



# Wrong-Way Driving Task Force

## NTTA's Recent Activities

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# Introduction

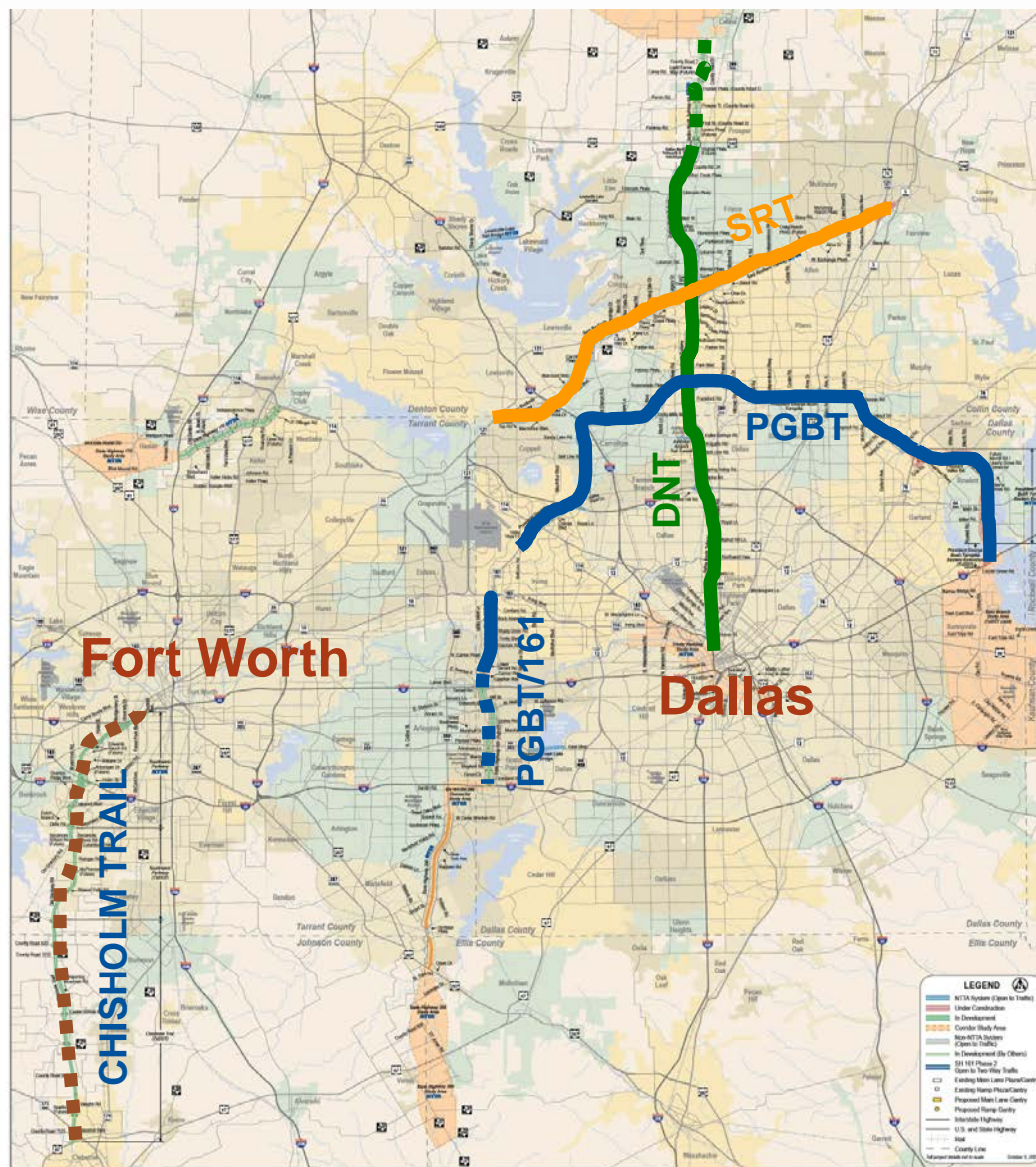
- The NTTA Wrong Way Driving Task Force
  - Backgrounds
  - Ongoing efforts
- Recent Activities on NTTA System
  - Monitor incident patterns and trend
  - Evaluate and deploy more feasible countermeasures
- Future Consideration



# NTTA Toll Road System

## Key Features:

- Expanding throughout Dallas/Ft Worth metro
- All Electronic Toll Collection (ETC) – cashless operation
- High-speed commuter routes to major destinations



NTTA System Map

# NTTA Wrong Way Driving Task Force

- Task Force was formed in June 2009
- Initial Analysis of the WWD Incidents:
  - Crashes caused by Wrong Way Drivers account for a very small percentage of the overall accidents (0.6%)
  - There was a high frequency of Wrong Way crashes during the first half of 2009 (5 WWD in 6 crashes including 4 fatalities)
  - There were 2 more WWD crashes (non-life threatening) during the 2<sup>nd</sup> half of 2009



# NTTA WWD Task Force Key Findings

- Driver impairment is the overriding factor
- 94% of crashes from 2007 to 2009 occurred between 11:00 PM & 4:00 AM
- No consistent correlation between incident and a particular roadway section or configuration
- All countermeasures evaluated have limitations
- Worldwide long term problem

# NTTA WWD Task Force Recommendations

- Three-pronged approach
  - Engineering
  - Enforcement
  - Education
- 17 Countermeasures evaluated:
  - 6 deployed immediately
  - 4 rejected at the time of study
  - 3 for pilot testing
  - 3 for further study
  - 1 emerging technology to be monitored

# Implemented Countermeasures

- Process Enhancements
- Reflective Tape on Sign Post
- RPM Arrows
- LED Enhanced Signs
- Modified Pavement Markings
- Adjustments to intersection signage
- Roadway intersection configurations
- Lowered Wrong Way and Do Not Enter Signage
- Loop Detection
- Law Enforcement and MADD Partnerships

# Process Enhancements

- Implemented the Field Condition Checklist
  - Developed by TTI
- Increased inspection frequency of signs
- Updated design standards
  - Specify countermeasures on all future designs
- Task Force stays active and meets regularly
- Maintain open communication



# Reflective Tape and RPMs

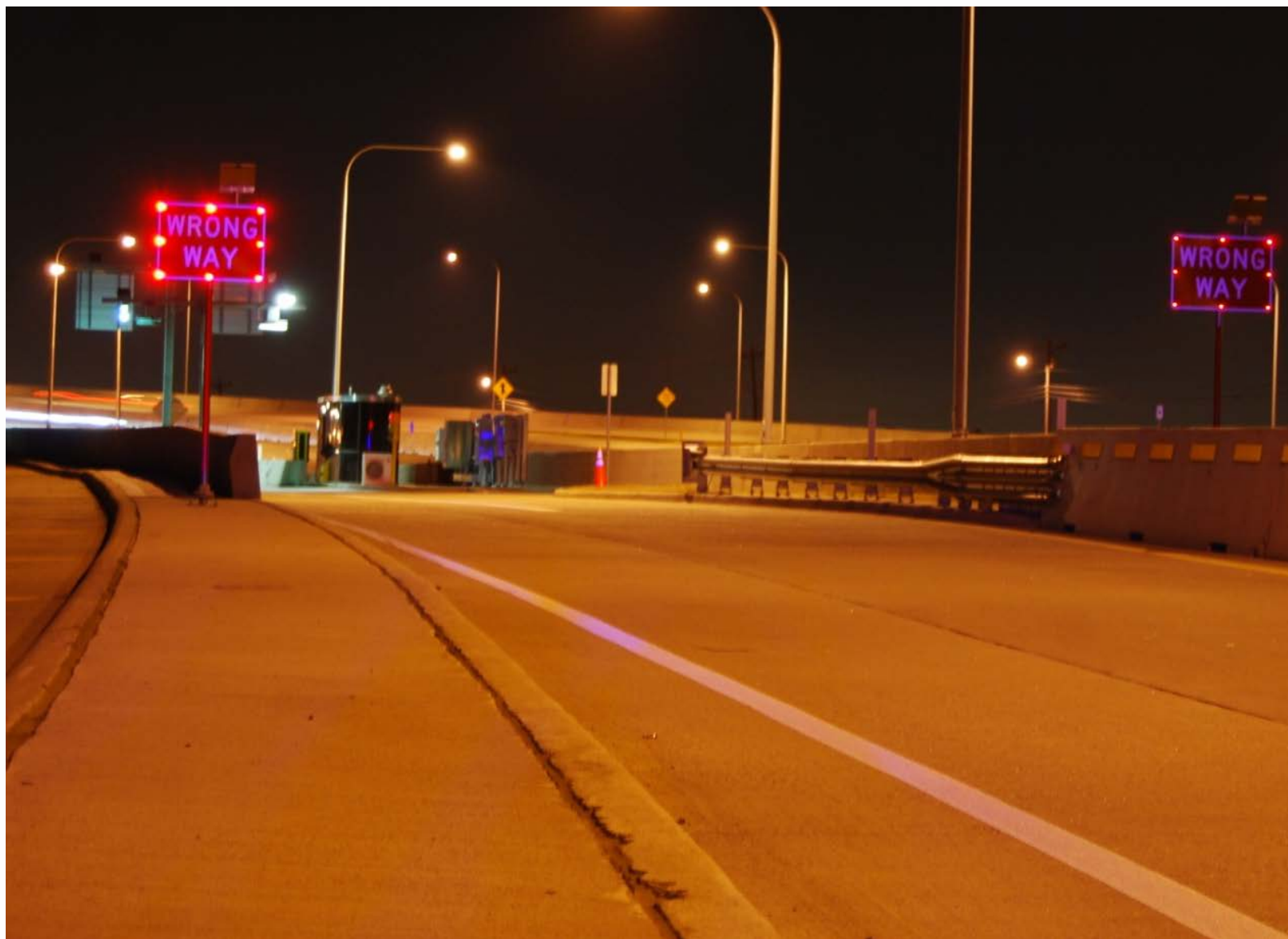


# Reflective Tape and RPMs





# LED Enhanced Signs



# Modified Pavement Markings



Imagery ©2012 DigitalGlobe, GeoEye, Texas OrthoImagery Program, U.S. Geological Survey

# Modified Pavement Markings





# Modified Pavement Markings





# Signage Modification



# Layout Improvements





# Layout Improvements



# Layout Improvements

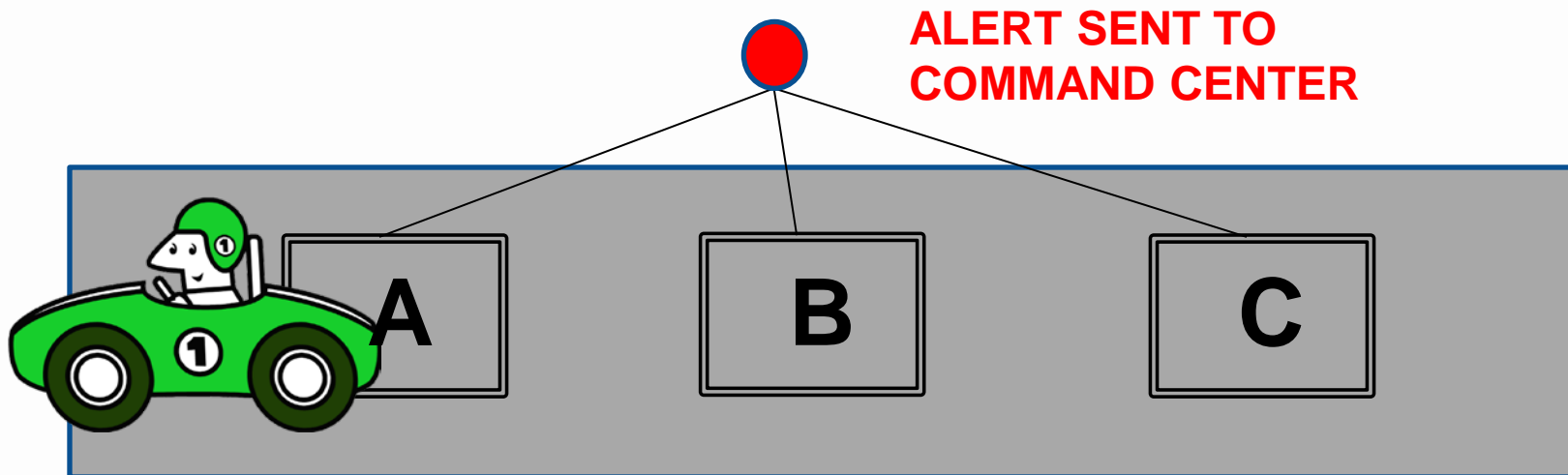
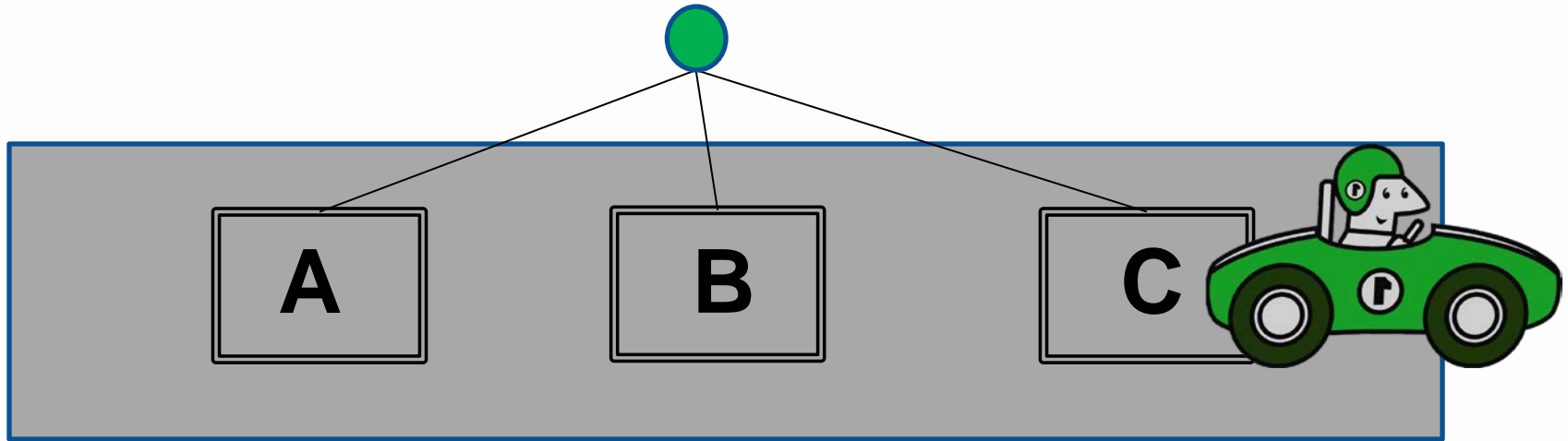


# Layout Improvements





# Loop Detection





# Enforcement

- DPS Enforcement
  - Immediate response to detections or reported incident
  - Quarterly DUI Task Force
- Command Center
  - Constant monitoring
  - Prompt dispatching
  - Video verification
  - Agency coordination



# Pilot Test Countermeasures

- LED Enhanced Signs
  - Installed at three locations in December 2009
  - Incidents reoccurred at two of the three locations
  - No negative impact to right-way drivers reported
- Lower Mounted Signs
  - Crash-tested by TTI
  - Installed at 28 locations in July 2011

# Lowered Signs





# Lowered Signs



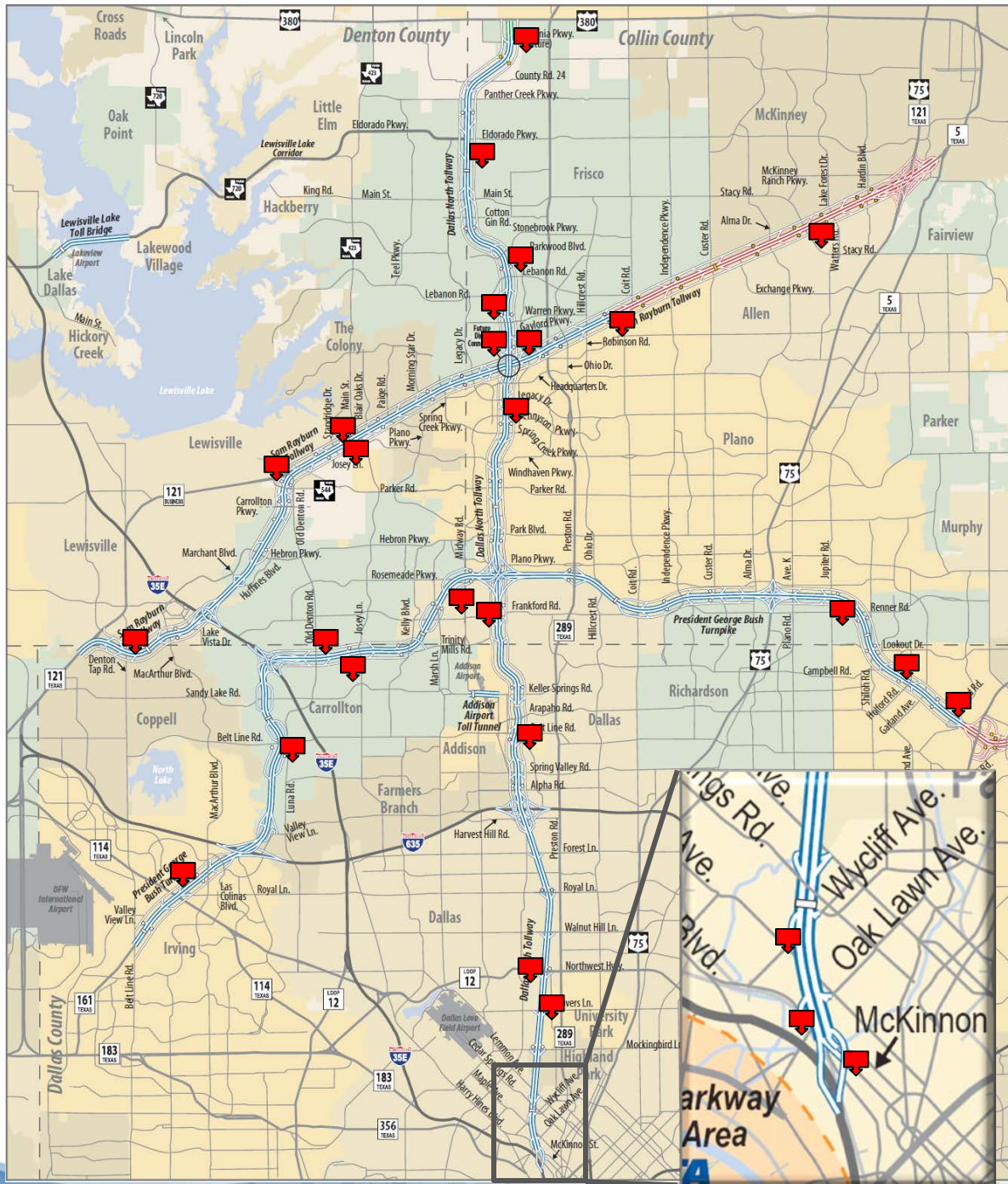
# Lowered Signs



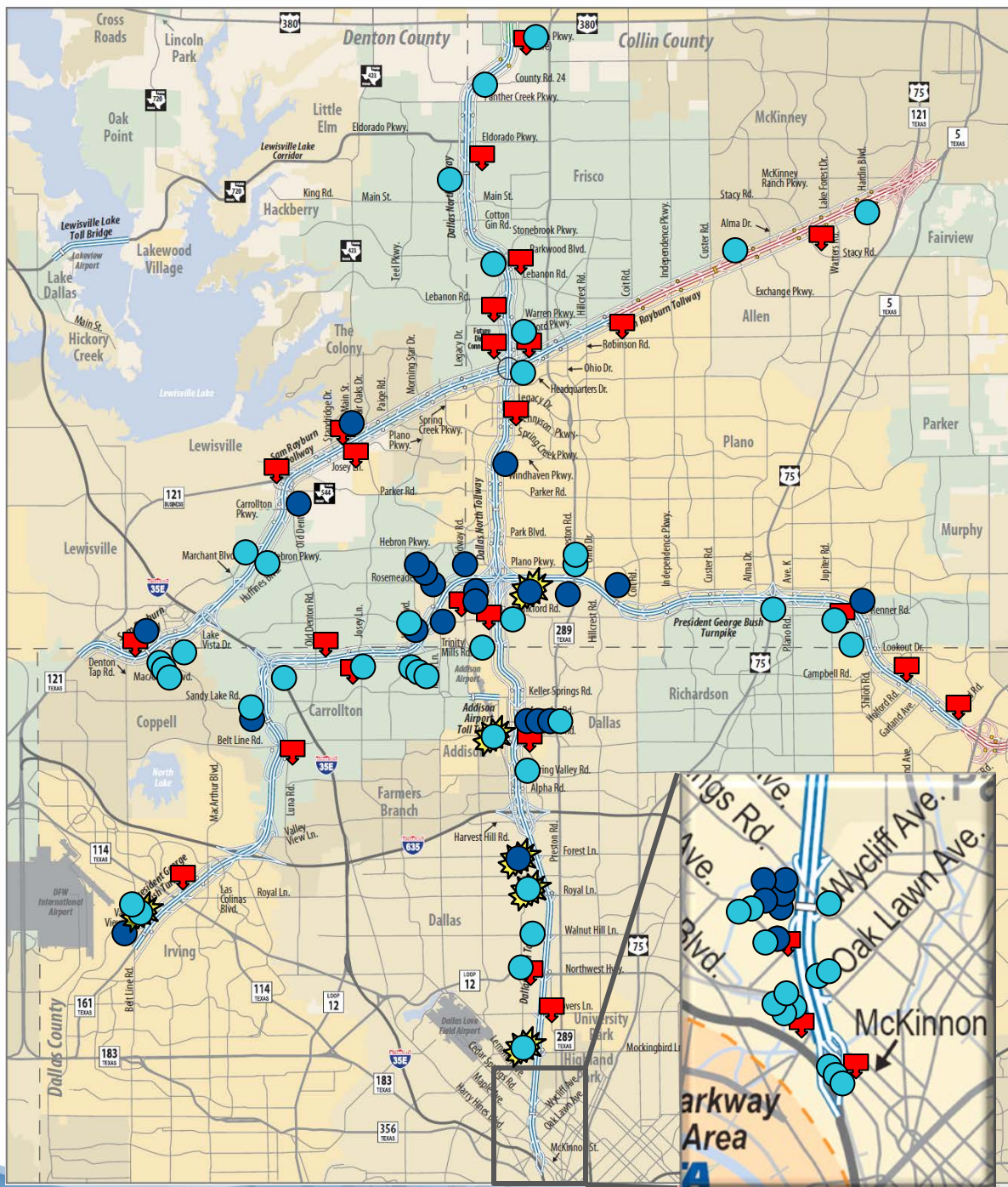


# Locations of the Lowered Signs on NTTA System

 Lowered sign test locations







# Locations of the Lowered Signs and the Recorded WWD Incidents – One Year Analysis

- Lowered sign test locations
- Incident locations Aug 2010 - Jul 2011 (Total: 28)
- Incident locations Aug 2011 – Jul 2012 (Total: 50)
- ★ Incident-related Crash

# Lower Mounted Signs

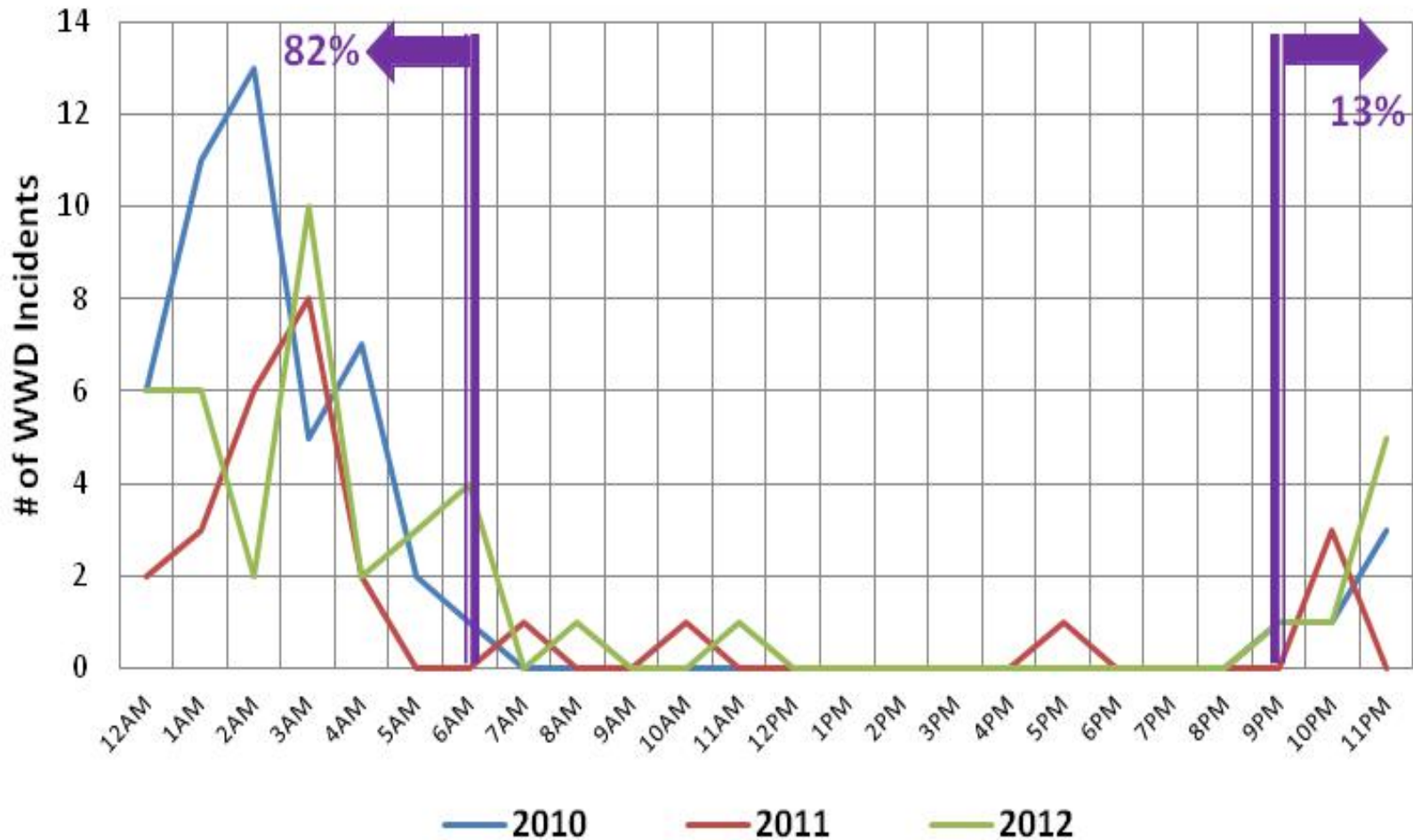
## Effectiveness Analysis – August 2012

- Incidents are reported at various locations throughout the system before and after the sign installation
- Some test locations have fewer but repeated incidents despite the presence of lower signs
- It is recommended that the test program be expanded to include more locations

# WWD Incident Patterns and Trend

- Previous finding:
  - 94% of **crashes** from 2007 to 2009 occurred between 11:00 PM & 4:00 AM
- Update:
  - 95% of **incidents** (and all **crashes**) from 2010 to present occurred between 9PM and 6AM

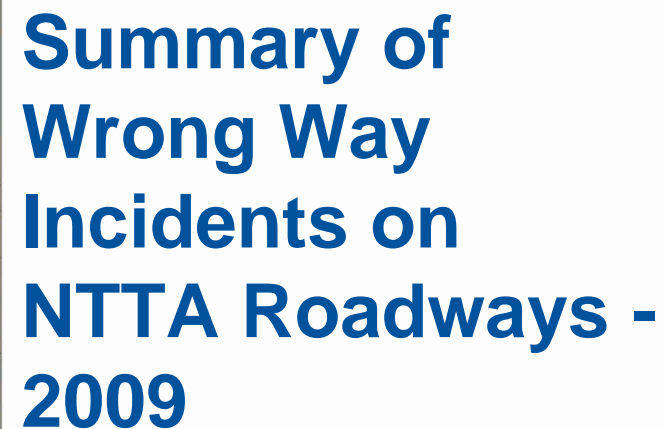
## WWD Incidents Time Distribution

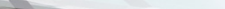




# WWD Incident Patterns and Trend

- Time Distribution
  - 94% of crashes from 2007 to 2009 occurred between 11:00 PM & 4:00 AM
  - 95% of incidents (and all crashes) from 2010 to present occurred between 9PM and 6AM
- Spatial Distribution
  - Incidents occurred on all corridors
  - Some locations have higher concentration



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- NTTA**  
NORTH TEXAS TOLLWAY AUTHORITY
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# Summary of Wrong Way Incidents on NTTA Roadways - 2010

- Fatal Crash
- Non-fatal Crash
- No Crash

## Summary of Reported Incidents

Total – 39 (26 confirmed)

- 67% Video
- 33% Loop Detection
- 36% DPS/Police
- 82% Phone Call
- 10% Crash



# Summary of Wrong Way Incidents on NTTA Roadways - 2011

- Fatal Crash
- Non-fatal Crash
- No Crash

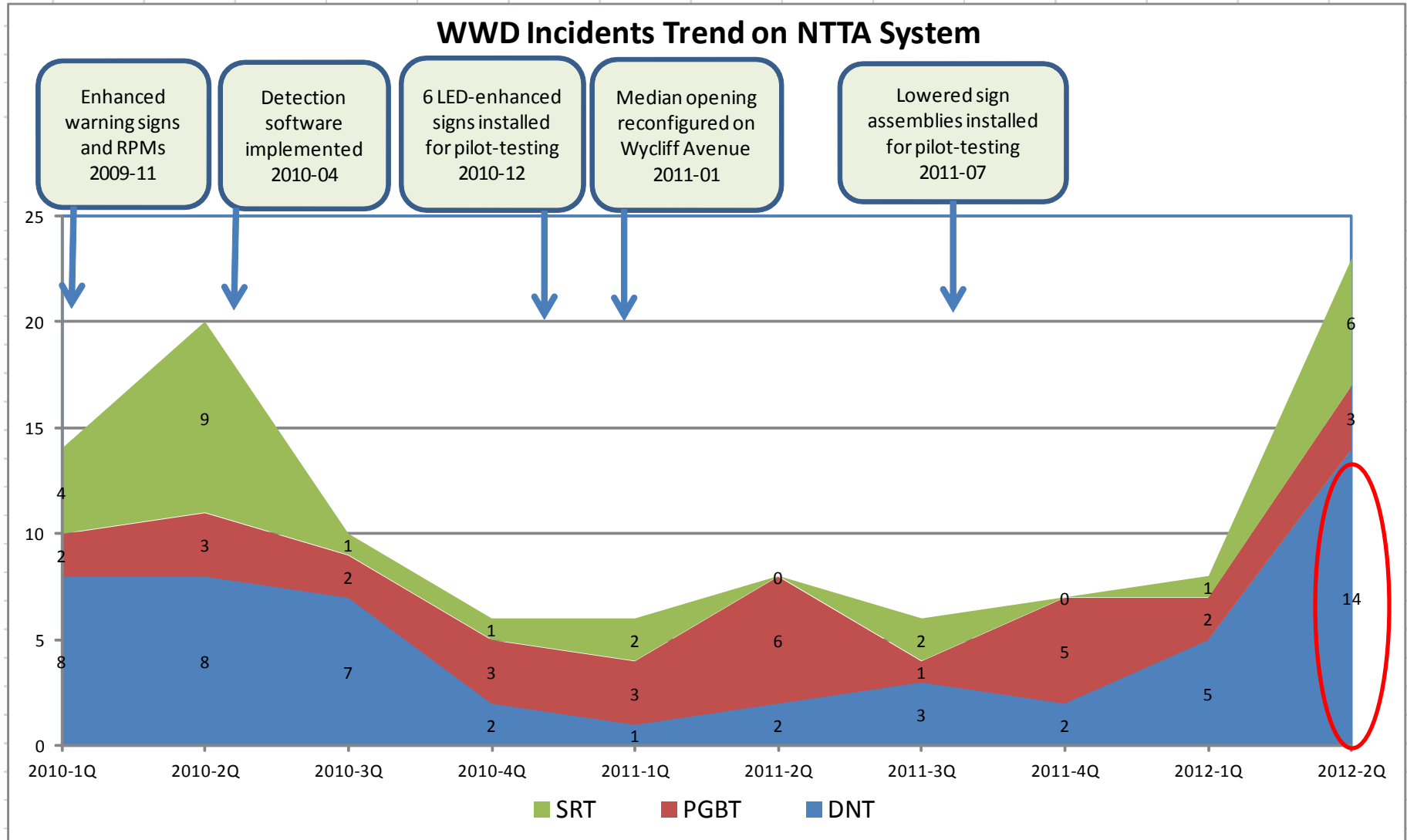








# Wrong Way Driving – Incident Trend Analysis



# DNT Southend – Harry Hines area

- Increased number of incidents during the first half of 2012
- Unique roadway configurations and adjacent land uses
- Multiple countermeasures are already in place
- Partner with City of Dallas for solutions







# DNT Southend – Harry Hines area

- Increased number of incidents during the first half of 2012
- Unique roadway configurations and adjacent land uses
- Partner with City of Dallas for solutions
- Improvements
  - Stripings (22 lane use legends and center lines on cross streets)
  - Signs (15 additional regulatory signs including 4 Wrong Way signs on signal mast arms)



Before condition at Wolf St



After the Striping Additions at Wolf St





Before condition at Payne St



After the Striping Additions at Payne St





After condition at Payne St - WB



After condition at Wolf St - EB



After condition at Randall and Hunt - WB



After condition at AAC parking lot driveways - EB



Before condition of  
Harry Hines at Payne St



After the Striping Additions  
on Harry Hines at Payne St



# Wrong Way Signs on Signal Mast Arms (at two locations)





# DNT Southend – Harry Hines area

- Encouraging results so far
- Continue to monitor the incident pattern and trend
- Additional improvement as applicable



# Summary

- Wrong Way Driving is a world wide long-term issue
- NTTA is proactively working to reduce incidents with a three-pronged approach:
  - Engineering
  - Enforcement
  - Education
- Partner with other entities for solutions
- Every small improvement counts



# Questions?

- provide a safe and reliable toll road system
- increase value and mobility options for our customers
- operate the Authority in a businesslike manner
- protect our bondholders
- partner to meet our region's growing need for transportation infrastructure.