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Technology and Software Products for Preventing and Mitigating Driver Distraction

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TECHNOLOGY

Technology and Software Products for Preventing and Mitigating Driver Distraction

Dial2Do, <http://www.dial2do.com/>

DriveSafe.ly, <http://www.drivesafe.ly/>

GOBIZ, sales@gobizcorp.com

Phoneguard, <http://www.phoneguard.com/assets/>

Trinity Nobel, http://www.trinitynoble.com/ga_mp.html

ZoomSafer, <http://zoomsafer.com/01a/>

REVIEWED BY LINDA S. ANGELL & HELEN P. FLANIGAN

Although cell phones took over a decade to penetrate the U.S. market, texting became *de rigueur* among teenagers shortly after it was introduced in 2000 (“Texting While Driving,” 2011). Texting is visually intensive, and texting while driving is associated with a 2,300% increase in accident risk over “just driving” (e.g., Klauer, Guo, Sudweeks, & Dingus, 2010; Lee et al., in press). This has caused deep concern among parents, employers, consumer groups, and legislators. At least 30 states and several countries have banned texting while driving (“Mobile Phones and Driving Safety,” n.d.). However, the draw of the cell phone appears irresistible. Teens and adults continue to text, talk, e-mail, and surf the Web with their cell phones while driving, many of them aware of the risk.

Parents, fleet owners, and insurance carriers have begun to look for ways to exert some control over subordinate drivers’ use of secondary devices while driving (Hurts, Angell, & Perez, 2011) – and in some instances, drivers themselves have begun looking for techniques to help them prevent distraction from the devices they carry into the vehicle.

These needs have prompted a surge of new, low-cost technology and software innovations for preventing and mitigating driver distraction. The functionality, implementation, degree of control, and price of these innovations vary widely.

Here we present a snapshot of some representative products (in order of increasing functionality), to provide a flavor of what is available on the market. The Federal Communications Commission (2011) has established a clearinghouse and Web site for informational purposes, where some of these emerging technology concepts are described.

Many devices that mitigate and prevent distraction are downloadable phone applications that allow the administrator (parent, employer, or insurance carrier) to exert control over the driver’s access to cell phone functions, usually while enabling emergency numbers, such as 911. These products work with an internal GPS or are linked to a vehicle through an external GPS receiver (Trinity Nobel, 2010). This class of applications is considered a “blunt tool” (“New Devices Aim to Disable Cell Phones While Driving,” 2009) because the apps prevent not only the driver but also passengers from using their phones. Another drawback is that GPS systems tend to drain the cell phone’s battery. Finally, covert disabling of these devices by drivers is a concern.

A Small Sample of Products Available Now

ZoomSafer is an example of a no-frills downloadable app that suppresses text and e-mail alerts and sends custom autoreplies explaining that the cell phone owner cannot receive calls or texts because he or she is driving.

DriveSafe.ly and Dial2Do are more than just suppressant software; these products read aloud incoming e-mails and text messages upon request by the driver. Dial2Do allows the driver to respond to messages by speaking. The intent of these apps is to ensure that the driver keeps his or her hands on the steering wheel and eyes on the road.

Phoneguard is a suppressant system in which a set speed (e.g., 10 mph) triggers the disabling of phone functions. (The 10-mph speed serves as an indicator that a vehicle is in motion.) The app administrator can be informed when a preset speed has been exceeded (e.g., 65 mph), alerting a parent (for example) that a teen driver may be driving faster than posted limits.

With GOBIZ, instead of disabling cell phone functions, administrators have visual proof of distracting behaviors via an audio/video recording with cameras mounted on the front of the vehicle and inside the passenger cab. Administrators can evaluate driver behavior for cell phone use, as well as drinking or drug use and erratic driving, and then regulate driving privileges accordingly.

Most of these devices were created and marketed in the past 1 or 2 years. They offer a degree of control and security to administrators and suggest increased safety for drivers, passengers, and pedestrians. An alternative to the approaches described here is being explored in a research collaboration between Microsoft and the California Institute of Technology (Iqbal, Horvitz, Ju, & Mathews, 2011). These researchers are examining whether automated, context-sensitive mediation can be given in multitasking situations to help drivers focus on maintaining safety. In a system with context-sensitive mediation, a driver is given alerts about road conditions and the possible need to suspend activity (e.g., conversation on a cell phone is interrupted by this alerting

(text continues on p. 30)

Key Takeaways

Incorporate various automation strategies into the design of in-vehicle information systems that warn drivers of a potential hazard or even suspend all interaction with the system when roadway conditions are complex. The more stringent automation strategy that prevents drivers from interacting with the in-vehicle information system may be more effective for younger

drivers. (Additional research on benefits and effects from such interventions is desirable.)

A speech-based in-vehicle system has the potential to cause less disruption in driving performance, presumably by helping drivers maintain a continuous link with the visual driving environment.

However, some speech-based interfaces can impose a cognitive load on

drivers. Such interfaces should be designed to consider complex roadway conditions and, ideally, even to help drivers modulate their use of the in-vehicle system based on the demands of the driving environment.

Finally, training programs aimed at developing the metacognitive skills of drivers have some potential to reduce their willingness to engage in distracting activities.

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information, which both the driver and the caller hear). Results from an initial simulator study, in which a mediation system of this type was emulated, suggested that a context- and cognition-aware communication mediation system could reduce driving errors and that specific information was more helpful than general alerts.

As exciting as the promise of these technological innovations seems for the prevention and mitigation of distraction while driving, research to evaluate their effectiveness has just begun. Yet comprehensive research in the simulator and the field is needed to understand how helpful such devices can be to drivers and whether their promises of security and safety are actually borne out. NHTSA has initiated one study of the effectiveness of these devices and apps (“Traffic Safety Facts,” 2010), and more are sure to follow.

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