Session Objectives

- Basic Work Zone Statistics
- Understanding the Fundamental Principles of MUTCD Part 6
- Workers Perspective on Safety
- Video: “The ABC’s of Work Zone Safety”
Basic Work Zone Statistics

Who is more likely to be killed in a work zone? (Driver or Worker)
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- **Since 1992 in Iowa – 141 fatalities**
  - 124 motorists, 88%
  - 17 workers, 12%
Basic Work Zone Statistics

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- Since 1992 in Iowa – 141 fatalities
  - 124 motorists, 88%
  - 17 workers, 12%

- Since 2002 in Iowa – 58 fatalities
  - 54 motorists, 93%
  - 4 workers, 7%
Basic Work Zone Statistics

What is the most common type of work zone crash?
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- Historically, rear-end crashes account for 90% of all work zone crashes.
Basic Work Zone Statistics

Are the majority of worker fatalities caused by motorists or by other workers?
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- Approximately two-thirds (62%) of worker fatalities are caused by fellow workers
Basic Work Zone Statistics

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- **Caught between or struck by construction equipment (16%)**
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What is the leading cause of worker fatalities?

- Backups / run over (46%), over half were dump trucks
- Caught between or struck by construction equipment (16%)
- Collision between vehicles (16%)
Basic Work Zone Statistics

• Summary:
  – motorists are killed by motorists
  – Workers are killed by construction activities

When it comes to worker safety, workers have much control over their working environment and safety.
Fundamental Principles

- Manual on Uniform Traffic Control Devices
Fundamental Principles

- Traffic safety is an integral and high-priority element of every project
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- Basic principles of permanent highway design govern design of TTC plans
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  - Basic principles of permanent highway design govern design of TTC plans
  - TTC plan prepared by trained and knowledgeable persons
Fundamental Principles

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  - Frequent and abrupt changes in geometrics should be avoided
  - Consider safe operation of work vehicles
  - Minimize construction time
Fundamental Principles

- Provide motorists with clear and positive guidance
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  - Provide proper warning, delineation, and channelization of the work zone
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- Provide motorists with clear and positive guidance
  - Provide proper warning, delineation, and channelization of the work zone
  - Remove or cover conflicting traffic controls (signs, pavement markings, etc)
Fundamental Principles

- Regular inspection and maintenance of TTC zones.
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  - Ensure that TTC devices are effective, visible, clean, correct
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  - Ensure that TTC devices are effective, visible, clean, correct
  - Maintain or replace devices that are moved or damaged
  - Note evidence of erratic maneuvers and/or crashes and take appropriate action
The MUTCD contains minimum requirements for Temporary Traffic Control assuming the following criteria:

- Good weather
- Daytime operation
- Normal traffic volumes traveling at design speed
- Average driver (good health, good vision, 15 yrs. of driving experience)
MUTCD Part 6

- Minimum requirement may be okay for average conditions
- With each deviation from average the safety level decreases
  - Night
  - Poor weather
  - Less than average driver
Negative Factors

- Most drivers use low-beam headlights
  - aimed toward the right side of the road
  - Objects on the left side receive 60% as much light as objects on right side
Negative Factors

- Poor weather (rain, fog, snow)
  - Much of the light of headlights is lost on its way to the traffic control device and an equal amount is lost on its way back to the driver
  - Pavement friction loss
MUTCD Part 6

Negative Factors

- Poorly maintained traffic control devices
  - Dirty (Over 50% reduction in effectiveness due to construction dust)
  - Incorrect orientation
  - Damaged or missing devices
MUTCD Part 6

Negative Factors

● Driver
  – Younger drivers with less experience
  – Older drivers with poorer vision and slowed reflexes
  – Drivers under the influence of legal and illegal substances
Negative Factors

- Driver
  - Unfamiliar drivers can become confused
  - Familiar drivers on auto-pilot
Vision / Visibility

Vision – eyesight (internal to the driver)
- Age
- Corrective Lenses
- Ambient Light (headlights)
- Car Windshield
- Weather
Vision / Visibility

Visibility – target value (external to driver)

- Size
- Brightness
- Position
Visibility

Iowa DOT accommodations for visibility

- Larger fluorescent orange signs and devices
- Wider pavement markings
- Proper placement of signs and devices
- No cones permitted at night
- Hi-Viz clothing at all times
Worker Visibility Rule

Rule

- All workers within the right-of-way of a Federal-aid highway who are exposed either to traffic (vehicles using the highway for purposes of travel) or to construction equipment within the work area shall wear high-visibility safety apparel.
Worker Visibility Rule

Purpose

Decrease the likelihood of worker fatalities or injuries caused by motor vehicles and construction vehicles and equipment while working within the right-of-way on Federal-aid highways.
Worker Visibility Rule

**Close proximity**
- within the highway right-of-way on Federal-aid highways.

**High-visibility safety apparel**
- personal protective safety clothing to provide conspicuity during both daytime and nighttime usage,
- ANSI 107 Class 2 or 3
Worker Visibility Rule

**Workers**

- people on foot whose duties place them within the right-of-way of a Federal-aid highway,
  - construction and maintenance forces,
  - survey crews, utility crews,
  - responders to incidents,
  - law enforcement personnel when directing traffic, investigating crashes, etc.
Worker Visibility
DOT PPE Requirements
Worker Visibility DOT and Contractor Employees

- Both PPM 230.05 and Specification 2528.03,L,05 Will Be Updated
- Applies to both DOT Staff and Contractor Employees
- Effective for all Construction projects in 2014 per Jan. 31, 2014 email
- On Interstate, Primary Highways, and Other Roadways:
  - During daytime hours, Class 2 Apparel; Unless in Vehicle Cab
  - and Class E Pants or Shin Reflectors at Night, Unless in Vehicle Cab
- Flaggers Comply with October 2013 Flagger’s Handbook
ANSI 107 Safety Apparel

- National Standard for hi-viz worker apparel
- Provides detailed information on manufacture and testing of safety apparel
- Requires classification and care tag in garment
ANSI 107 Safety Apparel

Standards Information

- American National Standards Institute
  www.ANSI.org

- International Safety Equipment Association
  www.safetyequipment.org
Components of Temporary Traffic Control Zones

- Advance Warning Area
- Transition Area
  - Tapers
- Activity Area
  - Buffer Space
  - Work Space
- Termination Area
Standard Road Plans

**Vehicle Stopped on Shoulder for Less Than One Hour**

**Slow-Moving Operation**

Do not allow work to interfere with the flow of traffic. When parked, locate vehicles as far from the open traffic lanes as possible. Entrances and driveways should be used whenever appropriate.

Illuminate all vehicles with an amber revolving light or amber strobe light.

For work lasting longer than one hour, refer to TxDOT or other guidance.

Possible Contract Item:
Traffic Control
Standard Road Plans
Standard Road Plans
Channelizing Devices

- Used in tapers to move traffic
- Delineate safe travel path
Channelizing Devices

- Types
Channelizing Devices

- Types
  - Cones for daytime use only
Channelizing Devices

• Types
  – Tubular markers for TLTWO
Channelizing Devices

• Types
  – Drums for lane closures and lane shifts
Channelizing Devices

- Types
  - Type 3 barricades for closures
Channelizing Devices

- Types
  - 42-inch channelizers for general delineation
Channelizing Devices

- Temporary Lane Separator System (TLSS)
Channelizing Devices

- Details in MUTCD Part 6
Questions

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