Road School 2018

Designing for Safer Work Zones
Calvin Lee
Indiana Constructors, Inc.
March 7, 2018
Total US Fatalities in Work Zones

Chart by state
US Worker Fatalities in Work Zones

Chart by state
WORK-ZONE SAFETY FACTS

- REAR-END: Is the most common work-zone crash
- A crash happens every 14 minutes
- 20% other work zone crash deaths
- 80% driver and passenger deaths in work zone crashes
- Workers killed in work-zone crashes annually
- Another 20,000 are injured

Slow down
Pay attention
Obey signs and flaggers

Protect men and women on the job, yourself and your passengers in work zones
Please Slow Down My Dad Works Here

EVEN CONE STANDS FOR A PERSON WORKING BEHIND IT.
Protecting Our Workforce

Policy Recommendations to Increase Highway Worker Safety

September 17, 2014

In Indiana, motorists are injuring and killing workers in highway work zones. The Indiana Construction Association offers the following recommendations to address this problem and to establish safe highway work zones for our most important asset – our workforce.
Protecting Our Workforce Document

Three Primary Components:

1. What Can Contractors Do?
2. What Can Lawmakers?
3. What Can INDOT Do?
ICA launched an initiative to work with INDOT, Contractors and Legislators to improve worker safety in work zones.

**INDOT**
1. Close roads or utilize median crossovers
2. Include positive protection
3. Reduce speed limits
4. Portable rumble strips
5. Portable speed monitoring displays
6. Require law enforcement patrols
7. Revise interstate congestion policy
8. Require TMAs

**Contractors**
1. Maintain lights and work zone signs
2. Remove or cover signs when not working
3. Inspect work zone devices regularly
4. Maintain portable changeable messages

**Legislators**
1. Redefine work zones to improve enforcement
2. Legalize photographic speed enforcement
3. Prohibit the use of handheld devices in work zones
Preservation Work VS New Construction

Different Challenge to Protect Workers
Typically Performed During Nights and Weekends
2 Laborers were working in this patch

INDOT truck was here

Initial impact with wall and pick.

Travel path of car. Went almost 400' before it stopped.
Fatal Accident
CONSTRUCTION WORKER FATALLY STRUCK ON I-65 IN HOBART

Brandon Beau Dewayne Fiscus, 35
WORK ZONE SAFETY CONSIDERATIONS

In 2014, significant efforts were made to outline the problem of worker safety in work zones, and a document titled “Protecting our Workforce” was created and presented to INDOT with hopes of working together to improve safety in work zones. Although improvements have been made, we still have a long way to go to make workers safe. This document represents our latest efforts toward that end. It was derived from members coming together to express their concerns and recommendations. Members request the following:

- Recommend that INDOT close roads, set up detours, or utilize median cross-overs.
  - This is strongly felt to be the most preferred method to reduce the worker exposure factor and will address the mobility concerns by reducing the length of the queues. Work can be completed much faster and more efficiently.

- Be allowed to work 24/7 to reduce costs and congestion, for faster completion, and greater safety for workers and the public, which will require temporary public inconvenience.
  - Congestion policy negatively affects contractors’ ability to complete the work in a more timely manner and places workers in harm’s way more frequently when required to continually set up and tear down traffic control to open lanes of traffic during certain intervals of the day.

- Emphasize that positive protection, e.g., barrier walls are as beneficial to the motoring public as it is for workers.
  - There seem to be a general consensus that barrier wall is not considered for worker safety nearly enough during the design process. It forces contractors to request wall through the change order process to better protect workers in the work zones. These requests are not always approved.

- Create policy for positive protection through unified efforts between legislators, engineers, ICI, etc.
  - Members would like to see a more uniform approach to identifying when barrier walls and other positive protections should be designed into the project.
WORK ZONE SAFETY CONSIDERATIONS

- Make drivers aware that there are consequences for their actions. Frequently run television advertisements similar to the “Mommy and daddy works here.”
  - Members have a strong desire to work with INDOT and other industry partners to communicate more with the public through advertisements and other social media to increase public awareness of the need for safety in work zones and that there is accountability for noncompliance. Also increase public awareness by posting fatality statistics on message boards with INDOT’s help, e.g., “Four out of five fatalities in work zones are drivers, and almost all are preventable.” and “More drivers are killed than workers in work zones.”

- Increase the use of police officers in work zones.
  - Members strongly feel that police officers patrolling work zones is the absolute best method of slowing down speeds in the work zones and every effort should be made to increase their use. We must move beyond the budget constraints that often accompany this subject, and identify criteria that depict when and for what types of jobs officers will be utilized. Additionally, new funding sources should be identified to pay for officers and perhaps built into the contracts.

- Utilize photo enforcement for ticketing.
  - Members are aware that efforts to make this a reality in Indiana failed in the past, but strongly support the effort to reintroduce the concept. Several other states utilize this method, and we should learn from their successes.

- Utilize portable speed monitoring displays.
  - Members feel that these displays are attention-grabbing, and alert motorists to enforcement efforts ahead, leading motorists to respond in a positive manner.

- Expand the Move Over Slow Down law to include construction equipment and vehicles.
  - The law currently identifies emergency vehicles, law enforcement, INDOT vehicles and tow trucks. No mention of construction.
A Message from the Commissioner

Work Zone Safety – We are all in this together – REALLY!

With traffic volumes on the rise, increased concerns over distracted driving, and INDOT’s record preservation program, work zone safety considerations are at the forefront of our industry as much as ever before.

Over the past few months, we have been working in partnership with Indiana Constructors, Inc., to hear industry concerns, brainstorm ideas, and implement actions to bring awareness, be proactive, and ultimately make our work zones as safe as possible. I want to share with you some of the things that have already been done, some things that we are doing, and some longer-term initiatives that we will be working on in collaboration with industry partners:

- **Dynamic Message Sign Displays** – We’ve already begun running general work zone safety messages on some permanent DMS’s. These messages are similar to what we’ve displayed during work zone awareness week (e.g., “Work zone safety … We’re all in this together”). We are investigating work zone statistics, enforcement warnings, and other related content that we could display, and the strategy for locations and timing to display them.

- **Increasing Signage and other Work Zone Safety Elements** – Construction project staff should look for opportunities and are empowered to increase signage or add other safety features in work zones where it makes sense. We will work to create a change order coding here for safety improvements that will not impact construction metrics.

- **Lane Closure/Congestion Policy Review** – A review of our current Congestion Policy is underway, including looking at best practices in similarly situated states.

- **Work Zone Enforcement Patrols** – Historically, we’ve chosen which work zones to put patrols in based on hazard analysis, and risk of congestion and queuing. We’re looking at a few other ways to determine where we can increase our investment. For instance, cross-referencing speed data with work zones without barrier walls to determine where it makes the most sense to increase patrols for worker safety.

- **Review of Scoping and Design Approaches to Maintenance of Traffic** – We continue to look at options to provide the use of crossovers, taking more lanes for closed areas in construction zones, A+B contracting, and considering full closures when possible. We will work with the industry to develop a uniform approach to determining when positive protection (e.g., barrier walls) and other protections should be designed into a project.

- **District Meetings with Industry** – We will consider hosting meetings to review upcoming projects to ensure that safety considerations have been made and to obtain industry feedback.
TO:  
District Deputy Commissioners  
District Construction Directors  
District Technical Services Directors  
District Area Engineers  
District Project Management Director  
Project Management Director  
District LPA Coordinators  
Project Engineers/Supervisors  
Field Engineers

FROM:  
Mark A. Miller, Director  
Division of Construction Management and District Support

SUBJECT:  
Maintenance of Traffic Safety Improvements Reason Code Addition

The intent of this memo is to inform field personnel of the addition of a new reason code in SiteManager called Maintain. Of Traffic Safety Improvements. The purpose of this reason code is to identify the safety improvements made to the Maintenance of Traffic on contracts. By identifying these improvements through change order, the costs to these improvements can be tracked and therefore not counted against the On Budget metrics. Safety is paramount on all construction projects and should not influence decisions based on meeting any metric concerning budget.

Some examples of common improvements that can be utilized with this reason code:

1) Additional Positive Protection such as temporary traffic barriers.
2) Temporary Rumble Strips to help reduce traffic speed coming into the work zone.
3) Speed Display Devices to reinforce Worksite Speed Limits.
4) Additional Construction Signs to provided clear guidance.

Many other safety improvements can be made to the original plans as field conditions may spur necessary changes or additions to accommodate any safety concerns.

Any questions should be directed to your Construction Management Field Engineer.
Hurdles to Overcome

1. Mutual Understanding and Alignment of Thoughts
2. Traditional Ways of Thinking
3. Identification of Specific Target Areas to Affect Change
4. Midstream, Post Letting and Award Safety Modifications
# Work Zone Safety Improvement Tracking Sheet

## Blue Lights

<table>
<thead>
<tr>
<th>#</th>
<th>KI Request</th>
<th>Implementation</th>
<th>Completion</th>
<th>Status</th>
<th>Actual Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Develop an INDOT RSP for local police in work zones. Capt. Burke, ISP; Kim Peters, INDOT; Gay Boruff, INDOT; Scott Cornelius, Milestone Contractors, L.P.; Dan Osborn, ICI.</td>
<td>Priority 1</td>
<td>Priority 2</td>
<td>Owner</td>
<td>Target Date</td>
</tr>
<tr>
<td>2</td>
<td>Bring design experts together to help with efficiency of patrols. (i.e. pull over/action) (i.e. pull over locations within work zones) INDOT Design Engineers: Dan Shaino, ACEG; Mark Thompson, E &amp; B Paving, Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Seek to increase the funding for work zone patrols in work zones. Dan Osborn, ICI; Dan Brown, Pfeifer &amp; Brown, Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Support efforts to adopt automated enforcement in work zones. Ed Solmon; Legislation: Calvin Lee, ICI; Capt. Burke, ISP.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Deploy more &quot;Your speed is&quot; taggys. Jon Krueger, INDOT; Mark Michael, E &amp; B Paving, Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Deploy additional signs in work zones – special patrols, speed limits. Jon Krueger, INDOT; Mark Michael, E &amp; B Paving, Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Initiate public education for moving over for amber lights during Work Zone Awareness Week. Will Wingfield, INDOT; Capt. Bursten, ISP; Calvin Lee, ICI.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Modify the slow down-get over laws to include all flashing lights which would aid surveyors, geotechnical engineers, and other design personal. ICI?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Bring INDOT and the industry together to address TMAs, rumble strips and other specifications as follows: Scott Cornelius, Milestone Contractors, L.P.; Dan Osborn, ICI; Kim Peters, INDOT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Barrier Wall

<table>
<thead>
<tr>
<th>#</th>
<th>KI Request</th>
<th>Implementation</th>
<th>Completion</th>
<th>Status</th>
<th>Actual Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clarify Type I anchor barrier wall specs? Elizabeth Phillips, INDOT</td>
<td>Priority 1</td>
<td>Priority 2</td>
<td>Owner</td>
<td>Target Date</td>
</tr>
<tr>
<td>2</td>
<td>Clarify the differences and usage of Type I and II barrier walls. Elizabeth Phillips, INDOT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Address positive protection where drop-offs occur. Elizabeth Phillips and John Wright, INDOT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Clarify when to use or not use G-trail type wall. Elizabeth Phillips and John Wright, INDOT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Enhance the partnerships between INDOT and industry to focus on work zones. Mark Miller, INDOT?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Improve the use of CRI if contractor has a better method? Mark Miller, INDOT?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

As of 1/17/2017
### BARRIER WALL, continued

<table>
<thead>
<tr>
<th>ICI Request</th>
<th>Implementation</th>
<th>Owner</th>
<th>Completion Target Date</th>
<th>Status</th>
<th>Completion Actual Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Integrate “positive protection” philosophy into the design policy and manuals. John Wright, INDOT?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Hold an Industry/INDOT forum to review methods to build Patch Jobs, bridge jobs and cable rail jobs to ensure that the products meet the quality needed and set that time consistent with the work zone duration requirements in the contract.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>INDOT help Industry better coordinate MOT and safety in projects that overlap.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Night work - investigate finding more opportunities to do work during the day when the roads are safer and driving public is more alert.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Consider methods to keep movable wall in Indiana.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### A+8 CONSTRUCTION

<table>
<thead>
<tr>
<th>ICI Request</th>
<th>Implementation</th>
<th>Owner</th>
<th>Completion Target Date</th>
<th>Status</th>
<th>Completion Actual Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Consider full closure. INDOT Construction Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Consider lane rental approach. INDOT Construction Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Encourage positive protection methods into Design/Build projects. INDOT Construction Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Guidance/awareness for designers and project managers for when A+8 might be appropriate. INDOT Construction Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### LANE CLOSURE POLICY

<table>
<thead>
<tr>
<th>ICI Request</th>
<th>Implementation</th>
<th>Owner</th>
<th>Completion Target Date</th>
<th>Status</th>
<th>Completion Actual Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Flag line item in project schedule to trigger design to look at MOT and TMP need for waiver.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Go back and review upcoming Interstate lettings.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>February / March lettings.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Complete all analyses for MOT with policy in mind.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Confirm that MOT is compatible with policy or get waiver at that time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Calibrate policy parameters with field.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Training for designers for uniform application (multi-discipline).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Place a feedback loop from field to refine policy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Multi-lane closure added to policy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>ITS/App relocation - Determine if telephone apps can reroute people during work zone times? On major projects work with the major mobile traffic apps Garmin, Waze, google, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Look for opportunities to create “buffer” zone by closing an extra lane of traffic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>