



Texas Strategic Highway Safety Plan Update

3rd Emphasis Area Team Meeting

Intersections

3/22/2017

Austin, TX

Agenda

- Welcome and introductions (roll call)
- Review revised strategies
- Review new data runs
- Finalize strategies
- Discuss countermeasures

Team Members

| Commitment | Responsible Person | Due Date |
|---|--------------------|--------------|
| Submit potential countermeasures | Entire team | |
| Ask someone from the Dallas Injury Prevention Center to join team | Kevin Cunningham | Next meeting |
| Get HGAC report for red-light cameras to post on website | Darren McDaniel | Next meeting |
| Add ISIP plans to SHSP website | Darren McDaniel | Next meeting |

Revised Strategies & Countermeasures

- Strategy #1: Improve data systems for identifying specific intersections and intersection types at high risk for serious intersection crashes
 - Improve safety data on intersections by developing an intersection database, e.g., roadway characteristics, traffic volumes, # of driveways, type of controls
 - **Create sample GIS data structure that can be distribute to cities across the state to collect information in uniform fashion**

Revised Strategies & Countermeasures

- Strategy #1: Improve data systems for identifying specific intersections and intersection types at high risk for serious intersection crashes (cont.)
 - **Create and post intersection identifier at on system intersections. Can be similar to the TRM system and paced on a sign post**
 - **Consider a standardized app for data collection (similar to how CRASH was developed for PDs to do reports) – IOS or Android app to allow locals to collect info and upload**
 - **Publish statewide intersection crash rates by volume, lanes, and district/county to allow locals means of comparison**

Revised Strategies & Countermeasures

- Strategy #1: Improve data systems for identifying specific intersections and intersection types at high risk for serious intersection crashes (cont.)
 - **Develop statewide intersection database using the Model Inventory Roadway Elements format**
 - **Populate the intersection database through partnerships between TxDOT, MPOs and locals to acquire and maintain inventory data for intersections and interchanges**



Revised Strategies & Countermeasures

- Strategy #2: Consider alternative design strategies for improving intersection safety.
 - Educate decision makers and the public on the safety factors associated with roundabouts.
 - **Create a campaign or education push on roundabouts and the safety benefits**
 - **Construct a roundabout**

Revised Strategies & Countermeasures

- Strategy #2: Consider alternative design strategies for improving intersection safety. (cont.)
 - **Convert a signalized intersection to a diverging left intersection**
 - **TxDOT – complete an intersection control evaluation process (ICE) for use in project development (underway with TxDOT Design Division)**
 - **TxDOT – train and provide case studies for the selection of alternative intersections using the ICE tool and other resources (FHWA everyday counts, ITE, etc.)**
 - **Promote the use of ICE procedures and other alternative intersection evaluation tools for use by locals in project development (outreach to TexITE, MPOS, etc.)**

Revised Strategies & Countermeasures

- Strategy #3: Improve pedestrian safety at high risk intersections
 - **(Define high/ need to use different term)**
 - **Prohibit right on red and permissive left turns at high risk locations**
 - **Install pedestrian signals, pedestrian crosswalks, and/or high friction surface treatment on intersection approaches**
 - **Pedestrian islands**
 - **Colored/separated bike lane**
 - **Ensure pedestrian signals, push buttons, crosswalk markings, etc. meet current requirements or upgrade to current requirements, including signal timing.**

Revised Strategies & Countermeasures

- Strategy #3: Improve pedestrian safety at high risk intersections (cont.)
 - **Provide low to medium cost intersection improvements that improve safety for pedestrians**
 - **convert free flow turn lanes to angled turn lanes that require stopping/yielding, add turn islands and median islands and curb bulb outs**
 - **convert permissive only or protected permissive phasing to protected only when pedestrian call is present or during active times of day**
 - **provide enhanced measures – RRFB, PHB, lighting, etc. at uncontrolled high risk locations**

Revised Strategies & Countermeasures

- Strategy #4: Increase driver awareness of intersections, (e.g., pavement markings, flashing beacons, risk factors, etc.)
 - Implement proven, low cost engineering countermeasures in a systemic manner
 - Advance signal ahead warning sign
 - Flashers on signal ahead warning sign
 - Arrow pavement markings
 - Stop lines
 - Lane lines
 - Lane control signs
 - Advance cross street name signs
 - No Turn on Red signs
 - Protected Left Turn Phase
 - One signal head per lane
 - Supplemental signal head
 - Traffic signal back plates
 - Red light indicator lights
 - Pedestrian signal
 - Pedestrian signal push button
 - Yield to pedestrians sign
 - Sidewalks
 - Curb ramps
 - Pedestrian crosswalk
 - Intersection lighting
 - High-friction surface treatment
 - Remove On-street parking

Revised Strategies & Countermeasures

- Strategy #4: Increase driver awareness of intersections, e.g., pavement markings, flashing beacons, risk factors, etc. (cont.)

Revised Strategies & Countermeasures

- Strategy #4: Increase driver awareness of intersections, e.g., pavement markings, flashing beacons, risk factors, etc. (cont.)
 - **Larger signs with green background (6'x6' green sign with 48" warning sign on top)**
 - **Use of BE PREPARED TO STOP WHEN FLASHING warning signs where sight restriction or speed is an issue**
 - **Blank out sign for left turn yield condition**
 - **In-lane pavement markings – SIGNAL AHEAD, STOP AHEAD, 55 MPH, etc.**
 - **Install transverse rumble strips**
 - **Use of mast arms for multiple lane warning signs**

Revised Strategies & Countermeasures

- Strategy #4: Increase driver awareness of intersections, e.g., pavement markings, flashing beacons, risk factors, etc. (cont.)
 - **Driver feedback signs**
 - **Create offset left turn lanes for divided roadbeds**
 - **Install intersection flashing beacon or traffic signal, advance intersection warning signals or signs, or flashing yellow**
 - **Safety lighting at intersections**
 - **Add left or right turn lanes**

Revised Strategies & Countermeasures

- Strategy #4: Increase driver awareness of intersections, e.g., pavement markings, flashing beacons, risk factors, etc. (cont.)
 - **Develop Texas specific resources on the use of specific countermeasures above, based on roadway types, system ownerships, rural/urban character, etc. as a guide to practitioners**
 - **Implement the current Texas Intersection Safety Implementation Plan to prepare for the next iteration of the ISIP**
 - **Do not enter one way, freeway guide signs, and other devices that could prevent or reduce instances of wrong way driving initiated from intersections.**

Revised Strategies & Countermeasures

- Strategy #5: Develop educational campaigns incorporating data analysis to improve intersection safety
 - Publicize high crash locations and point out the contributing crash factors, e.g., impaired driving, texting, phone use, etc.
 - Increase and renew emphasis on safe driving behaviors in driver education.

Revised Strategies & Countermeasures

- Strategy #5: Develop educational campaigns incorporating data analysis to improve intersection safety (cont.)
 - **Create info graphics and other social media friendly graphics of information**

Revised Strategies & Countermeasures

- Strategy #6: Reduce red light running
 - Use targeted enforcement at high incident locations
 - Research and address the factors contributing to reduced law enforcement citations
 - Educate decision makers and the public on the effectiveness and appropriate use of automated enforcement
 - **Improve traffic signals**
 - **Interconnect signals**
 - **Install red light indicator lights**
 - **Install automated red light enforcement cameras**

Intersection K & A Crashes by Collision Type

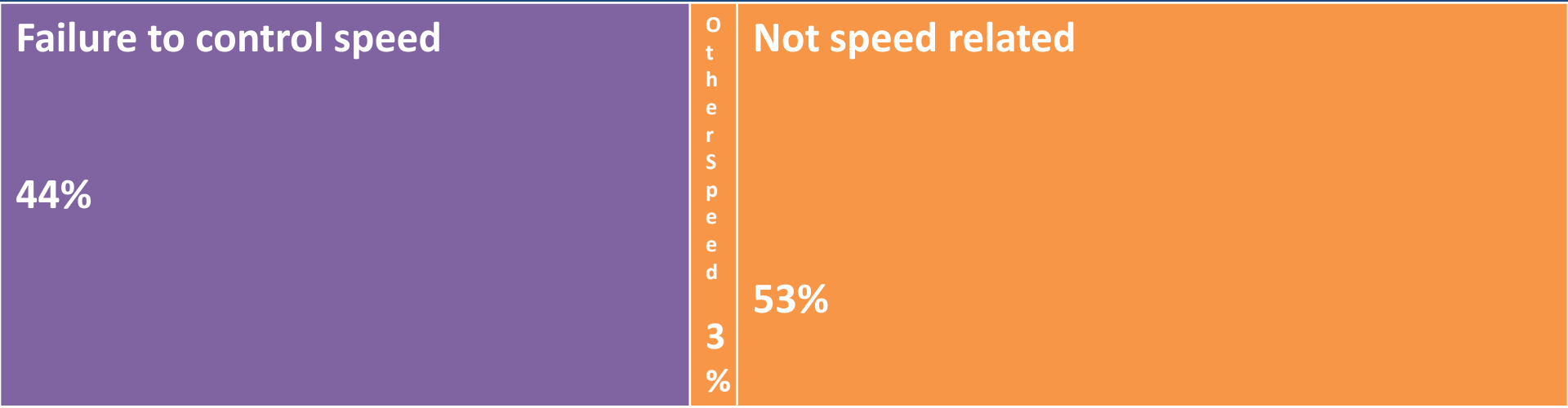
| | |
|---------------------|---------------------|
| Urban 73% | Rural 27% |
|---------------------|---------------------|

| Urban Signalized | | | | |
|------------------|-----------------------|-----------------|-----------|-------------------|
| RT Angle | LT across path | Same Dir | RE | SV / Other |
| 34% | 29% | 15% | 2% | 20% |

| Urban Unsignalized | | | | | (rear-end; sideswipe; RT across; opp dir no turn) | | |
|--------------------|-----------------------|-----------------|-----------|-----------|---|-------------|-------------------|
| RT Angle | LT across path | Same Dir | RE | SS | RAP | ODNT | SV / Other |
| 29% | 18% | 11% | 4% | 2% | 2% | 2% | 32% |

| All Rural | | | | | (opp dir; rear-end; RT across) | |
|-----------------|-----------------------|-----------------|------------|-----------|--------------------------------|-------------------|
| RT angle | LT across path | Same dir | OPP | RE | RAC | SV / other |
| 32% | 22% | 13% | 2% | 4% | 2% | 25% |

Rear-end Intersection K & A Crashes



Intersection K & A Crashes – On versus Off System

Urban



Rural



Urban Intersection K & A Crashes – On System

| | |
|--------------------------|----------------------------|
| Signalized 52% | Unsignalized 48% |
|--------------------------|----------------------------|

Signalized

| | | | | |
|-------------------------|---------------------------|---------------|-----------------------|----------------------|
| Disregard signal | Driver inattention | FTYROW | FT contr speed | A l c o h o l |
| 15% | 7% | 7% | 6% | 2% |

Unsignalized

| | | | | |
|---------------|---------------------------|-----------------------|------------------|----------------------|
| FTYROW | Driver inattention | FT contr speed | D S t o p | A l c o h o l |
| 13% | 8% | 8% | 3% | 2% |

Only top contributing factors presented;
≥60% involved other contributing factors

Urban Intersection K & A Crashes – Off System

Signalized
39%

Unsignalized
61%

Signalized

| | | | | |
|-------------------------|---------------------------|----------------|-----------------------|----------------|
| Disregard signal | Driver inattention | FTY ROW | FT contr speed | Alcohol |
| 15% | 7% | 7% | 5% | 2% |

Only top contributing factors presented;
≥60% involved other contributing factors

Unsignalized

| | | | | |
|---------------|---------------------------|-----------------------|-----------------------|----------------|
| FTYROW | Driver inattention | FT contr speed | Disregard stop | Alcohol |
| 17% | 7% | 6% | 5% | 2% |

Rural Intersection K & A Crashes On system

| | |
|--------------------------|----------------------------|
| Signalized 19% | Unsignalized 81% |
|--------------------------|----------------------------|

Signalized

| | | | | |
|-------------------------|---------------------------|---------------|-----------------------|----------------|
| Disregard signal | Driver inattention | FTYROW | FT contr speed | Alcohol |
| 15% | 7% | 7% | 5% | 3% |

Unsignalized

| | | | | |
|---------------|---------------------------|-----------------------|-----------------------|----------------|
| FTYROW | Driver inattention | FT contr speed | Disregard stop | Alcohol |
| 16% | 6% | 6% | 5% | 3% |

Only top contributing factors presented;
 ≥60% involved other contributing factors

Rural Intersection K & A Crashes

Signalized
22%

Unsignalized
78%

Signalized

| | | | | |
|-------------------------|---------------------------|---------------|-------------------------|----------------|
| Disregard signal | Driver inattention | FTYROW | FT control speed | Alcohol |
| 16% | 8% | 6% | 4% | 3% |

Only top contributing factors presented;
≥60% involved other contributing factors

Unsignalized

| | | | | |
|---------------|-----------------------|---------------------------|---------------------|----------------|
| FTYROW | Disregard stop | Driver inattention | Unsafe speed | Alcohol |
| 13% | 7% | 6% | 6% | 5% |

COUNTERMEASURES

A Word on Countermeasures

Effectiveness (history, current, new measures)

Impact (history, priorities)

Feasibility (policies, resources, expertise, sponsors, public acceptance)

Summary and Adjourn

- Review action items
- Summarize additional needs requested by the EA team members prior to the next meeting
- Next meeting: March 22; 9:30-11:00am
- Adjourn