

**Stakeholder Meeting on  
Preventing Backover Injuries and Fatalities  
Arlington, Texas  
February 5, 2013**

**Meeting Summary Report—Afternoon Session  
March 14, 2013**

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# 1 Background

This report summarizes key points made during an informal stakeholder meeting that the Occupational Safety and Health Administration (OSHA) held to gather information on best practices for preventing workplace-related backover injuries and fatalities. The meeting was held from 2:00 p.m. to 4:00 p.m. Central Standard Time on February 5, 2013, at the University of Texas at Arlington. It was convened to help OSHA learn more about backover hazards; the types of vehicles that pose significant hazards; and the potential role that training, technology, and other controls can play to reduce backover hazards. The goal was to elicit viewpoints from employers, workers, and health and safety professionals about backover hazards and obtain insight on how best to control them. The stakeholder meeting was part of OSHA's larger effort to gather information about backover risks across different industries and potential solutions for reducing backover injuries and fatalities.

On March 29, 2012, OSHA published a Request for Information (RFI) on backover hazards in the *Federal Register* (77 FR 18973). The RFI was published jointly with a RFI on hazards in reinforced concrete in construction. OSHA received comments from 32 individuals and organizations, now available at [www.regulations.gov](http://www.regulations.gov) under docket OSHA-2010-0059.

New technologies have been developed to address backover hazards, including cameras, proximity detecting equipment, and new types of alarms that more precisely direct audible signals to danger zones or combine sound with light to better attract attention. In addition, internal traffic plans that control traffic flow and limit backing can help prevent backovers. OSHA is considering whether new technologies, traffic plans, or other approaches, such as training for drivers and spotters, will help reduce backover hazards.

OSHA announced the stakeholder meeting in the *Federal Register* on December 17, 2012, with an explanation that interested parties should register in advance. Five stakeholders participated in this meeting, and they were all given the opportunity to provide verbal comments. Members of the general public were allowed to observe (but only participate if time allowed) on a first-come, first-served basis as space permitted. Thirteen people attended the meeting as observers. Eastern Research Group, Inc. (ERG) provided logistical support for the stakeholder meeting, and a technical writer from ERG attended the meeting and prepared this summary report. This report captures the main discussion points that stakeholders raised during the meeting but is not a verbatim transcript. Its content reflects stakeholders' remarks, not the opinions of ERG or OSHA.

## 2 Opening Remarks

Lisa London, the Director of OSHA's Education Center at the University of Texas at Arlington, welcomed attendees to the meeting, saying that the university was pleased to host the event. Paul Bolon, the Director of OSHA's Office of Construction Standards and Guidance (within the Directorate of Construction), also welcomed participants and thanked them for their willingness to speak with OSHA. Mr. Bolon introduced the other two OSHA representatives in attendance: Meghan Smith (the primary staff member performing research on backover incidents) and Charles McCormick (an economist with the Office of Regulatory Analysis). Mr. Bolon said that this would be an informal meeting, designed to foster constructive dialogue and help OSHA

collect the best available information on existing best practices and solutions for preventing backover injuries and fatalities. He then described OSHA's efforts to date in gathering information about backover hazards.

As noted earlier, OSHA published an RFI last March on backover hazards and received 32 comments from employers, equipment manufacturers, trade associations, and unions. Since then, OSHA has met with experts from universities and the National Institute of Occupational Safety and Health; conducted site visits; and collected information about risks, available technologies, and measures that employers are taking to address backover hazards. Additionally, OSHA convened a series of stakeholder meetings (including this one) to collect additional data. OSHA also developed a ["Preventing Backovers" Web page](#) that presents information on risks, technologies, spotters, and resources.

Mr. Bolon cited some data to underscore the importance of addressing backover hazards. According to OSHA's Integrated Management Information System, about 360 backover-related fatalities occurred in the workplace over a six-year period. Data from the Bureau of Labor Statistics, which recently began collecting such data, indicate that 79 backover fatalities occurred in 2011 alone. Backover incidents tend to cluster in trucking terminals, dump trucks involved in road work, and sanitation, but also occur in many other industries that use large vehicles having an obstructed view to the rear.

Some states – Washington and Virginia – already have regulations that address backover hazards. Washington requires dump trucks to have operational mechanical devices that provide drivers a full view behind their trucks, or to use a spotter. Virginia's regulation, which covers all types of vehicles with obstructed views to the rear, requires a backup alarm plus at least one of the following: 1) a camera, 2) a spotter, or 3) that drivers get out of their vehicles to visually inspect the area around the vehicle before reversing. Additionally, the National Highway Traffic Safety Administration has published a proposed rule that would require rear-view cameras on all new vehicles under 10,000 pounds. OSHA, which has not yet decided whether rulemaking is appropriate to address backover hazards, is engaging affected stakeholders (both through stakeholder meetings and site visits) to help inform its decision about the need for rulemaking.

Mr. Bolon encouraged participants to speak freely and provide their opinions during this stakeholder meeting, noting that the meeting summary (posted on [OSHA's "Preventing Backovers" Web page](#)) would capture the viewpoints offered but would not attribute them to specific individuals. He also encouraged participants to contact OSHA after the meeting if they have additional information or data that they would like to share.

### **3 Introductions and Ground Rules**

Meeting facilitator Barbara Upston (of Management Consulting Associates) provided an overview of the meeting agenda, identifying four topics that OSHA wanted stakeholders to address:

- What are the backup hazards in your industry? What types of vehicles?
- What measures are effective in reducing or eliminating backover hazards?
- Are cameras or other technologies used?
- Do you train drivers, spotters, and pedestrians? How?

Ms. Upston asked attendees to refrain from delivering long presentations, but noted that OSHA would accept such presentations (or any other useful data) after the meeting. She then asked the stakeholders to introduce themselves, identify their affiliations, and briefly explain why backover injuries are important to them. After doing so, participants launched into an open, roundtable discussion.

### **4 Points of Discussion**

The following is a summary of the key comments that stakeholders provided during the meeting, grouped by topic, without reference to the identity of the speaker.

#### ***4.1 What Are the Backup Hazards in Your Industry? What Types of Vehicles?***

One stakeholder, representing a company that developed a proximity detection device, said that he had experience in the mining industry (using trucks, backhoes, and bulldozers) and in warehouse environments (using forklifts and golf carts).

Another stakeholder, an insurance provider for the moving and storage industry, said that backing accidents are fairly common and create significant property damage. Accidents involving human casualties are rare, however. About 80 percent of the trucks his company covers are straight trucks weighing less than 26,000 pounds. The company also covers pickup trucks and tractor trailer units.

A third stakeholder, from the security industry, noted that about 80 percent of his company's fleet consists of armored vehicles, which often must back into enclosed dark spaces (e.g., vaults). The fleet also includes pile jacks, industrial lifts, and a range of other types of trucks (including tractor trailers). The stakeholder said that backover injuries are infrequent but credited his company's robust safety program for the low statistic rather than an absence of risk.

A fourth stakeholder, representing the oil and gas industry, reported having a mix of company drivers and contract drivers. While company drivers typically drive pickup trucks and sports utility vehicles, contractors drive a broader range of vehicles, including water trucks, flatbeds, cement trucks, forklifts, and backhoes.

The fifth stakeholder, from the garbage collection industry, said that his company operates throughout the United States and Canada, frequently driving in very tight spaces (e.g., alleys)

and in densely populated areas (e.g., New York City and Washington, D.C.). His company has trucks that perform street-side garbage collection, as well as some that transport materials to landfills and transfer stations. About 80 percent of the fleet consists of straight trucks (weighing between 34,000 to 39,000 pounds), 10 percent are transport trailers, and 10 percent are construction trucks (e.g., compactors, bulldozers, haulers). This stakeholder said that backovers are an ever-present concern in his industry.

#### ***4.2 What Measures Are Effective in Reducing or Eliminating Backover Hazards?***

##### **Integrated Approaches**

Meeting participants agreed that there is no single solution that will prevent backover hazards, noting that the best strategy is one that integrates several different approaches.

One stakeholder said that his company supports a strong safety culture and has paid significant attention to backing safety. For starters, the company uses two-man crews, one serving as a driver and the other as a spotter (or a “jumper”). Before backing the vehicle, the spotter must get out of the vehicle and assist the driver using military-style backing signals. Any drivers caught backing a vehicle without a spotter receives a warning (for a first offense) or termination (for a second offense). Also, the company uses the Smith System<sup>®</sup> to ensure that its drivers are well trained and possess a strong understanding of backover hazards and controls. In addition, the company equips its newer trucks with backup cameras, backup alarms, and high-powered spotlights, all three of which automatically activate when a vehicle begins to back up. Some of the company’s vehicles also have proximity detection systems that provide both visual cues (red lights) and audio messages to alert drivers when they are getting close to an obstacle. For example, the system, which has four sensors, speaks to drivers, alerting them that an obstacle is gradually getting closer and then says “stop, stop, stop” when the obstacle is within one foot of the vehicle. In combination, these efforts have helped reduce backing accidents. Although backover injuries rarely occur, a company driver struck a business partner (resulting in a leg amputation) a couple years ago when the driver ignored company rules and failed to stop his vehicle upon losing sight of his spotter.

Another stakeholder noted that his company observed a reduction in backing accidents in 2012 for the first time in seven years. He credited this outcome to the company’s commitment to a safety culture, in-house training, and use of spotters and technological equipment (e.g., DriveCam<sup>®</sup>, microphone-equipped backup cameras, audible alarms).

A third stakeholder, representing the garbage collection industry, also spoke of the importance of using a variety of methods to address backing hazards. The company uses the Smith System<sup>®</sup> and other training products to teach drivers about backing hazards and controls. Additionally, the company implemented a variety of technological solutions (e.g., cameras, proximity alarms, audible backup alarms), and tells drivers that they may, in some instances, need to get out of their trucks to visually inspect areas around the vehicle. Regarding spotters, the garbage collection industry is undergoing a transition. For years, garbage collection involved a crew, with workers riding on the back of trucks and hopping on and off to dump garbage barrels. Given the safety hazards associated with this type of work, however, garbage collection companies are now trying to use vehicles that pick up and dump garbage barrels with a mechanical arm. One

negative outcome associated with this transition is that drivers are losing their spotters, as the crew members riding on the backs of trucks often served in this capacity.

## **Enforcing Best Practices**

Some companies implement severe consequences (e.g., termination) if a driver does not adhere to recommended backing best practices. One stakeholder noted that this approach works when company drivers are on staff. However, many companies hire contractors to haul their goods or operate machinery. In such cases, it is more difficult for the company to enforce recommended best practices. Additionally, companies relying on contract drivers are often reluctant to hold drivers accountable for accidents because there is currently a driver shortage. In fact, companies may never report some accidents to insurance companies.

### ***4.3 Are Cameras or Other Technologies Used?***

#### **Technologies of Interest**

##### *Backup Cameras Equipped with Microphones*

One stakeholder said that the backup cameras his company uses come equipped with microphones, which allows spotters to communicate effectively with drivers without needing to shout. He said that the microphone has made an amazing difference. The microphone is activated when a vehicle is backing but shuts off automatically when the vehicle is in neutral or drive, thereby preventing ambient noise from becoming a distraction.

##### *Deadman's Handle*

One stakeholder said that his company would like to have a deadman's handle, a device that plugs into the back of a truck. Spotters could hold the handle and release it to automatically trigger the truck's braking system. Another stakeholder said that the mining industry, characterized by dark, harsh environments, applied a similar concept.

##### *DriveCam<sup>®</sup> and Vehicle Data Recorders*

Three stakeholders spoke highly of DriveCam<sup>®</sup>, a technology that captures potentially dangerous driving situations and accidents on videotape for use in coaching drivers on how to avoid such events in the future. With this technology, video cameras are placed on the windshield and train the cameras on the driver. Although the cameras are on constantly, events are only recorded and uploaded if the vehicle exceeds a specific speed, makes a hard stop, or the driver chooses to manually activate the recording system to capture an event. In such cases, the camera captures video for 15 seconds before the event and 15 seconds after the event. The video is then immediately uploaded and sent to DriveCam<sup>®</sup>'s Data Center, which helps trucking companies determine if their drivers require follow-up coaching to avoid dangerous situations in the future. Note, however, that recorded footage is rarely captured when vehicles are backing because the current triggers (high speed, sharp stops) typically involve forward-moving vehicles. Nevertheless, if a backing vehicle struck an obstacle, the cameras likely would record the event, allowing companies to view and learn from it. Post-event coaching is critical, and thus far is proving to have a dramatic impact on driver behavior. One stakeholder said that an insurance

company recently concluded that supervisor feedback (positive or negative) is the most effective way to change an employee's behavior. DriveCam<sup>®</sup> gives supervisors the ability to provide such feedback.

Stakeholders admitted that their drivers were initially resistant to the idea of DriveCam<sup>®</sup> because the thought of a video camera trained on them at all times was unnerving. However, over time, drivers have learned to appreciate the benefits that DriveCam<sup>®</sup> can offer. One stakeholder said that union members were initially upset when his company decided to evaluate DriveCam<sup>®</sup> on 50 trucks. Shortly thereafter, however, one truck driver was falsely accused of being at fault for an accident that involved a drunk driver running a red light. The judge dismissed the case, however, after viewing the video tape of the accident (provided by DriveCam<sup>®</sup>). The elated driver shared the outcome with his coworkers, which made them realize that DriveCam<sup>®</sup> has the potential to protect them. The pilot program was a big success; it reduced accidents by 70 percent during the six-month period that DriveCam<sup>®</sup> was in place.

Another stakeholder said that one of his drivers, who initially resisted DriveCam<sup>®</sup>, recently told him he never wants the system removed from his truck. A third stakeholder said that his drivers (especially the older, more seasoned ones) were initially skeptical about using DriveCam<sup>®</sup> but subsequently accepted it after realizing that DriveCam<sup>®</sup> often vindicates drivers, showing that accidents are not their fault. He noted that there is a tendency to immediately blame the trucker when an accident occurs; DriveCam<sup>®</sup> is helping to change that perception. A stakeholder representing an insurance company noted that DriveCam<sup>®</sup> is a game changer because having access to footage removes much of the haggling that previously occurred during claims processing.

Nevertheless, although drivers are becoming more accepting of DriveCam<sup>®</sup>, some drivers remain resistant to it, and would prefer to deactivate the system. One stakeholder said that the camera company is staying one step ahead, noting that it programmed its cameras to capture and upload any event immediately preceding a power loss.

One stakeholder said that his company uses vehicle data recorders, which also provide useful information to help companies determine if action is necessary to improve driver behavior. The system is set up to provide constant feedback to drivers in their cabs—i.e., an alarm sounds when they break a rule (e.g., speeding). The system also allows companies to track other behaviors, such as how long drivers allow trucks to idle and the location of the trucks when they are idling. Collecting this information helps companies change behavior that causes adverse environmental or financial impacts as well. This point prompted another stakeholder to note that his company observed a five percent reduction in fuel when it started using DriveCam<sup>®</sup>.

## **Challenges Associated with Technology and Other Points to Consider**

### *Maintenance Issues*

An OSHA representative asked attendees to comment on maintenance issues associated with cameras. One stakeholder shared a lesson that his company learned: to better protect backup cameras, install them on the body of a vehicle rather than the bumper. After making this shift, the company had few maintenance issues with backup cameras. In contrast, another stakeholder said that maintenance issues have posed difficulties because his drivers must often work in oil fields,

where vehicles kick up lots of dust and mud. These conditions easily foul camera lenses (despite protective measures), and drivers quickly grow weary of exiting their trucks to clean them manually. A third stakeholder said that maintenance issues have become less burdensome now that wireless cameras are available.

### *Retrofit Versus Upfront Installation*

One stakeholder said that retrofitting existing vehicles with cameras and other technologies can be difficult and costly, noting that it is far more preferable to ask truck outfitters to integrate such features in vehicle design specifications upfront. Another stakeholder agreed, indicating that his company now asks its truck manufacturers to include wireless cameras in design specifications. A third stakeholder also agreed, noting that it would be beneficial to foster more dialogue and cooperation between users and manufacturers because manufacturers should include safety features in the design specifications, rather than apply them as an after-market consideration.

### *Costs and Potential Impacts of Regulatory Actions*

One stakeholder said that the cost of cameras has decreased significantly over time. However, maintenance costs may be increasing as initial upfront costs decrease.

An OSHA representative asked whether companies pay lower insurance premiums if they use technologies that improve backing safety. One stakeholder said they do, noting that some insurance companies even purchase the equipment and sell it to customers at reduced prices. This stakeholder, who described himself as pro-camera, warned OSHA that many trucking companies are small mom-and-pop entities struggling to stay afloat in a challenging economy. If OSHA were to impose a regulatory requirement for cameras, the financial implications could be severe for such companies. While camera costs have decreased, the costs are still significant for a small company. If OSHA decides to issue a rule, the stakeholder continued, industry would likely be more amenable to one that provides options (like Virginia's regulation).

Another stakeholder said that he thinks all trucks should have, at a minimum, audible backing alarms. He said these alarms are cheap, costing about \$15 or \$20. An OSHA representative noted that some concern has been expressed that pedestrians become desensitized to audible alarms, and that the alarms become part of the background noise in some industries. In response, one stakeholder said that his company changed the intonation of its backup alarm three times to avoid desensitization.

### *Automated Versus Manual Systems*

One stakeholder said that automated technologies (e.g., cameras that automatically turn on when a truck begins backing) are preferable than those that require manual activation, such as flipping a switch. Anytime you ask a driver to manually activate a system, the technology is more likely to fail.

### *Multiple Monitors – the Potential for Information Overload*

One stakeholder representing the garbage collection industry said that the biggest challenge his drivers face is effectively processing information coming from multiple monitors. He noted that

garbage trucks, especially those operating in densely populated urban areas, may have to back into very tight spaces, such as alleys. Thus, drivers worry about hitting obstacles on the sides of the vehicles, as well as behind the vehicles. As a result, some of the trucks have backup view monitors, alley-view monitors, and other devices that offer visual assistance.

### *Overreliance and Complacency*

One stakeholder emphasized the importance of reminding drivers they are ultimately the “captains of their ships,” and that they must not become too reliant on the technological tools at their disposal. Drivers should be encouraged to resist complacency and remain acutely aware of their surroundings at all times. Another stakeholder said that his company constantly reminds drivers to “keep their heads on a swivel,” rather than relying only on their backup cameras.

## **4.4 Do You Train Drivers, Spotters, and Pedestrians? How?**

### **Smith System®**

Three stakeholders indicated that they have used driver training products developed by Smith System®, a driver training company headquartered in Arlington, Texas. One of them said that Smith System® offers a train-the-trainer class, noting that representatives from more than 150 of his company’s facilities became certified trainers after taking the class. He also spoke of a hands-on exercise that has proven to be particularly beneficial in terms of helping students understand the extent of a vehicle’s blind spots. During the exercise, he said, some students are in the cab of the vehicle, while others walk around the vehicle. The student in the cab then must honk the horn each time someone comes into view, using only the vehicle’s mirrors as a guide. The exercise clearly demonstrates how restricted visibility is when drivers rely only on mirrors.

### **In-house Training**

In addition to using Smith System® products, one stakeholder said that his company has also developed in-house safety training to address industry-specific hazards. In the oil and gas industry, the stakeholder noted, most of the vehicles that have accidents are contractor-owned vehicles rather than company trucks. Thus, his company realized it was imperative to work with its contractors to ensure that they have adequate safety training. To that end, his company interviewed some of its contractors’ best drivers and asked them to participate in a face-to-face meeting to share their expertise. The session, which the company videotaped, served as the basis for a training program, which the company distributed (along with a train-the-trainer module) to its contract trucking companies. The stakeholder said the training was well received, noting that the contractors appreciated that his company paid for training development. More commonly, any safety requirements that a company imposes on a contractor translates to additional costs for the contractor.

### **Onsite Safety Training**

A stakeholder from the oil and gas industry said that trucking contractors often deliver or pick up supplies at well sites. The first time a driver visits a site, the driver receives an in-depth site safety briefing and must sign a safety checklist.

## **Training for the Public**

One stakeholder advised educating the general public about blind spots associated with large vehicles, and warning them to stay away from vehicles.

## **5 Comments from Observers**

Ms. Upston opened the floor to questions and comments from those attending the meeting as observers. One person noted that he would like OSHA to keep in mind that commenters representing large companies offered the pro-technology viewpoints during the meeting. He said that some of the technological solutions that participants advocated may not work as well in the construction industry, which consists mainly of small contractors.

## **6 Wrap-Up and Next Steps**

Mr. Bolon thanked the stakeholders for attending the meeting and providing their input. He encouraged them to contact OSHA after the meeting if they have additional information they would like to share. Mr. Bolon also thanked those who hosted, planned, and facilitated the meeting.