IMPROVING WORK ZONE SAFETY WITH TECHNOLOGY

2019 VTCA Conference

Paul Szatkowski
2018 Work Zone Crash Data

In Virginia
2,523
work zone
crashes

Virginia Department of Transportation
### 2018 Work Zone Crash Data (Cont.):

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injured</td>
<td>1,256</td>
</tr>
<tr>
<td>Reduction</td>
<td>↓ 5%</td>
</tr>
<tr>
<td>Killed</td>
<td>9</td>
</tr>
<tr>
<td>Reduction</td>
<td>↓ 18%</td>
</tr>
</tbody>
</table>

- **54%** work zone crashes were rear-end collisions
- **89%** occurred in dry weather
- **68%** happened during daylight hours

Statewide, the majority of work zone crashes involved drivers between the ages of 20 and 24 years old.

Two of the leading causes of crashes in work zones are driving too fast for conditions or driving distracted.

- **482** distracted driving crashes reported in work zones
- **↓ 19%**

2019 legislation, effective July 1, prohibits motorists from holding a handheld personal communications device while driving in a highway work zone.
Recent Supported Industry Technologies:

Variable Speed Limits (VSL) I-77; I-64; I-95; I-66
  • Successful impact in speed reductions during fog conditions

Work Zone Digital Speed Limits (DSL)
  • DSL units have the capability to communicate with VDOT Traffic Operation Centers
Recent Supported Technologies (Continued):

Portable Temporary Rumble Strips (PTRS)

- Proven effective in gaining driver attention in the work zone
- Evolving from two lane operations to multi-lane use

Automated Queue Warning (AQW) roadway sensors used for work zones
Recent Supported Technologies (Continued):

Highway Truck Entry System

- Flashing cone sensors alert drivers to construction trucks entering highway “When Flashing”

- Testing phase on I-66 resulted in reduced speeds from vehicles when flashing
Recent Supported Technology Findings:

**I-66 Study ATM conclusions Phase I (2016)**
- 6% EB and 2% WB weekday off-peak Travel Time improvement
- 21% EB and 48% WB crash rate reduction for rear-end and side swipe crashes
- Limited sample sizes

**I-77 VSL Study Conclusions**
- Reduced speeds of 2 to 5 mph with visibilities were 250-645 ft
- VSL system effective in reducing crashes, speed and increased safety
New Activities

Traveler Information

• Travel Times
• Crowdsourcing
• FHWA Work Zone Data Initiative
• Truck Parking

Emerging Technologies
Traveler Information:

Travel Times

- Enhanced queue management capabilities
- Assisting driver awareness of work zones and incidents
Leverage current technologies feeding from applications such as Waze, INRIX, HERE, and TOMTOM for live road conditions.

Push / pull information reported about work zones to and from travelers through the use of 511 and various applications.

Expand connected vehicle opportunities.
FHWA Work Zone Data Initiative

- Promotes the Work Zone Activity Data Standard
  - Standardize data for sharing across jurisdictions
  - Expands opportunities for connected & automated vehicle use
  - Promotes better coordination & data analysis
- Piloted among 3 states
- Future grant funding
Emerging Emergency Technologies (Cont.):

Truck Parking Applications-Improving Interstate Safety

- Use crowd sourced data
- Embedded parking lot sensors
  - Piloted at select VDOT Rest areas
- Includes highway signage
Emerging Emergency Technologies:

Smart Cones and Arrow Boards

- Alarms and lighting warnings
- Lighted, synchronized flashing cones
- Sensors for connected vehicle & crowdsourcing detection
Emerging Emergency Technologies (Cont.):  

Connected Smart Vests

- Virginia Tech Transportation Institute Engineers are creating a prototype, application and testing through grant funding
  
- Various technologies will be tested to include geo-fencing

- “InZoneAlert” vest – Alerts Driver and worker of work zone dangers
  
- Uses GPS, shortwave radio signals and connected vehicle technologies
Emerging Emergency Technologies (Cont.):

Smart and Connected Work Zones (Cont.)

- **Vehicle Intrusion Technology**
  - Sensor data
  - Geo-fenced work zone area
  - Air filled tubes to detect vehicle stray
Emerging Emergency Technologies (Cont.):

Work Zone Builder

- Grant activity led by VTTI
- Tool to communicate work zones and closures directly to third-party applications
- Tablet based
- Beta testing is occurring
Closing Thoughts:

Safety technologies and opportunities will advance rapidly as vehicles become connected and autonomous.

Information is becoming an increasingly important tool to improve work zone safety.
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