



DISTRACTED WHILE DRIVING: TEXT MESSAGING

According to the United States (U.S.) Department of Transportation (DOT), distracted driving is any non-driving activity that has the potential to divert the driver's attention from the primary task of driving and increase the risk of crashing. There are three main types of distraction:

- Visual - taking your eyes off the road;
- Manual - taking your hands off the steering wheel; and
- Cognitive - taking your mind off what you are doing.

In 2009, the U.S. DOT reported that 20 percent of all injury crashes were related to distracted driving. Of those killed in distracted driving-related crashes, 18 percent were using a cell phone. Drivers using a hand-held device were four times more likely to get into serious enough crashes to injure themselves. In addition, cell phone use (i.e., hand held or hands-free) delays a driver's reaction time as much as having a blood alcohol level at the legal limit of 0.8 percent.

Because of the perceived dangers of either using a cell phone or sending and receiving text messages while driving, a number of states have banned or partially banned the practices. According to the Insurance Institute for Highway Safety, the following cell phone or texting bans have been enacted:

- 10 states (California, Connecticut, Delaware, Maryland, Nevada, New Jersey, New York, Oregon, Utah, and Washington) and the District of Columbia have banned all drivers from talking on hand held cell phones;
- 5 states (Arkansas, Illinois, Louisiana, Oklahoma, and Texas) have partial bans on the use of hand held cell phones;
- 34 states (Arkansas, Alaska, California, Colorado, Connecticut, Delaware, Illinois, Indiana, Iowa, Kansas, Georgia, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Rhode Island, Oregon, Tennessee, Utah, Vermont, Virginia, Washington, Wisconsin, and Wyoming) and the District of Columbia have banned all drivers from text messaging; and
- 7 states (Alabama, Mississippi, Missouri, New Mexico, Oklahoma, Texas, and West Virginia) have partial bans on texting while driving.

Figure 1 shows the states that have bans on cell phone use while driving. Figure 2 shows the states that ban texting while driving.



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While all distractions endanger drivers' safety, the U.S. DOT is most concerned by texting because it involves all three types of distractions. Research has shown that cell phone used for texting can increase fatal crashes by 6 to 23 times. However, only a limited number of experimentally controlled research studies have examined the dangers of texting and most studies were performed using a driving simulator not actual driving.

Because of the lack of data, the U.S. DOT funded the Texas Transportation Institute (TTI), a division of Texas A&M University, to investigate the effects of reading and writing text-based messages while driving under varying roadway and texting response demands. The study used an instrumented research vehicle that included a light emitting diode (LED) on the hood that drivers had to respond to at regular intervals and cameras, both inside and outside the vehicle, to monitor lane position and track the driver's head position, eye glances, and hand movements.

The driving course was on an old U.S. Air Force base runway that had a one-mile lane divided equally with a barreled section and an open section. A total of 42 persons participated in the driving study ranging in age from 16 to 54 and split equally between the genders. Participants used their own cell phones.

TTI's study was trying to answer the following three questions:

- How well do texting while driving results obtained using an actual vehicle compare to those using a driving simulator?
- Do drivers change the way they interact with non-driving tasks as driving becomes more demanding?
- When texting while driving, is driving impairment from reading different from writing?

In order for TTI to evaluate the effects of reading and writing texts on driving, each driver participated in three separate drives. The three segments were:

- Control - text messages were not sent or received;
- Writing - drivers composed a story on their mobile device while driving; and
- Reading - drivers read a story on their mobile device while driving.

During the test, drivers were supposed to focus on maintaining a speed of 30 miles per hour (mph), maintaining lane position, and responding to the light response task. When compared to the control condition, TTI found that while driving:

- Text messaging had a significant delay in response times;
- The number of missed light response events increased;
- Overall vehicle speed was reduced;
- The standard deviation of speed on the open roadway sections increased;
- The standard deviation of lane position on the open roadway sections increased;
- Writing and reading rates were reduced; and
- The number of glances to the forward roadway was decreased.

Of the various measures considered in the analysis, TTI found that only response time to the light task was differentially affected by the writing and reading tasks, with the greatest response time impairment associated with writing a

text message. Therefore, the researchers found that overall performance on each measured task clearly indicated significant impairment from both writing and reading text messages. The study's results also suggested that any possible difference in driving impairment associated with writing and reading were likely very small.

TTI's findings suggested that:

- Previous research may have underestimated reaction time delays associated with texting and driving;
- Reading and writing text messages were equally difficult and dangerous; and
- The efficiency of both the texting and driving tasks were dramatically reduced when text messages were sent from the vehicle.

The findings of the TTI scientific study under actual driving conditions only confirmed what most persons perceived or thought about the dangers of texting while driving. Because the study was funded and the results publicly supported by the U.S. DOT, further action on bans by federal and state governments is likely. The waste management industry should be informing divers about the importance of not using cell phones in safety meetings to prevent accidents.

A copy of the TTI report with complete data analysis can be downloaded at:

<http://tti.tamu.edu/2011/10/05/new-study-says-texting-doubles-a-driver%E2%80%99s-reaction-time>.

For more information on NSWMA's *Distracted While Driving: Text Messaging*, contact Edward W. Repa, PhD, Director, Environmental Programs, at 202-364-3773 or erepa@nswma.org. October 2011.
