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OCTOBER 2009

Cell phones and driving:
A review of legislation, risk perception, and mitigation tactics

The National Highway Traffic Safety Administration (NHTSA, 2009) estimates that over 800,000 drivers are using a cell phone at any given time during the day (11 percent of all drivers). Another study on the risk of a collision associated with driver cell phone use found that 3.6 percent of all crashes and near-crashes are the result of a driver distracted by cell phone use (NHTSA, 2006). Public opinion surveys have found that cell phone use is viewed as a dangerous driving action, yet the admitted rates of cell phone use by those same respondents is relatively high.

Awareness of the issue has increased to the point that a national forum of policy makers, law enforcement officials, and academics took place on the issue of distracted driving from September, 30, to October, 1, 2009, in Washington, DC (Research and Innovative Technology Administration, 2009b). In addition, several US senators have proposed legislation that would impose a nationwide ban on text messaging while driving (Associated Press, 2009). However, while the risks of cell phone use on driver behavior are well documented, evidence of the effectiveness of laws prohibiting cell phone use while driving is sparse. A primary concern is that such legislation is generally unenforceable because of the difficulty in identifying a driver using a cell phone, especially with hands-free devices. Also, while media awareness campaigns aim to inform drivers of the dangers inherent in cell phone use while driving, it is clear that many drivers continue to use cell phones despite their opinions about the danger of it.

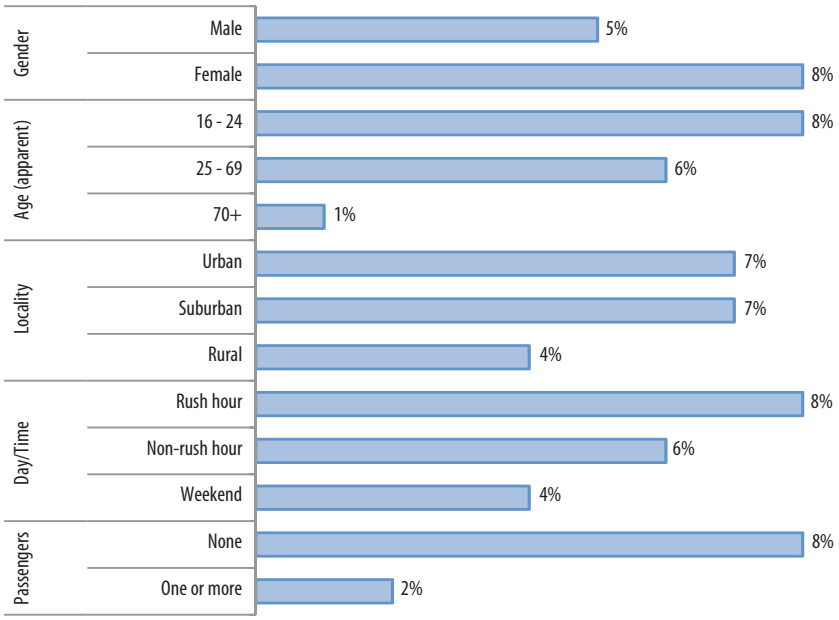
This issue brief examines the effects of cell phone use on driving behavior and crash risk. Since Indiana recently implemented a law banning drivers under age 18 from using a cell phone while driving, this brief concentrates on evaluations of the success of legislation in other states, including how varying levels of police enforcement and media publicity contribute to compliance. Statistics and theories on the gap in risk perception associated with cell phone use while driving are examined. Finally, implications of these findings are examined in the context of Indiana.

GENERAL TRENDS

As of December, 2008, there were 270.3 million wireless device subscribers in the United States, or 87 percent of the total population. In 2008, there were over two trillion minutes of use and one trillion short message service (SMS, more commonly known as "text") messages sent (CTIA, 2009). The National Occupant Protection Use Survey (NOPUS) conducted annually by the National Center for Statistics and Analysis found that six percent of drivers were using a hand-held cell phone and estimate that 11 percent were using either a hand-held or hands-free device at any given time (NHTSA, 2009). The survey also found that cell

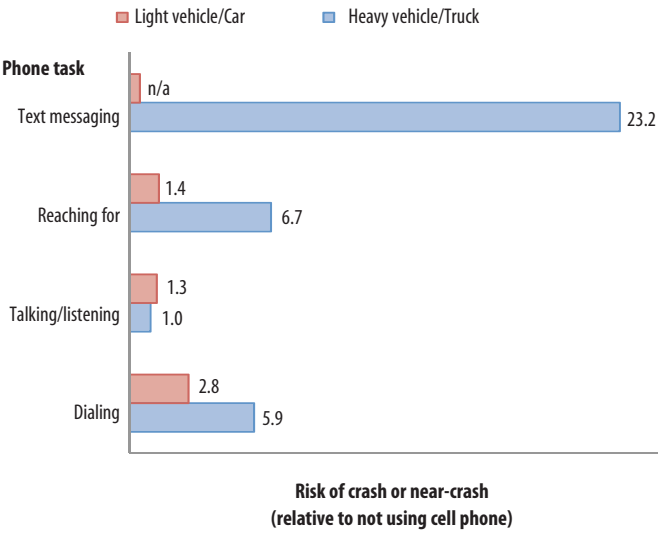
phone use was highest among drivers 16 to 24 years old (eight percent), was higher among female drivers (eight percent versus five percent for male drivers), and was four times higher when the driver was alone, relative to when passengers were present (see Figure 1).

Figure 1: Drivers using a cell phone, as a percent of total drivers observed



Source: National Highway Traffic Safety Administration, National Occupant Protection Use Survey, 2008

Figure 2: Risk of crash or near-crash among drivers, by vehicle type and cell phone task



Note: *Risk of crash* defined as likelihood of crash or near-crash for phone task, relative to not using a phone while driving.

Source: 100-car study, Virginia Tech Transportation Institute, 2008

EFFECTS ON DRIVING PERFORMANCE

The risks associated with cell phone use while driving are well documented. A seminal study using hospitalization records and cell phone usage records in Western Australia found that the risk of a crash increased fourfold when the driver was using a cell phone prior to the crash, relative to drivers not using a cell phone (McEvoy, Stevenson, Mccartt, Woodward, Haworth, Palamara, & Cercarelli, 2005). A meta-analysis concluded that cell phone use increases reaction time to external events, thereby increasing the risk of a collision (Caird, Willness, Steel, & Scialfa, 2008). Further, use of "bluetooth" or hands-free phones did not eliminate the problem because reductions in reaction time due to hands-free devices were not significantly different from hand-held devices. In a driving simulator study, researchers concluded that driving while using a cell phone produces reductions in driving performance similar to that of alcohol-impaired driving (Strayer, Drews, & Crouch, 2006).

The extent to which simulator studies can accurately reflect general driving conditions is uncertain. To provide more naturalistic driving data, the Virginia Tech Transportation Institute (VTTI) conducted a two-year study by placing video monitoring equipment in 100 cars of drivers in the Washington, DC, area (VTTI, 2009). Results from the study have provided risk profiles that more accurately reflect real-world driving vis-à-vis cell phone use. Figure 2 shows risk profiles of drivers by cell phone usage, as determined from the VTTI dataset. The results show that, among large truck drivers, those who were text messaging were 23 times more likely to have been involved in a crash or near-crash than drivers not text messaging.

LEGISLATIVE EFFORTS

By July 2009, six states (California, Connecticut, New Jersey, New York, Utah, and Washington) had jurisdiction-wide bans on driving while using a cell phone, while 21 states had restrictions on cell phone use for young drivers (Insurance Institute for Highway Safety, 2009). Indiana is now one of nine states to prohibit driv-

ers under age 18 from using any type of telecommunications device (Indiana SB 16, 2009). In 2006, North Carolina banned all drivers under age 18 from using a mobile telephone device while driving, a law nearly identical to that of the 2009 Indiana bill. In an evaluation of its effectiveness, Foss, Goodwin, McCartt, and Hellinga, (2009) found through observational surveys of teen drivers in North Carolina that cell phone usage remained generally unchanged by the law. A telephone survey of parents and teen drivers showed that only 39 percent of parents and 64 percent of teens knew about the ban, implying that a lack of awareness may have contributed to minimal changes observed in cell phone usage rates.

Common to the North Carolina law evaluation and to evaluations of similar laws in New York and Washington, DC, researchers conclude that without a strong publicity campaign and the perceived threat of enforcement, legislation prohibiting cell phone use among drivers will have a minimal impact at best. The Foss et al. study found that parents of teen drivers and the teen drivers themselves saw little enforcement and publicity for the law. In a study on the effects of a statewide ban on cell phone usage while driving in New York, McCartt and Geary (2004) showed that phone usage decreased from 2.3 percent pre-law to 1.1 percent post-law, but increased to 2.1 percent one year after the law was in effect.[1] An evaluation of a ban on cell phone use while driving in Washington, DC, found that usage rates remained relatively low in the long term because of sustained enforcement of the law (McCartt & Hellinga, 2007).

RISK PERCEPTION, PUBLICITY, AND ENFORCEMENT

Several surveys suggest a perceptual gap in risks presented by using a cell phone and actual driving behavior (see Table 1). The 2009 *Traffic Safety Culture Index,* the results of a survey of drivers conducted by the AAA Foundation for Traffic Safety, found that 87 percent of respondents rated text messaging or emailing as a "very serious threat" (AAA Foundation, 2009). In addition, the vast majority of respondents stated that text messaging and talking on cell phones were unacceptable behaviors while driving (95 percent and 71 percent, respectively). However, among those respondents, 30 percent admitted to talking on a cell phone while driving and 18 percent to text messaging while driving. In another survey conducted by the Insurance Institute for Highway Safety (IIHS, 2008), 67 percent of respondents admitted to using a cell phone while driving at some point in the past. Ninety-eight percent of respondents stated that they felt they were "safe" drivers, but curiously, nearly 50 percent responded that cell phone usage is one of the most dangerous forms of distracted driving.

These findings and research on the effects of enforcement and publicity for cell phone laws suggest a gap in the perception of risk associated with this behavior. Without publicity campaigns to highlight the risks and without enforcement to provide a punitive deterrent, drivers may be inclined to continue this driving behavior. In addition, drivers may be discerning illusory differences in driving capabilities between themselves and other drivers (Vanderbilt, 2009). Yagil (2005) cites other research findings that compliance with traffic laws is affected in the short-term by enforcement activities but without long-term changes in attitudes toward such behavior, violations of these laws will increase. In another study, Yagil (1998) concludes that normative attitudes toward traffic laws in younger drivers are better predictors of the likelihood to violate laws, whereas "instrumental" motives (i.e., the threat of punishment via enforcement) are stronger in older drivers. This finding is especially relevant to Indiana as its cell phone law focuses on young drivers and would suggest that publicity of cell phone restrictions would have a greater impact on reducing usage while driving than would enforcement policies.

The impact of sustained media publicity and enforcement has been investigated for other traffic safety law evaluations and provides a compass for effective planning on cell phone laws. In a systematic review of publicity campaigns for reducing alcohol-involved driving, Elder, Shults, Sleet, Nichols, Thompson, and Rajab (2004) determined that the most effective media campaigns were carefully planned and used pre-tested messages with maximum exposure to target audiences. Beck (2009)

Table 1: Opinions and incidence of types of driving behavior

Driver behavior	% who view it as unacceptable behavior	% admitted to engaging in behavior in previous month
Text messaging	95	18
Talking on cell phone	71	30
Running red lights	94	26
Tailgating	91	24
Driving 15mph over speed limit (residential)	95	21
Driving 15mph over speed limit (interstate)	63	28

Source: 2009 Traffic Safety Culture Index (AAA)

[1]These findings suggest that the effects of new laws might be short-lived anyway. In addition, the general rate of cell phone use has increased over time, so a return to pre-law rates should be compared to projected use rates had no law been implemented.

found in a study of a Maryland media campaign on drunk driving that insufficient enforcement and publicity on enforcement resulted in negligible effects on the incidence of drunk driving and alcohol-related crashes. An evaluation of bicycle helmet laws and education campaigns by Dannenberg, Gielen, Beilenson, Wilson, and Joffe, (1993) found that legislation combined with effective media campaigns had a greater impact on helmet use than did either legislation or education alone.

SUMMIT ON DISTRACTED DRIVING

United States Transportation Secretary Ray LaHood convened a meeting of policy makers, enforcement officials, academics, and other practitioners to Washington, DC, for the Distracted Driving Summit (RITA, 2009b). The agenda for the Summit included panel presentations on analyses of the effects of and risks associated with driver distractions, legislative and regulatory approaches to reducing distracted driving, and a review of public awareness initiatives on the issue. In addition, President Obama signed an Executive Order that directs government employees not to text message while driving in work-related situations (US Department of Transportation, 2009). At the end of the Summit, Secretary LaHood issued a set of action items and recommendations for key stakeholders (Table 2).

Table 2: Recommendations from 2009 Distracted Driving Summit

Rulemakings proposed
- Permanent restrictions on telecommunications devices in rail operations
- Universal ban on text messaging, and cell phone bans on truck and interstate bus operators
- Prohibiting school bus drivers convicted of text messaging while driving from maintaining proper licensing
Recommendations to states
- Include distracted driving in state highway safety plans
- Enact legislation to counteract distracted driving in all vehicles
- High visibilty enforcement campaigns against distracted driving

Source: US Department of Transportation, 2009

Table 3: Drivers distracted while in traffic collisions and involvement rates per 10,000 licenses in Indiana, by age cohort, 2007-2008

	Drivers distracted while in collisions		Licensed drivers (000s)		Distracted while in collisions, per 10k licensed	
Age cohort	**2007**	**2008**	**2007**	**2008**	**2007**	**2008**
16-20	2,600	2,456	374.6	291.6	69.4	84.2
21-24	1,313	1,142	393.3	392.9	33.4	29.1
25-34	1,954	1,913	889.3	870.5	22.0	22.0
35-44	1,630	1,515	931.5	899.3	17.5	16.8
45-54	1,310	1,317	986.6	978.7	13.3	13.5
55-64	834	853	741.4	756.5	11.2	11.3
65-74	401	403	426.7	434.4	9.4	9.3
75 +	297	298	359.1	316.7	8.3	9.4
TOTAL	**10,339**	**9,897**	**5,102.3**	**4,940.6**	**20.3**	**20.0**

Sources: *Drivers distracted in collisions:* Indiana State Police Automated Reporting Information Exchange System, as of March 1, 2009
Licensed drivers: Indiana Bureau of Motor Vehicles, as of February 16, 2009

The extent to which these recommendations and actions will affect changes in driver behavior will vary from location to location. Some states may already have these actions in place or have an environment where implementing them is both cost-effective and likely to succeed, relative to other location. Clearly, these recommendations have been influenced by existing research and evaluations on the effects of cell phone use while driving, highlighting the importance of quantitative and qualitative data on this complex issue.

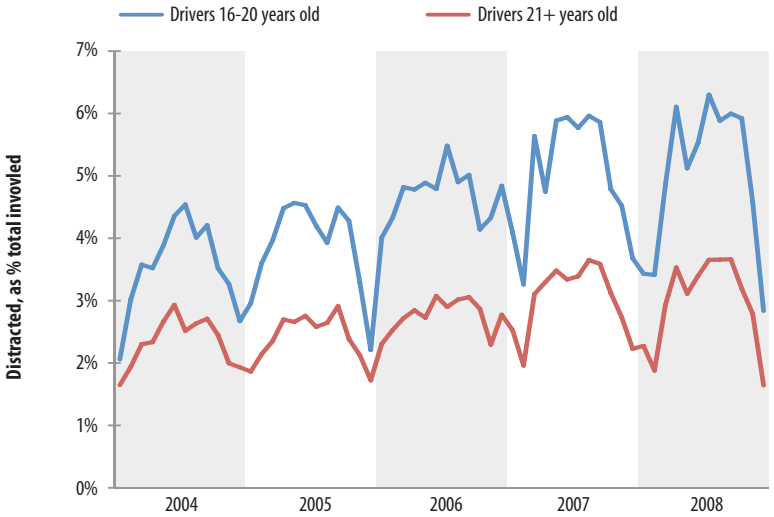
IMPACT ON INDIANA

Research on the effects of text messaging while driving has also influenced federal lawmakers, who in July proposed a national ban from text messaging while driving on all drivers (ALERT Drivers Act, 2009). This legislation would withhold up to 25 percent of federal highway funds from states that do not enact and enforce the text message ban. If passed, this legislation would present enforcement and publicity challenges very different from those currently faced by Indiana and its ban on cell phone use among teen drivers. Currently, the Indiana law applies to any use of a telecommunications device by a driver under age 18; officers may issue citations after an at-fault crash or in the context of a moving traffic violation. In terms of enforcement, a universal ban on text messaging will be problematic in that officers must make a determination that a driver is in fact using a cell phone to send a text message, versus any other use of it.

Data on Indiana traffic collisions show an inverse relationship between driver age and the likelihood of being distracted while in a collision. Table 3 shows that for every 10,000 licensed 16-20 year old drivers in a collision, 84 were distracted by either cell phone use, passengers, or some other event. From 2007 to 2008, the rate of distracted driving increased by nearly 15 drivers per 10,000 licensed, by far the largest increase of any age cohort. Since 2004, the incidence of distracted driving in traffic collisions has generally increased among all drivers, but the

disparity between young drivers and older drivers has increased (Figure 3). In targeting this higher risk group with the Indiana law, the issue is now how to bring about behavioral and attitudinal changes among young drivers; peer influences and general increases in the ability to communicate on a continual basis present significant challenges to Indiana policy makers and practitioners.

Figure 3: Percent of drivers involved in Indiana collisions that were distracted, by month, 2004-2008



Note: *Distracted* defined as a driver with any one of *passenger distraction*, *cell phone* or *other telematics*, or *other distraction* listed as a driver contributing factor on the Indiana Officer's Crash Report.

Source: Indiana State Police Automated Reporting Information Exchange System, as of March 1, 2009

CONSIDERATIONS FOR POLICY MAKERS AND PRACTITIONERS

In terms of public awareness campaigns, the current Indiana law and the possible federal law on text messaging presents different target audiences and, from the findings in the literature above, different motivations and attitudes toward compliance. An additional consideration is the ubiquity of cell phone use and the efforts needed to change attitudes toward the risks associated with driving while on a cell phone. Any media campaign to raise awareness of these risks should incorporate the varying motivations and attitudes of the driving population, most distinctly across age and gender groups. Below are several considerations for policy makers as they integrate national mandates and recommendations to state policy:

How will national laws and recommendations on restricting cell phone use while driving affect local law and policy practices? How might they be implemented?

What can be learned from the implementation of previous changes in traffic safety laws and how they affected driver behavior? How can these best-practices be applied toward cell phone use while driving?

How can Indiana collaborate with other states that are undergoing similar changes to improve the chances for success in changing attitudes toward cell phone use while driving?

What mix of enforcement and public awareness will produce the greatest reduction in collisions associated with cell phone use and driver distraction in general?

Considering what is known about the motivations for behavioral change among different driver age groups in relation to traffic laws, how should publicity and awareness campaigns be constructed (content, format, etc.) to effect long-lasting changes?

Transportation Secretary LaHood plans to continue the release of research and recommendations on how best to implement plans to reduce distracted driving and cell phone use specifically. Each of the above questions can be focused further as these materials are made available. In addition, policy makers should consider how non-governmental groups can contribute; evaluations should be conducted on the efficacy of driver education programs, media campaigns, and various types and levels of enforcement.

With the Distracted Driving Summit, potential federal legislation to ban text messaging while driving, and an increasing number of states and municipalities restricting the use of telecommunications devices among drivers, alternative attitudes toward this issue are gaining traction. Demographic and behavioral differences across states will require unique approaches to enforcement and publicity of these changes to state laws. Indiana lawmakers, policy makers, enforcement officials, and the educational community will need to consider the appropriate level of awareness and enforcement to maximize changes in driver attitudes toward driving while using a cell phone.

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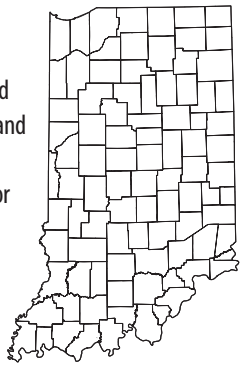

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Publication of this report was made possible by the Indiana University Public Policy Institute and the Indiana Criminal Justice Institute. All research and analysis was conducted independently by the author; conclusions and recommendations are those of the author and may not reflect the views of the sponsor organizations.

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