



CLM 2015 Transportation Conference  
June 18-19, 2015 in Omaha, NE

## **Work Zone Safety, Operation and Incident Investigation**

### **Introduction**

With consumers and producers moving more goods and services domestically and internationally and with more and more traffic traversing the already tired highway system, more and more roads, highways and bridges are under construction. With the increase in highway and roadway construction, there is an increase in injuries and fatalities. It is paramount to understand the problems and pitfalls with work zone safety from an expert, adjustor, and attorney's perspective.

### **Work Zone Crash Problem**

There were 87,606 crashes in work zones in 2010. This represents 1.6 percent of the total number of roadway crashes (5,419,345) that occurred that year. Most crashes that occur in work zones do not involve a fatality. In 2010, 0.6 percent were fatal crashes, 30 percent were injury crashes, and 69 percent were property damage only crashes. Most of the fatalities in work zone crashes (85 percent) are either drivers of or passengers in cars.

Large trucks are involved in 30 percent of work zone crashes. Further, large trucks are overrepresented in fatal work zone crashes. For example, in 2012, the percentage of all fatal crashes that involved at least one large truck was 11.2 percent. However, for that same year, the percentage of work zone fatal crashes that involved at least one truck was 23.6 percent—roughly double!

The majority (65 percent), of fatal work zone crashes involving large trucks occur during the day. These fatal work zone crashes involving heavy trucks mostly take place on divided roadways (60 percent), on level roadways (70 percent), and on straight roadways (90 percent).

Examining critical reasons for crash occurrences shows that the predominant reasons trucks are involved in crashes are attributed to driver decisions, such as speed or aggressive driving (42 percent) and recognition problems, such as driver inattention (35 percent). When compared to the critical reasons for crash occurrences in automobile drivers, the results show that truck drivers have a significantly higher representation of these reasons. Further information collected by the

Large Truck Crash Causation Study listed the top ten “causative” factors for truck crashes as: overweight, making illegal maneuver, inadequate surveillance, travelling too fast for conditions, inattention, following too close, misjudgment of gap or other’s speed, stop required before crash, external distraction, and brake problems.

The reality for roadway construction workers is that every 14 minutes, a worker is injured and every 10 hours, a worker is killed in this country. While overall fatalities in work zones have been decreasing over the past decade, worker fatalities in roadway construction have been increasing. Overall, transportation accidents make up 70 percent of the events resulting in worker fatalities in the highway, street, and bridge construction areas.

## **Work Zones**

What is a work zone? The Manual on Uniform Traffic Control Devices (MUTCD) defines a work zone as “an area of a highway with construction, maintenance or utility work activities. A work zone is typically marked by signs, channelizing devices, barriers, pavement markings, and/or work vehicles. It extends from the first warning sign or high-intensity rotating, flashing, oscillating, or strobe lights on a vehicle to the END ROAD WORK sign or the last TTC [temporary traffic control] device.”

### ***Work Zone Elements***

As can be seen from the definition, a work zone extends beyond the “activity area” where workers are present. A typical roadway work zone can be broken down into four areas: advance warning area, transition area, activity area, and termination area. The advance warning area is the section of highway where road users are informed about the upcoming work zone or incident area and tells traffic what to expect ahead. The typical crash types that occur in the advance warning area are rear-end and fixed-object crashes. The transition area is the section of highway where road users are redirected out of their normal path. The transition usually involves the strategic use of tapers and the predominant crash types that occur in the transition area are rear-end, fixed-object, and angle. The activity area is the section of highway where the work takes place and is comprised of work space, traffic space, and buffer space. The work space is closed to road users and is set aside specifically for workers, construction equipment, material, and for mobile operations and shadow vehicles. The traffic space is where road users are routed through the activity area. The buffer space is the lateral and/or longitudinal area that separates the traffic space from the work space and may include recovery space for an errant vehicle. Typical crash types that occur in the activity area are rear-end, fixed-object, angle, and head-on. Finally, the termination area is the section of highway where road users are returned to their normal driving path. Typical crash types that occur in the termination area are rear-end and fixed-object crashes.

### ***Work Zone Standards***

The Manual on Uniform Traffic Control Devices (MUTCD) is a document that is issued by the Federal Highway Administration (FHWA) of the United States Department of Transportation. All traffic control devices used on street and highway construction, maintenance, utility, or incident management operations must conform with the applicable standards found in the MUTCD. Each state highway agency may elect to develop their own sets of standards, up to a state-specific MUTCD, but these must substantially conform with the national MUTCD.

The current edition of the MUTCD is the 2009 version, which has been subject to two substantive revisions since its release. The MUTCD is incorporated by reference in 20 Code of Federal Regulations, Part 655, Subpart F and shall be recognized as the national standard for all traffic control devices installed on any street, highway, bikeway, or private road open to public travel. A new version of the MUTCD is scheduled for release in 2016. Part 6 of the MUTCD deals specifically with Temporary Traffic Control (TTC) associated with work zones.

### ***Shall, Should and May***

The use of the words shall, should, and may within the MUTCD carries specific meaning. When denoting a standard, which is a required, mandatory, or specifically prohibitive practice regarding a traffic control device, the manual uses the verb “shall.” When denoting guidance, which is a statement of recommendation, but not mandatory practice in typical situations, the manual uses the verb “should.” Deviations from guidance are allowed if engineering judgment or engineering study indicate the deviation to be appropriate. When denoting an option, which is a statement of practice that is a permissive condition and carries no requirement or recommendation, the manual uses the verb “may.” Options typically outline allowable modifications to a standard or guidance statement.

The 2016 version of the MUTCD will change this structure to must, shall, should, and may. “Must” will then be used to denote a standard, “shall” to denote guidance that can be deviated from with engineering study, “should” to denote guidance that can be deviated from through engineering judgment, and “may” to denote an option.

### ***Contradictory Language***

There are instances within the MUTCD. For example, in Section 6G.06, guidance is provided that, “If the equipment travels on the roadway, the equipment should be equipped with appropriate flags, high-intensity rotating, flashing, oscillating, or strobe lights, and/or a SLOW MOVING VEHICLE (W21-4) sign.” As discussed above, this is guidance and could be deviated from with appropriate engineering judgment to perhaps run dump trucks on the roadway using hazard (four-way) flashers instead. However, in the notes for Figure 6H-1, which is a typical application figure for work beyond the shoulder, there is a standard that states, “Vehicle hazard warning signals shall not be used instead of the vehicle’s high-intensity rotating, flashing,

oscillating, or strobe lights.” This more restrictive statement forbids the use of the hazard flashers. Thus, the subject dump truck must either use its strobe light, its strobe light and hazard flashers, or no warning lights to satisfy the more restrictive standard.

### ***Negligence Per Se***

Is a violation of the MUTCD negligence per se? Unfortunately, the answer is that it depends. In a recent state Supreme Court decision, the high court ruled that indeed it was. The high court pointed out that the state Legislature had adopted the state Manual on Uniform Traffic Control Devices by promulgating state revised code, which required the state Department of Transportation to adopt “a manual for a uniform system of traffic control devices.” The state revised code further establishes a duty to act in conformity with the state MUTCD’s specification so that the state MUTCD comprises a section of state law regarding traffic control devices. Thus, a violation of the state MUTCD can therefore provide the basis for a finding of negligence per se.

### ***Personal Protective Equipment***

As of December 31, 2011, the MUTCD requirements outlined in Section 6D.03 Worker Safety Considerations must be adopted for all publically traveled rights-of-way. This new rule states that, “All workers, including emergency responders, within the right-of-way who are exposed either to traffic (vehicles that use the highway for purposes of travel) or to work vehicles and construction equipment within the TTC zone shall wear high-visibility safety apparel that meets the Performance Class 2 or 3 requirements of the ANSI/ISEA 107-2004 publication...” The selection of the appropriate class of garment shall be made by “a person designated by the employer to be responsible for worker safety.”

### ***Private Property Impacts***

The MUTCD requirements also apply to roadways that are “open to public travel.” The impact of this terminology was clarified by the FHWA by revising the language in 23 CFR 655.603(a) to define “open to public travel” to include toll roads and roads within shopping centers, parking lots, airports, sports arenas, and other similar businesses and recreation facilities that are privately owned, but where the public is allowed to travel without access restrictions. Military bases and other gated properties where access is restricted and private railroad grade crossings are not included in the term ‘open to public travel.’”

### **Work Zone Crash Investigation**

When investigating a crash or incident that has occurred in a work zone, it is critical to be able to place the events within the environment in which they occurred. Thus, detailed knowledge of how the work zone should have been set up and maintained; maintenance of traffic (MOT) plans;

industry standard of care for TTC; agency, contractor, and subcontractor roles and responsibilities; driver training and standards; personal protective equipment (PPE) requirements; and safety plans and practices are all typical areas of investigation.

### ***When the Incident Happens***

When an incident happens, it is important to establish a chain of command. Who reported the incident? Who will the company contact be? Is it the safety director? Do you have a hotline? Below is a potential workflow for dealing with a catastrophic event.

### ***Determine Severity***

Most of our discussion is going to be on the catastrophic event, but we have very favorable results contacting claimants and getting the claim process going immediately, which helps in preventing your cases ending up at your defense counsel.

### ***Consulting Counsel***

Determine if it is the appropriate time to bring in your attorney. Waiting may save money initially, only to cost much more on the backside. Make the call.

### ***Hire an Adjuster***

The decision to hire should be made as soon as possible. The majority of our transportation cases and clients are truck liability accidents. Delay in assigning an adjuster may jeopardize valuable information gained at the scene, including discussion with claimant, witnesses, police, and your involved vehicles. It is important when hiring an adjuster that they have transportation experience.

### ***Scene, Photos, Measurements***

With work zone accidents, it is very important to document and inquire with witnesses, construction personnel, or state officials as to what signage or changes were done to the road. If a lane is merged to one, is that during the whole construction period or does the lane open up or change during certain hours. Establish the point of impact. Usually, when vehicles collide, it causes the frame to dive into the roadway from the vehicle contact. Establish that one point of impact and work from there.

### ***Engage the Expert / Preserve the Evidence***

Much of the evidence associated with a work zone crash is extremely volatile. By definition, the traffic control in place is “temporary.” However, that TTC may hold the key to a potential causality of the crash. The captured detailed information about the layout of the TTC, marks that may appear in the roadway surface, pedestrian evidence, and temporary signal data often need to

be accomplished within days or it is lost. The volatility of onboard vehicle data, the condition of vehicle subsystems, and vehicle damage is more variable.

### ***Technology Can Be Your Friend***

New 3D laser scanning technology allows an investigator to capture and document large-scale environments from a safe distance. The 3D scanner can preserve the scene by projecting infrared laser light that is reflected back to the scanner from the subject point, allowing it to be located in 3D space. The entire head of the scanner then rotates, sweeping the laser across the desired area. Objects in the path of the laser will reflect energy back to the scanner and the scanner will place each point in 3D space. Millions of these data points are assembled together to create the representation of the scanned scene in a database called a “point cloud.” The phase shift technology of the scanner means that each of the data points are captured within plus or minus 2 millimeters of accuracy.

Once the scene data has been captured, it can be brought back to the office and examined from various vantage points, allowing detailed measurements to be taken, different lines of sight to be examined, and even animations of the event to be extremely accurately depicted. The point cloud itself is a highly effective visual tool for use in the courtroom. Because the point cloud is essentially data points, it may be permitted to be viewed by the jury in the jury room.

### **Real Life Occurrences**

#### ***Rapid Response***

Why is a Rapid Response mentality to work zone injuries and fatalities vital in the current legal climate? Retaining the right expert, qualified in the field, is paramount to a proper and thorough investigation. This requires a thorough understanding of Rule 702, Testimony by Expert Witness, and Rule 703, Bases of an Expert’s Opinion Testimony, of the Federal Rules of Evidence. It is critical that you avoid a potential Daubert Motion coming out of the starting block. When considering which experts you may need to evaluate an incident, an accident reconstruction and Bio-mechanical/Bio-medical expert may just be the surface of what might be necessary to perform an adequate investigation. It is important to remember that your expert assists not only in understanding the liability associated with the incident, but also assists in the risk transfer assessment paramount in work zone safety incidents.

Why is the inclusion of an attorney so important in a Rapid Response scheme? An attorney is best qualified to establish and maintain Work Product Doctrine. The creation of the client relationship early in the process can help over the course of the process and establishes early the attorney client privilege. This is critical to protect the investigation and the client and further helps when identifying strategies to mitigate damages and in preservation of evidence. An attorney is best

qualified to both understand and avoid the potential pitfalls associated with spoliation of evidence. Finally, an attorney understands how the players, both government and private, interact (e.g., law enforcement, DOT, EPA, OSHA, insurance carriers, private adjustors).

Coordination of efforts and professional collaboration between the Adjuster, the Engineering Expert and the Attorney is paramount in reaching resolution to work zone accident claims.