

**Statements before the Pennsylvania House of
Representatives Transportation Committee**

**Pennsylvania Seat Belt Requirements
and Distracted Driving Issues**

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The Insurance Institute for Highway Safety is a nonprofit research and communications organization whose mission is to reduce the deaths, injuries, and property damage that occur on our nation's roads. We are supported by automobile insurers. Thank you for the opportunity to share results of our research on the risks of young drivers transporting other teenage passengers as well as research on the risk associated with cellphone use while driving and the effect of state laws on restricting phone use while driving.

PANEL 1 – EVIDENCE FOR GDL LAWS ON PASSENGER RESTRICTIONS, CELLPHONE RESTRICTIONS, AND PRIMARY SEAT BELT USE FOR ALL TEENAGE PASSENGERS

Driving with Passengers

Most teenagers fatally injured in crashes are drivers, but many teenagers also die as passengers. In Pennsylvania, 39 percent of passenger vehicle occupant deaths among 16-19 year-olds during 2004-08 were passengers. Among 16 year-olds, this increases dramatically (61 percent passengers, 39 percent drivers) (Table 1). Seventy-three percent of the 16-year-old passengers killed were in passenger vehicles driven by teenage drivers (Table 2).

**Table 1
Number of Fatally Injured Teenage Passenger Vehicle Drivers and Passengers in Pennsylvania, 2004-08**

Age	Drivers	Passengers
16	45	70
17	107	72
18	139	78
19	130	54
Total	421	274

**Table 2
Percentage of Teenage Passengers Fatally Injured in Passenger Vehicles Driven by Teenage Drivers (Ages 16-19) in Pennsylvania, 2004-08**

Age	Number of passenger crash deaths	Percentage of deaths in vehicles with teenage drivers
16	55	73
17	49	68
18	46	59
19	31	53
Total	181	64

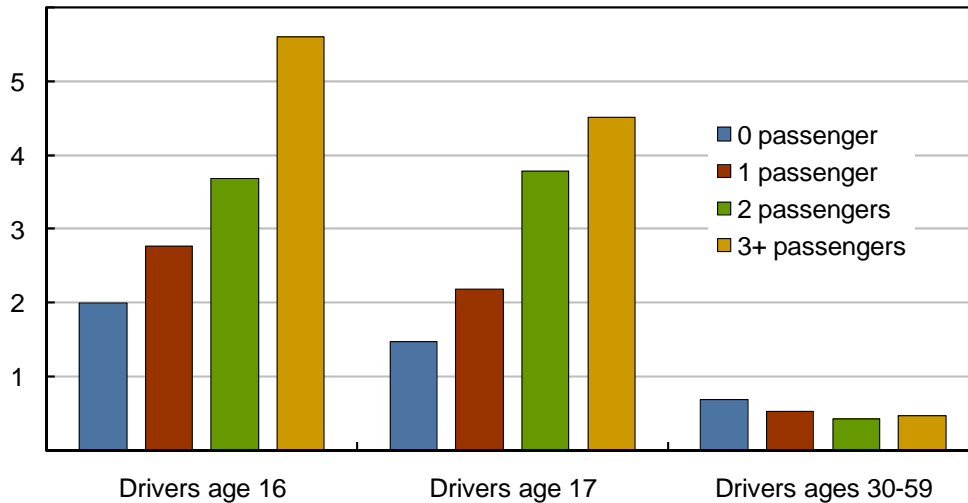
A major crash risk factor for teenage drivers is passenger presence, especially teenage passengers. For older drivers, passenger presence either has no effect on crash risk or decreases it; but for young drivers, passengers greatly magnify the risk.¹ That is, teenagers' already high fatal crash risk when driving alone increases dramatically when passengers are added (Figure 1, page 2).¹

Teenage passengers create distractions for drivers who are inexperienced to start with and who need to be paying full attention to the driving task. Plus the presence of peers in the vehicle may induce young drivers to take risks.

Restrictions on Driving with Passengers

Passenger restrictions can involve some inconvenience for parents. Still, Insurance Institute for Highway Safety (IIHS) surveys of parents show strong support for graduated licensing in states where it has been adopted and for passenger restrictions where they are in effect.^{2,3}

Figure 1
Driver Death Rates per 10,000 Trips by Driver Age and Passenger Presence



Because of the risks that teenage passengers pose for young drivers, 42 states and the District of Columbia have introduced passenger limitations as part of their graduated driver licensing (GDL) systems. Evaluations conducted in states that have enacted passenger restrictions have found these restrictions are effective in reducing crashes of teenage drivers transporting other teenagers.⁴⁻⁷

Additionally, IIHS has evaluated the effect of US state GDL laws on the rate of teenage driver fatal crash involvements per 100,000 teenagers during 1996-2007 and the contributions of specific licensing components.⁸ The fatal crash rate for 15-17-year-old drivers was 21 percent lower when they were prohibited from having any teenage passengers in their vehicles versus allowing two or more passengers. Allowing only one teenage passenger reduced the rate by 7 percent. A companion study by the Highway Loss Data Institute, an affiliate of IIHS, evaluated the effect of GDL laws on the frequency of insurance collision claims per insured vehicle year among insured teenage drivers during 1996-2008.⁹ Collision insurance covers damage to the insured driver's vehicle, and the majority of collision claims are for relatively minor crashes. The study found a 5 percent reduction in the rate of collision claims for 16-17-year-old drivers subject to restrictions allowing no more than one teenage passenger, compared with drivers not subject to passenger restrictions or those allowed to have more than one teenage passenger.

Implementing a strong passenger restriction as part of Pennsylvania's GDL law will reduce the rate of teenage crashes and save lives.

References

1. Chen, L.; Baker, S.P.; Braver, E.R.; and Li, G. 2000. Carrying passengers as a risk factor for crashes fatal to 16- and 17-year-old drivers. *Journal of the American Medical Association* 283:1578-82.
2. Ferguson, S.A.; Williams, A.F.; Leaf, W.A.; Preusser, D.F.; and Farmer, C.M. 2001. Views of parents of teenagers about graduated licensing after experience with the laws. *Journal of Crash Prevention and Injury Control* 2:221-27.

3. Williams, A.F.; Nelson, L.A.; and Leaf, W.A. 2002. Responses of teenagers and their parents to California's graduated licensing system. *Accident Analysis and Prevention* 34:835-42.
4. Chaudhary, N.K.; Williams, A.F.; and Nissen, W. 2007. Evaluation and compliance of passenger restrictions in a graduated licensing program. Report no. DOT HS-810-781. Washington, DC: National Highway Traffic Safety Administration.
5. Cooper, D.; Gillen, D.; and Atkins, F. 2005. Measuring the impact of passenger restrictions on new teenage drivers. *Accident Analysis and Prevention* 37:19-23.
6. Masten, S.V. and Hagge, R.A. 2004. Evaluation of California's graduated driver licensing program. *Journal of Safety Research* 35:523-35.
7. Rice, T.M.; Peek-Asa, C.; and Kraus, J.F. 2004. Effects of the California graduated driver licensing program. *Journal of Safety Research* 35:375-81.
8. McCartt, A.T.; Teoh, E.R.; Fields, M.; Braitman, K.A.; and Hellinga, L.A. 2009. Graduated licensing laws and fatal crashes of teenage drivers: a national study. Arlington, VA: Insurance Institute for Highway Safety.
9. Trempel, R.E. 2009. Graduated driver licensing laws and insurance collision claim frequencies of teenage drivers. Arlington, VA: Highway Loss Data Institute.

PANEL 2 – EVIDENCE FOR DISTRACTED DRIVING LEGISLATION AND CELLPHONE/TEXTING BANS FOR ALL DRIVERS

Cellphone Use while Driving is Widespread

Many US drivers talk on cellphones while driving. Observational surveys conducted by the National Highway Traffic Safety Administration (NHTSA) indicate that at any given time during daylight hours in 2008, 6 percent of passenger vehicle drivers were talking on hand-held phones. This was double the rate observed in 2000, but use has not risen since 2005.¹⁻³ Precise measurements of hands-free cellphone use cannot be obtained through observational surveys, but many drivers report using hands-free phones in telephone surveys.⁴⁻⁷ Based on drivers' self-reported phone use combined with observed use rates, NHTSA estimates that 11 percent of drivers were using any kind of phone at any given daylight moment in 2008. The estimated rate of daytime total phone use was up from 4 percent in 2000 but has been relatively steady since 2005.¹⁻³

A recent national telephone survey of drivers found that roughly 7 percent of time behind the wheel is spent on the phone.⁷ This is lower than the federal government's daytime estimate, but includes driver phone use on all kinds of roads during all hours. Overall, 40 percent of drivers surveyed reported talking on phones at least a few times per week, and 19 percent talk daily. Forty-two percent of drivers said they use phones when traffic was stop and go, just shy of the 45 percent who use them in free-flowing traffic on high-speed roads, presumably when driving requires less concentration. Even in heavy, fast traffic, 24 percent said they have talked on phones.

Risk Associated with Cellphone Use while Driving

Research has established that talking on a phone increases crash risk. Two controlled epidemiological studies used cellphone company billing records to verify crash-involved drivers' phone use. One study observed that talking on a phone was associated with a four-fold increase in the risk of a property-damage-only crash,⁸ and the other observed a four-fold increase in the risk of a crash serious enough to injure the driver.⁹ In both studies, the increased risk was similar for hand-held and hands-free phones.

Other evidence comes from research involving drivers observed in their own vehicles outfitted with cameras and other technology. In a study of 100 vehicles monitored for about a year, cellphone use was a common source of driver distraction.¹⁰ The odds of an at-fault near-crash or crash were 2.8 times as high when dialing a hand-held device than when hand-held phones were not used. When talking on a hand-held phone, the odds were 1.3 times as high. This increase did not reach traditional levels of statistical significance, but when the amount of time spent conversing on a phone versus dialing was considered, the percentages of near-crashes or crashes attributable to talking and dialing hand-held phones were equivalent (3.6 percent).

Effect of Increased Phone Use on Population Crash Rates

The increased rates of cellphone use (Figure 1) would be expected to be leading to increased rates of crashes in the US population. The Insurance Institute for Highway Safety (IIHS) and National Safety Council have separately estimated that the rates of cellphone use by drivers, coupled with the four-fold increase in crash risk, would imply that by 2008, 20-25 percent of crashes were caused by cellphone use.^{11,12} However, the number of police-reported crashes has steadily declined during the past decade (Figure 2). Similarly, there has been no increase in insurance collision claim frequencies per insured vehicle year during this time period (Figure 3, page 6).

This is a paradoxical finding. It is theoretically possible that factors other than cellphone use are acting to reduce crash risk nationally, and that increased cellphone use actually has limited this reduction. But

Figure 1
US Cellphone Subscribers (in Millions), 1985-2008

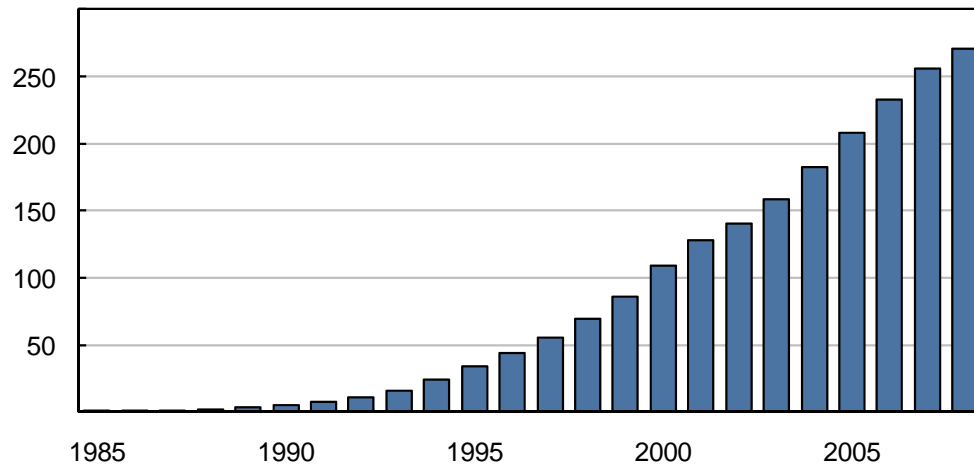


Figure 2
Police-Reported Crashes (in Millions), 1988-2008

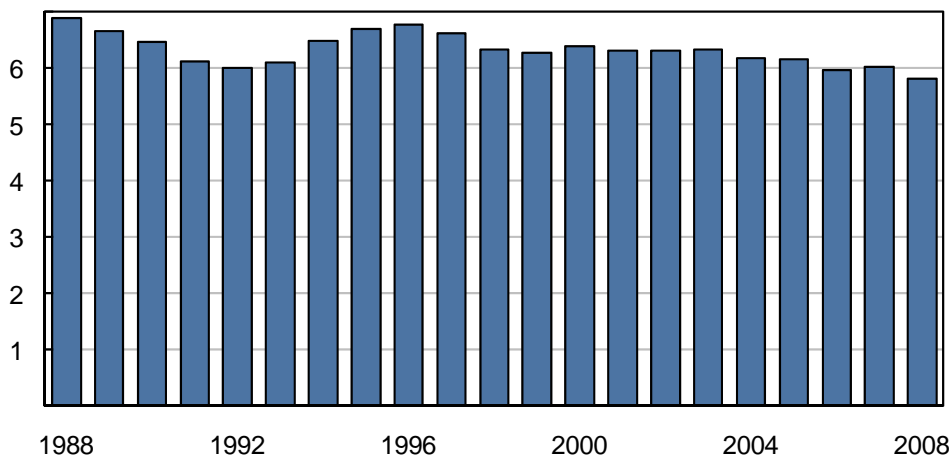
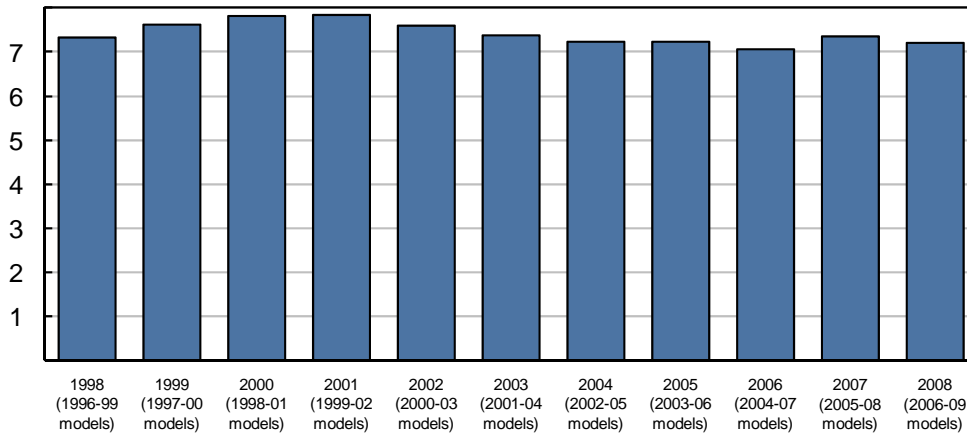


Figure 3
Collision Claims per 100 Insured Vehicle Years by Calendar Year
Based on Four Most Recent Model Years

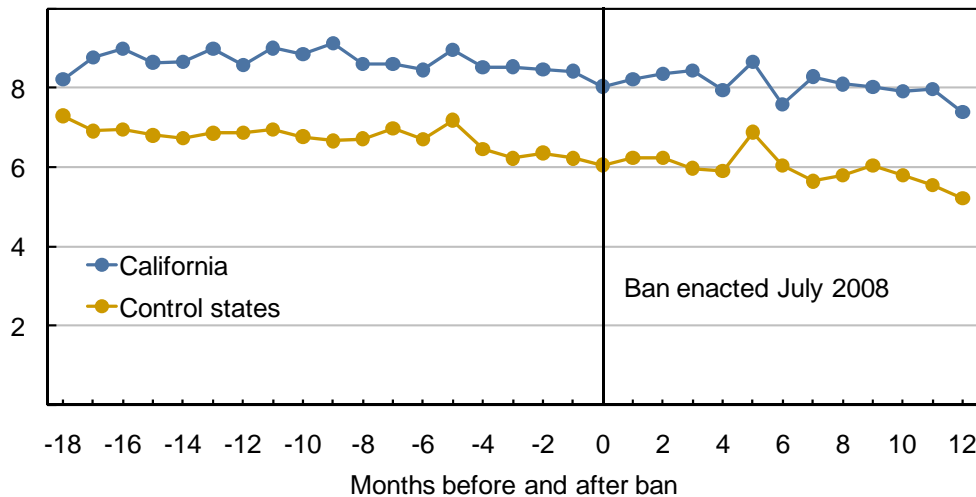


there are no known factors that would be expected to have offset the large increase in risk estimated from cellphone use. More important, this would imply that a reduction in cellphone use by drivers should increase the decline in crash rates. Analysis of crash rates in states that have banned handheld phone use shows this not to be the case.

IIHS studied driver cellphone use following three bans on handheld use by all drivers in New York, Connecticut, and the District of Columbia and found that long-term reductions in handheld use varied from 24 to 65 percent.¹³⁻¹⁵ Some of the reductions in handheld use occurred as drivers switched to hands-free devices, but probably not all. In a 2009 IIHS telephone survey, respondents in states with handheld bans for all drivers were much more likely than respondents in other states to say they use hands-free devices (22 vs. 13 percent) but also to say they never phone while driving (44 vs. 30 percent).

However, this clear change in driver phone use behavior has not been accompanied by reductions in crashes in the states with handheld bans. The Highway Loss Data Institute, an affiliate of IIHS, recently analyzed insurance collision claim frequencies for 0-3-year-old vehicles in four jurisdictions with handheld bans. Figure 4 shows monthly frequencies of collision claims per 100 insured vehicle years in California during the 18 months before and 12 months after the state's hand-held ban took effect in July 2008. Also shown are claim frequencies for vehicles aggregated across the neighboring states of Arizona, Nevada, and Oregon, jurisdictions without bans. Although monthly claim frequencies varied considerably, there was no change in California associated with the law. Monthly changes in claim frequencies during the months leading up to and following the California ban were very similar to patterns in the comparison states. Collision claim frequencies also were examined before and after bans took effect in New York, Connecticut, and the District of Columbia relative to claim frequencies in nearby jurisdictions that did not have bans. Results were the same: no reduction in claim frequencies coincident with the laws.

Figure 4
Collision Claim Frequencies (per 100 Insured Vehicle Years) for New Vehicles
before and after Hand-Held Phone Use Ban, California vs. Arizona, Nevada, and Oregon



These findings are not consistent with what research has found about the risk of cellphone use while driving. If crash risk increases with phone use and fewer drivers use phones where it is illegal to do so, a decrease in crashes would be expected. However, collision claim frequencies did not decline after hand-held phone bans. Nor were there increases in claim frequencies before the phone bans took effect, when drivers' phone use had been increasing.

The finding that national and state crash rates are uncorrelated with changes in driver cellphone use is difficult to explain, given the wealth of data showing that cellphone use is distracting and increases driver errors. One possible explanation is that the crash risk associated with cellphone use has been overestimated. Another is that driver distraction in the absence of cellphone use has been underestimated; it is possible that driver phone use is displacing other distracting behavior that similarly increases crash risk. At this time, the explanation is unknown. What is known is that population crash risk has not increased with driver phone use, and state laws that reduce phone use have not improved safety as measured by crashes reported to insurers.

Texting while Driving

It is apparent that looking at a phone and manipulating it with both hands is inconsistent with safe driving. Yet 13 percent of drivers interviewed in the 2009 IIHS survey reported at least some texting while driving, and this figure rose to 43 percent for drivers ages 18-24.⁷ There is not a lot of research on texting and driving, but three studies of young drivers found that receiving, and especially sending, text messages led to decrements in simulated driving performance, particularly lane keeping and reaction time.¹⁶⁻¹⁸ A naturalistic driving study reported a 23-fold increase in the risk of crashing, nearly crashing, conflicting with traffic, or drifting from the driving lane among truckers who texted while driving. More than 95 percent of the

incidents involved traffic conflicts or lane drifts, 4 percent were near-crashes, and less than 1 percent were crashes. It is unknown whether the findings can be generalized to drivers of passenger vehicles.

Laws banning texting while driving, especially ones allowing drivers to dial phones, are difficult to enforce. So far it appears that drivers, especially young adults, largely ignore texting bans. Among 18-24 year-olds responding to IIHS's telephone survey, 45 percent reported texting while driving in states that ban the practice for all drivers, just shy of the 48 percent of drivers the same ages who reported texting in states without bans. Among drivers 25-29, 40 percent reported texting in states with bans, compared with 55 percent in states without bans. Twelve percent of drivers ages 30-59 reported texting while driving in states both with and without bans.⁷ Only about half of the drivers in states with all-driver texting bans knew about the bans, and only 22 percent of them thought the bans were being strongly enforced.

Crash Avoidance Technology May Help

Driver error has long been the most frequent proximal cause of crashes, even before the advent of cell-phones and other electronic distractions in vehicles.¹⁹ To prevent or mitigate some of these errors, auto-makers and their suppliers are introducing technology designed to alert drivers to imminent collisions or dangerous situations and, in some cases, take action automatically to brake or correct vehicle course. Such technology may offer some protection against distractions from cellphone use, with the additional advantage that the technology would address errors made by drivers when the distractions come from other sources.

Remaining Research Questions

Policymakers require better evidence on several key issues to make sound decisions about what countermeasures to adopt. It is known that phone use while driving increases crash risk, but there are discrepancies in the estimated size of the risk that need to be better understood. The risk associated with various types of hands-free phones, including fully hands-free devices, relative to other devices has not been established. The most serious knowledge deficit is understanding why banning driver cellphone use does not reduce collision claim frequencies, even though research has demonstrated the risk of phone use while driving and that bans reduce how often phones are used behind the wheel.

IIHS will continue to conduct research to understand apparent discrepancies in the findings of various studies and seek answers to key questions so that public policy will be based on sound evidence.

References

1. Glassbrenner, D. 2005. Driver cellphone use in 2005—overall results; traffic safety facts research note. Report no. DOT HS-809-967. Washington, DC: National Highway Traffic Safety Administration.
2. National Highway Traffic Safety Administration. 2009. Driver electronic device use in 2008. Report no. DOT HS-811-184. Washington, DC: US Department of Transportation.

3. Utter, D. 2001. Passenger vehicle driver cell phone use results from the fall 2000 National Occupant Protection Use Survey. Report no. DOT HS-809-293. Washington, DC: National Highway Traffic Safety Administration.
4. Boyle, J.M. and Lampkin, C. 2008. 2007 Motor Vehicle occupant safety survey, volume 4: crash injury and emergency medical services report. Report no. DOT HS-810-977. Washington, DC: National Highway Traffic Safety Administration.
5. Harris Interactive. 2006. Despite understanding risks many U.S. adults still use cellphones while driving. The Harris Poll no. 46, June 6, 2006. Available: http://www.harrisinteractive.com/harris_poll/index.asp?PID=673. New York, New York: Harris Interactive.
6. Nationwide Insurance. 2008. Driving while distracted, public relations research. Columbus, OH: Nationwide Mutual Insurance Company.
7. Braitman, K.A. and McCartt, A.T. 2010. National survey of cellphone use while driving. Arlington, VA: Insurance Institute for Highway Safety.
8. Redelmeier, D.A. and Tibshirani, R.J. 1997. Association between cellular-telephone calls and motor vehicle collisions. *The New England Journal of Medicine* 336:453-58.
9. McEvoy, S.P.; Stevenson, M.R.; McCartt, A.T.; Woodward, M.; Haworth, C.; Palamara, P.; and Cercarelli, R. 2005. Role of mobile phones in motor vehicle crashes resulting in hospital attendance: a case-crossover study. *British Medical Journal* 331(7514):428-30.
10. Klauer, S.G.; Dingus, T.A.; Neale, V.L.; Sudweeks, J.D.; and Ramsey, D.J. 2006. The impact of driver inattention on near-crash/crash risk: an analysis using the 100-car naturalistic driving study data. Report no. DOT HS-810-594. Washington, DC: National Highway Traffic Safety Administration.
11. Farmer, C.M. and Braitman, K.A. 2010. Cellphone use while driving and attributable crash risk. Arlington, VA: Insurance Institute for Highway Safety.
12. National Safety Council. (2010) National Safety Council Estimates that At Least 1.6 Million Crashes are Caused Each Year by Drivers Using Cell Phones and Texting. Press Release, January 12. National Safety Council, Itasca, IL.
13. McCartt, A.T. and Geary, L.L. 2004. Longer term effects of New York State's law on drivers' hand-held cellphone use. *Injury Prevention* 10:11-15.
14. McCartt, A.T. and Hellinga, L.A. 2007. Longer term effects of Washington, DC, law on drivers' hand-held cellphone use. *Traffic Injury Prevention* 8:199-204.
15. McCartt, A.T.; Hellinga, L.A.; Strouse, L.M.; and Farmer, C.M. 2009. Long-term effects of hand-held cellphone laws on driver hand-held cellphone use. Arlington, VA: Insurance Institute for Highway Safety.
16. Drews, F.A.; Yazdani, H.; Godfrey, C.N.; and Cooper, J.M. 2009. Text messaging during simulated driving. *Human Factors* 51(5):762-770.
17. Hosking, S.; Young, K.; and Regan, M. 2006. The effects of text messaging on young novice driver performance. Monash University Accident Research Center. Report no. 246. Monash, Australia: Monash University.
18. Reed, N. and Robbins, R. 2008. The effect of text messaging on driver behavior: a simulator study. Published re-port PPR 367. Berkshire, United Kingdom: Transport Research Laboratory.
19. Treat, J.R.; Tumbas, N.S.; McDonald, S.T.; Shinar, D.; Hume, R.D.; Mayer, R.E.; Stansifer, R.L.; and Castellan, N.J. 1979. Tri-level study on the causes of traffic accidents: final report, volumes I and II. Report No. DOT HS-805-086. Washington, DC: US Department of Transportation.