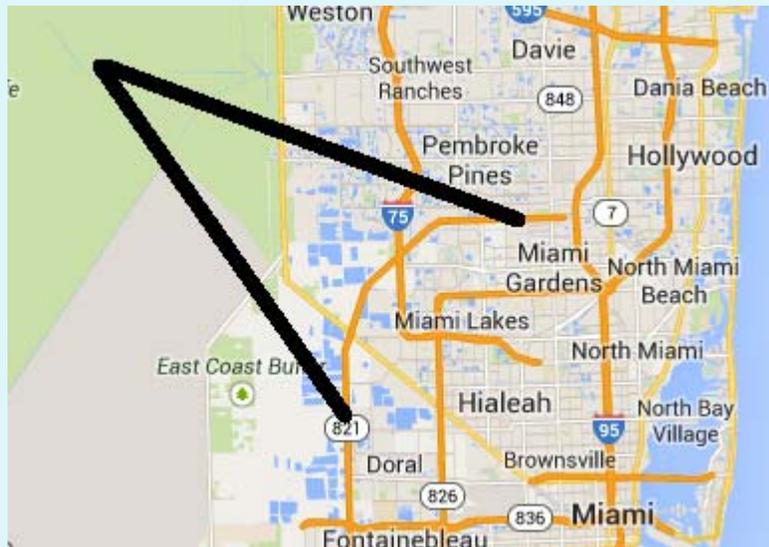


Courtesy: San Antonio News Express

IMPROVEMENTS

Florida's Turnpike Enterprise SR 821 Doral/Miramar

- LED Sign/Pavement Markings
- Mainline/Ramp Detection
- Traffic Management Software enhancements



Milwaukee Wisconsin

- 9 ramp radar detector
- Winner 2012 American Traffic Safety Service Assoc. Innovation Award



TAPCO

- Red “airport type” pavement lighting activated by detectors
- Survey high risk ramps and U-Turn openings
- Left turn arrow review
- Police report wrong-way checkbox



Autonomous Vehicles

- Dashboard Warning Display
- Vehicle to Vehicle (V2V)
- Vehicle to Roadside



IMPROVEMENTS

Fortran

- Wavetronix radar device
- 500 feet advanced detection

Sensys Networks

- Embedded pavement detectors
- 3 x 3 array per lane

CityLog

- Media Intruder
- Installed on existing CCTV system

Wrong Way Detection

- tapconet.com
- fortrantraffic.com
- citilog.com
- atssa.com
- sensysnetworks.com
- kapsch.net
- traficon.com
- swarco.com
- siqura.com
- siemens.be

WRONG WAY DRIVING RESOURCES

- **NTSB Special Investigation Report - December 2012** ([nts.gov](http://www.nts.gov))
- **National Wrong-Way Driving Summit – July 2013, Illinois**
- **Virginia Highway & Transportation Research Council – June 1975 Report**

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