

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

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

Table of Contents

	Page Number
1 BACKGROUND	1
2 OPENING REMARKS	1
3 INTRODUCTIONS AND GROUND RULES.....	3
4 POINTS OF DISCUSSION	3
5 COMMENTS FROM OBSERVERS.....	10
6 WRAP-UP AND NEXT STEPS.....	11

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 9:00 a.m. to 11:30 a.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 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. Eleven stakeholders participated in this meeting, and they were all given the opportunity to provide verbal comments. Participants included representatives from: manufacturing; fire services; the insurance industry; and the highway construction, hydrocarbon, and longshore sectors. 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. Twenty-one 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 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 the use of 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 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 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 an important issue. 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?

Industries Represented at the Meeting

Representing the highway construction industry, one stakeholder noted that a variety of equipment (e.g., pickup trucks, dump trucks) is needed to build roads and that busy work sites create a potential for backover hazards. He also said that the highway construction industry relies heavily on contract drivers, who have varying levels of safety awareness training. Efforts are made to keep a log of the people working at a highway construction site each day, but the composition changes daily. Contract drivers are instructed to stay on route and follow site safety procedures, but they have some motivation to rush their activities because many independent truckers get paid by the stop.

Another stakeholder indicated that he had experience working in both the construction and hydrocarbon industries. Regarding the latter, he cited water trucks, oil delivery trucks, and construction equipment as frequently used vehicles.

A stakeholder from the scrap and recycling industry said that the combination of constantly moving vehicles (e.g., cranes, various material handlers, large bucket loaders, skid steers), multiple operations, and circulating pedestrians (including customers and contractors), leads to concern about potential backover hazards in his industry.

A representative from the firefighting field noted that backing safety is an important issue in fire services. Not only must firefighters back their vehicles into fire stations, they must also back them down densely populated, narrow streets during emergency situations.

Another stakeholder representing a company in the stevedoring industry said that very large vehicles and equipment are used at shipping terminals, locations typically characterized by fast-paced and complex operations. These combined factors make it extremely important to implement controls to reduce backover hazards.

Manufacturers also attended the stakeholder meeting. One manufactures vehicle safety equipment, including backup cameras and backup alarms. Another represented a company that produces a broad range of material-handling equipment (including cranes, straddle carriers, top picks, and side picks) for customers around the world. A third stakeholder noted that his company, which manufactures large mobile equipment (including forklifts, large lift trucks, and a variety of material handling equipment), has recently developed an innovative approach, which he discussed later, to assist drivers in identifying nearby pedestrians.

Two insurance providers also participated in the meeting. One of them represented a company that insures about 230 companies, most of which are in the longshore business (including ship yards, grain terminals, stevedoring, and boat repair). The other represented a company that provides coverage to about 60,000 large commercial trucks (including 18-wheelers). He said that most backover accidents occur at terminals, parking facilities, and truck stops, and that many of them occur at night. He also noted that many terminals were built in the 1940s, at a time when tractor trailers were significantly shorter than they are now.

Who Is At Risk?

One stakeholder said that pedestrians are not the only victims of backovers. Surprisingly, more often than expected, a driver who is temporarily out of his or her vehicle ends up being the victim. In some cases, a driver may be walking between vehicles (perhaps at a truck stop) and unable to get a clear view of his or her surroundings. With many trailers lacking audible alarms, sufficient cues may not be available to alert a driver that he or she is in danger.

Another stakeholder also described a fatality that involved an operator: the driver of a large cap loader had a fatal accident after switching with another operator. Despite receiving training, the victim broke a cardinal rule upon exiting his vehicle and took a short cut behind the loader.

Another stakeholder said that the highway construction industry often works very close to the public. In fact, efforts to put more separation between work activities and the public are unpopular as they involve taking away driving lanes. Additionally, the highway construction industry often has third parties present at their work sites, such as representatives from the toll road authority or state highway regulatory agency. All of these parties can become backover victims unless appropriate precautions are taken.

Another stakeholder spoke of a recent project, which involved installing a pipeline in downtown Fort Worth, where the public paid no heed whatsoever to ongoing construction work, barely deviating from their regularly established walking routes to skirt the construction area. No technology will fix that issue; the only solution is to set up barricades or to station employees in places where they can redirect the public if they come too close to danger zones.

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

Corporate Safety Culture

Several stakeholders spoke of the importance of fostering a safety culture throughout all levels of an organization, starting at the top with chief executives and extending down to the rank and file. Managers and supervisors are responsible for setting the tone by communicating that they view safety to be a serious and urgent matter. One stakeholder advised providing training to mid-level managers and supervisors to drive home this important point.

Integrated Approaches

Meeting participants agreed that no single solution can be applied to prevent all backover hazards. To the contrary, the best strategy is one that integrates several different approaches.

One stakeholder said that his company uses a systems approach to address backover hazards because it understands that no “one-size-fits-all” solution exists. As a first step, his company tried to improve site lines to reduce blind spots. Additionally, his company examined standards developed around the world to identify useful best practices and implemented traffic flow controls at work sites to reduce hazards.

One stakeholder said that fire departments also implement a broad suite of measures to reduce backover hazards (e.g., spotters, backup cameras, backup alarms, reflective vests, proximity sensors that automatically activate brake systems when vehicles come within 6 feet of an object). Speaking from personal experience, the stakeholder noted that his own fire department basically eliminated backover injuries by adopting a strategy that involved the following three components: 1) incorporating assistive technology, 2) providing extensive (and repeated) safety training, and 3) enforcing procedures and policies. He said that he cannot overemphasize the importance of the third component – enforcement – which is why his department imposes mandatory discipline for any employee caught deviating from department policy.

Another stakeholder noted that solutions that work well for one industry may not work well for another. Technological solutions, like cameras, may be effective in a controlled environment, like a shipping terminal, where management has tight control over site layout, and terrains are typically smooth. The same solutions may not work well in other industries, like construction, where drivers and equipment operators typically work under variable and harsh environmental conditions. If OSHA decides to move forward with rulemaking, it may need to consider developing different standards for separate industries. In response, another stakeholder agreed that there is a disparity among industries but noted that they are all committed to improving backover safety and helping OSHA identify solutions that make sense.

Administrative and Traffic Controls

One stakeholder noted that his company loads and unloads vessels. Given the number of large vehicles present at a terminal, and the speed and complexity of operations, his company’s main goal is to remove as many pedestrians from the terminal as possible. For this reason, his company does not advocate the use of spotters, as it wishes to have fewer (not more) people on

the ground. Additionally, drivers may only get out of their vehicles at designated places because they can become backover victims if allowed to walk unrestricted at the terminal. Strict traffic control plans also are in place to achieve safe traffic flow, and efforts are underway to computerize the terminal so that management will be able to better track (and control) where vehicles move. In some areas, where certain tasks simply require boots on the ground, the terminal has pedestrian-safe zones to keep vehicles away from workers.

Spotters

One stakeholder said that the highway construction industry uses spotters, although he acknowledged that it can be difficult keeping spotters attentive for extended periods.

Another stakeholder, who has worked in both the construction and hydrocarbon industries, advocated the use of spotters and offered the following three recommendations:

- **Ensure that spotters are readily recognizable.** For example, they may need to wear a safety vest that stands out from the type of vest the rest of the crew wears.
- **Ensure that drivers can hear their spotters.**
- **Use two spotters.**
- **Train the spotters.** Spotters must receive adequate instructions to guide drivers and keep themselves out of harm's way. Although some companies assume that any warm body can serve as a spotter, this is simply not true.

In contrast, another stakeholder said that some industries are trying to eliminate the use of spotters and get as many pedestrians off the work site as possible. This stakeholder, who has experience working in busy terminals, reminded meeting attendees that spotters can become backover victims themselves. For this reason, he advised using them as the last line of defense, rather than the first. Agreeing with him, another stakeholder said that it would be a mistake, at least in the longshoring industry, to require a spotter under all circumstances. He asked OSHA to keep this point in mind as it considers rulemaking options.

Get Out and Look (GOAL)

One insurance provider noted that his company advises drivers to “get out and look” (GOAL), if spotters are unavailable, and also gives them GOAL stickers to place on their mirrors as a reminder. However, another stakeholder reminded attendees that drivers, if they are in particularly large vehicles, may need to climb down 13 or more steps to reach the ground. If the driver has to do this multiple times, fatigue becomes an issue and other hazards (slipping, tripping) come into play. Another stakeholder supported this point by noting that 35 percent of the equipment-related accidents that his insurance company reviews involve individuals getting up and down from equipment.

Prohibiting Cell Phone Use

One stakeholder noted that drivers have many distractions in their cabs, including radios, CBs, and cell phones. Two stakeholders said their companies are trying to eliminate cell phone use on the worksite, except for certain supervisors, who may use them for essential, company-approved uses. One of the stakeholders said that managers periodically call drivers and equipment operators on their cell phones while they are working. If drivers answer the call, the company may terminate them.

Approaches Advocated by Other Countries

One stakeholder said that Australian lawmakers are trying to foster dialogue and collaboration between customers and manufacturers to ensure that appropriate backover prevention technologies (as well as other safety features) are built into vehicle and equipment designs upfront. Such dialogue is beneficial, as customers clearly understand what risks must be addressed, and manufacturers know which preventative options work best under different scenarios.

4.3 *Are Cameras or Other Technologies Used?*

Technologies of Interest

Cameras That Offer a 360-Degree View

One stakeholder said that a new camera system that provides a 360-degree view has recently become available in the United States. Noting that European suppliers already are using these cameras, another stakeholder expressed interest in the technology but said that he has concern about potential distortion, especially on larger pieces of equipment.

Vision Plus™ – A Pedestrian Detection Aid

One stakeholder noted that audible alarms and cameras have been available for decades. Nevertheless, despite their availability, backing accidents continue to occur, causing some to wonder if drivers simply tune out existing alarms that sound continuously when they are within 30 to 40 feet of an object. An alternate approach, Vision Plus™, is a new technology that provides fewer alarms but delivers more meaningful information. Vision Plus™ differentiates between the human form and other objects, and only sounds an alarm when humans are within close proximity to a vehicle. With this system, drivers are more likely to pay attention to the alarm because they know that the sound is warning them that a human is nearby, rather than just an inanimate object.

A second stakeholder expressed interest in Vision Plus™, noting that operators currently struggle with workload and sensory overload. Thus, any effort to provide more intelligent signals that stand apart from background noise is intriguing.

Strobe Lights – A Potential Tool for Alerting Pedestrians

One stakeholder described an accident at a terminal in which a vehicle struck two people, resulting in a triple amputation. It was night; the vehicle had its lights on and had an audible alarm, but neither person reported seeing or hearing anything before being struck, raising the question about the efficacy of existing warning cues. To address such issues, efforts are underway to develop a backup system that uses strobe lights. In its most current iteration, four strobe lights are positioned underneath a vehicle. The lights, which do not distract operators, reflect outside the wheel base and can more readily attract a pedestrian's attention.

Pressure Pads

One stakeholder described measures that one state-of-the-art terminal in Portsmouth, Virginia, has taken to control pedestrian movement. At this terminal, drivers delivering goods are directed to a booth and instructed to stand on a pressure mat while their cargo is loaded or unloaded. If the driver moves off the pad, the system automatically stops.

Challenges Associated with Technology and Additional Points to Consider

Shortcomings Associated with Audible Alarms

One stakeholder noted that alarms sound from all directions at busy work sites, making it almost impossible for pedestrians to focus on the alarms that are relevant to their activities. Another stakeholder agreed, saying that audible alarms are nearly useless in such situations. A third stakeholder mentioned that white noise alarms may help address this issue. A fourth stakeholder said that the best way to attract a pedestrian's attention is to hit multiple senses simultaneously, using both audible and visual signals in combination, if possible.

Situations Where Technology Is Not Viable

A stakeholder representing the scrap and recycling industry said that his company experimented with tag devices in the aftermath of a fatal backover incident. However, it soon became apparent that this technology would not work in a scrap and recycling yard because the dust circulating in the air created an excessive amount of false positives. Moreover, the pervasive dust and metal particles that characterize this industry would likely undermine the efficacy of other technologies as well, such as radar sensing equipment and cameras.

Another stakeholder said that he could see the benefits of using backup cameras in terminals and other controlled areas that do not involve rough terrain. In other industries, however, backup cameras are not practical or reliable because they require too much maintenance. For example, in the highway construction industry, where vehicles travel on bumpy terrain and kick up dirt, the cameras get too dirty or simply break because they cannot withstand the vibration and shock associated with off-road activities. Another stakeholder echoed these points, noting that cameras will not work for most of his drivers either, as many of them must drive on 30 miles of bad roads before they get to their work sites.

Cost Issues Associated with Technology

One insurance provider made the following points:

- Many trailers lack audible alarms because they are quite old. (The average age of a trailer is about 20 years, although some types, like refrigerated trailers, have a shorter life span.) Outfitting all trailers with an alarm would likely be a substantial financial nightmare for companies, as so many of their existing trailers do not currently have them.
- Insurance companies often advise trucking companies to buy and install camera systems on their trailers. Many trucking companies, however, do not plan to purchase such equipment (due to its expense) unless it is specifically required.

Overreliance on Technology

Two stakeholders emphasized the importance of reminding drivers that they must always stay true to the basic rules of backing safety rather than becoming overly reliant on technology. While technological features (e.g., backing cameras) are useful, they are not intended to undercut the traditional rules of backing safety, such as stopping your vehicle if you are unable to obtain an eye-to-eye visual with someone moving around your vehicle. Adding to this point, another stakeholder noted that cameras can take a driver's attention away from other important peripheral activities that may require attention.

Retrofit Versus Upfront Installation

One stakeholder said that it is much harder and more expensive to install backover protection devices on existing equipment than it is to design these features into the system upfront.

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

Frequency and Duration of Training

One stakeholder said that employees can never receive too much training, as it lays the groundwork for good habits. He said that his organization delivers morning safety meetings, provides refreshers at lunch (if needed), and follows up with weekly inspections. Additionally, if site conditions change over the course of a day, the company conducts special training sessions.

Another stakeholder representing the highway construction industry said that the company performs safety briefings at least daily. When asked specifically about backover training, he said that 250 employees recently received it, logging a collective total of 1,600 hours.

Retention

Two stakeholders spoke of the importance of ensuring that employees understand and retain the training they receive. They agreed that hands-on demonstrations are the most effective in this regard, and they advised asking employees to recite back what they learned and teach it to their co-workers. One of them also noted the importance of providing training in Spanish if necessary.

Animated Orientation Training

Two stakeholders are collaborating to develop innovative safety training for new employees. The animated training (which will resemble the movie *Avatar*) will look like a video game. They will expand this type of training into other areas if it proves to be effective.

Identifying Blind Spots

An OSHA representative asked meeting attendees what they do to ensure that operators have a firm understanding of the blind spots associated with their equipment. Two stakeholders said they use diagrams to demonstrate this point; a third stakeholder described a more interactive approach, which involves having operators sit in the cab while spotters walk around their vehicles.

Near Miss Training

One stakeholder spoke of the importance of developing training to address near misses, as such events highlighting areas that require additional awareness and attention. For example, if an employee ignores company policy and cuts between trailers, a photo is taken (if possible) and the event is broadcasted (along with a brief toolbox training) to ensure that everyone is made aware of the danger associated with such behavior.

Training for Spotters

One stakeholder offered information about a training class provided to spotters. The class emphasizes that spotters perform a critical task, not a menial one. It also aims to instill a sense of accountability, explaining that if a backing accident occurs, both the driver and the spotter could face discipline. Upon completion, students receive a card certifying that they took the class.

Educating Customers and Third Parties

While companies can ensure that their employees receive training, it is more difficult to ensure that customers, third parties (including contractors), or other parties with access to work sites are fully aware of potential hazards. Toward that end, one stakeholder said that his company gives visiting customers an educational pamphlet that outlines potential hazards.

5 Comments from Observers

Ms. Upston opened the floor to questions and comments from those attending the meeting as observers. One person asked whether the 79 backover fatalities that the Bureau of Labor Statistics reported for 2011 captured just employees, or also non-employee pedestrians. An OSHA representative responded that the 79 fatalities were occupational fatalities, although some of the victims were independent contractors. More comprehensive data covering a broader segment of society (including children) is available on the National Highway Traffic Safety Administration's website.

Another observer advised OSHA to keep in mind that operator acceptance is critical in determining a technology's success, noting that operators have the ability to undermine technologies they do not like.

Putting the backover issue into perspective, another observer noted that his company backed up vehicles about 2 million times the previous day, with no accidents reported. While the frequency of backing accidents (especially those that involve a pedestrian) is low, he acknowledged that it takes the "whole package" (e.g., technology, training, policy) to get such results.

6 Wrap-Up and Next Steps

Mr. Bolon thanked the stakeholders for attending the meeting, as well as those who hosted, planned, and facilitated it. Mr. McCormick also thanked the stakeholders, and he encouraged them to contact OSHA after the meeting if they would like to share additional information with the agency. (OSHA is particularly interested in gathering data on the number of injuries and the amount of property damage associated with backover incidents.) Mr. McCormick also noted that OSHA will need to recruit interested parties to serve on a small business panel if it decides to pursue rulemaking. He asked attendees to notify him if they, or anyone they know, is interested in participating on such a panel.