



LAPTOP COMPUTERS IN THE MOBILE WORKFORCE

Abstract

The global workforce is becoming increasingly mobile, continuing a trend that began in the early 20th century. Companies have employed a variety of methods to communicate with the mobile worker, first using mobile two-way radios, more recently using cell telephones, and now using in-vehicle display devices, such as laptop computers, that communicate with central computers using radio waves, cellular or satellite technology.

While each of these technologies have provided improvements in communications, each has also brought distraction into the cabs of moving vehicles, negatively impacting safety and exposing companies to increasing liability. The extensive use of in-vehicle display technologies, such as laptop computers, has brought this safety and liability issue to the forefront, a problem that demands a solution. By disabling the display of the device while the vehicle is in motion, BlackOutPro provides this solution.

Introduction

Companies with mobile workforces have used technology for some time to increase worker productivity. For almost a century, two-way radio communications have been used to communicate with mobile crews. Orders are given and the status of work is relayed to a central location. Now two-way radio is being supplemented, or some might say supplanted, by cellular telephone. While the cellular telephone is economical and provides other advantages, it shares a fundamental problem with two-way radio: each person involved in the communication is required to keep and refer to records related to the communication. Addresses must be written down, an order marked complete, and sometimes follow-up is required.

In response to this, many companies have turned to laptop computers and related display technologies to not only provide the essential communications link, but also to transmit and receive business data. The mobile computer is linked to a central dispatch computer via radio, cellular signal or satellite communications circuit. The storage and

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organizational capabilities of the computer are brought to bear to minimize the data entry at each end of the communication link and to facilitate information availability and streamline record keeping. Data can be updated instantly from anywhere. Maps and diagrams can be accessed in the field. An order can be received, dispatched, and worked without anyone transcribing previously entered data. The serviceman is not required to stop and write out an order; it appears on his or her screen and is prioritized automatically. All these technological and productivity advancements are available and are being deployed by municipalities, utility companies, trucking companies, and government agencies.

The Cost of Increased Productivity

While the use of technology to communicate with and control the mobile workforce has resulted in huge increases in productivity, it has come at a price. As is usually the case with technological advances, behavioral and operational changes are required of those who use the technology.

Technology often advances at such a fast pace that it places challenging demands on the capabilities of the end users. For example, is it reasonable to expect a driver to operate a large vehicle, monitor a radio, answer or dial a cell phone, and receive or transmit data while driving? According to Dr. Paul Atchley, a researcher at the University of Kansas who focuses on how humans allocate attention in demanding environments, the more tasks a person is performing at any one time the less attention they can pay to any one task. The level of attention directed toward a particular task, such as driving a vehicle, may change with the driver's perception of what is most important to him or her at that moment in time. The problem is obvious; even a few seconds of distraction can lead to disastrous consequences.

In the National Conference of State Legislatures publication *Along for the Ride: Reducing Driver Distraction*, Dr Thomas Dingus of the Virginia Polytechnic Institute and State University states, "The primary threats to public safety ... are devices that are carried into the car. These devices include standard cell phones...personal digital assistants, and portable computers." Dr Dingus goes on to theorize that this is because these devices were not designed to be in the vehicle. Manufacturers have designed these products to be used with two hands and both eyes as well as the major portion of the user's cognitive capacity.

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The more available these products become, the more drivers use them. The result is a sharp increase in the number of distracted drivers on the road, with attendant increases in vehicular accidents resulting from their use. This danger has reached the point that even the communications industry is acknowledging the risk. The Cellular Telecommunications and Internet Association (CTIA) is currently airing public service announcements that advise of the increased risks involved in driving while using a cell phone. Mobile communications manufacturers such as Qualcomm are now posting warnings on their Web sites stating that their products should not be used while driving.

Not surprisingly, these types of warnings are being driven by an underlying recognition by the public that these are dangerous activities. Matt Sundeen reported in the National Conference of State Legislatures 2003 State Legislature Update: *Cell phones and Highway Safety*:

A March 2003 survey by the Gallup Organization found that forty-eight percent of drivers perceive that making outgoing calls can make driving dangerous. Forty-four percent of drivers perceive that receiving calls can be dangerous. Twice as many people--eighty-eight percent of drivers surveyed--indicated they support increased public awareness of the risk of wireless phone use while driving. Seventy-one percent of drivers support prohibitions of the use of hand-held phones while driving, and sixty-seven percent support insurance penalties for being in a crash while using a cell phone. Sixty-one percent support double or triple fines for traffic violations involving cell phone use, and fifty-seven percent support a ban on all wireless phone use while a car is moving, except in emergency situations. (p.4)

Legislative Activity

Legislatures are now getting into the game. California enacted Citation AB 301, which prohibits that a video screen or monitor to be viewable by a driver while the vehicle is in motion. Thirty-four other states restrict the use of television monitors in vehicles. In addition to these laws, forty-two states are considering legislation to enact restrictions on in vehicle *telematics*, the term being used to describe the convergence of computer and automotive technology.

There is a real possibility that these legislative acts, fueled by public opinion, may deter the use of these valuable technological advances by commercial carriers. The devastating

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results of crashes that involve commercial vehicles over 10,000 pounds with passenger cars is well documented. According to the National Highway Traffic Safety Administration (NHTSA), nearly seven percent of the 6.3 million police reported motor vehicle crashes in 2002--or 434,000 crashes--involved large trucks. One out of nine traffic fatalities in 2002 resulted from a collision involving a large truck. Of the fatalities that resulted from large truck crashes in 2002, seventy-nine percent were occupants of another vehicle. Similarly, occupants of other vehicles suffered seventy-seven percent of the injuries in large truck crashes, while only twenty percent of the truck occupants were injured.

Insurance Industry Activity

Since commercial vehicles are leading the way in the deployment of portable computers and other telematic devices, they are the focus of not only legislative action, but also face the introduction of restrictive provisions by insurance providers. Currently, estimates are for commercial insurance rates to continue to rise at an annual rate of 9.3% in order to offset the economic costs of crash injuries each year. The NHTSA estimates that \$100 billion in actual damages are incurred along with additional compensation for intangibles such as pain & suffering, and other comprehensive costs of about \$350 billion.

This 350 percent multiple is representative of the public's intolerance for activities in the drivers' compartment that distract their attention from the road. A review of selected cases illustrates the monetary risk of not taking preventative measures:

An Arkansas lumber company, Dykes Industries, lost a \$21 million lawsuit after a 78-year-old woman was struck and disabled by a Dykes salesman who was using his phone for a sales call at the exact time of the accident. The case was later settled for \$16.2 million.

The state of Hawaii paid \$1.5 million to a New Jersey man in 2001 for injuries he suffered after being struck in 1996 by a Hawaii Department of Education special education teacher. The teacher had just finished using her cell phone on the way to work when she hit the man as he walked across the street. The court ordered

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the state to pay 20 percent of the \$7.5 million in damages, and the state agreed to pay \$1.5 million on appeal.

In 1999, the investment firm Smith Barney paid a \$500,000 settlement to the family of a motorcyclist killed in Pennsylvania by one of its brokers. The employee had been making a sales call at the time of the accident. Although Smith Barney had not provided the cell phone, the plaintiffs argued that the company encouraged its brokers to make calls outside normal business hours to reach potential customers.

These and other damage awards have not escaped the attention of the insurance industry; making it likely that increasingly restrictive provisions will be added to commercial insurance policies.

Meeting the Challenge

Appropriate tools are required to perform specific types of work. Linemen need pliers, servicemen need wrenches, and the mobile worker requires a means to communicate. As each new tool is introduced into the work environment, particularly a mobile work environment, attention must be given to safety. In the case of mobile computing equipment, we must ask, "Will the presence of the equipment in the vehicle distract the operator of the vehicle?" If the answer is "Yes," then we must take steps to eliminate the distraction.

Companies can take passive or active measures to achieve the productivity gains that laptop computers provide while ensuring safety. Passive measures include publishing a company policy that prohibits the use of telematic devices whenever a vehicle is in motion, or establishing a policy that requires the distracting items be physically placed out of sight or reach of the driver. While such passive measures are easy to introduce, they are difficult if not impossible to enforce, or defend in a litigious environment.

A better approach is to actively eliminate the distraction. In the case of laptop computers, the display should be automatically disabled when the vehicle is in motion and enabled when it stops. This ensures the driver will not be distracted by changing screens on a laptop and it sends a message that the company has practiced due diligence in the deployment of the device. It also serves as a reminder to employees that safety is first on the mind of the company and should remain first on their minds also.

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The leading example of this approach can be found in a patented product named *BlackOutPro*. This simple and inexpensive device incorporates advance GPS motion-detection technology to blank the screen of the laptop computer when the vehicle is in motion and to restore it when the vehicle stops. The screen-blanking function does not interfere with the ability of the computer to perform its communication and computation activities; it merely eliminates the distraction of the screen and the temptation to operate the keyboard while the vehicle is moving. This technological solution meets the requirements of laws and insurance provisions that restrict the use of telematic devices.

Summary

Driver distraction caused by the use of communication and control devices is an increasing problem that is triggering action from both legislative bodies and the insurance industry. The prohibitive liability incurred demands a solution. While a passive approach based on training and policies is a good start, it is ineffective and indefensible in court. The low-cost approach provided by *BlackOutPro* is effective at ensuring safety and also provides a winning defense in the event of litigation.

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