Work Zone Safety Issues
96th Annual Road School

Driving Indiana’s Economic Growth

Work Zone Safety Review

For 2009 on the state highway system:
- Work zone fatalities: 8 motorist & 2 worker
  - Equal to the average of the past 3 years
  - (1 more fatality than 2009)

[Graph showing work zone fatalities]
For 2009 on the state highway system:

- 2255 work zone crashes
  - 14.6% above the average of the past 3 years (1967)

<table>
<thead>
<tr>
<th>State Highways, Interstate Routes, and US Highways ONLY - NO Local Roads</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>3 yr Average prior to 2008</th>
<th>Change from 3 yr average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Collisions</td>
<td>2661</td>
<td>1779</td>
<td>1600</td>
<td>1903</td>
<td>2390</td>
<td>2255</td>
<td>1967</td>
<td>14.6%</td>
</tr>
<tr>
<td>Collisions with property damage only</td>
<td>2128</td>
<td>1431</td>
<td>1240</td>
<td>1561</td>
<td>1926</td>
<td>1841</td>
<td>1576</td>
<td>16.8%</td>
</tr>
<tr>
<td>Collisions with injury</td>
<td>521</td>
<td>333</td>
<td>354</td>
<td>338</td>
<td>455</td>
<td>406</td>
<td>382</td>
<td>6.4%</td>
</tr>
<tr>
<td>Total injuries</td>
<td>790</td>
<td>506</td>
<td>575</td>
<td>515</td>
<td>662</td>
<td>598</td>
<td>584</td>
<td>2.4%</td>
</tr>
<tr>
<td>Collisions with fatality</td>
<td>12</td>
<td>15</td>
<td>14</td>
<td>6</td>
<td>9</td>
<td>10</td>
<td>10</td>
<td>0.0%</td>
</tr>
<tr>
<td>Total fatalities</td>
<td>16</td>
<td>18</td>
<td>15</td>
<td>7</td>
<td>9</td>
<td>10</td>
<td>10</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Indiana Manual on Uniform Traffic control Devices

- Current version adopted in 2008
- New Federal version approved for 2010
- Indiana has 2 years to adopt a new manual that is in compliance
- Work Zones Traffic Control Standards are contained by chapters 1, 5, and 6
Work Zone Issues

Signing issues:

- Knocked down

Knocked down

Message
Work Zone Issues

Signing issues:

- Knocked down
- Message

3/1/2010

Work Zone Issues

Signing issues:

- Knocked down
- Message

3/1/2010

Work Zone Issues

Signing issues:

- Knocked down
- Message
- Damage

3/1/2010
Work Zone Issues

Signing issues:
- Knocked down
- Message
- Damage
- Retro-reflectivity
Work Zone Issues

Signing issues:

- Knocked down
- Message
- Damage
- Retro-reflectivity

3/1/2010
Work Zone Issues

Signing issues:
- Knocked down
- Message
- Damage
- Retro-reflectivity
- Placement

Signing issues:
- Missing signs for shifting tapers
Work Zone Review Findings

Changeable Message Signing

Improvements found:

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>35.7%</td>
<td>5.9%</td>
<td>10.2%</td>
</tr>
<tr>
<td>Location</td>
<td>21.4%</td>
<td>3.9%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Legibility</td>
<td>10.7%</td>
<td>7.8%</td>
<td>4.1%</td>
</tr>
<tr>
<td># Screens</td>
<td>32.1%</td>
<td>11.8%</td>
<td>6.1%</td>
</tr>
<tr>
<td>All CMS</td>
<td>16.7%</td>
<td>4.5%</td>
<td>3.5%</td>
</tr>
</tbody>
</table>

Biggest Issue in 2009:
Content – Repeats a Static Sign unnecessarily

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Work Zone Review Findings

Changeable Message Signs

CONTENT
- Only use two screens
- Eight letters per line
- Three lines per screen
- Use second board for additional information
- Should only display releve information
- Make sure the default password has been changed

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Work Zone Review Findings

Changeable Message Signs

- Make sure the default password has been changed

Location
Tended to be found too far in advance of work zone

Work Zone Review Findings

Changeable Message Signs

Location
Tended to be found too far in advance of work zone
Work Zone Review Findings

Flashing Arrow Boards

Problems with legibility due to dimmers
0.0% in 2009
5.6% in 2008
2.2% in 2007

Work Zone Review Findings

Channelizing Devices

- Still have common problems with:
  - Poor condition

Work Zone Review Findings

Channelizing Devices

- Still have common problems with:
  - Poor condition
  - Moved out of position or knocked down
Work Zone Review Findings

Channelizing Devices

- Still have common problems with:
  - Poor condition
  - Moved out of position or knocked down
  - Improperly placed
  - Spacing (13.1% in 2009)

Std Spec 801.03 Requirements
>75% of devices in “acceptable” condition

Reference source:
ATSSA Quality Guidelines for Traffic Control Devices
WWW.ATSSA.COM
Barrelman says, "Only you can prevent work zone accidents."

Work Zone Review Findings

Barricade Issues
Orientation of the Striping

Work Zone Review Findings

Barricade Issues
Orientation of the Striping
Work Zone Review Findings

Barricade Issues
Position and Staggering (13.4 %)

Work Zone Review Findings

Barricade Issues
Position and Staggering (13.4 %)

Work Zone Review Findings

Barricade Issues
Maintenance
Work Zone Review Findings

Work Site Speed Limit Assembly

- Flasher activation
  - 2007 rate 8.3%
  - 2008 rate 4.7%
  - 2009 rate 20.5%
- Placement
  - 2007 rate 16.7%
  - 2008 rate 4.6%
  - 2009 rate 0.0%
- Mounting Height
  - 2007 rate 0.0%
  - 2008 rate 4.5%
  - 2009 rate 5.1%
- Improper covering of subsequent Speed Limit signs 10.3%

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Work Zone Review Findings

Work Site Speed Limit Assembly

- Place the same signs on both sides of the road

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Work Zone Review Findings

Flagging and Worker Issues

More work zones with flagging were reviewed in 2008

Problems continue to be noted with:

- Attire – improper or absent retro-reflective gear

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Work Zone Review Findings

Flagging and Worker Issues
More work zones with flagging were reviewed in 2008

Problems continue to be noted with:

- Positioning 2009 rate 25.1%

Device used – Flags are only for emergency use – Do not use hand signals

“I use this one when it’s raining.”

Work Zone Review Findings

Flagging and Worker Issues
More work zones with flagging were reviewed in 2008

Problems continue to be noted with:

- Device used – Flags are only for emergency use – Do not use hand signals
Work Zone Review Findings

Driver Behavior Problems

- Speeding
  - 2007 – 13.7%
  - 2008 – 6.7%
  - 2009 – 3.5%

- Following too closely