HIGHWAY WORK ZONE TRAFFIC INCIDENT MANAGEMENT (WZ-TIM)

Training for Law Enforcement and Other First Responders

Course Introduction

Dealing with a crash or other traffic incident occurring in a work zone requires the combined skills of many people/disciplines.

Formal Definition of "Work Zone"

"An area of a highway with construction, maintenance, or utility work activities…typically marked by signs, channelizing devices, barriers, pavement markings, and/or work vehicles. It extends from the first warning sign…or strobe lights on a vehicle to the END ROAD WORK sign or the last temporary traffic control (TTC) device."

Source: 2009 Manual on Uniform Traffic Control Devices

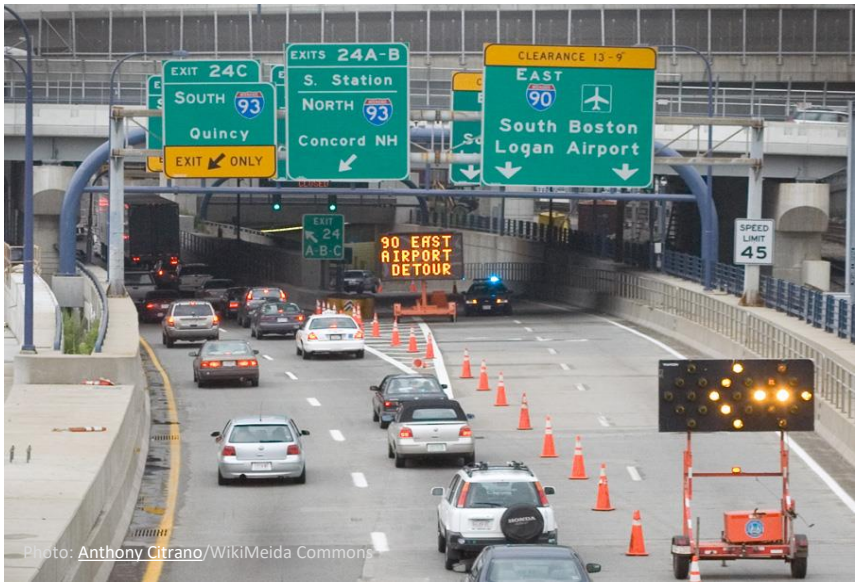


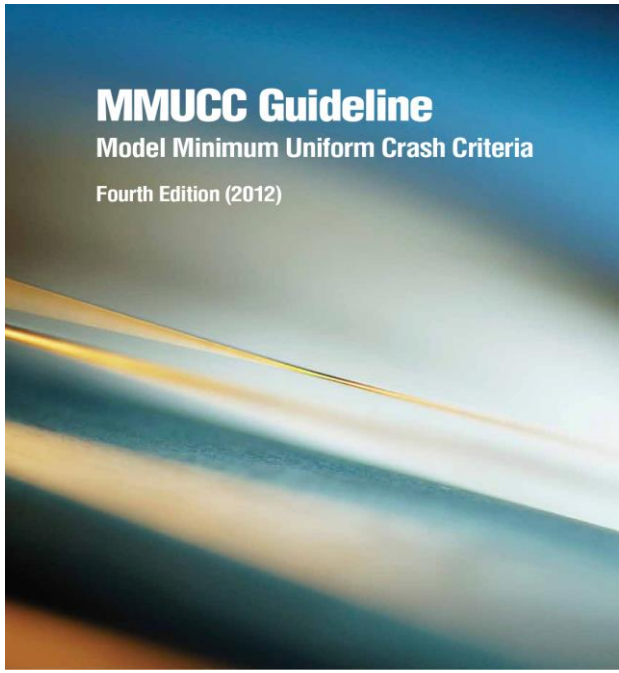
Photo: Anthony Citrano/WikiMeida Commons

Photo: Anonymous/WikiMeida Commons

What is a “work zone crash”?

As defined by the Model Minimum Uniform Crash Criteria (MMUCC) standards, a WZ crash:

- *Is any crash that occurs in or is related to a construction, maintenance, or utility work zone, whether or not workers were actually present at the time of the crash*
- ***Also includes any crash involving motor vehicles slowed or stopped because of a work zone, even if the first harmful event occurred before the first warning sign***



Work Zone Characteristics

Competing Road Space Demands

- Lane and shoulder closures
- Narrow lanes
- Obstacles near live lanes
- Reduced visibility

Complicated Driving Environment

- Driver comprehension / distraction
- Congestion
- Regular traffic mixing with slow-moving work vehicles

More collision risk than under ordinary conditions.

More crashes than usual per vehicle-mile traveled.

More hazards than under ordinary conditions.

Unique WZ Challenges

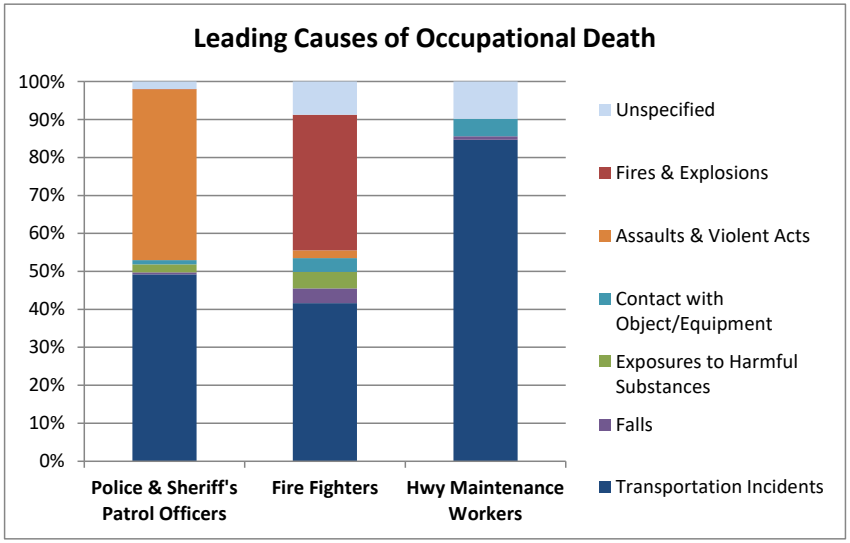
Work Zone Traffic Incident Management (WZ-TIM) differs from TIM on ordinary roadways in several ways:

- **Difficult access** to work zone incidents
- **Limited space:** lane restrictions
- **Traffic congestion:** back-ups / queues
- **Many organizations** to coordinate:
  - First responders (police, fire, EMS, towing)
  - Agency traffic operations center
  - Contractor personnel
  - Agency construction management personnel

First Responder Safety

- Almost as many on-duty police officers killed in traffic crashes as by gunfire
- More firefighters killed by motor vehicles than by fires and explosions
- Tow truck operators and EMS personnel also at high risk of being struck by traffic

Source: Bureau of Labor Statistics



We're In This Together

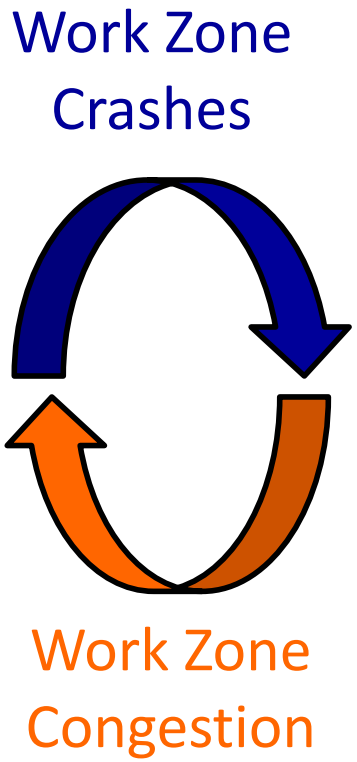
All work zone partners have shared responsibility to prepare for potential work zone crashes by:

1. Arranging the work zone to minimize the chances of a crash
2. Making efforts to ensure that crash severity and crash consequences are minimized
3. Being ready to respond quickly and efficiently if a crash occurs

Incident Prevention:
3 things first responders can do:

- **1. Participate** in Transportation Management Plan (TMP)development and pre-construction incident management planning.
  - **Identify** threats to responder safety.
  - **Develop** a Plan of Action for work zone incident management.

Transportation Management Plan



- TMP- brings together first responders and construction personnel to plan for and mitigate issues in a work zone prior to the work zone implementation.
- Benefits:
  - Improved travel conditions
  - Creating a better safety environment
  - Reducing complaints from the public.

Should contractors be involved in incident management?

Pro

- Typically, the contractor is already on scene
- Some contractor personnel have experience as fire/EMS volunteers
- Contractor assets such as traffic control drums and lifting equipment might be useful for incident response

Con

- Contractor could get in the way of first responders
- Contractor personnel might lack relevant training
- Contractors might not understand Integrated Command
- Many times not a contractual bid item

Pre-Project Agenda

- **Prepare** contact lists (including contractor Point of Contact) for routine updates and emergencies
- **Distribute** anticipated project timeline
- **Agree** to periodic evaluations of work zone effectiveness
- **Conduct** training/tabletop exercises to practice and clarify incident management procedures
- **Tactical Pre-plan** for:
- Pre-staging of TIM equipment
- Ingress and egress access routes to/from incidents inside the work zone
- Pre-planned detour routes

Photo: Iowa DOT

Emergency Management Accommodation Examples

- Emergency parking pullouts (safe space when there is no shoulder)
- Changeable signs (hinged or electronic)
- Traffic control storage caches (traffic cones, drums, signs, etc.)
- Triage areas and landing zones (especially remote/rugged sites)

Incident Prevention:
3 things first responders can do:

- **2. Stay informed** about lane/ramp closures and “back door” ways to access the work zone as the work progresses.

Getting to the Incident Site

Congestion caused by incidents often hampers response and recovery

Potential Solution Examples

- Gates in temporary barriers
- Gated “back-door” access to work sites
- Temporary access from overpasses or side roads
- Emergency response vehicles suitable for off-road driving

Incident Prevention:
3 things first responders can do:

- **3. Notify** highway agency or contractor if you observe a problem.
  - Situations that encourage illegal/risky road user behavior.
  - Missing traffic control devices.
  - Improper work practices.

- **Set a positive example** by complying with work zone traffic laws, on- and off-duty.

CASE EXAMPLE

Case Study: Emergency Response Through Work Zone

- Wisconsin Sheriff's Deputy
- Sheriff’s deputy is responding during hours of darkness, at high speed, to an emergency call
- Enters a low traffic work zone that had been recently been altered
- Deputy's vehicle strikes a gravel pile that was blocking much of both traffic lanes
- Deputy was killed in the crash


ROAD CLOSED
TO
THRU TRAFFIC
SPEED
LIMIT
45
TRUCK
ROUTE
11 13 '03

Lessons Learned

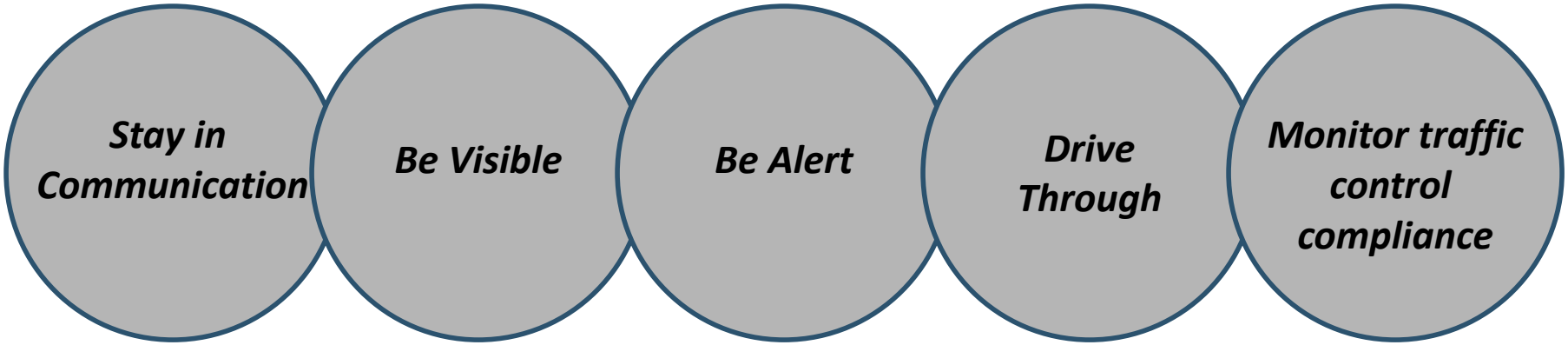
- Lack of coordination/communication between the municipality and the signing contractor
- Signing and lighting of the work zone were not in conformity with the MUTCD requirements
- Signs were not properly secured and were moved by high winds which limited their effectiveness
- Signs at the gravel pile were defective and of inferior quality
- Little coordination/communication with law enforcement regarding work zone dynamics and changing conditions

Traffic Control

- FHWA's *Manual on Uniform Traffic Control Devices* (MUTCD) establishes national standards for traffic control devices, such as signs, lights and traffic cones
- Chapter 6 of the MUTCD includes recommended layouts for work zone traffic control and incident management
- Can be downloaded free of charge at http://mutcd.fhwa.dot.gov
- Printed copies available from online booksellers

The Human Factor

Law Enforcement/ First Responder Strategies



Incident Prevention:
Essential Roles of First Responders

- **Secure** and protect the scene
- **Aid** crash victims
- **Coordinate** the response
- **Protect** the back-of-queue to prevent secondary collisions
- **Manage** traffic and re-route if necessary
- **Ask** for contractor equipment and manpower if it will help expedite response and recovery

Secondary Crashes/ The Queue

- “Secondary crash” is a second (or subsequent) crash that occurs at the incident scene or in a traffic queue resulting from the original incident.
- About **18%** of freeway fatalities are the result of secondary crashes.
- Most common scenario: traffic is backed up and a fast-moving vehicle strikes a slowed or stopped vehicle at the back of the queue.
- Less likely to occur if warning is provided at least ¼ mile in advance of the slowed traffic or incident is removed from the roadway/shoulder.

Secondary Crashes

Back-of-Queue Protection Methods

Roll-Up Fabric Signs

- Pro: Easy to set up and remove
- Con: Small, may need to reposition as queue changes

Electronic Signs

- Pro: DMS/VSLs. Easily updated advanced warning
- Con: Queues move, signs don't. Expensive. Not crash-tested.

Law Enforcement Vehicle

- Pro: Can move as queue grows/shrinks
- Con: Officer not available for other duties

Contractor-Supplied Vehicle

- Pro: Can move as queue grows/shrinks
- Con: Requires special contractual provisions, response time possibly slower than law enforcement

Measuring Success

Three generally accepted performance measures for gauging TIM effectiveness:

- **Roadway Clearance Time** – Interval between first awareness of an incident by a responding agency (detection, notification, or verification) and first confirmation that all lanes are available for traffic flow
- **Incident Clearance Time** – Interval between first awareness of an incident and time the last responder leaves the scene
- **Secondary Incidents** – Number of additional unplanned incidents that occur at the scene (or in the traffic queue approaching the scene) after the original incident is reported

FOR YOU TO DISCUSS