

Driver Distraction

Accidents caused by distractions while driving are not a new phenomenon, but as more devices are installed in vehicles and used by the driver, the risk of having an accident has greatly increased. This report analyzes accidents caused by driver distractions, with particular emphasis on the use of cellular telephones. Information is provided to address and reduce the risk of driver distraction.

Introduction

What causes driver inattention? A host of things enter a driver's world, some preventable, some not. Sudden noise from another vehicle (e.g., backfiring), another vehicle having a problem (e.g., flat tire), and similar distractions are not preventable. Reading the newspaper, checking the labels on the CD collection, shaving, cell-phone use, and a host of other driver-made distractions can be avoided.

Accidents caused by distractions while driving are not a new phenomenon, but as more devices are installed in vehicles and used by the driver, the risk of having an accident has greatly increased. According to a 2001 study by the University of North Carolina's Highway Safety Research Center (HSRC), an estimated 284,000 distracted drivers are involved in serious crashes. The HSRC's study used data from 1995 through 1999 and included 32,303 vehicles. The study found that drivers were most often distracted by something outside their vehicle (29.4%) followed by adjusting a radio or CD player (11.4%). Other distractions included talking with other occupants (10.9%), adjusting vehicle or climate controls (2.8%), eating or drinking (1.7%), cell phone use (1.5%), and smoking (0.9%).

Today, one device in particular—the cellular telephone (cell phone)—has become a significant highway safety concern. More than 110 million people use cell phones in the United States, a number that will undoubtedly continue to grow. A National Highway Traffic Safety Administration (NHTSA) survey, completed in January 2001, found that 54 percent of motor vehicle drivers in the United States usually have a cell phone in their vehicles or carry cell phones when they drive. Almost 80 percent of these drivers leave their cell phone turned on while driving, and 73 percent report having talked on the phone while driving. Many states and jurisdictions now prohibit drivers from using hand-held phones while driving.

However, cell phones do have proven safety benefits. According to the Cellular Telecommunications & Internet Association (CTIA), cell phone users place over 118,000 emergency calls each day, many from their motor vehicles. Studies have shown that cell phones can help to reduce emergency response times and actually save lives.

In-vehicle information systems, including navigation and cell phone technology, should be as compatible with safe driving as the state-of-the-art allows, through the

application of good engineering and human-factors design practices. Educating drivers about the hazards associated with using these technologies while driving should also be included in any program to reduce the risk of accidents.

A number of studies have concluded that insufficient data exist upon which to estimate the magnitude of safety-related problems associated with the use of in-vehicle devices. Factors contributing to this situation include limitations in crash-reporting systems, as well as a lack of valid techniques for measuring distraction. In an attempt to resolve these problems, in January 2003, a revised list of crash codes that will include a new category for distractions by electronic communications devices will become available to the various states. It is anticipated that the use of the updated crash codes will provide more accurate data as to the extent communications devices are creating a safety problem.

Drivers need to be trained to avoid distractions whenever possible and fleet management needs to lead the way in suppressing distracting behavior by their drivers. This report provides information on what fleet managers (and drivers, in general) can do to reduce the risk of driver distraction, especially regarding cell phone use.

Cell Phones

Does cell phone use while driving increase the risk of a crash? The available evidence is adequate to support the conclusion that the answer is "Yes," at least in isolated cases. The conclusion appears reasonably plausible, particularly in light of the trends in the data, the growing complexity of the technology, and the inherent distraction potential of using such devices in a moving vehicle. What

remains unknown is the relative contribution of cell phone use, per se, and characteristics of the involved drivers (e.g., less capacity to time-share attention between cell phone use and driving tasks, greater propensity for risk taking, fatigue, etc.).

Research of subjective opinions indicates that the vast majority of the public believes that it is not safe to use cell phones when driving. People, in general, are finding it harder and harder to keep up with all of the tasks and activities for which they are responsible. American motorists in particular spend substantial amounts of their working day in automobiles, vans, trucks, and buses—it is not surprising that they will attempt to optimize their time in the vehicle by doing other things.

A number of intelligent transportation system (ITS) initiatives intended to improve highway safety and efficient transportation are, in fact, focusing on increasing the availability of information. These initiatives, however, have heightened concern over possible synergistic effects of the various technologies that might increase driver workload beyond acceptable levels.

What are the options for enhancing the safe use of cell phones by drivers?

Educational materials should be provided to drivers on the hazards of driving while distracted during cell phone use. These materials should inform drivers of the subtle influences of cell phone use while driving (e.g., loss of situational awareness even though lane-keeping is good). They could illustrate driving conditions where cell phone use is particularly ill-advised. If use while driving is allowed at all, cell phone etiquette could be taught that provides guidance on how to politely refuse, postpone, or abruptly halt a conversation when driving conditions

demand it. Drivers should be taught to recognize signs of “attentional impairment” in other drivers as part of defensive driving. The installation and placement of a cell phone and crashworthiness (e.g., as it may interfere with a deploying airbag) also need to be considered.

Many assume that hands-free cell phones are acceptable while driving, but hand-held phones are not. Legislation requiring hands-free designs may inadvertently be promoting greater use of cell phones among drivers who currently limit or altogether avoid cell phone use while driving by implying that hands-free designs are safe, thus increasing exposure to other potential risks that still exist. However, hands-free designs do not mitigate the distraction potential of a cell phone conversation.

While the hands-free approach may, at first, seem like an obvious solution to cell phone-related safety problems, it presumes that crashes caused by cell phone use result primarily from dialing, from having only one hand on the wheel, or from reaching for, holding, or dropping a phone. Although these factors certainly contribute to the crash picture, case studies suggest that conversation itself is the most-prevalent, single behavior associated with cell phone-related crashes.

This is not surprising for several reasons. First, because conversing may take place over minutes, while dialing typically takes place over seconds, the greater exposure occurs while conversing. To put this into perspective, using the CTIA 1995 average cell-phone call duration of 2.15 minutes, at 65 mph, this would translate to about 2.3 miles (3.7 Km) of roadway traversed for the average duration of a conversation. While

having only one hand on the wheel may influence the ability of the driver to turn or respond appropriately to adverse situations created by use of the cell phone, this is not the only factor that would influence the outcome of an evasive maneuver.

Second, a cell phone conversation may hold a driver’s attention (i.e., cognitive capture) over a longer period, transforming what is typically characterized as a closed loop activity (i.e., driving) to an open loop activity (i.e., lost in thought) where the driver is less likely to respond appropriately to outside events. This phenomenon, though not unique to cell phone use, is suggested as a causal factor in some of the case studies reviewed where drivers have drifted off the road or into an adjacent lane.

Third, the emotional (i.e., personal involvement) or critical nature (e.g., a domestic argument, closing a deal, etc.) of conversation can be particularly distracting, and is also highlighted in case studies as a causal factor.

Finally, the driver is not fully in control of the conversation since the party at the other end has no way of knowing the traffic situation and cannot adapt the conversation accordingly. A 1996 Japanese study found that 42 percent of cell-phone-related crashes occurred in responding to calls and indicates that even a ringing phone can elicit inappropriate responses from some drivers (e.g., startle or reaching/searching for a phone at an inopportune time).

Understanding the relative contribution of behaviors associated with cell-phone use to crashes is important in evaluating the potential for successful intervention, but this is not the whole story. The majority of cell phone users do not regularly use the phone

while driving, and many who do claim to find cell phone use as distracting or more distracting than tuning a radio.

According to the National Law Journal, the use of cell phone records as evidence to indicate driver distraction has become an important method of determining fault in disputed automobile accidents. For additional information, see News Report NR-2002-11-04, *15-Passenger Van Instability Leads NLJ's List of Emerging Litigation Trends*.

A company might permit drivers to use the phone only when safely pulled off the road or might instruct driver's to forward their calls to voice mail while driving, to avoid being distracted by an incoming call. Whatever decisions a company makes need to be clearly defined in a written safety policy.

In-Vehicle Information Systems (IVIS)

The installation and use of in-vehicle information systems (IVIS) is growing. While these systems can help drivers by providing timely information, there is concern that they do not create another driver distraction.

Manufacturers of many of these devices are conducting extensive testing to verify that the systems do not compromise safety by adding to driver distraction. When IVIS systems are installed on a vehicle, the driver must be thoroughly trained on what the devices can and cannot do, and how to recognize a malfunctioning device. A copy of the manufacturer's instructions for installed devices should be carried in the vehicle in the event questions arise.

In addition to cell phones, the devices that are receiving NHTSA's main attention are route navigation systems, on-board computers that deliver personalized Internet-based information, and other multifunction

systems. One developer predicts that, by 2005, all new cars will have some form of on-board computer accessible to the driver. The rate of implementation from innovation to installation is so fast that the public's first awareness of a product or service may well be when it is already being used by drivers.

Third party suppliers are now providing hardware for mounting laptop computers adjacent to the driver or, in some cases, right on the steering wheel (over the airbag). Anecdotal evidence, such as in the HSRC data, suggests that crashes have occurred where drivers were using a laptop computer while driving. Manufacturers of such products warn drivers not to use the systems while the vehicle is in motion; however, based on observations of other "extreme" driver behavior (e.g., reading, shaving, and brushing teeth), the expectation is that some drivers will use them while driving, regardless of the risk. With handheld PCs or Personal Digital Assistants (PDAs) gaining in popularity, it is inevitable that drivers will use them in their vehicles, like cell phones and pagers.

Safety Policy

The use of cell phones, laptop computers, navigational devices, and similar devices while driving should be addressed in a company's safety policy. Employers may want to include a statement, such as the following, in their safety policy:

"Employees shall refrain from operating cell phones, laptop computers, navigational devices and any other device that may cause driver distraction while operating a company vehicle or while operating a privately owned vehicle in the course of conducting company business. Drivers shall make every attempt to properly park their vehicle prior to using such devices."

As with all safety policies, the driver should sign a dated receipt that he/she received the information. A safety policy is meaningless unless management enforces it for all employees. In fact, an un-enforced safety policy may expose the company to greater liability than no policy at all.

Driver Training

While it is unlikely that supervisors will be able to stop all distracting behaviors, providing the driver with knowledge regarding those issues that may increase the risk of accidents can certainly aid the driver in making decisions on what activities to avoid.

To help reduce the risk of driver distraction, a driver needs to assure that all necessary adjustments (e.g., mirrors, CD player, etc.) are made before they move a vehicle, and that all items are appropriately stowed before the start of a trip. Drivers need to be reminded that they should not operate additional electronic equipment, or shave or put on makeup, etc., while driving a vehicle.

When discussing the issue of distraction with drivers, trainers should consider situational cases. For example, they may ask drivers how they would feel if, while being operated on, the surgeon was talking on his/her cell phone or drinking a cup of coffee? Controlling a vehicle is a difficult task that requires a driver's full attention. It is a difficult enough task to monitor the environment around the vehicle through the use of mirrors, keep track of operational gauges, and pay attention to the road ahead. Drivers need to know the danger they put themselves and others in

by adding unnecessary distractions to their already complex task. In addition, drivers who would otherwise be paying attention may have a diminished capacity to respond to errors resulting from other drivers (i.e., the distraction may not only impact an individual's driving performance, but his/her ability to respond to other drivers' mistakes as well).

Driver training should include the issue of driver distraction. Items that could be highlighted include—

Before driving—

- Know where your vehicle's controls are located so that adjustments can be made without losing concentration on the driving task.
- Make sure all loose objects are properly stowed and secured.
- Adjust mirrors.
- Prepare in advance for needs (e.g., sun glasses, toll money, etc.).
- Make as many adjustments as possible (e.g., radio volume).
- Take care of personal hygiene (e.g., shaving, putting on make-up, etc.).
- Get sufficient rest.

When operating a vehicle—

- Drive defensively.
- Do not eat or drink.
- Do not read or write anything.
- Avoid smoking.
- Do not use communications devices, except in an emergency.
- Do not engage in distracting conversations.
- If you feel your concentration is impaired, park the vehicle in a safe location and take a break.

Accident Investigation

Where drivers are evaluated for their defensive driving practices following a crash, to determine if the crash was a “preventable accident” on the part of the driver, a company should take driver distraction into consideration. Where warranted, driver distraction should be discussed when explaining to a driver the reasons a crash was determined to be preventable. For additional information on determining accident preventability, see Commercial Vehicle Report CV-45-01, *Determining the Preventability of Motor Vehicle Accidents*.

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