




Wrong-Way Driver: Challenges and Opportunities

Presented to: TextITE 2010 Winter Meeting


Yang Ouyang, P.E., PTOE
Traffic Operations Engineer
North Texas Tollway Authority

January 29, 2010



Agenda

- Introduction of NTTA System and WWD Issue
- The Challenges
- NTTA Task Force Findings and Recommendations
- Opportunities Ahead
- Where do we go from here

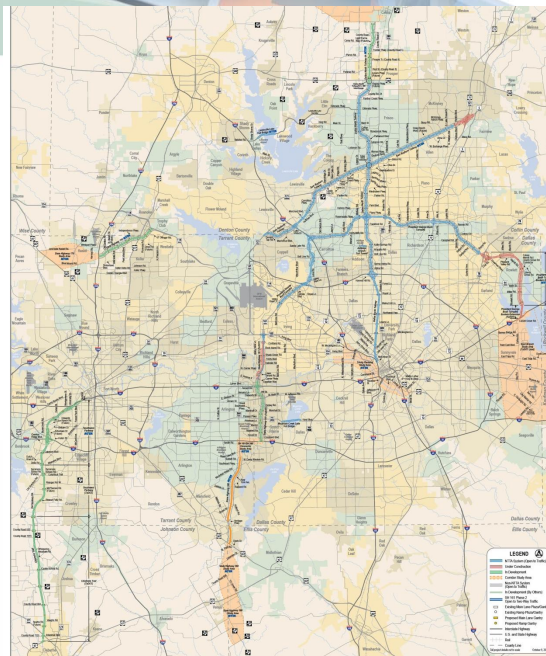


2



Introduction

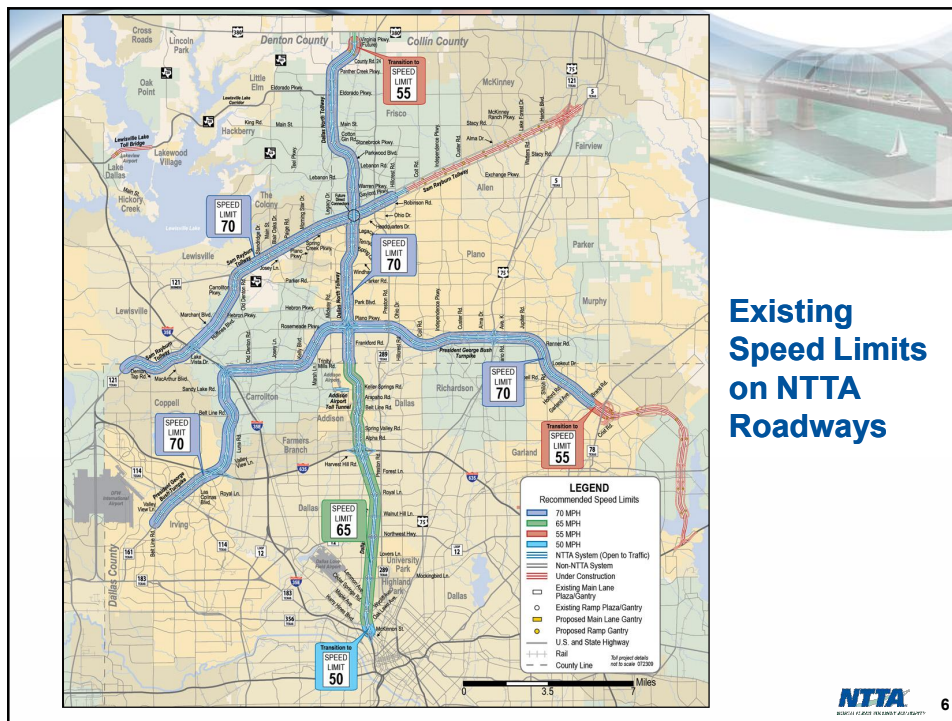
- The NTTA Roadway System
 - Currently 90 center-line miles and growing
 - Mostly divided high-speed roadways:
 - majority of roadways have frontage roads;
 - no frontage road on DNT south of IH-635 and a few small sections along PGBT
 - There are a total of 282 ramps system wide:
 - entrance ramps – 147;
 - exit ramps – 135
 - toll plazas at about 1/3 of the ramps



NTTA System Map

Introduction

- Traffic Characteristics on NTTA Roadways
 - Major mobility provider for DFW area traveling public:
 - connecting growing suburbs and various businesses;
 - with predominant commuter travel patterns;
 - Steady traffic growth with many new roadway openings in the near future
 - High operating speeds on main lanes
 - Conversion from traditional toll plazas to all Electronic Toll Collection (ETC)

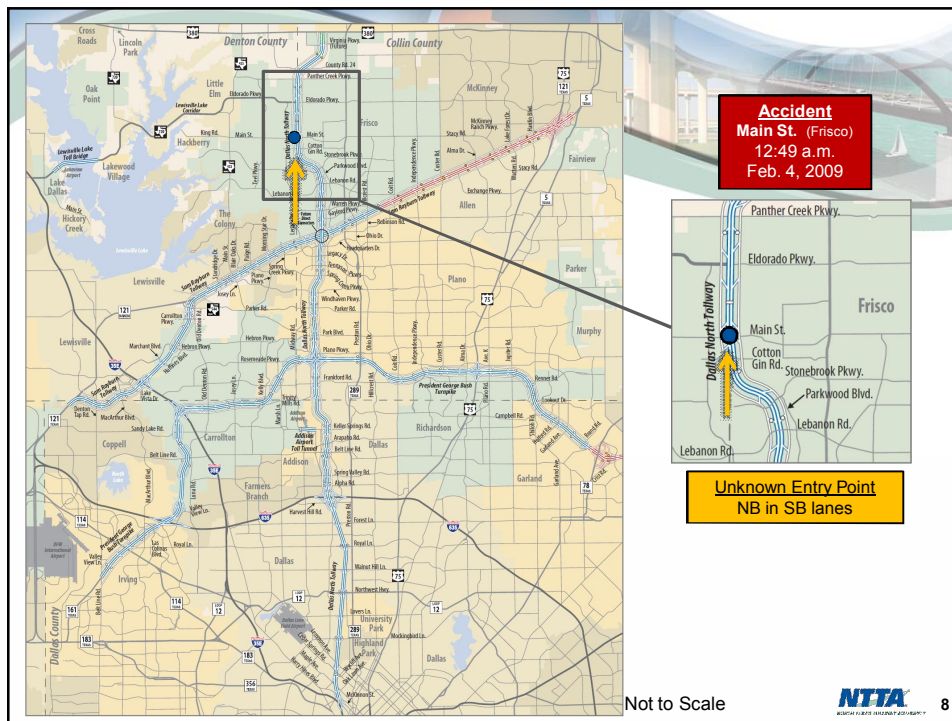


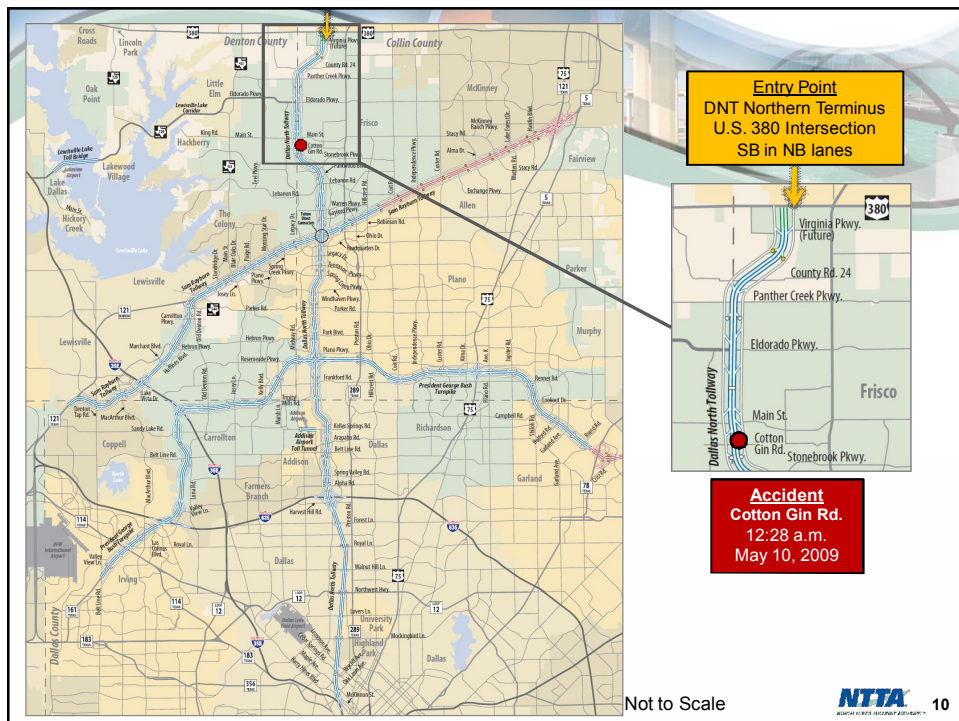
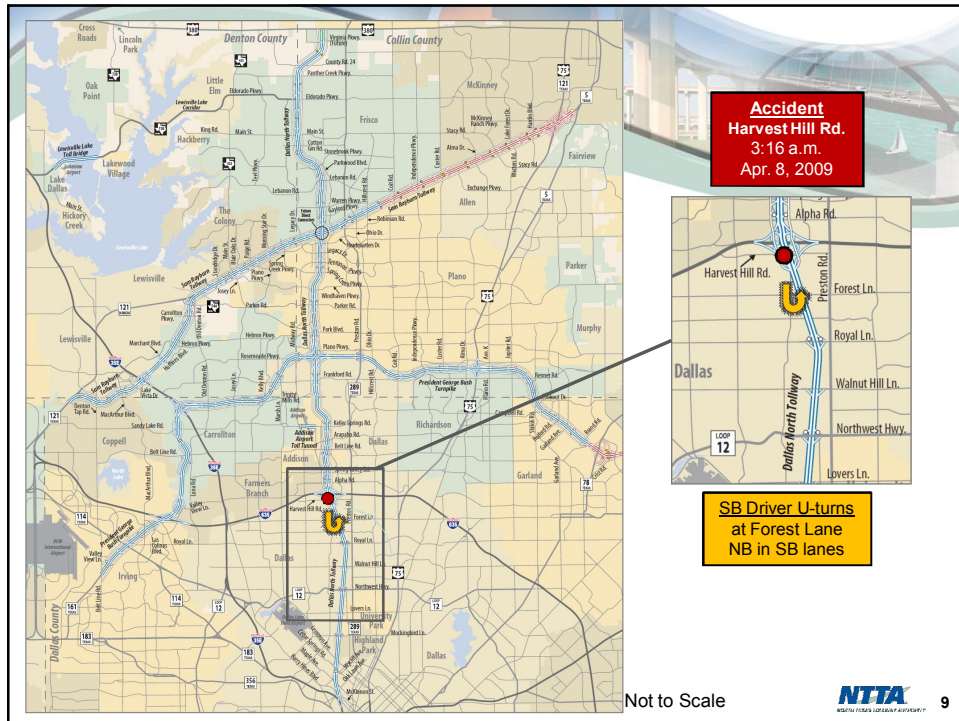
Introduction

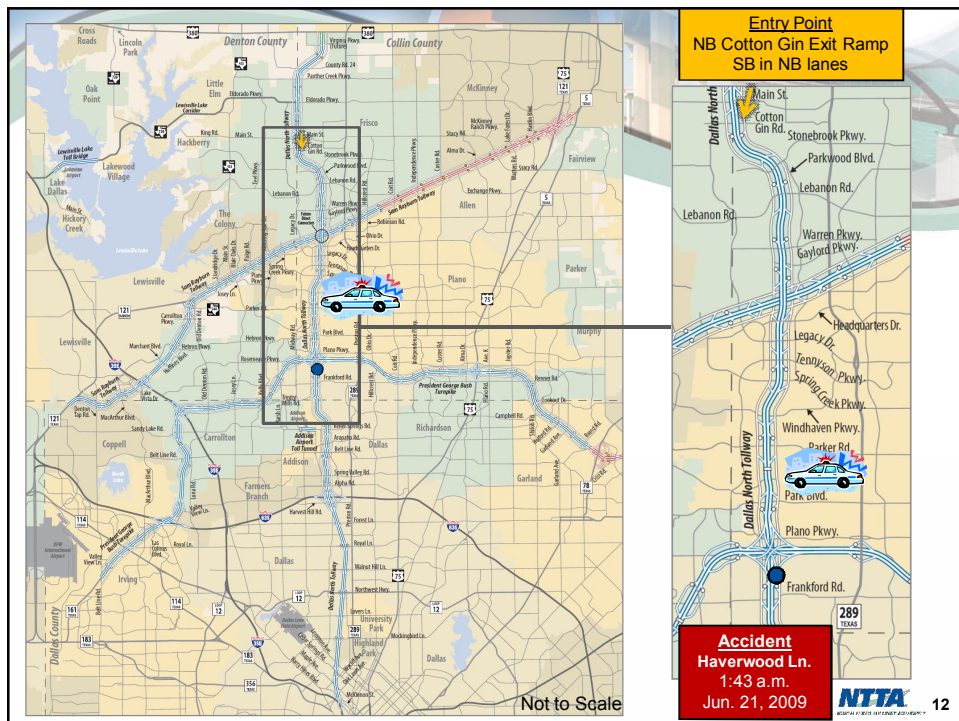
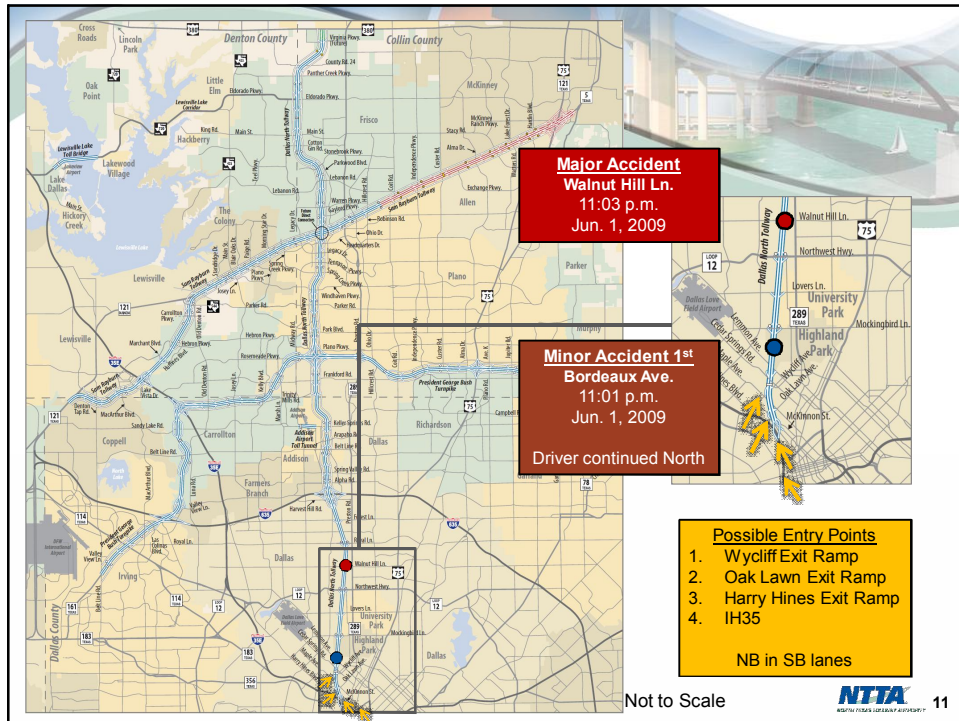
- Safety Performance on NTTA Roadways
 - Overall crash rates on DNT and PGBT are lower than those on other **Texas Interstate Highways**:
 - State-wide crash rate on Interstate highways is **105** per 100 million VMT in 2008;
 - The crash rates on **DNT** and **PGBT** are **87** and **59** during the same period;
 - 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 incidents during the first half of 2009 (5 WWD in 6 accidents)
 - There were 2 more WWD crashes (non-life threatening) during the 2nd half of 2009

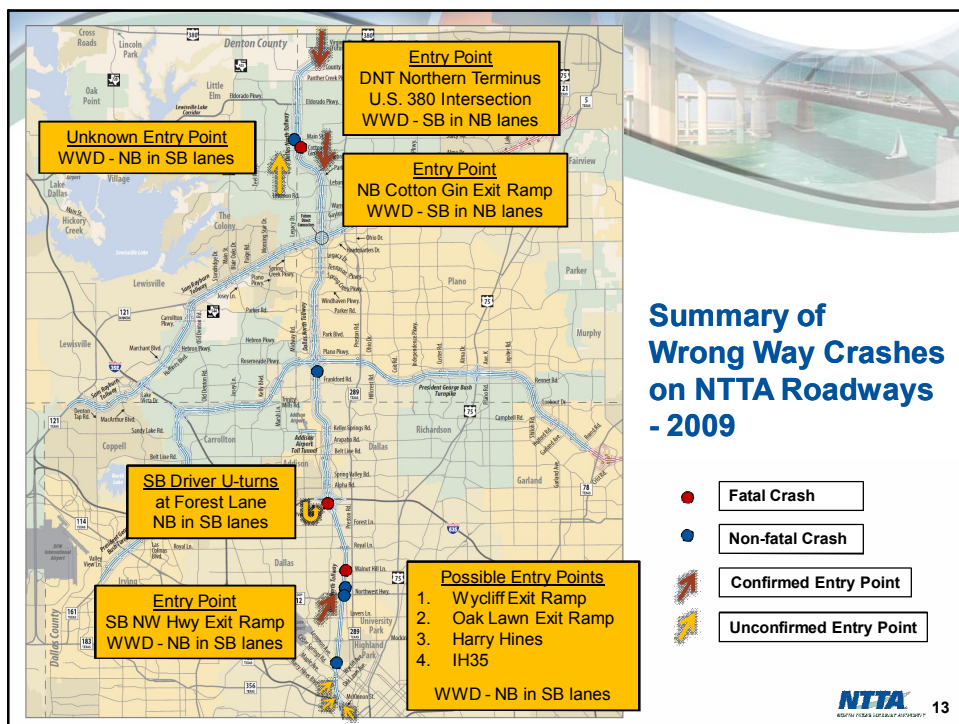
NTTA
NORTH TEXAS TRAILWAY AUTHORITY

7









The Challenges

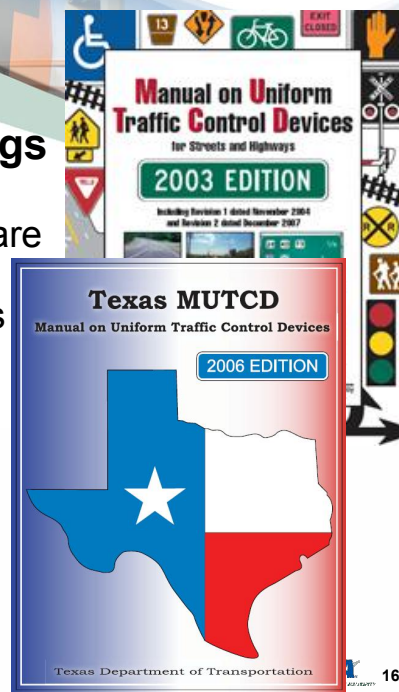
- Wrong way incidents could result in severe damage to the traveling public, often deadly
- It could happen at every decision point
- Researches by various agencies have indicated no one-size-fits-all solution
- Drivers are diverse and affected by many factors while driving
- One incident is too many

NTTA Task Force Key Findings

- Driver impairment is the overriding factor
 - All WWD crashes in 2008 & 2009 involved one or more intoxicated drivers
- 94% of NTTA WWD crashes from 2007 to 2009 occurred between 11:00 PM & 4:00 AM (15 of 16)
- No consistent correlation between WWD and a particular roadway section or configuration
- All countermeasures evaluated have limitations
- Worldwide long term problem

NTTA Task Force Findings

- The countermeasures that are currently in place on NTTA roadways meets or exceeds existing MUTCD standards
- All new countermeasures recently deployed exceed existing MUTCD standards





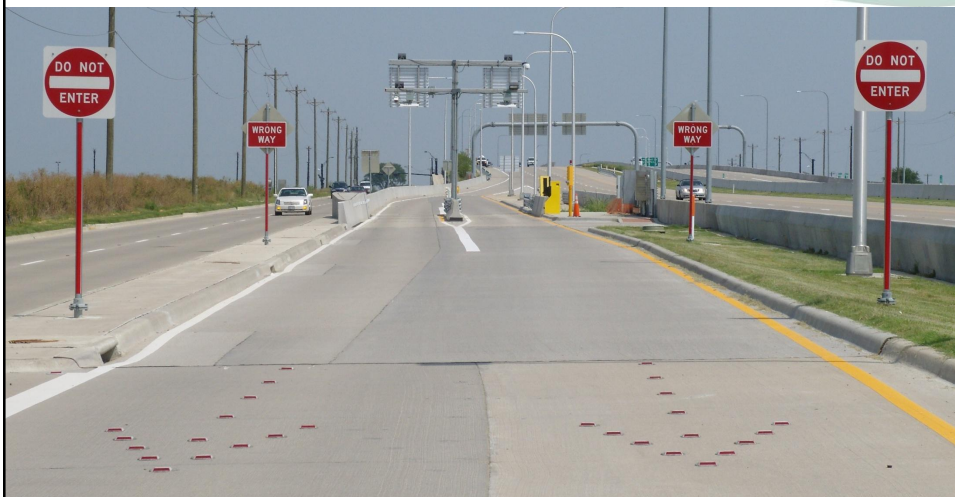
NTTA Task Force Recommendations

- Three-pronged approach to reduce WWD
 - Engineering
 - Enforcement
 - Education
- Continued assessment and deployment of feasible countermeasures:
 - 6 deployed immediately
 - 3 for pilot study to assess viability on NTTA System
 - 3 for further study
 - 1 emerging technology to monitor
 - 4 rejected



Countermeasures Assessed & Deployed

- Retro-reflective Tape and Wrong Way Arrows



Countermeasures Assessed & Deployed

- Retro-reflective Tape and Wrong Way Arrows – night time view



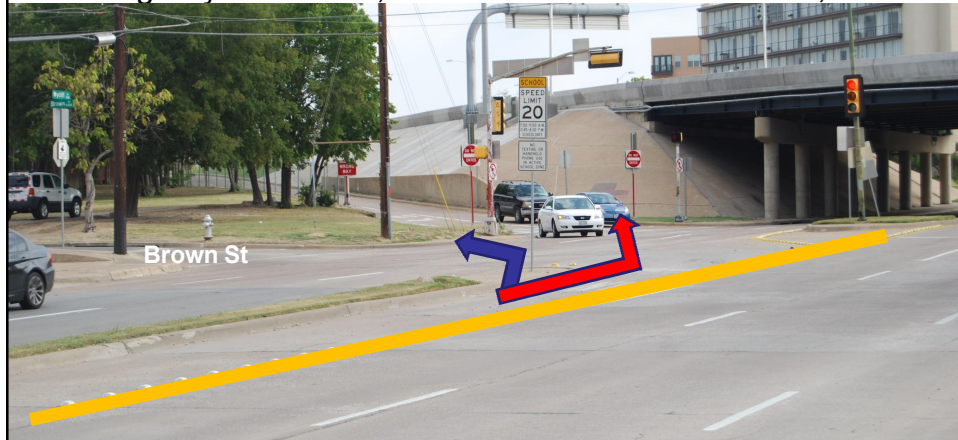
Countermeasures Assessed & Deployed

- Pavement marking modifications at cross streets to reduce driver confusion



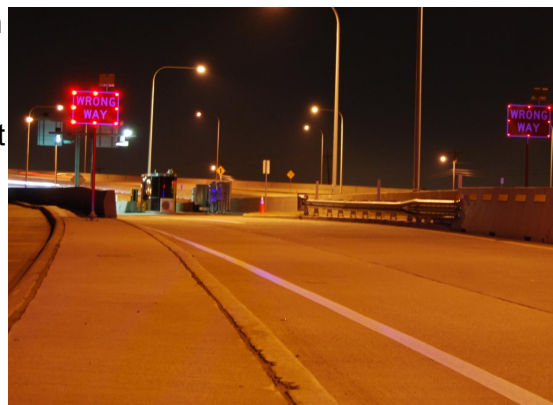
Countermeasures Assessed & Deployed

- Roadway layout modifications to reduce opportunities for wrong way movement, such as median modifications, etc.



Countermeasures Pilot Test – LED Enhanced Regulatory Sign

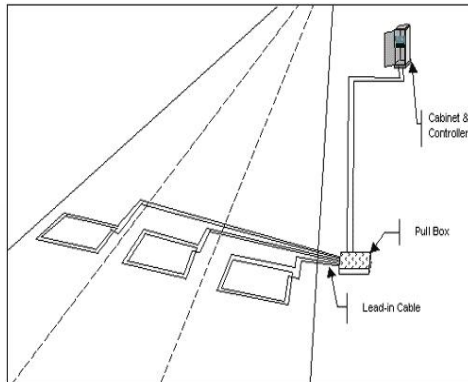
- Increased sign visibility in low light areas
- Can run on a timer to activate and flash at night
- Flexibility of solar or electrical power
- Meets regulatory standards
- No special mounting hardware required



Countermeasures

Pilot Test – Detection using Smart Loops

- Technology currently used by the NTTA
- More reliable than other alternatives
- Not affected by inclement weather
- Test beds are readily available



Countermeasures

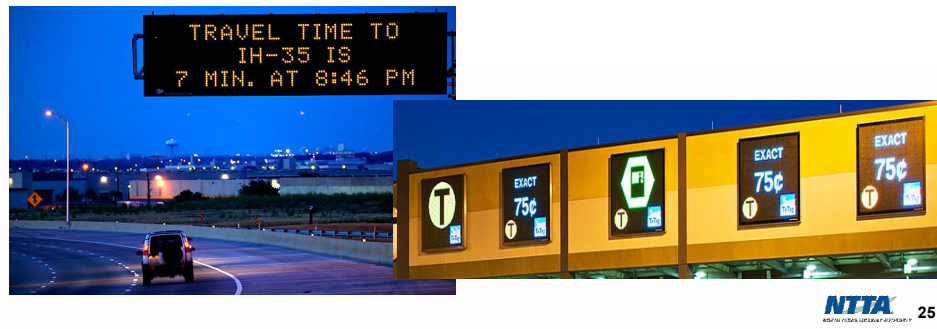
Assessed - Further Study

- Sign Assembly Modification – Lowered sign height or additional signs below current signs to reflect low beam headlights
 - effectiveness
 - new MUTCD recommendations
 - safety compliance



Countermeasures Assessed – Further Study

- Right Way Driver Warning Message using Dynamic Message or LED Signs
- Value and risk in providing driver information



Countermeasures Assessed – Further Study

- Video Detection
 - reliability in all weather conditions
 - sends alert to Command Center
 - communicates with other warning devices



Countermeasures Assessed – Monitor Progress

- IntelliDrive (formerly Vehicle Infrastructure Integration - VII)
 - Emerging technology being tested by FHWA
 - Onboard equipments in vehicle communicate with each other, hand-held devices, and roadside infrastructures
 - Alert drivers of potential safety hazards and take actions



Countermeasures Recommended - Enforcement

- DPS Enforcement
 - Immediate response to detections
 - Quarterly DPS DUI Task Force
- Command Center
 - Immediate dispatch
 - Video verification
 - Incident management





Business Process Enhancements

- Implemented the *Field Condition Checklist* based in part on a form developed by TTI
- Increased inspection frequency of signs
- Updates design standards to include specific countermeasures on all future designs
- Task Force stays active and meets regularly to review safety-related issues
- Maintain open communication



Opportunities Ahead

- New provisions in 2009 MUTCD
- Pilot Test results by NTTA Task Force
- Technology advancement in vehicle design and telecommunication infrastructure
- Continued partnership with other agencies to
 - deploy effective countermeasures consistently
 - improve enforcement and incident response
- Better public awareness

Which way to go from here ?



NTTA 31
North Texas Tollway Authority

Questions ?

**The mission of the North Texas Tollway Authority
is to enhance mobility through responsible
and innovative tolling solutions.**