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Driver Hand-Held Cellular Phone Use in Minnesota, June and August 2009

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Consultant's Report

INTRODUCTION

Serious crashes attributed to distracted driving are frequently reported in the news media, particularly those related to the use of cellular phones. Because of the extraordinary communication abilities cellular phones provide, they have become a part of American culture. More Americans than ever before are using cellular phones and many are using them while they drive. Use of these phones while driving a motor vehicle is a growing traffic safety concern. To date, seven states (California, Connecticut, New Jersey, New York, Oregon, Utah, and Washington) as well as the District of Columbia have banned drivers from using cellular phones behind the wheel. Specific localities (usually cities) also ban drivers from using cellular phones in eight additional states (Florida, Kentucky, Louisiana, Mississippi, Nevada, Oklahoma, Oregon, and Utah). Twenty-one states (including Minnesota) and the District of Columbia also specifically ban novice drivers from using cellular phones while driving. Seventeen states, including Minnesota, ban drivers from texting while driving (Insurance Institute for Highway Safety, 2009).

Indeed, use of a cellular phone can distract a person from the primary task of driving. Evidence obtained from simulated driving (e.g., Alm & Nilsson, 1995; de Waard, Brookhuis, & Hernández-Gress, 2001; McKnight & McKnight, 1993; Serafin, Wen, Paelke, & Green, 1993; Strayer & Johnston, 2001) and on-the-road driving (e.g., Brookhuis, deVries, & de Waard, 1991; Tijerina, Kiger, Rockwell, & Tornow, 1995a,b) has shown that use of a cellular phone can lead to decrements in tasks required for safe driving. There is general agreement in the literature that the most distracting activities involving cellular phone use are dialing and receiving phone calls (see e.g., Alm & Nilsson, 2001; Brookhuis, de Vries, & de Waard, 1991; Green, 2000; Tijerina, Johnston, Parmer, Winterbottom, & Goodman, 2000; Zwahlen, Adams, & Schwartz, 1988). In addition, use of hand-held phones tend to be associated with greater decrements in driving performance than hands-free phones, but the conversations tend to be equally distracting, especially when the information content is high (see e.g., McKnight & McKnight, 1993; Patten, Kircher, Östlund, & Nilsson, 2004; Strayer & Johnston, 2001).

Evidence is also mounting that the use of cellular phones increases crash risk. In their analysis of the Crashworthiness Data System (CDS) data, Stutts, Reinfurt, and Rodgman (2001) found that cellular phone use or dialing was implicated in about 1.5 percent of distraction-related crashes. One would expect this percentage to increase as the predicted use of cellular phones increases. More recent work in Virginia has found that about 5 percent of distraction-related crashes involve cellular phones (Glaze & Ellis, 2003). Utilizing self-reported data on cell phone crash involvement, Royal (2003) estimates that there are 292,000 drivers in the US who report cell-phone involvement in a crash in the past 5 years. Results from epidemiological studies in which cellular phone use has been linked with crash records, are beginning to support the hypothesis that use of a cellular phone while driving increases crash risk (Koushki, Ali, & Al-Saleh, 1999; Redelmeier & Tibshirani, 1997; Sagberg, 2001; Violanti & Marshall, 1996).

However, the magnitude of the potential public health problem posed by cellular phone

use in motor vehicles is moderated by the amount of exposure to this risk; that is, how frequently cellular phones are used by the motoring public. There are few solid exposure data available. Surveys in which people self report use either gather only general use information (such as whether or not people use their phone in the car), or the results cannot be generalized to a larger population. Cellular phone use derived from police crash records may not accurately reflect exposure because use is often acquired by self-report from the crash-involved driver. Drivers may be reluctant to report this potential distraction because of liability issues.

A less biased way to obtain frequency of mobile phone use is through direct observation on the roadway, where observers stand at intersections and record use of hand-held cellular phones as vehicles pass by. Past direct observation studies of cellular phone use in Michigan (Eby, Kostyniuk, & Vivoda, 2003; Eby & Vivoda, 2003), North Carolina (Reinfurt, Huang, Feaganes, & Hunter, 2001), Minnesota (Eby & Vivoda, 2004, 2005, 2006, 2007, 2008) and nationwide (National Highway Traffic Safety Administration, NHTSA, 2001) have found that about 3-5 percent of the driving population are conversing on a hand-held cellular phone at any given moment during daylight hours.

The purpose of the present study was to continue tracking the statewide hand held cellular phone use rate of drivers in Minnesota in order to better understand the exposure to this distracting activity. Cellular phone use was observed in two surveys. The surveys took place in June and August, 2009.

METHODS

The study utilized a direct observation survey to collect hand-held cellular phone use. As described in detail elsewhere (Eby, Vivoda, & Cavanagh 2004), the sample design was a stratified probability sample of 240 freeway exit ramps and intersections in Minnesota. The sample design allowed for data to be weighted so that it represented Minnesota vehicle occupants traveling in passenger cars, sport utility vehicles, vans/minivans, and pickup trucks. Hand held cellular phone use data were collected at the same time as safety belt use and vehicle occupant demographics.

Driver cellular phone use rates by vehicle miles of travel (VMT) were calculated by weighting the data for each site by a factor based on the number of vehicles observed and an estimate of traffic volume. Weighted rates and variances for hand-held cellular phone use were calculated using the equations in a previous report (Eby, Vivoda, & Cavanagh, 2004), except that cell phone use was substituted for safety belt use.

RESULTS

A total of 9,976 and 9,542 drivers were observed in the two survey waves respectively. Of those, 568 and 433 were using hand-held cellular phones. When weighted by VMT, the study found that 5.8 ± 2.4 and 5.6 ± 3.1 percent of drivers in Minnesota were using a hand-held cellular phone at any given moment during daylight hours. These rates are higher than what has been found in previous surveys in Minnesota.

Driver hand-held cellular phone use for intersections (5.9 and 6.1 percent) was higher than the rates of use at exit ramps (5.5 and 4.4 percent). Table 1 shows hand-held cellular phone use rates by the eight strata utilized in the sampling design.

| Table 1: Driver Hand-Held Cellular Phone Use by Stratum in Minnesota. | | | |
|--|---|--|--|
| Stratum | Counties | June, 2009 Driver Hand-Held Cellular Phone Use (unweighted N) | August, 2009 Driver Hand-Held Cellular Phone Use (unweighted N) |
| <i>High Belt Use</i> Stratum 1: intersections | Carver, Dakota, Olmsted, Ramsey, Wright | 3.7% (52) | 2.7% (32) |
| Stratum 5: exit ramps | | 2.9% (18) | 3.5% (12) |
| <i>Hennepin</i> Stratum 2: intersections | Hennepin | 7.7% (155) | 5.0% (108) |
| Stratum 6: exit ramps | | 7.1% (100) | 5.1% (76) |
| <i>Medium Belt Use</i> Stratum 3: intersections | Beltrami, Blue Earth, Clay, Crow Wing, Freeborn, Goodhue, Kandiyohi, Nicollet, Rice, Scott, Sherburne, St. Louis, Steele, Washington | 6.1% (61) | 5.9% (55) |
| Stratum 7: exit ramps | | 4.8% (67) | 5.7% (80) |
| <i>Low Belt Use</i> Stratum 4: intersections | Anoka, Becker, Benton, Brown, Carlton, Cass, Chisago, Douglas, Isanti, Itasca, McLeod, Morrison, Mower, Otter Tail, Polk, Stearns, Winona | 6.2% (69) | 7.5% (50) |
| Stratum 8: exit ramps | | 7.0% (46) | 3.3% (20) |

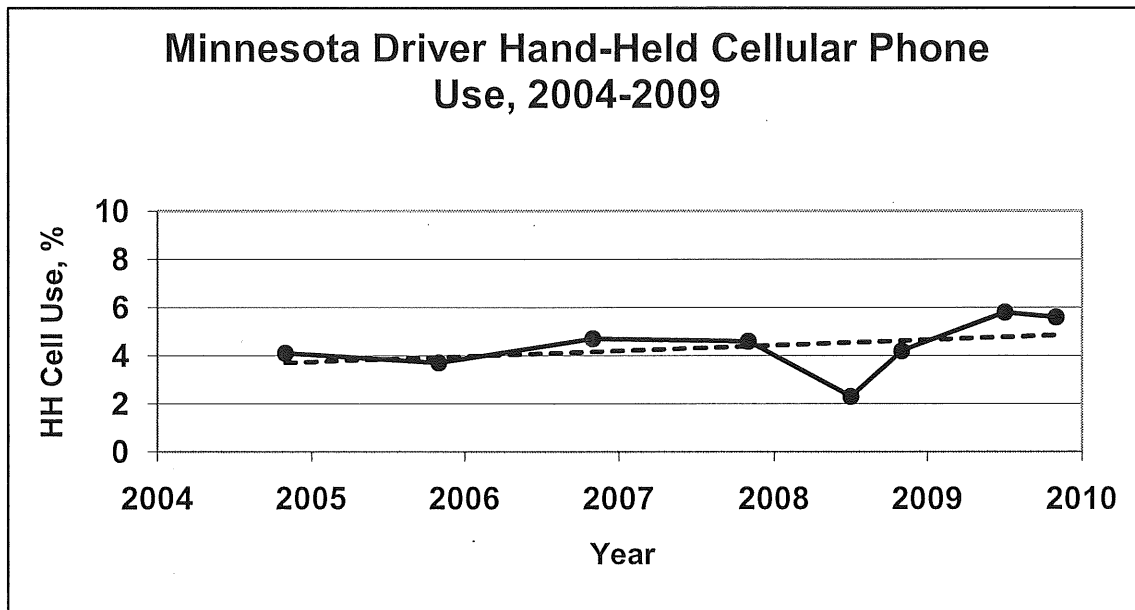


Figure 1: Driver Hand-Held Cellular Phone Use in Minnesota from 2004-2008.

The current surveys mark the seventh and eighth statewide surveys in which driver hand-held cellular phone use was measured. Figure 1 shows the statewide use rates over the past five years and the best fitting trend line. These data show that hand held cellular phone use by drivers in Minnesota changed little between 2004 and 2008, but then increased in 2009.

DISCUSSION

This study measured hand-held cellular phone use for drivers in Minnesota by VMT. We found that at any given daylight time in Minnesota, 5.8 percent of drivers in June and 5.6 percent of drivers in August were engaged in a conversation over a hand-held cellular phone. There has been an apparent increase in overall cellular phone use since last year.

There are approximately 4.5 million registered passenger cars, sport utility vehicles, vans/minivans and pickup trucks in Minnesota (Federal Highway Administration, FHWA, 2004) using the most recent data available. Following NHTSA's (2001) reasoning, if we assume that these vehicles are being used for an average of one hour during daylight times, then there would be about 375,000 vehicles on the road in Minnesota at any given daylight hour. If 5.8 percent of these vehicles are being driven by people using hand-held cellular phones, there would have been approximately 21,750 drivers in Minnesota conversing on cellular phone at any given daylight hour in June.

While this number is small compared to the total number of drivers in Minnesota, it is important to keep in mind two facts related to cellular phone use. First, cellular phone use may begin increasing dramatically in Minnesota. Michigan estimates show that hand-held cellular phone use has increased at a rate of nearly one percentage point per year over the last five years (Eby, Vivoda, & St. Louis, 2006). Second, studies have shown that cellular phone use is linked to a lack of safety belt use (Eby, Kostyniuk, & Vivoda, 2003; Eby & Vivoda, 2003). Whether this finding results from the tendency of cellular phone users to engage in risky driving behaviors more often than nonusers, or whether the use of a cellular phone interferes with the use of a safety belt is unknown. What is known is that not only are those who are conversing on cellular phones potentially more likely to be in a motor vehicle crash, but due to the lower safety belt use of this population they are also more likely to sustain greater injury should a crash occur.

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