HB
257

3026

Alaska State Legislature

Mike Doogan
Representative
District 25, Anchorage

SPONSOR STATEMENT

HB 257

An Act relating to prohibiting the use of cellular telephones when driving a motor vehicle

Distracted drivers cause accidents. Current Alaska law prohibits the use of certain devices with screens (such as televisions) while driving, in order to prevent drivers from taking their focus off the road. This prohibition includes the use of cell phones for sending text messages, but excludes the use of cell phones for "verbal communication or displaying caller identification information". HB 257 would prohibit any use of a cell phone while driving—including the use of a phone with a hands-free device—with an exception only for emergency calls. Violations would be punishable by fines of up to $300.

As cell phones have become more widely available, the number of drivers distracted by cell phones has increased—putting more and more Alaskans in harm's way. The use of a cell phone while driving slows a driver's reaction time by dividing their attention. One study showed that using a cell phone while driving is as dangerous as driving drunk. This held true even for drivers using hands-free devices. Another study showed that drivers are four times more likely to get in an accident if they talk on a cell phone while driving.

Distracted drivers put themselves and everyone around them at risk. By prohibiting the use of cell phones while driving, HB 257 will make Alaska's roads safer for drivers, pedestrians, and cyclists, preventing needless accidents caused by distracted drivers.

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District 25, Anchorage

SECTIONAL ANALYSIS

HB 257

An Act relating to prohibiting the use of cellular telephones when driving a motor vehicle

Section 1: Amends AS 28.35 to stipulate that a person may not use a cell phone while driving. An exception is made for emergency phone calls. Punishment is to be assigned as provided under AS 28.90.010, with a maximum possible fine of $300.

Section 2: Sets the date for the Act to take effect as July 1, 2010.

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ALASKA STATUTES

Title 28. MOTOR VEHICLES

Chapter 28.35. OFFENSES AND ACCIDENTS

Article 03. MISCELLANEOUS OFFENSES

Sec. 28.35.161. Driving a motor vehicle with a screen device operating; unlawful installation of television, monitor, or similar device.

(a) A person commits the crime of driving with a screen device operating if

(1) the person is driving a motor vehicle;

(2) the vehicle has a television, video monitor, portable computer, or any other similar means capable of providing a visual display that is in full view of a driver in a normal driving position while the vehicle is in motion; and

(3) the monitor or visual display is operating while the person is driving.

(b) A person may not install or alter equipment described in (a)(2) of this section that allows the images to be viewed by the driver in a normal driving position while the vehicle is in motion.

(c) Subsections (a) and (b) of this section do not apply to

(1) portable cellular telephones or personal data assistants being used for verbal communication or displaying caller identification information;

(2) equipment that is displaying only

(A) audio equipment information, functions, and controls;

(B) vehicle information or controls related to speed, fuel level, battery charge, and other vehicle safety or equipment information;

(C) navigation or global positioning;

(D) maps;

(E) visual information to

(i) enhance or supplement the driver's view forward, behind, or to the sides of the motor vehicle for the purpose of maneuvering the vehicle; or

(ii) allow the driver to monitor vehicle occupants seated behind the driver;

(F) vehicle dispatching and response information for motor vehicles providing emergency road service or roadside assistance;

(G) vehicle dispatching information for passenger transport or freight or package delivery;

(H) information for use in performing highway construction, maintenance, or repair or data acquisition by the Department of Transportation and Public Facilities or a municipality; or

(I) information for use in performing utility construction, maintenance, repair, or data acquisition by a public utility; in this subparagraph, "public utility" has the meaning given in AS 42.05.990.

(d) Subsections (a) and (b) of this section do not apply to devices and equipment installed in an emergency vehicle. In this subsection, "emergency vehicle" means a police, fire, or emergency medical service vehicle.

(e) It is an affirmative defense to a prosecution under (b) of this section that the equipment installed or altered includes a device that, when the motor vehicle is being driven, disables the equipment for all uses except those described in (c) of this section.

(f) A person who violates (a) of this section is guilty of

(1) a class A misdemeanor, unless any of the circumstances described in (2) - (4) of this subsection apply;

(2) a class C felony if the person's driving causes physical injury to another person;

(3) a class B felony if the person's driving causes serious physical injury to another person;

(4) a class A felony if the person's driving causes the death of another person.

(g) A person who violates (b) of this section is guilty of a class A misdemeanor.

History -

(Sec. 1 ch 99 SLA 2008; am Sec. 1 ch 42 SLA 2009)

Amendment Notes -

The 2009 amendment, effective September 18, 2009, added (c)(2)(I), and made related stylistic changes.

Effective Date Notes -

Section 3, ch. 99, SLA 2008, makes this section effective September 1, 2008.

ALASKA STATUTES

Title 28. MOTOR VEHICLES

Chapter 28.90. GENERAL AND MISCELLANEOUS PROVISIONS

Article 01. MISCELLANEOUS PROVISIONS

Sec. 28.90.010. Penalties for violations of law, regulations, and municipal ordinances.

(a) It is a misdemeanor for a person to violate a provision of this title unless the violation is by this title or other law declared to be a felony or an infraction.

(b) A person convicted of a misdemeanor for a violation of a provision of this title for which another penalty is not specifically provided is punishable by a fine of not more than $500, or by imprisonment for not more than 90 days, or by both. In addition, the privilege to drive or the registration of vehicles may be suspended or revoked.

(c) Unless otherwise specified by law a person convicted of a violation of a regulation adopted under this title, or a municipal ordinance regulating vehicles or traffic when the municipal ordinance does not correspond to a provision of this title, is guilty of an infraction and is punishable by a fine not to exceed $300.

(d) An infraction, as provided for in (c) of this section, is not considered a criminal offense and may not result in imprisonment, nor is a fine imposed for the commission of an infraction considered a penal or criminal punishment; nor may the commission of a single infraction result in the loss of a driver's license or privilege to drive in this state except as may result from the accumulation of points under AS 28.15.221 - 28.15.261, or the registration of vehicles; nor does a person cited with an infraction have a right to trial by jury or to court-appointed counsel.

(e) [Repealed, Sec. 5 ch 85 SLA 1987].

History -

(Sec. 50-1-8 ACLA 1949; am Sec. 12 ch 241 SLA 1976; am Sec. 22, 23 ch 144 SLA 1977; am Sec. 5 ch 85 SLA 1987)

Revisors Notes -

Formerly AS 28.35.230. Renumbered as AS 28.40.050 in 1984 and renumbered again in 2006.

Decisions -

This section governs the penalties for violations of this title, and creates three categories of traffic offenses: felonies, misdemeanors and infractions. State v. Clayton, 584 P.2d 1111 (Alaska 1978).

Violations of AS 28.35.050(a) are punishable under this section. Drahosh v. State, 442 P.2d 44 (Alaska 1968).

Prerequisite to suspension of license or privilege to drive. - A driver's license or privilege to drive cannot properly be suspended unless the driver was in fact licensed or otherwise actually privileged to drive a motor vehicle within the state. Roberts v. State, 700 P.2d 815 (Alaska Ct. App. 1985).

Generic penalty provision. - Subsection (b) is not a penalty provision dealing specifically with the offense of driving while license suspended; rather it is a generic penalty provision, broadly applicable to violations of all Title 28 provisions for which the specific penalties are given. Roberts v. State, 700 P.2d 815 (Alaska Ct. App. 1985).

Meaning of "law" in subsection (c). - The term "law," as used in subsection (c) of this section, refers to statutory enactments of the Alaska legislature and cannot be read to include the provisions of municipal ordinances. Anderson v. Municipality of Anchorage, 645 P.2d 205 (Alaska Ct. App. 1982).

Nature of "correspondence" between ordinance and statute required by subsection (c). - The requirement of correspondence stated in subsection (c) of this section calls for a level of similarity between a municipal ordinance and a provision of AS 28 that would make the ordinance a functional equivalent of its statutory counterpart. Anderson v. Municipality of Anchorage, 645 P.2d 205 (Alaska Ct. App. 1982).

The legislature's purpose in enacting subsection (d) was to eliminate the criminal stigma from minor traffic offenses while keeping the enforcement of such offenses within the criminal system's procedures. State v. Clayton, 584 P.2d 1111 (Alaska 1978).

A prosecution for a traffic infraction is a quasi-criminal proceeding to which certain criminal procedures including the issuance of warrants are applicable. State v. Clayton, 584 P.2d 1111 (Alaska 1978).

Although the language in subsection (d) with regard to an infraction not being considered a criminal offense nor a fine therefor a criminal punishment indicates that the legislature did not intend to make minor traffic offenses criminal offenses, it does not follow that the legislature by labeling infractions "noncriminal" meant that they are civil in nature and thus that criminal procedures are not available for the enforcement of infractions. State v. Clayton, 584 P.2d 1111 (Alaska 1978).

Notwithstanding the legislative labeling of a traffic infraction a noncriminal offense by this section, it retains many criminal terms, such as "convicted," "violation," "guilty," "punishable by a fine." State v. Clayton, 584 P.2d 1111 (Alaska 1978).

An infraction is not an offense for double jeopardy purposes. Carlson v. State, 676 P.2d 603 (Alaska Ct. App. 1984).

Jury trial. - AS 28.10.105(a) (now repealed) and the other registration statutes in pari materia do not specify a violation of the registration statutes as an infraction, and thus under this section, such a violation is a misdemeanor punishable by up to 90 days' imprisonment, and entitling a defendant to a jury trial, denial of which right constitutes prejudicial error, requiring a new trial. Epperly v. State, 648 P.2d 609 (Alaska Ct. App. 1982).

Traditional use of criminal process not affected. - In the absence of express contrary declaration, the legislature did not intend by the enactment of subsection (d) to affect the traditional use of the criminal process for enforcement of traffic infractions. State v. Clayton, 584 P.2d 1111 (Alaska 1978).

This section makes no changes in the traditional mode of proceeding in criminal matters with the exception of its declaration that a person cited with an infraction does not have a right to trial by jury or to court-appointed counsel. The action is brought in the name of the state; it is commenced by the filing of a complaint by a law enforcement official; it is prosecuted by the district attorney. The exceptions appear to merely codify existing constitutional law. State v. Clayton, 584 P.2d 1111 (Alaska 1978).

Applied in Manderson v. State, 655 P.2d 1320 (Alaska Ct. App. 1983).

Stated in Francis v. Municipality of Anchorage, 641 P.2d 226 (Alaska Ct. App. 1982).

Quoted in State v. Dutch Harbor Seafoods, Ltd., 965 P.2d 738 (Alaska 1998).

Cited in Lowry v. State, 655 P.2d 780 (Alaska Ct. App. 1982); Hamilton v. State, 59 P.3d 760 (Alaska Ct. App. 2002); Walsh v. State, Op. No. 2048, 134 P.3d 366 (Alaska Ct. App. 2006).

Collateral Refs -

7A Am. Jur. 2d, Automobiles and Highway Traffic, Sec. 244.

61A C.J.S., Motor Vehicles, Sec. 1311 et seq.

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HB 257
1/2010

The National Highway Traffic Safety Administration policy on cellular phone use while driving is that it is the primary responsibility of the driver is to operate a motor vehicle safely. The task of driving requires full attention and focus. Cell phone use can distract drivers from this task, risking harm to themselves and others. Therefore, the safest course of action is to refrain from using a cell phone while driving.

NHTSA encourages states to pass laws which ban the use of cell phones. Distracted driving related crashes have increased in the last 10 years.

Ten years ago only 15% of the reported traffic crashes were attributed to driver inattention. NHTSA estimates that driver distraction from all sources contributes to 25 % of all traffic crashes.

A ban on hand-held devices has been enacted in 8 states:

1. California
2. Connecticut
3. District of Columbia
4. New Jersey
5. New York
6. Oregon
7. Washington
8. Virgin Islands

In those states with established handheld laws, distracted driving-related fatalities have declined between 24 % (New York) and 65% (Connecticut). (Source: Insurance Institute for Highway Safety)

NHTSA Recognized Research:
Using a cell phone use while driving, whether it's hand-held or hands-free, delays a driver's reactions as much as having a blood alcohol concentration at the legal limit of .08 percent. (Source: University of Utah)
Driving while using a cell phone reduce the amount of brain activity associated with driving by 37 percent. (Source: Carnegie Mellon)
80 percent of all crashes and 65 percent of near crashes involve some type of distraction. (Source: Virginia Tech 100-car study for NHTSA)
The Virginia Tech study also showed that talking on a cell phone allowed drivers to keep their eyes on the road and did not carry nearly the same increased safety risk as texting. The research showed that most of the danger involved finding the phone, putting on the headset (if used) and dialing the number.
In a NHTSA test track study, the results showed that manual dialing was about as distracting as grooming/eating, but less distracting than reading or changing CDs. It is also important to keep in mind that some activities are carried out more frequently and for longer periods of time and may result in greater risk.
Nearly 6,000 people died in 2008 in crashes involving a distracted or inattentive driver, and more than half a million were injured. (NHTSA)
Drivers who use hand-held devices are four times as likely to get into crashes serious enough to injure themselves. (Source: Insurance Institute for Highway Safety)

Alaska Distracted Driving Statistics:
Driver inattention is cited in 28% of all traffic-related crashes.
Driver distraction plays a factor in an average of 10-12 crashes daily.
From 2002-2007 there were 189 reported traffic crashes involving cell phone use.
From 2002-2007, of the 189 reported traffic crashes, 127 resulted in minor injuries, 19 in major injuries and 0 fatalities.
From 2002-2007 of the 189 reported traffic crashes, there were 200 minor injuries and 20 major injuries in these traffic crashes.

National Distracted Driving Statistics:
In 2008, there were a total of 34,017 fatal crashes in which 37,261 individuals were killed.
In 2008, 5,870 people were killed in crashes involving driver distraction (16% of total fatalities).
The proportion of drivers reportedly distracted at the time of the fatal crashes has increased from 8 percent in 2004 to 11 percent in 2008.
An estimated 21 percent of 1,630,000 injury crashes were reported to have involved distracted driving.

Number of Motor Vehicle Crashes Involving Cell phone Use, Alaska 2002-2007

	Property Damage Only	Minor Injury	Major Injury	Fatal	TOTAL
2002	38	16	5	0	59
2003	34	24	1	0	59
2004	33	22	6	0	61
2005	38	21	3	0	62
2006	24	21	3	0	48
2007	22	23	1	0	46
TOTAL	189	127	19	0	335

Source: State of Alaska, DOT&PF, Highway Analysis System (HAS)

Number of Injuries in Motor Vehicle Crashes Involving Cell Phone Use, Alaska 2002-2007

	No Injuries	Minor Injury	Major Injury	Fatalities	TOTAL
2002	132	30	6	0	168
2003	140	39	1	0	180
2004	121	32	6	0	159
2005	109	32	3	0	144
2006	94	38	3	0	135
2007	79	29	1	0	109
TOTAL	675	200	20	0	895

Source: State of Alaska, DOT&PF, Highway Analysis System (HAS)

Number of Motor Vehicle Crashes Involving Cell Phone Use, By Age of Driver Using Cell Phone, Alaska 2002-2007

Age of Driver using Cell Phone	2002	2003	2004	2005	2006	2007	TOTAL Crashes
under 10							0
10-15			1				1
16-20	17	20	22	24	16	18	117
21-25	8	9	8	6	12	9	52
26-30	7	5	6	8	5	5	36
31-35	9	7	6	6	2	1	31
36-40	7	3	6	3	7	3	29
41-45	4	6	3	6	4	3	26
46-50	3	7	6	5	1	2	24
51-55		1	1	1		2	5
56-60	1		2	1		1	5
61-65		1		1		0	2
66-70	1			1		1	3
71-75	1						1
76-80							0
81+					1		1
Unknown	1					1	2
TOTAL	59	59	61	62	48	46	335

Source: State of Alaska, DOT&PF, Highway Analysis System (HAS)

adn.com Anchorage Daily News

Our view: Distracted

Ban on cell phone use while driving is common sense

Published: January 12th, 2010 07:16 PM
Last Modified: January 12th, 2010 07:17 PM

Multitasking is overrated. Sometimes it's dangerous. That's the case with talking on a cell phone while driving.

And that's why Rep. Mike Doogan has pre-filed a bill to ban jabbering on a cell phone while driving in Alaska. His bill would make exception for emergencies.

Doogan's blanket ban is better than a bill left over from last year that bans the practice for drivers younger than 18. Evidence is clear that young drivers are on average worse at driving than adult drivers. But everyone's driving gets worse when they use a cell phone on the road.

Cell phone distraction is insidious. University of Utah researchers found that driving while using a cell phone was as bad as driving drunk. They also found that most drivers felt using a cell made no difference in their driving. That misperception makes the practice even more dangerous.

Alaska should make it illegal.

Rep. Jay Ramras said Doogan's bill won't get out of his committee unless it makes the offense secondary. In other words, a driver won't get cited for cell phone use unless he's pulled over for something else first. That defeats the purpose of the bill, which is to get drivers off their cell phones and paying attention to the one job they need to do while behind the wheel -- driving. Give police and troopers discretion to warn first and ticket later. But for the bill to matter, driving while distracted by cell should be a primary offense.

Rep. Ramras said police don't need another reason to pull people over. The reason -- and danger -- is already with us. We just need to give our police the authority to deal with it.

BOTTOM LINE: Cell phone use while driving is dangerous and unnecessary. Alaska should ban it.

adn.com
Anchorage Daily News

Letters to the editor (10/22/09)

Published: October 21st, 2009 07:11 PM
Last Modified: October 21st, 2009 07:12 PM

Get cell-phone drivers off road

Driving with others who aren't attentive to their bad driving habits is bad enough. Now you throw in a cell phone and they are totally oblivious to the fact that they are even on the road in control of a 3,000-pound vehicle. It's time we stop this nonsense before winter starts. The bases have the right idea by banning all use of cell phones while driving -- why not the public roads? I don't know about you, but I have enough bills and don't want to add my insurance deductible to the debt -- much less a possibility of being injured or loss of my vehicle for weeks at a time while it's being repaired.

Maybe more pulloffs for those who insist on having to talk on the phone -- anything!

Change the law now before more people get hurt. Other states have wised up -- what are we waiting for?

-- John Reece

Anchorage

Talk of the Tundra

Safe driving not a partisan issue

John Aronno
Jan 23, 2010

It's dark. I'm in a hurry. Only 15 minutes separate me from one end of the University of Alaska Anchorage campus, where I have just gotten out of class, and the opposite end, where my next one starts. Although it's an evening class and the traffic has somewhat dissipated, there is still a definite early-semester buzz in the air: confusion, anxiety, tension. Well, I probably shouldn't try to limit that to campus life.

Throwing my backpack into the passenger seat, I turn on the engine, and slowly begin to back out. This is the part where I almost lose the back half of my truck. If not more.

As I see the car fade off into the distance at speeds that tout the immortal feeling of youth while falling well short of promoting a healthy lifestyle, I notice the single hand firmly cupping the driver's cell phone to their ear, and a detached conversation taking place which presumably bore no mention of the fact that it could have been their last.
It's happened to you. Don't lie. It doesn't have to be at UAA. It happens in the Fred Meyer parking lot, or Costco, or Wal-Mart. Good God does it happen at Wal-Mart. It doesn't have to happen in your car, either. You've seen the mock space shuttle launches when trying to cross the street; inches separating your toes from a random Hummer's tires.

It's not a partisan issue. Just as cross walks and stop signs are not partisan issues. Or as the old saying goes: "There's no such thing as a Republican or Democratic pothole."

But not according to the Alaska Standard contributor, Alex Gimarc, who mounted a pious partisan hack job of an attack article regarding proposed legislation that would join Alaska with 23 other states in having laws that attach restrictions to cell phone use while driving.

Instead of appealing to legitimate Libertarian values that arguably give teeth to questions regarding whether this legislation steps over a boundary from the standpoint of government interference with our every day lives, Gimarc has chosen to threaten civil disobedience in response to (not exactly the most popular Democrat) Rep. Mike Doogan's proposal (which also begs into question the argument that we should limit the legislation to require hands-free devices in lieu of an all-out ban. But that didn't carry enough anti-establishment vitriol, apparently), and is furthermore appalled by Republican representative and candidate for lieutenant governor Jay Ramras, who according to Gimarc, "fell all over himself promising to give this important topic a fair hearing in the Legislature this session."

Wouldn't want to have the bill discussed, pondered, or improved, would we?

Gimarc offers a very pander-heavy perspective:

> "Make no mistake. This argument is not about whether cell phones are a good thing or not. Rather it is about the age old argument between liberty and safety. Are we Alaskans prepared to give up yet another slice of our freedom -- the ability to talk on the phone while driving -- for safety -- some unspecified reduction in accident rates on our highways?"

How much time did you spend reflecting on whether or not this issue, this proposal, was about the good or bad nature of cell phones?

An exercise conducted by The Journal of the Human Factors and Ergonomics Society in Salt Lake City, Utah conducted a well-cited study back in 2006 entitled"A Comparison of the Cell Phone Driver

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and the Drunk Driver." The following is what they found, and what has inspired more and more case studies that continue to trickle into the public domain:

> "Method: We used a high-fidelity driving simulator to compare the performance of cell phone drivers with drivers who were intoxicated from ethanol (i.e., blood alcohol concentration at 0.08% weight/volume).
>
> Results: When drivers were conversing on either a handheld or hands-free cell phone, their braking reactions were delayed and they were involved in more traffic accidents than when they were not conversing on a cell phone. By contrast, when drivers were intoxicated from ethanol they exhibited a more aggressive driving style, following closer to the vehicle immediately in front of them and applying more force while braking.
>
> Conclusion: When driving conditions and time on task were controlled for, the impairments associated with using a cell phone while driving can be as profound as those associated with driving while drunk."

And it doesn't stop there. The National Safety Council, this month, released a report which estimates "at least 28 percent of all traffic crashes -- or at least 1.6 million crashes each year -- are caused by drivers using cell phones and texting."

Gimarc remains unphased and belligerent, using familiar tag lines, such as "the free market already tells us how safe the use of cell phones during driving is."

Yeah, you're right. Read all the stuff I just typed.

What else does the free market tell you during your talks, sir?

> "Are we willing to put ourselves in the position of asking our government permission to make a phone call while driving? I for one choose freedom and would remind Mr. Doogan, Ramras and the ADN that it is not any of their damned business what I do or do not do in my vehicle as long as I don't hit anything."

Except this is utter nonsense. Alaska Statutes Title 28: Motor Vehicles, Chapter 35: Offenses and Accidents, Sections 10 through 410 (AS 28.35.10-410), spell out in no uncertain terms that acts such as driving without an owner' s consent, drunken driving, driving without a license, driving a stolen car, among many, many other offenses, are expressly forbidden by state law.

In a simple appeal to common sense, if "negligent" or "reckless" driving infractions are not specific enough to extend to cell phone usage, than we need to make them.

But, possibly the most egregious and detached statement offered by Mr. Gimarc was in this one liner:

> "I come from the 'you break it; you pay for it' school of public safety."

How does one exactly pay for someone else's son or daughter who is killed in an auto accident? This is arrogance over content. While I believe that the conversation over where governmental involvement becomes intrusion is a phenomenally important one, I don't believe that hiding behind the right to privacy grants us the right to use our cars as weapons for the sole purpose of checking our voice mail messages. Again, at least theoretically, we don't drive drunk. We don't drive without a license. We have to put on seat belts, obey signs and traffic lights, yield to pedestrians, and pull over and either accept the penalties or challenge them in court when we are accused of breaking the law in a way that puts others, and ourselves, at risk. Let's not take the referees completely out of the game, when lives are at risk, simply to make a political point.

Can't we opt to err on the side of preventing careless and avoidable deaths? By stating that, should this legislation pass, we must self righteously defy it as some middle finger to Obama, you're not seeing the reality: The statistics are in. It's not a hoax. Kids are getting hurt, and some are dying. You can't just see them as Republicans or Democrats. Their deaths are tragedies. Avoidable tragedies. How dare you politicize this?

Whether you really believe that we should have the right to do anything in our cars, so long as we "don't hit anyone," are you prepared to tell me that you're going to support that statement when it's your loved one coming down the other side of a two-way highway on a cold, icy night?

John Aronno studies political science at the University of Alaska Anchorage. This opinion piece originally appeared on his blog, Alaska Commons. Talk of the Tundra features commentary by Alaskans from across the state. The views expressed are the writers' own and are not endorsed by Alaska Dispatch.

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Member Comments

Posted By: Crosspicker @ 01.24.2010 7:14 PM

With numbers like 1.6M floating around regarding cell phone related collisions, I find remarks made by Mr. Gimarc to be fairly selfish. Neither am I happy about having my driving freedoms further regulated, however if we were capable of self regulating certain aspects of our lives related to public safety, they would not need to be regulated by the legislature. After having worked my share of traffic collisions for a premier law enforcement agency, I found that the carnage produced by a cell phone driver/operator, versus that of a drunk driver looked strangely similiar.

Mr. Gimarc's attitude is and typical of those we continue to see driving without due regard for the rest of us on the highways of this state, or any other. Blame it on the other guy, stomp on the gas pedal and leave a wake of carnage for someone else to worry about, seems to sum it up.

+0

Rebecca Rooney

From: Backlagoon@aol.com
Sent: Tuesday, February 09, 2010 7:51 PM
To: Rep. Peggy Wilson
Subject: HB 257

Hi Representative Wilson,

I am excited about HB 257 and think it is a proactive way to prevent accidents and save lives. Being a bicyclist who rides on roads for work and recreation on an almost daily basis, I worry about the attentiveness of drivers on cell phones.

I know that I can't both talk and focus on driving. The two activities have become so commonplace and yet so dangerous to road users and pedestrians. Yet, people survived without talking on the phone and driving long before carphones/cell phones were invented. There's no need to have divided attention while operating a vehicle inches away from other people.

Thank you,
Anissa Berry-Frick
(Port Alexander voter)
6105 Thane Rd
Juneau AK 99801 (winter)

Rebecca Rooney

From: Bill Ward [bdward@hughes.net]
Sent: Sunday, February 21, 2010 11:21 AM
To: Rep. Peggy Wilson
Subject: HB 257, Ban Cell Phone use while Driving

PLEASE PROVIDE TO TRANSPORTATION COMMITTEE WHEN SCHEDULED FOR HEARING

I am opposed to the passage of HB 257, Ban cell phone use while driving

1) This bill will punish everyone for the irresponsible actions of a few poor drivers. Government can't legislate a good responsible driver.

2) There are numerous distraction to drivers including: loud music, talkative passengers, children, personal grooming in the mirror, & other visual distractions. It is the responsibility of the driver to manage these distractions including cell phone use.

3) The troopers/police already have the authority to stop & cite drivers who are driving irresponsibly including careless driving due to cell phone use. You should compel law enforcement to do their job to control poor driving instead of restricting the actions of responsible drivers.

Bill Ward 895-5415
Delta Jct

3045

Alpenglow, Inc
P O Box 84608 * Fairbanks, AK 99708
1 800 770-7275 * 907 456-5134 * 907 456-5135(fax) * 907 388-8394

February 18, 2010

Dear Representative Doogan, Buch, P. Wilson & Munoz
% Legislative Office
Fairbanks, Alaska

Regarding: HB 257 ban on cell Phones in vehicles

Dear Representatives:
I oppose the imposition of HB 257 on the people of Alaska.

I am a small seasonal shuttle and tour operator carrying passengers between Whitehorse, Dawson City, Fairbanks, Denali, Talkeetna, and Anchorage. When cell phone coverage became available along the Parks, Richardson and Alaska Highways our company stopped dispatching and keeping in touch with our drivers along their route with hand held radio phones and began using cell phones. In addition to being more burdensome for drivers and less reliable to use, radio phone service was almost five times more expensive than cell phones. If your bill is passed, we will have to return to radio phone service to dispatch and keep in touch with our drivers.

We have requested text blocking on all our phones so that drivers cannot text. It is against our policy for drivers to use cell phones for anything but emergency use and to contact or respond to the office while on duty, driving or parked.

We agree that "chatting" on a cell phone while driving reduces concentration, as does talking to customers while operating a vehicle – which is required of drivers by the largest tour operators in Alaska and Canada. Some of their driver/guides actually have ear phones and microphones attached to their head while driving along the roadways and in cities so that they can both drive and conduct tours. To my knowledge none of them have had accidents in Alaska based on their headphone use. There is no more dangerous place to operate than on the narrow gravel roads in Denali, yet all the bus drivers there are both tour operators and bus drivers using head-phone intercoms during their entire shift.

There are many activities in private vehicles which are distracting but have not been made illegal, including but not limited to:
Eating while driving;

Carrying children who are fighting or otherwise interacting boisterously;
Putting on make-up while driving;
Looking at GPS navigators or maps while driving;
Selecting radio stations, sorting and playing tapes or CDs;
Drivers chatting, flirting or arguing with other passengers in the vehicle;
Narrating tours while also driving;
Rushing to/from destinations when late;
Getting cigarettes out of packs, lighting and smoking while driving;
Watching for moose and other critters while allegedly "not" road hunting;
Driving while sleepy;
Other activities within a vehicle too numerous to mention

Many of the above activities have likely contributed to accidents in the past. Yet, none of those activities have been made illegal. And, if they were made illegal, it would likely not reduce the incidents of those activities occurring while operating a vehicle. If they were made illegal it would simply make criminals out of people living their lives as always they have, and always they will.

In my opinion, this bill is one more example of government over-reaching into the private lives of citizens and making it more difficult for transportation businesses to operate profitably in Alaska.

If you feel you MUST pass yet another law to regulate our personal lives, please consider including cell phones as a punishable mitigating offense if, and only if, it contributes to an accident and/or amending the bill so that commercial operators may continue to use cell phones for dispatching and driver contact with the main office.

Thank you for your consideration.

Valerie Mundt
P O Box 84608
Fairbanks, Alaska 99708

26-LS1104\E.1
Luckhaupt
2/8/10

AMENDMENT

OFFERED IN THE HOUSE BY REPRESENTATIVE MUÑOZ

TO: HB 257

Page 1, line 8, following "telephone":

Insert "(1)"

Page 1, line 10, following "entity":

Insert "; or

(2) by hands-free mode"

Page 1, following line 10:

Insert a new subsection to read:

"(c) In this section, "hands-free mode" means use of a cellular telephone for listening or talking by means of a speaker function, headset, or earpiece without holding the telephone."

Reletter the following subsection accordingly.

L

3048

Joan Priestley, M.D.
Medical Director,
Health Renewal Institute
3705 Arctic Blvd., # 1332
Anchorage, Alaska 99503
(907) 562-2161, Ext. 1332

March 15, 2010

To: Representative Peggy Wilson
Alaska State Legislature
120 4th Street
State Capitol, room 3
Juneau, Alaska 99801

Dear Representative Wilson,

I have enclosed for your review a summary of the testimony that I gave at your recent hearing on House Bill 257 (Cell Phones and Motor Vehicles), and the accompanying exhibits.

You told me that you would be happy to make copies available to the other committee members. However, several graphs are not very readable unless those pages are in color. Therefore, I have already distributed a copy of this complete packet to all the other members of the Transportation Committee, and also to Mr. Doogan and Mr. Buch, the original sponsors.

Thank you for your consideration of the research material that I have provided.

Sincerely,

Joan Priestley, M.D.

Joan Priestley, M.D.
Medical Director,
Health Renewal Institute

Joan Priestley, M.D.
Medical Director,
Health Renewal Institute
3705 Arctic Blvd., # 1332
Anchorage, Alaska 99503
(907) 562-2161, Ext. 1332

March 5, 2010

To Peggy Wilson, Chairwoman, and all the other members of the Transportation Committee,

In accordance with the request of the Transportation Committee Chairwoman, I have enclosed a summary of the telephonic testimony I presented at a recent hearing on the proposed cell phone ban. I have also included the references showing the data that I discussed.

If you do continue with this bill, please note that the Health Renewal Institute <u>strongly</u> <u>supports</u> the two amendments that passed, exempting hands-free devices, and making hand-held cell phone usage a secondary offense.

These two amendments will go far to make this legislation much more sensible, and less onerous for citizens of Alaska.

Thank you for your attention to this important matter.

Sincerely,

Joan Priestley, M.D.

Joan Priestley, M.D.
Medical Director,
Health Renewal Institute

Enclosure:
Testimony summary and exhibits

Joan Priestley, M.D.
Medical Director,
Health Renewal Institute
3705 Arctic Blvd., # 1332
Anchorage, Alaska 99503
(907) 562-2161, Ext. 1332

TELEPHONIC TESTIMONY BEFORE THE TRANSPORATION COMMITTEE, CONCERNING PROPOSED LEGISLATION TO BAN THE USE OF ALL CELL PHONES IN MOVING VEHICLES

I am Joan Priestley, M.D., speaking as the Medical Director of the Health Renewal Institute in Anchorage, Alaska. I discussed 4 major points for the committee members to consider.

1. ***This law will not produce the intended effect of enhancing highway safety.***

The Insurance Institute of Highway Safety (IIHS) has been researching vehicles since 1959. In 2009, this organization completed three novel, exhaustive and analytical studies, seeking objective evidence for the first time of the effectiveness of cell phone restrictions in several jurisdictions.

RESULTS:

A. Cell phone usage has increased some 700% from 1995 to 2008. Now there are over 270 million users in the United States. However, vehicle accident insurance claims have remained the same during that entire time period, and both fatal and non-fatal accidents have decreased by about 8% from 1995 to 2008. (1)

B. Several states have already banned the use of hand-held cell phones. IIHS reviewed 4 of those states (New York, California, Connecticut and Washington D.C.), and found that the frequency of vehicle accident claims in each state was essentially unchanged, during two years before and two years after hand-held cell phone usage was banned.

C. There is no difference in the frequency of accident claims, when those 4 states were compared to similar, near-by states, for 2 years before and even 2 years after those 4 states imposed the cell phone restrictions.

Adrian Lund, President of IIHS, stated that "if crash risks increases with phone use and fewer drivers use hand-held phones where it's illegal to do so, we would expect to see a decrease in crashes. But we aren't seeing it. Nor do we see collision claim increases before the phone bans took effect." (2)

Dr. Lund concluded that "crashed aren't going down where hand-held phone usage has been banned. This finding doesn't bode well for any safety payoff from all the new laws that ban phone use and texting while driving." (3)

The American Automobile Association has also performed numerous studies of "driver distractions." The most common distractions, by far, were an outside event (29%), adjusting the radio or CD (11%), passengers (11%), eating or drinking (71%), grooming (46%), and cell phone usage (a paltry 1.5 to 3.5%). (4)

Even in Alaska, where thousands of collisions are reported every year, only 59 annually are even related to cell phone usage! (5)

2. *The proposed COMPLETE ban on all forms of cell phone usage may well cause an increase in the number of car crashes.*

People in many competitive professions need to be instantly available to their business clients, just for economic survival.

Citizens will have about 12 seconds (the time frame of four rings on a phone) to swerve over several lanes, find a spot on the side of a road (often impossible in winter, with snow piled everywhere) find and answer their cell phone.

This vehicle maneuver will, at best, be difficult and distracting. This legislation could easily create a public safety hazard.

3. ***The proposed law will cause citizens to suffer needless expenses and damage, in two ways.***

A. FINES-

Many states have found that it is politically not feasible to raise taxes directly, in rough economic times. However, states can garner revenue indirectly by criminalizing innocent and victimless acts, and then imposing hefty fines on citizens.

The $ 300 proposed fine for ANY cell phone usage appears to be in this category of indirect revenue enhancement, quite apart from any interest in public safety.

B. INSURANCE RATES-

Insurance companies LOVE this type of legislation, and have lobbied vigorously for other states to enact such restrictions. Even such a minor offence results in points on one's license, and thereby gives the insurance industry an excuse to raise an individual's premiums sky-high for years.

This legislation may well result in more citizens driving without any insurance coverage, because they cannot afford to pay both rent and huge monthly premiums.

4. ***This legislation will undermine our 4th Amendment protection against unreasonable searches and seizures.***

Police will now be able to stop a vehicle, and interfere with a citizen's liberty, when they have no discernable "probable cause" to act. The new "fallback" excuse to violate the 4th Amendment will be "Oh, I thought you might be using a cell phone."

In that regard, this legislation should be subtitled, "The Police State Acceleration And Enhancement Act."

Moreover, there will not be enough officers available for stopping and solving real crimes, if they have to divert their limited manpower for the enforcement of this cell phone ban.

Thank you for the opportunity to bring these important issues to your attention.

Sincerely,

Joan Priestley M.D.

Joan Priestley, M.D.

Enclosures:

(1) Adrian Lund, PhD. Testimony before the Society of Automotive Engineers, January 29, 2010

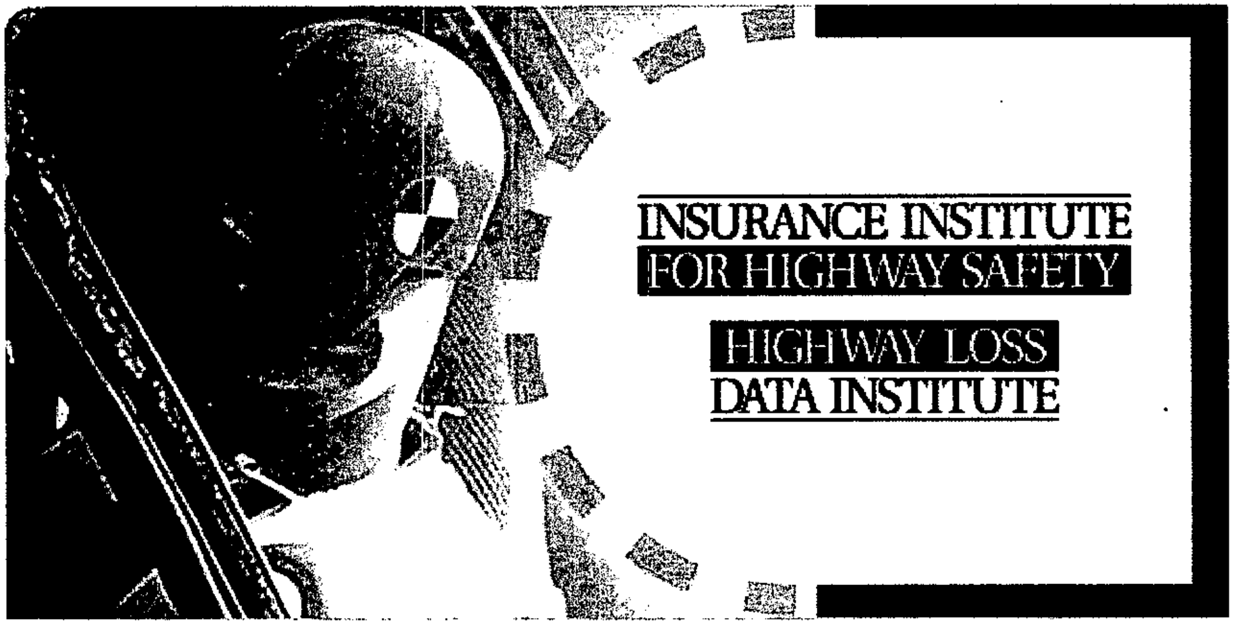
(2) Status Report of IIHS, Vol. 45, No. 27, 2/27/10

(3) News Release, Highway Loss Data Institute, 1/29/10

(4) Cell Phones and Driving: Research Update 12/2008 American Automobile Association, Foundation for Traffic Safety

(5) State of Alaska, Department of Transportation, Highway Analysis System graph

3055



SAE®

www.iihs.org

Do Bans on Driver Cellphone Use make Safer Drivers?

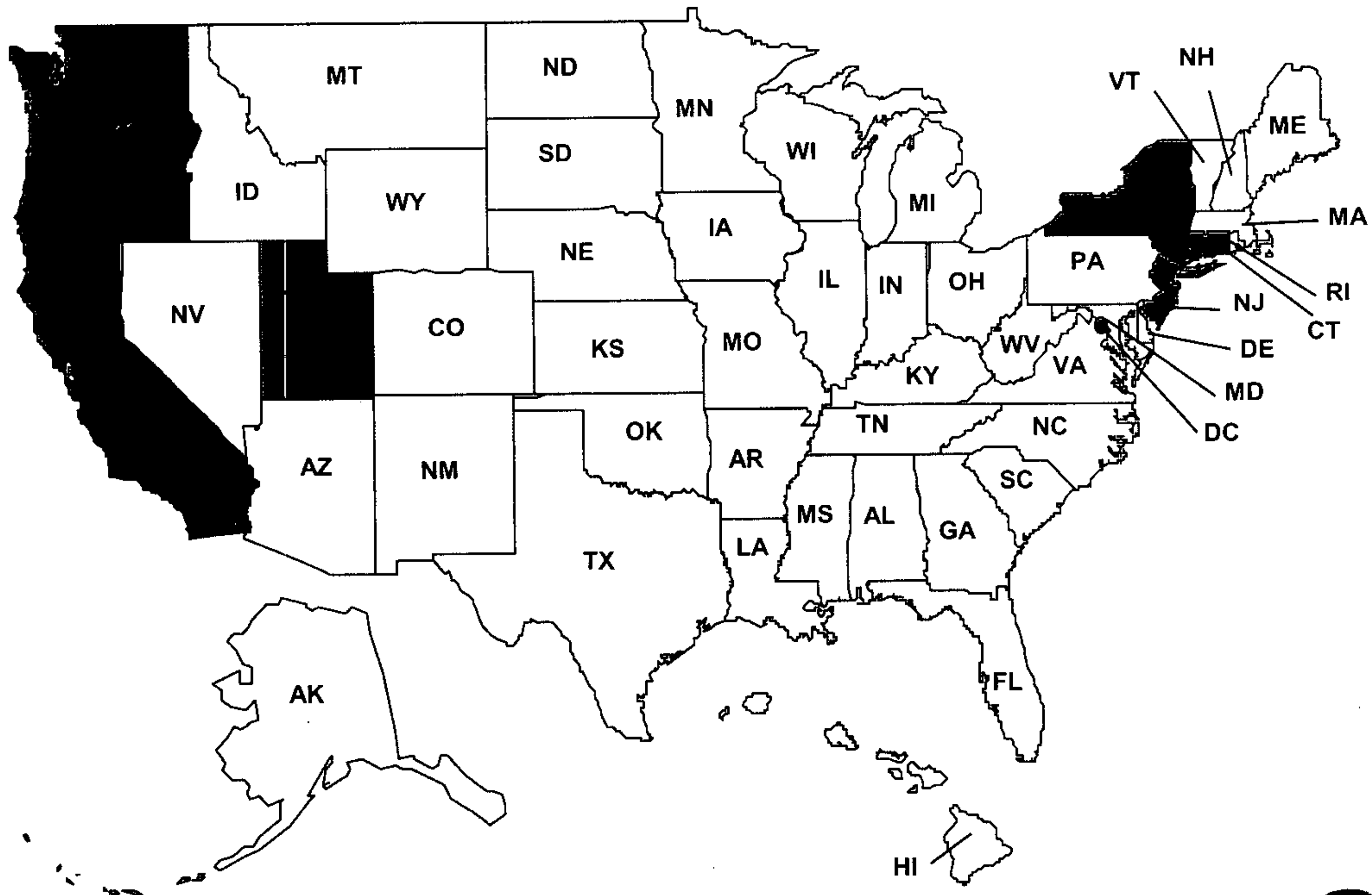
SAE Government/Industry Meeting
Washington, DC • January 29, 2010

Adrian Lund, Ph.D., President

3056

States that ban all drivers from using hand-held phones

January 2010



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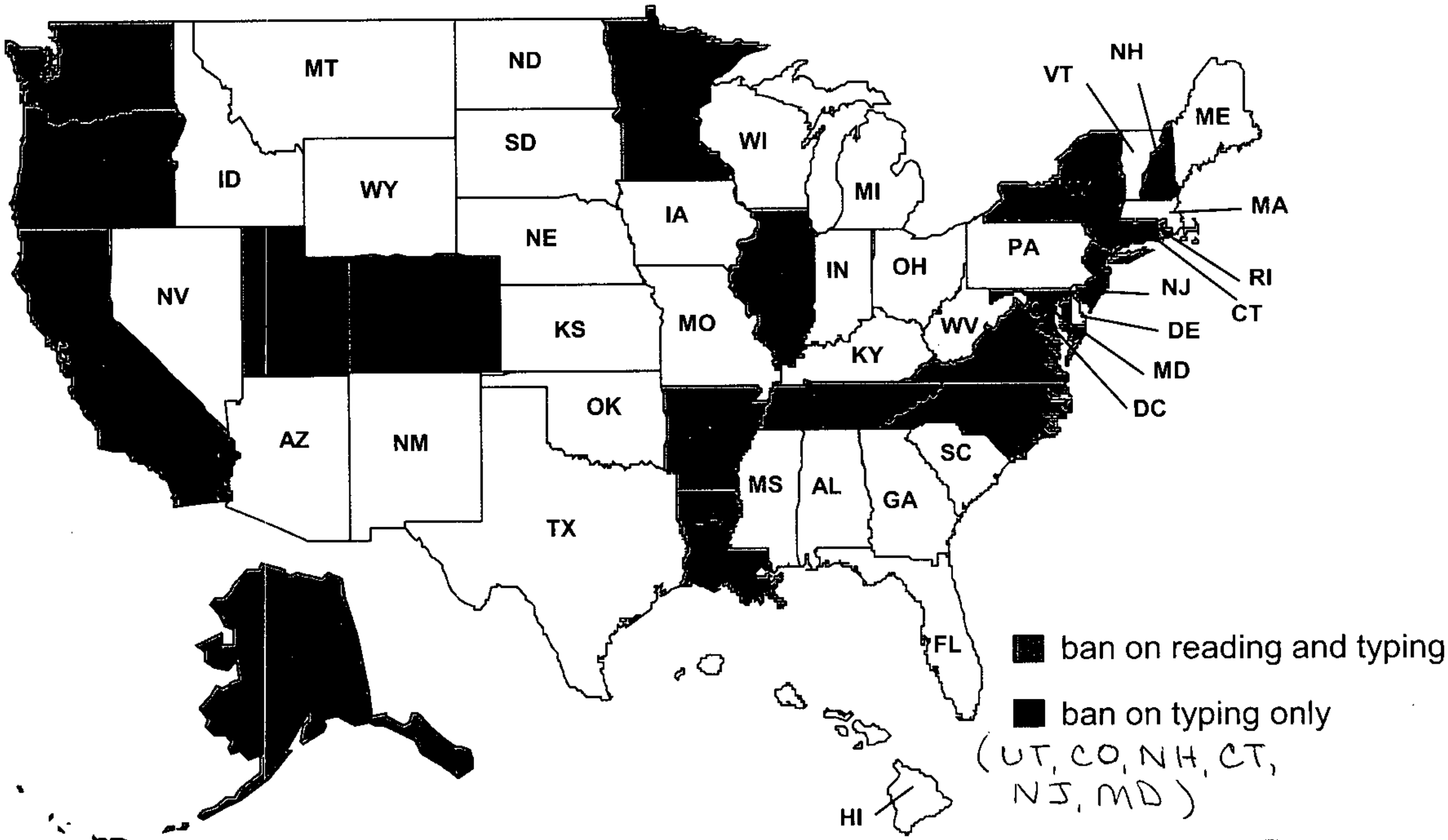
3057

Bans on texting while driving

January 2010



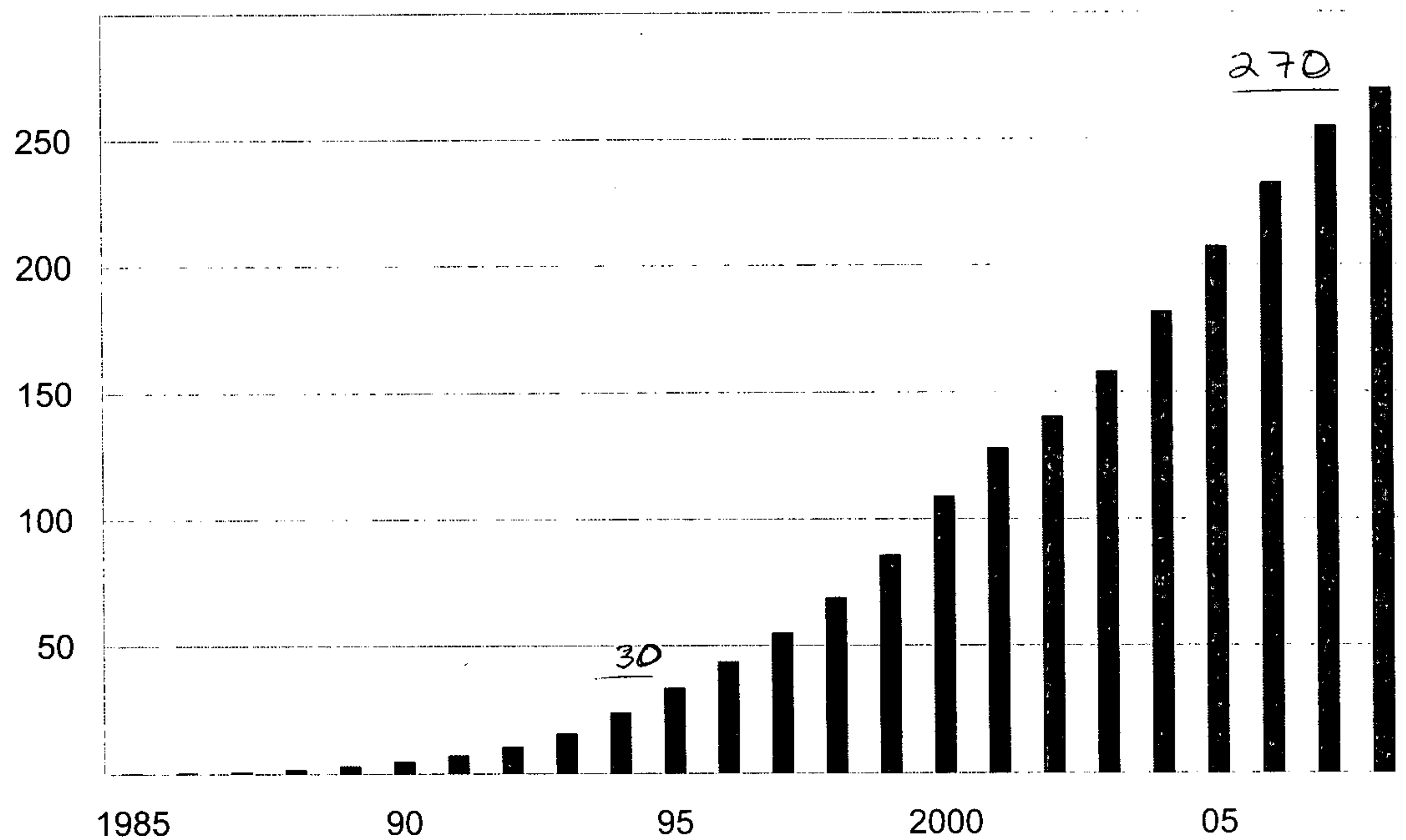
www.iihs.org

Where's the epidemic?

3059

Cellphone subscribers

In millions, 1985-2009

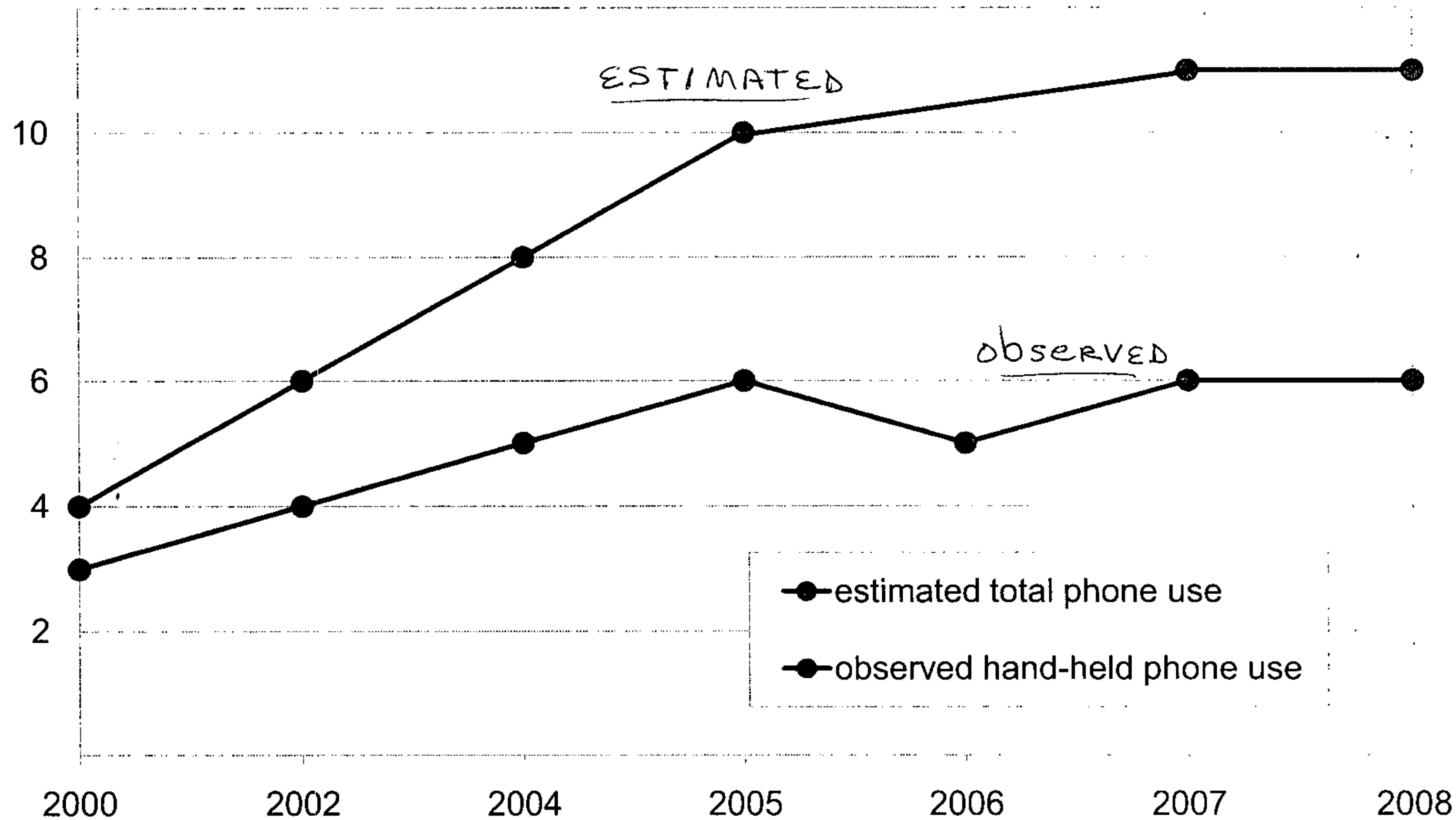


www.iihs.org

3060

Percent of drivers talking on phones

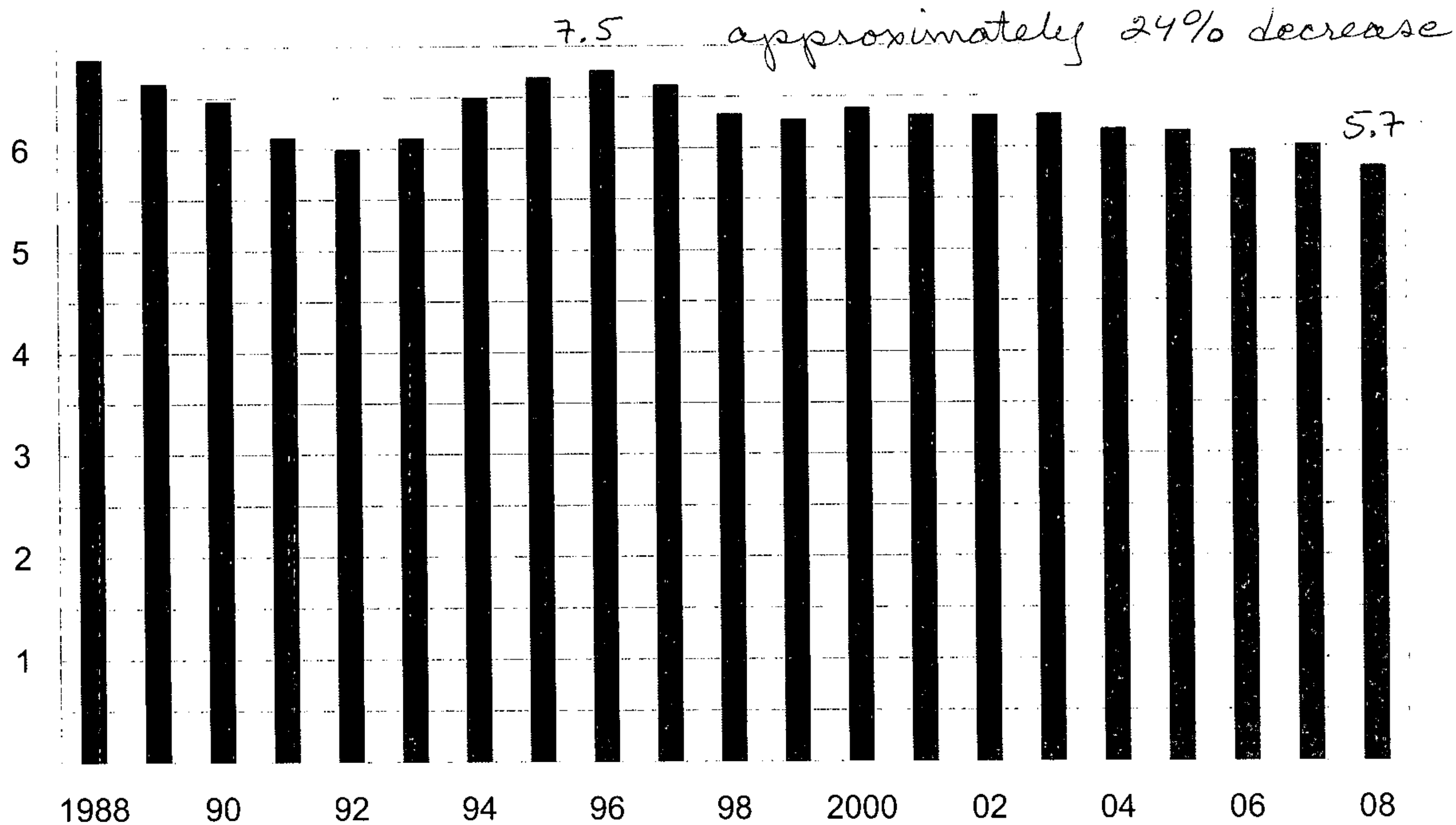
National Highway Traffic Safety Administration, 2000-08



3061

All crashes

In millions, GES for non-fatal and FARS for fatal, by calendar year



SAE

3062

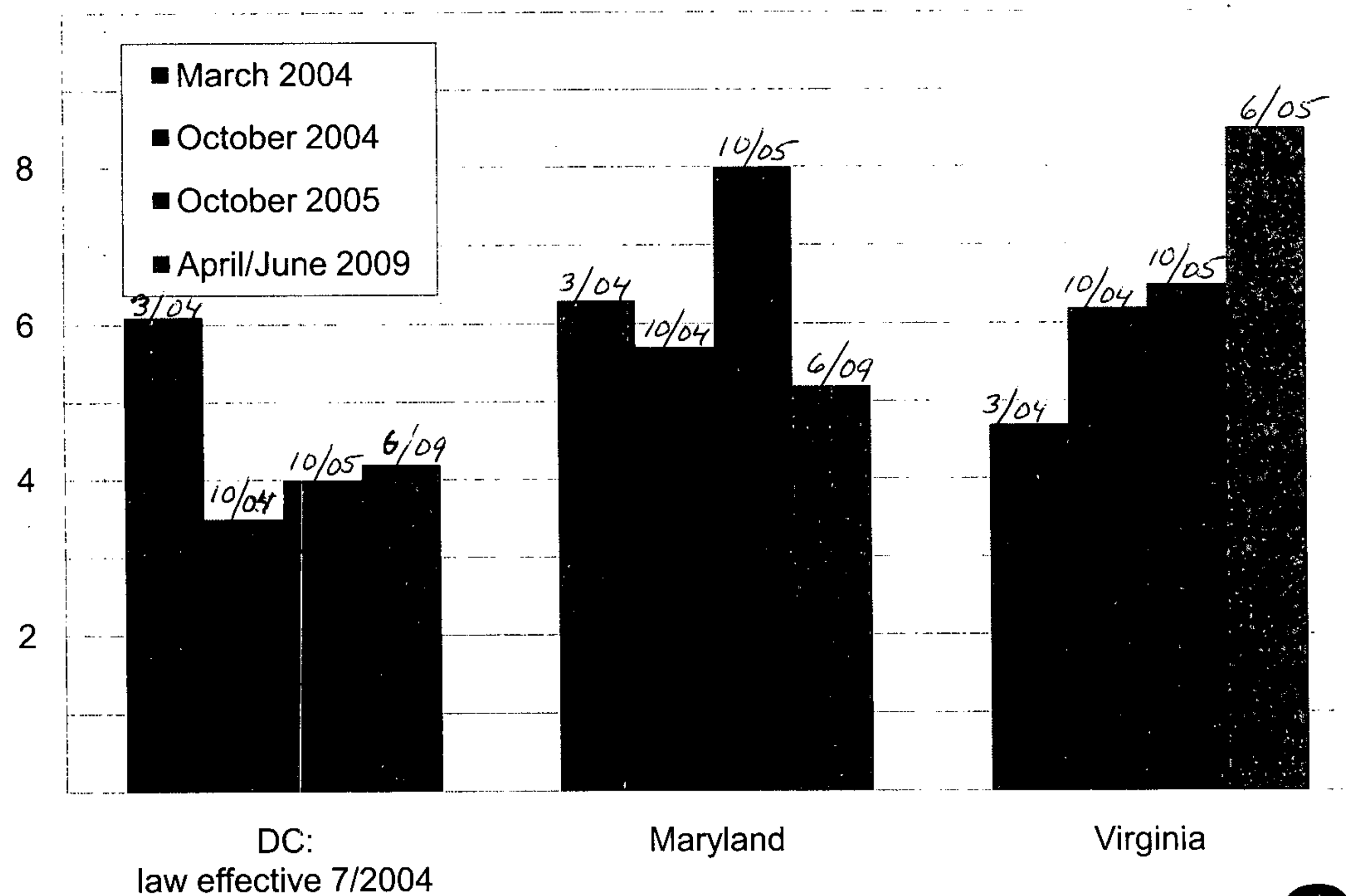
How effective are cellphone use laws – the case of hand-held bans?

www.iihs.org

SAE

Percent of drivers using hand-held phones

Washington, DC, metro area



www.iihs.org

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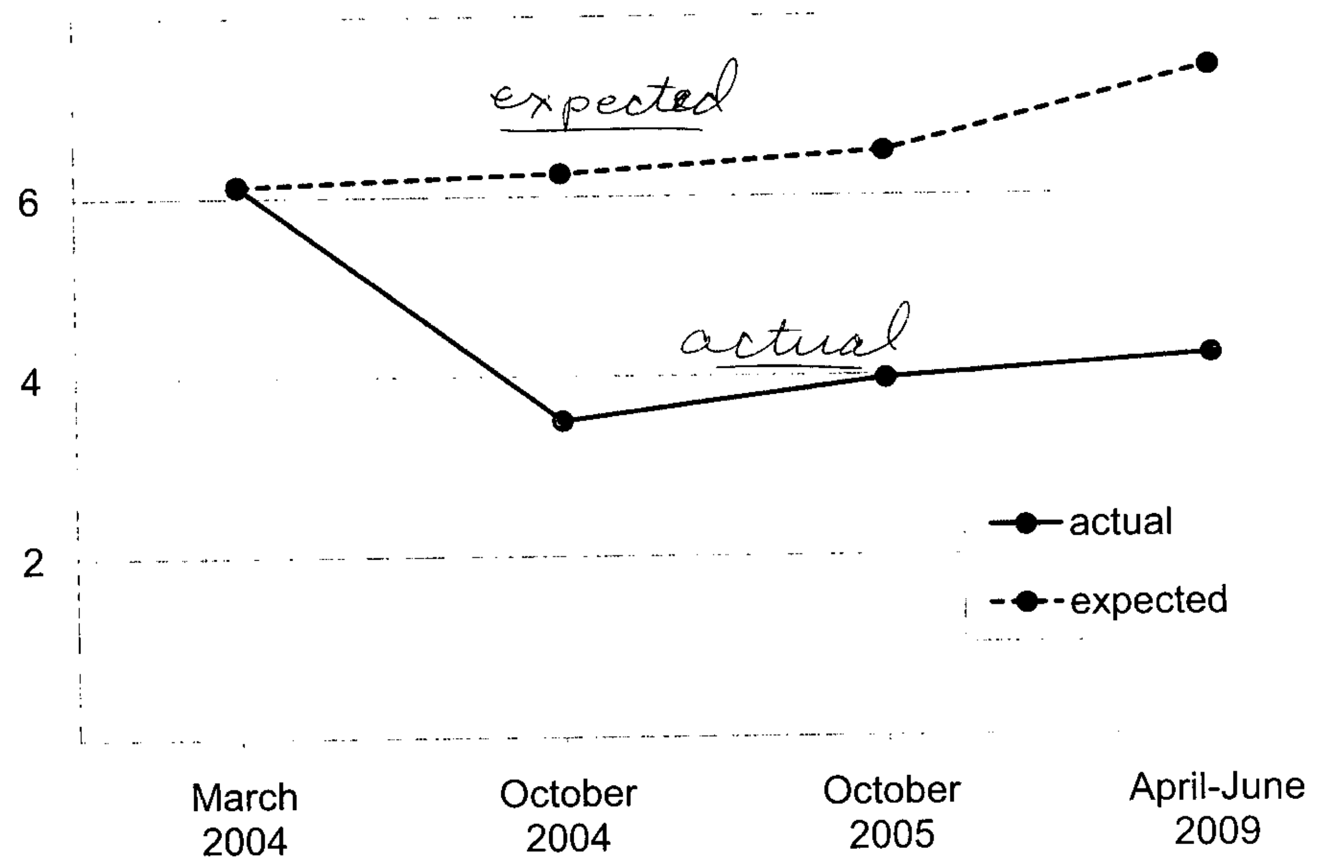
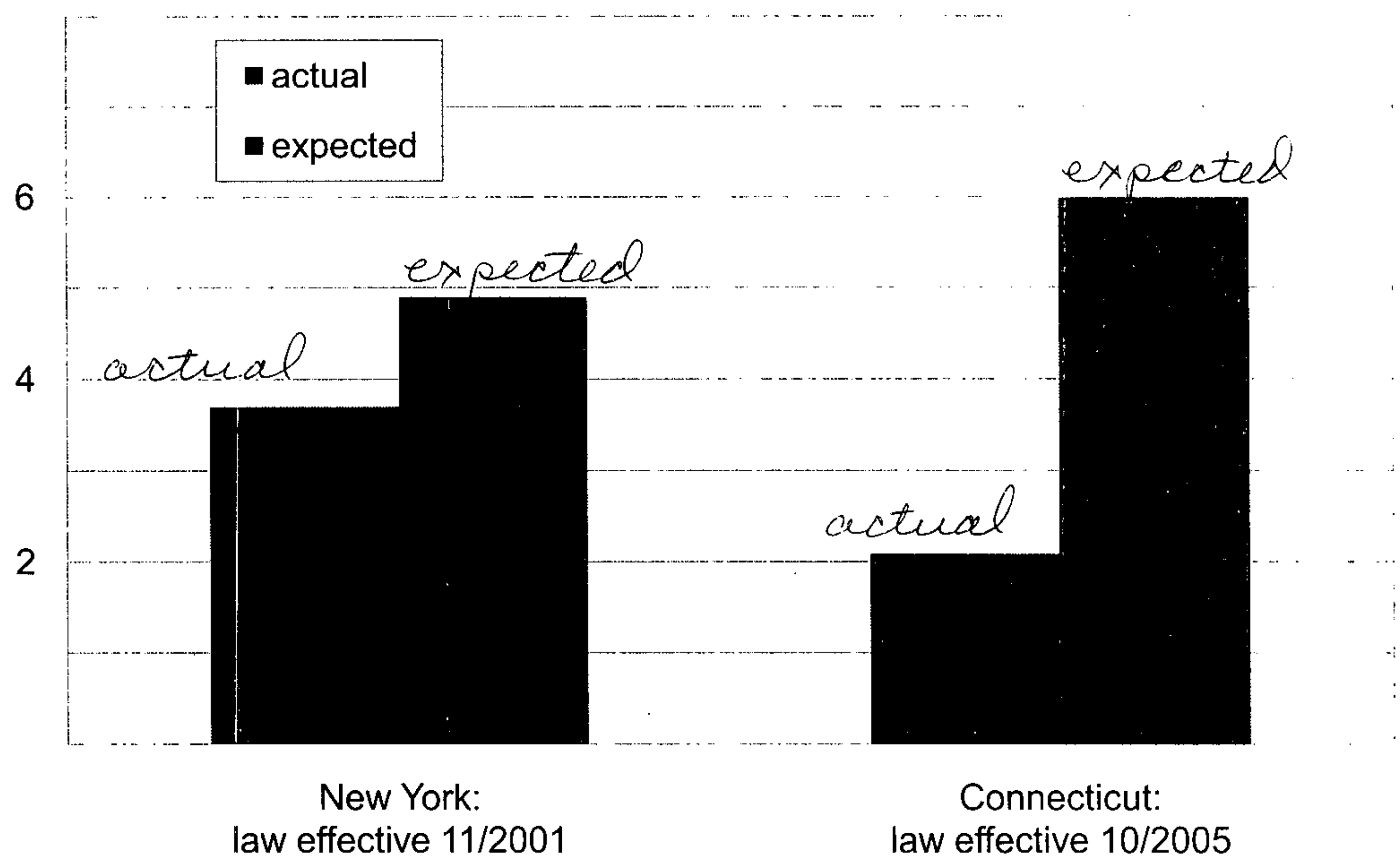
Actual percent of drivers in Washington, DC using hand-held phones vs. use that would have been expected without cellphone law

Law effective July 2004



Actual hand-held phone use vs. use that would have been expected without law

Percent phone use, April 2009



Collision claim frequencies in states with hand-held cellphone bans

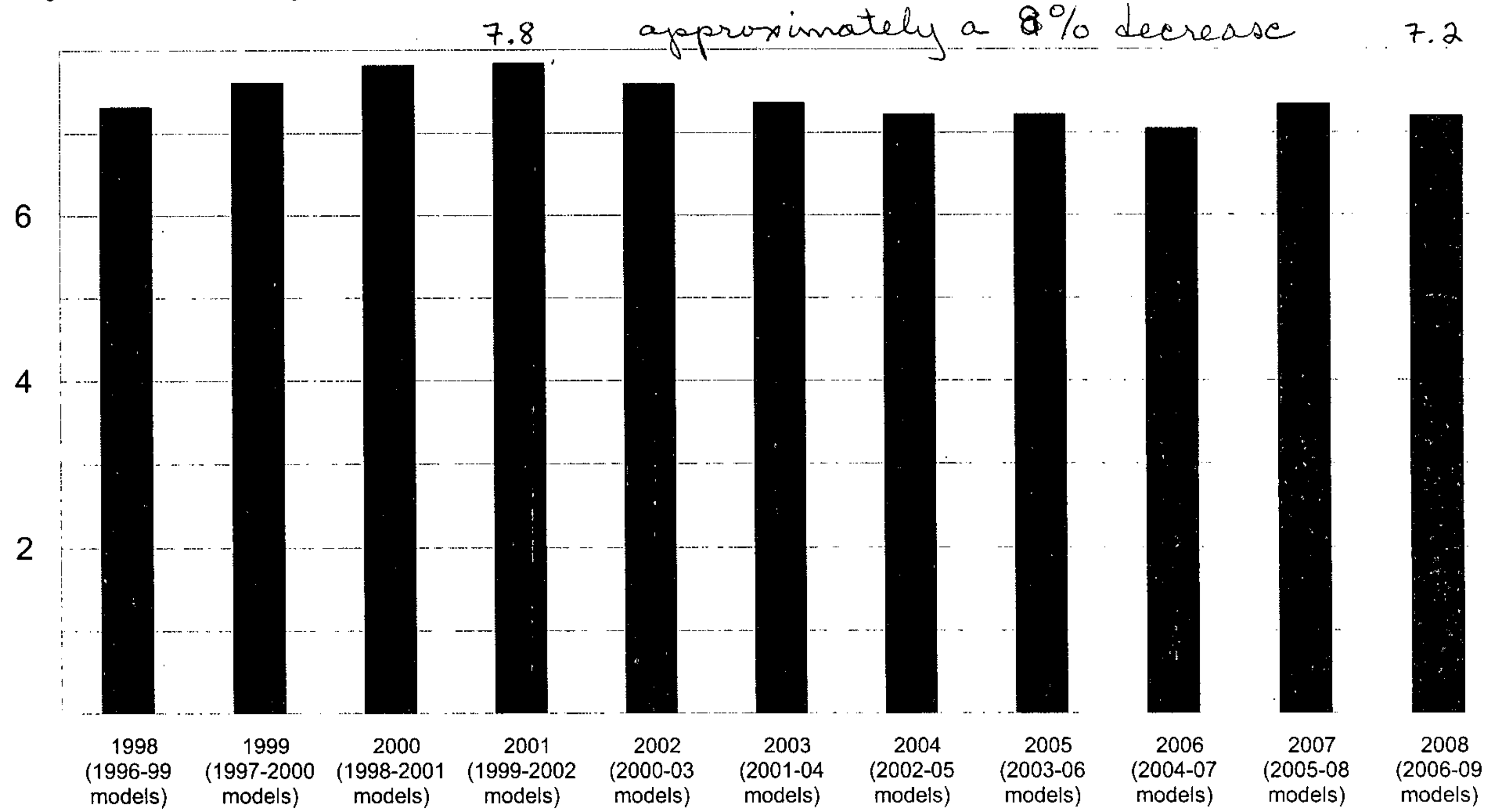
www.iihs.org

SAE

3067

Collision claim frequencies

Claims per 100 insured vehicle years
By calendar year, based on 4 most recent model years



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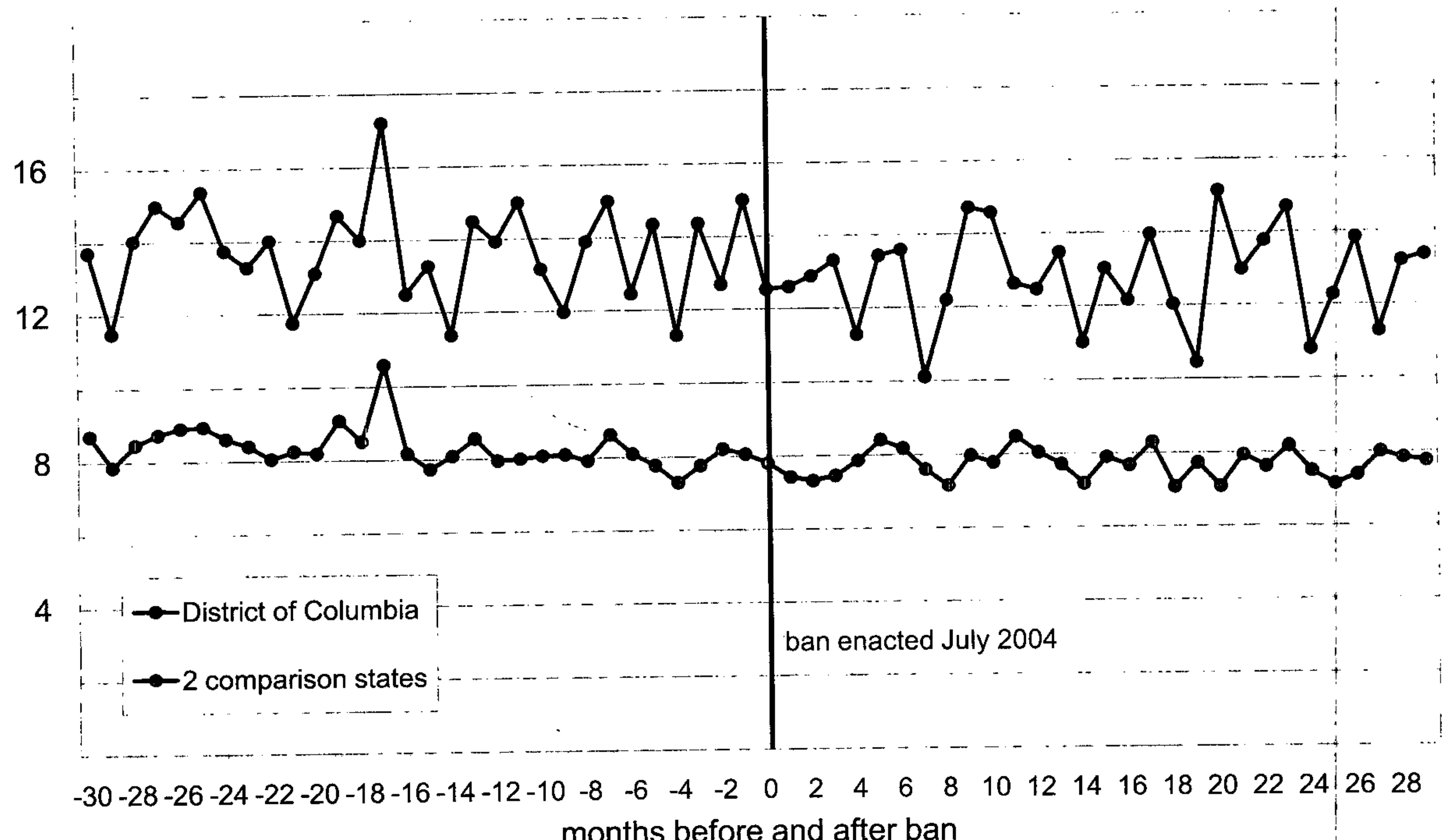
3068

Collision claim frequencies for new vehicles by month

District of Columbia vs. Maryland and Virginia



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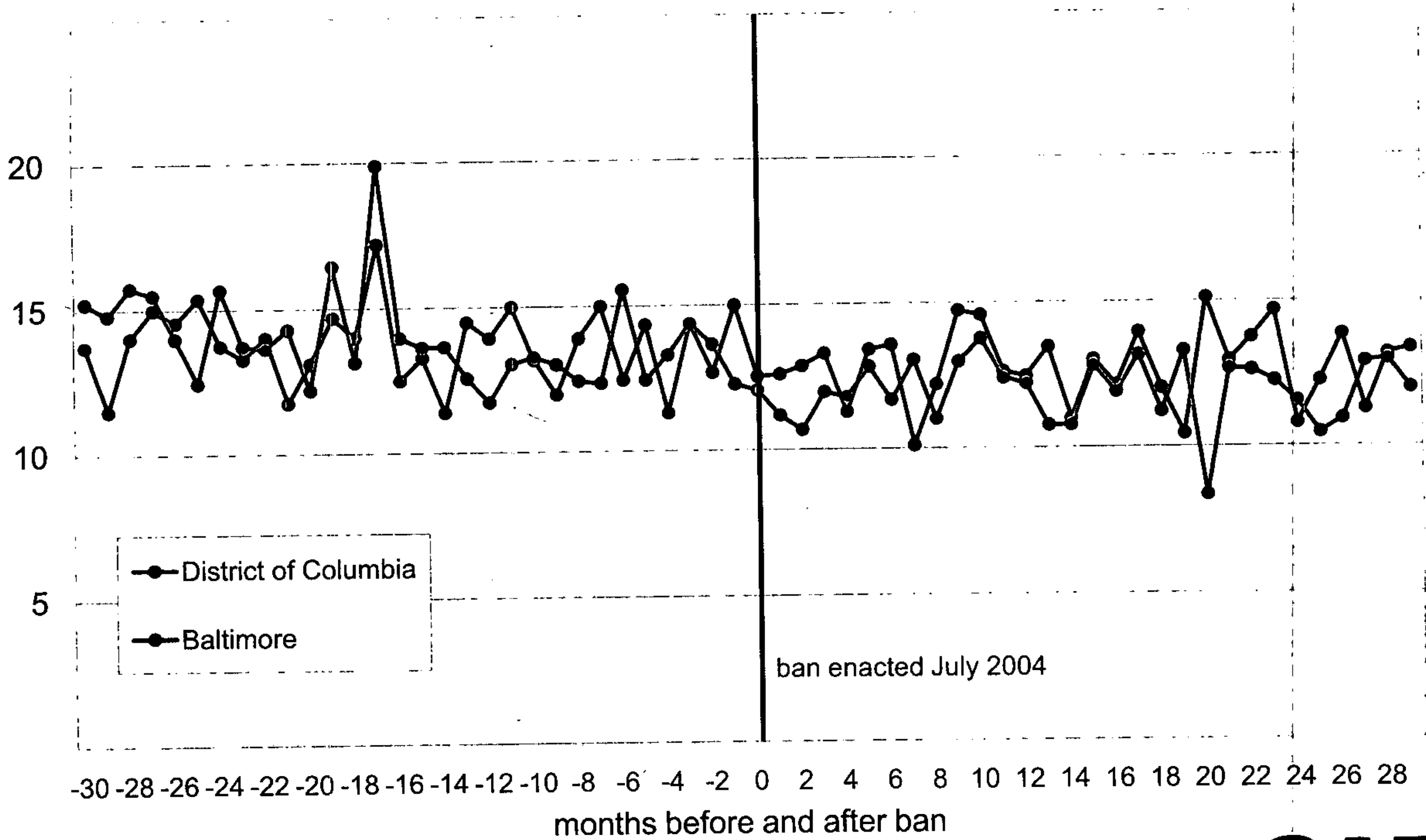
3069

Collision claim frequencies for new vehicles by month

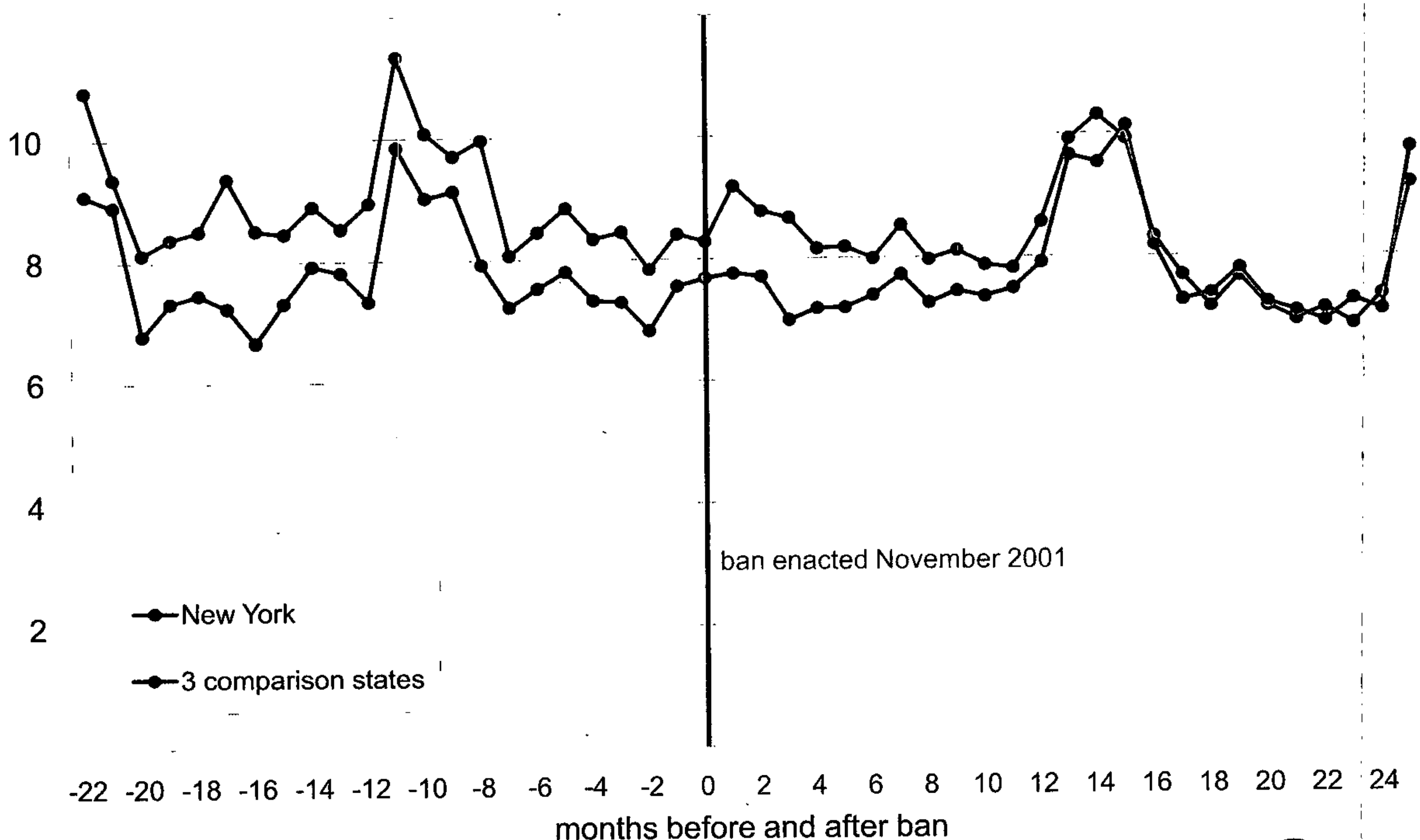
District of Columbia vs. Baltimore



3070

Collision claim frequencies for new vehicles by month

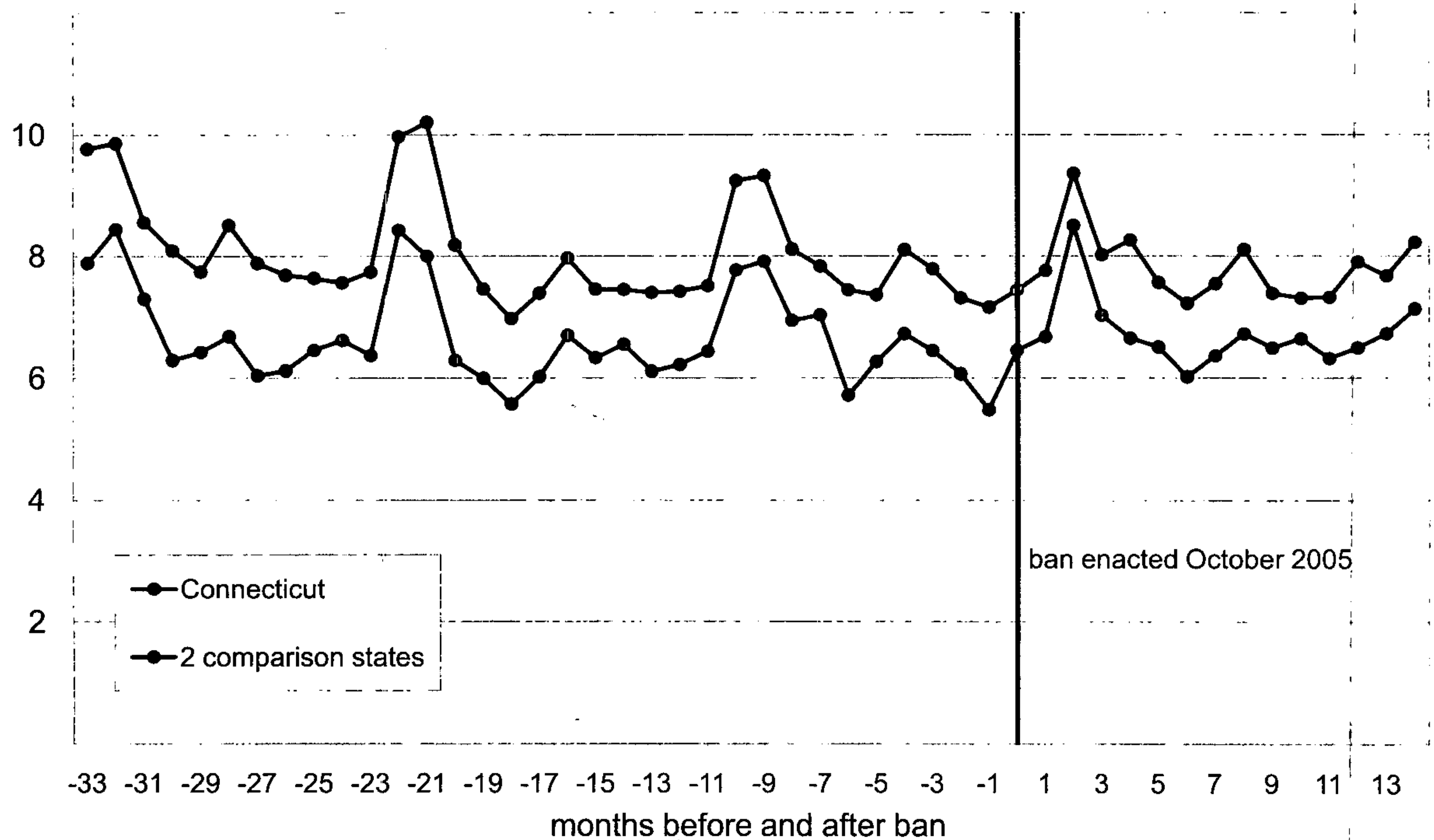
New York vs. Connecticut, Massachusetts, and Pennsylvania



3071

Collision claim frequencies for new vehicles by month

Connecticut vs. Massachusetts and New York



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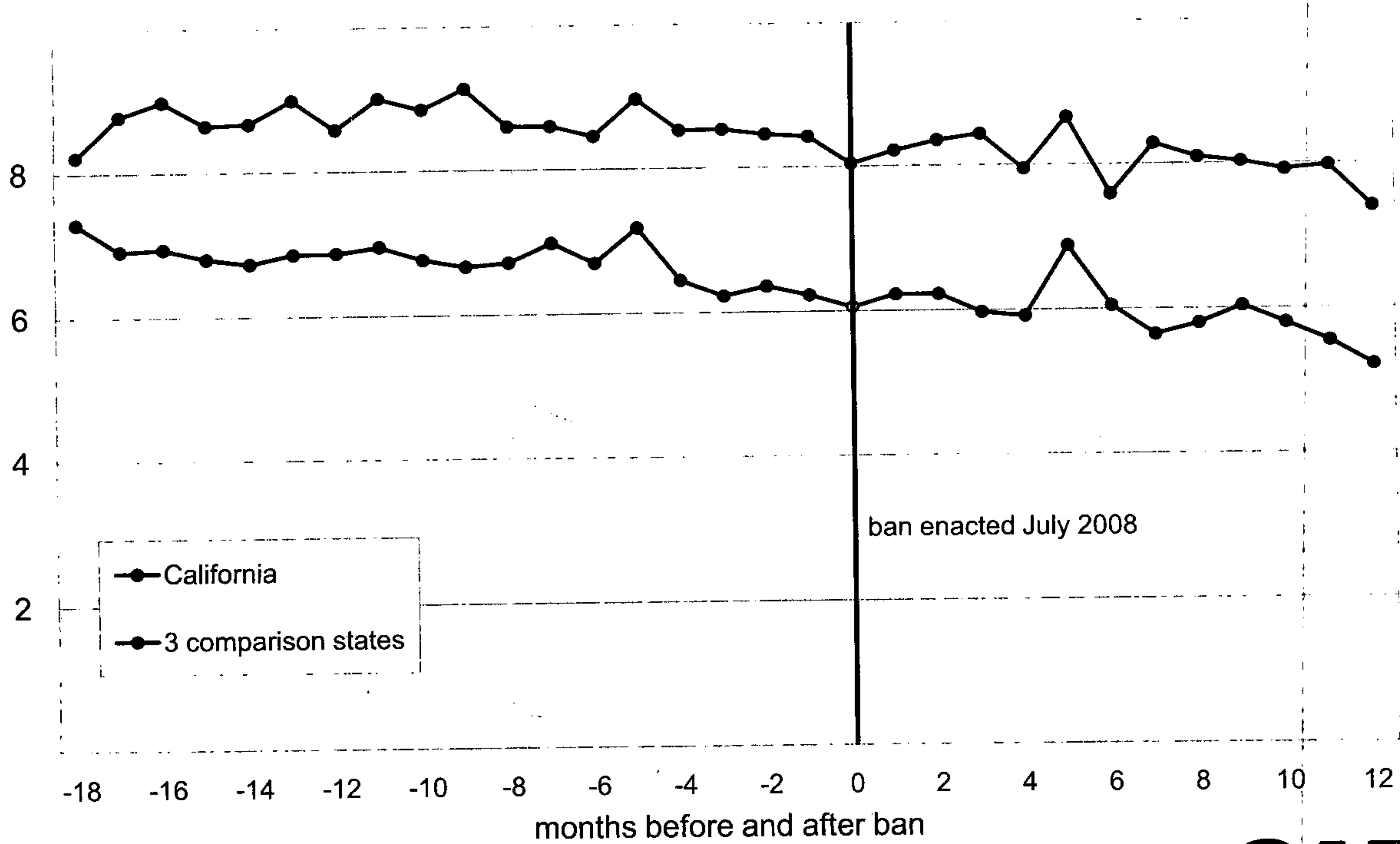
3072

Collision claim frequencies for new vehicles by month

California vs. Arizona, Nevada, and Oregon

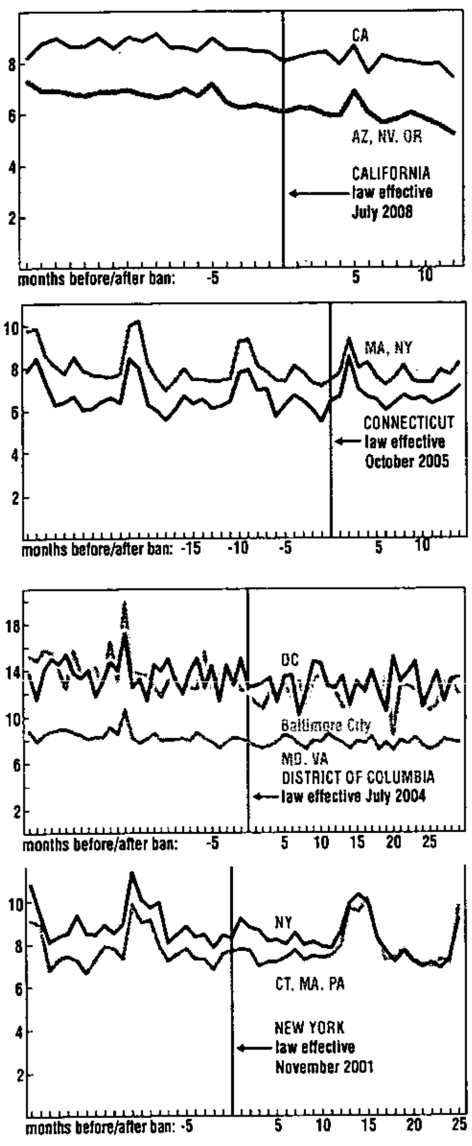


www.iihs.org

PHONE USE BANS AREN'T PRODUCING EXPECTED BENEFIT

Driver use of hand-held phones already is illegal in 8 US jurisdictions, and these laws are proving successful in reducing proportions of drivers using such phones (see *Status Report*, Oct. 13, 2009; on the web at iihs.org). A new Institute survey also confirms that fewer people are phoning while driving in states with bans, and some have switched to hands-free cellphones (see p.2). Given the established risk associated with phoning while driving, banning hand-held use would be expected to reduce crashes. But so far it hasn't. Crashes aren't declining. This is the major finding of a new study comparing insurance claims for crash damage in 4 jurisdictions before and after hand-held phone use bans.

COLLISION CLAIMS PER 100 VEHICLE YRS. FOR NEW VEHICLES, BEFORE AND AFTER HAND-HELD PHONE USE LAWS



Highway Loss Data Institute (HLDI) researchers found steady claim rates before and after the bans. Month-to-month fluctuations in rates of collision claims in jurisdictions with bans didn't change. Nor did the patterns change in comparison with trends in jurisdictions that didn't have such laws.

Specifically, the researchers calculated monthly collision claims per 100 insured vehicle years (a vehicle year is 1 car insured for 1 year, 2 insured for 6 months each, etc.) for vehicles up to 3 years old during the months immediately before and after hand-held phone use was banned while driving in New York (November 2001), the District of Columbia (July 2004), Connecticut (October 2005), and California (July 2008).

The other 4 US jurisdictions where driver use of hand-held phones is banned are New Jersey, Oregon, Utah, and Washington. Data were collected not only in the 4 study jurisdictions but also in nearby jurisdictions without the bans. This method controlled for possible changes in collision claim rates unrelated to the bans — changes in miles driven because of the economy, seasonal changes in driving patterns, etc.

"The laws aren't reducing crashes, even though we know that such laws have reduced hand-held phone use, and several studies have established that phoning while driving increases crash risk," says Adrian Lund, president of both the Insurance Institute for Highway Safety and HLDI.

The HLDI database doesn't identify drivers using cellphones when their crashes occur. However, reductions in observed phone use following bans are so substantial and estimated effects of phone use on crash risk are so large that reductions in aggregate crashes would be expected. In New York HLDI researchers did find a decrease in collision claim frequencies, relative to comparison states, but this decreasing trend began well before the state's ban on hand-held phoning while driving and actually paused briefly when the ban took effect. Trends in the District of Columbia, Connecticut, and California didn't change.

"So the new findings don't match what we already know about the risk of phoning and texting while driving," Lund points out. "If crash risk increases with phone use and fewer drivers use hand-held phones where it's illegal to do so, we would expect to see a decrease in crashes. But we aren't seeing it. Nor do we see collision claim increases before the phone bans took effect."

HLDI researchers compared the District of Columbia's collision claim frequency trend not only with statewide trends in Virginia and Maryland but also with the nearby city of Baltimore's trend. Again, the finding is no difference in the pattern of collision claims. Nor were any differences apparent when HLDI researchers applied a time-based regression model to insurance claims data for each of the study and comparison jurisdictions.

Lund points to factors that might be eroding the effects of hand-held phone bans on crashes. One is that drivers in jurisdictions with such bans may be switching to hands-free phones. In states with all-driver bans on using hand-held cellphones, 22 percent of drivers the Institute surveyed reported using cellphones and always talking hands-free. In this case crashes wouldn't go down because the risk is about the same, regardless of whether a phone is hand-held or hands-free.

No US jurisdiction bans all drivers from using hands-free phones. Twenty-one states and the District of Columbia do prohibit beginning drivers from using any type of phone, including hands-free, but such laws are difficult to enforce. This was the finding in North Carolina, where teen drivers didn't curtail phone use in response to a ban, in part because they didn't think the law was being enforced (see *Status Report*, June 9, 2008; on the web at iihs.org).

Laws banning cellphone use while driving fail to reduce crashes, new insurance data indicate

ARLINGTON, VA — As state legislators across the United States enact laws that ban phoning and/or texting while driving, a new Highway Loss Data Institute study finds no reductions in crashes after hand-held phone bans take effect. Comparing insurance claims for crash damage in 4 US jurisdictions before and after such bans, the researchers find steady claim rates compared with nearby jurisdictions without such bans. The Highway Loss Data Institute (HLDI) is an affiliate of the Insurance Institute for Highway Safety.

HLDI researchers calculated monthly collision claims per 100 insured vehicle years (a vehicle year is 1 car insured for 1 year, 2 insured for 6 months each, etc.) for vehicles up to 3 years old during the months immediately before and after hand-held phone use was banned while driving in New York (Nov. 2001), the District of Columbia (July 2004), Connecticut (Oct. 2005), and California (July 2008). Comparable data were collected for nearby jurisdictions without such bans. This method controlled for possible changes in collision claim rates unrelated to the bans — changes in the number of miles driven due to the economy, seasonal changes in driving patterns, etc.

Month-to-month fluctuations in rates of collision claims in jurisdictions with bans didn't change from before to after the laws were enacted. Nor did the patterns change in comparison with trends in jurisdictions that didn't have such laws.

"The laws aren't reducing crashes, even though we know that such laws have reduced hand-held phone use, and several studies have established that phoning while driving increases crash risk," says Adrian Lund, president of both the Insurance Institute for Highway Safety and HLDI. For example, an Insurance Institute for Highway Safety study that relies on driver phone records found a 4-fold increase in the risk of injury crashes. A study in Canada found a 4-fold increase in the risk of crashes involving property damage. Separate surveys of driver behavior before and after hand-held phone use bans show reductions in the use of such phones while driving.

The HLDI database doesn't identify drivers using cellphones when their crashes occur. However, reductions in observed phone use following bans are so substantial and estimated effects of phone use on crash risk are so large that reductions in aggregate crashes would be expected. In New York the HLDI researchers did find a decrease in collision claim frequencies, relative to comparison states, but this decreasing trend began well before the state's ban on hand-held phoning while driving and actually paused briefly when the ban took effect. Trends in the District of Columbia, Connecticut, and California didn't change.

"So the new findings don't match what we already know about the risk of phoning and texting while driving," Lund points out. "If crash risk increases with phone use and fewer drivers use phones where it's illegal to do so, we would expect to see a decrease in crashes. But we aren't seeing it. Nor do we see collision claim increases before the phone bans took effect. This is surprising, too, given what we know about the growing use of cellphones and the risk of phoning while driving. We're currently gathering data to figure out this mismatch."

HLDI researchers compared the District of Columbia's collision claim frequency trend not only with statewide trends in Virginia and Maryland but also with the trend in the nearby city of Baltimore. Again, the finding is no difference in the pattern of collision claims. Nor were any differences apparent when the researchers applied a time-based regression model to claims data for each of the study and comparison jurisdictions.

Lund points to factors that might be eroding the effects of hand-held phone bans on crashes. One is that drivers in jurisdictions with such bans may be switching to hands-free phones because no US state currently bans all drivers from using such phones. In this case crashes wouldn't go down because the risk is about the same, regardless of whether the phones are hand-held or hands-free. Twenty-one states and the District of Columbia do prohibit beginning drivers from using any type of phone, including hands-free, but such laws are difficult to enforce. This was the finding in North Carolina, where teenage drivers didn't curtail phone use in response to a ban, in part because they didn't think the law was being enforced.

"Whatever the reason, the key finding is that crashes aren't going down where hand-held phone use has been banned," Lund points out. "This finding doesn't auger well for any safety payoff from all the new laws that ban phone use and texting while driving."

3076

Number of Crashes Involving Cell Phone Use, By Age of Driver Using Cell Phone, Alaska 2002-2006

Age of Driver using Cell Phone	2002	2003	2004	2005	2006	TOTAL
under 10						0
10-15			1			1
16-20	17	20	22	24	16	99
21-25	8	9	8	6	12	43
26-30	7	5	6	8	5	31
31-35	9	7	6	6	2	30
36-40	7	3	6	3	7	26
41-45	4	6	3	6	4	23
46-50	3	7	6	5	1	22
51-55		1	1	1		3
56-60	1		2	1		4
61-65		1		1		2
66-70	1			1		2
71-75	1					1
76-80						0
81+					1	1
Unknown	1					1
TOTAL	59	59	61	62	48	289

Source: State of Alaska, DOT&PF, Highway Analysis System, Data Port

ALASKA STATUTES

Title 28. MOTOR VEHICLES

Chapter 28.35. OFFENSES AND ACCIDENTS

Article 03. MISCELLANEOUS OFFENSES

Sec. 28.35.161. Driving a motor vehicle with a screen device operating; unlawful installation of television, monitor, or similar device.

(a) A person commits the crime of driving with a screen device operating if

(1) the person is driving a motor vehicle;

(2) the vehicle has a television, video monitor, portable computer, or any other similar means capable of providing a visual display that is in full view of a driver in a normal driving position while the vehicle is in motion; and

(3) the monitor or visual display is operating while the person is driving.

(b) A person may not install or alter equipment described in (a)(2) of this section that allows the images to be viewed by the driver in a normal driving position while the vehicle is in motion.

(c) Subsections (a) and (b) of this section do not apply to

(1) portable cellular telephones or personal data assistants being used for verbal communication or displaying caller identification information;

(2) equipment that is displaying only

(A) audio equipment information, functions, and controls;

(B) vehicle information or controls related to speed, fuel level, battery charge, and other vehicle safety or equipment information;

(C) navigation or global positioning;

(D) maps;

(E) visual information to

(i) enhance or supplement the driver's view forward, behind, or to the sides of the motor vehicle for the purpose of maneuvering the vehicle; or

(ii) allow the driver to monitor vehicle occupants seated behind the driver;

(F) vehicle dispatching and response information for motor vehicles providing emergency road service or roadside assistance;

(G) vehicle dispatching information for passenger transport or freight or package delivery;

(H) information for use in performing highway construction, maintenance, or repair or data acquisition by the Department of Transportation and Public Facilities or a municipality; or

(I) information for use in performing utility construction, maintenance, repair, or data acquisition by a public utility; in this subparagraph, "public utility" has the meaning given in AS 42.05.990.

(d) Subsections (a) and (b) of this section do not apply to devices and equipment installed in an emergency vehicle. In this subsection, "emergency vehicle" means a police, fire, or emergency medical service vehicle.

(e) It is an affirmative defense to a prosecution under (b) of this section that the equipment installed or altered includes a device that, when the motor vehicle is being driven, disables the equipment for all uses except those described in (c) of this section.

(f) A person who violates (a) of this section is guilty of

(1) a class A misdemeanor, unless any of the circumstances described in (2) - (4) of this subsection apply;

(2) a class C felony if the person's driving causes physical injury to another person;

(3) a class B felony if the person's driving causes serious physical injury to another person;

(4) a class A felony if the person's driving causes the death of another person.

(g) A person who violates (b) of this section is guilty of a class A misdemeanor.

History -

(Sec. 1 ch 99 SLA 2008; am Sec. 1 ch 42 SLA 2009)

Amendment Notes -

The 2009 amendment, effective September 18, 2009, added (c)(2)(I), and made related stylistic changes.

Effective Date Notes -

Section 3, ch. 99, SLA 2008, makes this section effective September 1, 2008.

ALASKA STATUTES

Title 28. MOTOR VEHICLES

Chapter 28.90. GENERAL AND MISCELLANEOUS PROVISIONS

Article 01. MISCELLANEOUS PROVISIONS

Sec. 28.90.010. Penalties for violations of law, regulations, and municipal ordinances.

(a) It is a misdemeanor for a person to violate a provision of this title unless the violation is by this title or other law declared to be a felony or an infraction.

(b) A person convicted of a misdemeanor for a violation of a provision of this title for which another penalty is not specifically provided is punishable by a fine of not more than $500, or by imprisonment for not more than 90 days, or by both. In addition, the privilege to drive or the registration of vehicles may be suspended or revoked.

(c) Unless otherwise specified by law a person convicted of a violation of a regulation adopted under this title, or a municipal ordinance regulating vehicles or traffic when the municipal ordinance does not correspond to a provision of this title, is guilty of an infraction and is punishable by a fine not to exceed $300.

(d) An infraction, as provided for in (c) of this section, is not considered a criminal offense and may not result in imprisonment, nor is a fine imposed for the commission of an infraction considered a penal or criminal punishment; nor may the commission of a single infraction result in the loss of a driver's license or privilege to drive in this state except as may result from the accumulation of points under AS 28.15.221 - 28.15.261, or the registration of vehicles; nor does a person cited with an infraction have a right to trial by jury or to court-appointed counsel.

(e) [Repealed, Sec. 5 ch 85 SLA 1987].

History -

(Sec. 50-1-8 ACLA 1949; am Sec. 12 ch 241 SLA 1976; am Sec. 22, 23 ch 144 SLA 1977; am Sec. 5 ch 85 SLA 1987)

Revisors Notes -

Formerly AS 28.35.230. Renumbered as AS 28.40.050 in 1984 and renumbered again in 2006.

Decisions -

This section governs the penalties for violations of this title, and creates three categories of traffic offenses: felonies, misdemeanors and infractions. State v. Clayton, 584 P.2d 1111 (Alaska 1978).

Violations of AS 28.35.050(a) are punishable under this section. Drahosh v. State, 442 P.2d 44 (Alaska 1968).

Prerequisite to suspension of license or privilege to drive. - A driver's license or privilege to drive cannot properly be suspended unless the driver was in fact licensed or otherwise actually privileged to drive a motor vehicle within the state. Roberts v. State, 700 P.2d 815 (Alaska Ct. App. 1985).

Generic penalty provision. - Subsection (b) is not a penalty provision dealing specifically with the offense of driving while license suspended; rather it is a generic penalty provision, broadly applicable to violations of all Title 28 provisions for which the specific penalties are given. Roberts v. State, 700 P.2d 815 (Alaska Ct. App. 1985).

Meaning of "law" in subsection (c). - The term "law," as used in subsection (c) of this section, refers to statutory enactments of the Alaska legislature and cannot be read to include the provisions of municipal ordinances. Anderson v. Municipality of Anchorage, 645 P.2d 205 (Alaska Ct. App. 1982).

Nature of "correspondence" between ordinance and statute required by subsection (c). - The requirement of correspondence stated in subsection (c) of this section calls for a level of similarity between a municipal ordinance and a provision of AS 28 that would make the ordinance a functional equivalent of its statutory counterpart. Anderson v. Municipality of Anchorage, 645 P.2d 205 (Alaska Ct. App. 1982).

The legislature's purpose in enacting subsection (d) was to eliminate the criminal stigma from minor traffic offenses while keeping the enforcement of such offenses within the criminal system's procedures. State v. Clayton, 584 P.2d 1111 (Alaska 1978).

A prosecution for a traffic infraction is a quasi-criminal proceeding to which certain criminal procedures including the issuance of warrants are applicable. State v. Clayton, 584 P.2d 1111 (Alaska 1978).

Although the language in subsection (d) with regard to an infraction not being considered a criminal offense nor a fine therefor a criminal punishment indicates that the legislature did not intend to make minor traffic offenses criminal offenses, it does not follow that the legislature by labeling infractions "noncriminal" meant that they are civil in nature and thus that criminal procedures are not available for the enforcement of infractions. State v. Clayton, 584 P.2d 1111 (Alaska 1978).

Notwithstanding the legislative labeling of a traffic infraction a noncriminal offense by this section, it retains many criminal terms, such as "convicted," "violation," "guilty," "punishable by a fine." State v. Clayton, 584 P.2d 1111 (Alaska 1978).

An infraction is not an offense for double jeopardy purposes. Carlson v. State, 676 P.2d 603 (Alaska Ct. App. 1984).

Jury trial. - AS 28.10.105(a) (now repealed) and the other registration statutes in pari materia do not specify a violation of the registration statutes as an infraction, and thus under this section, such a violation is a misdemeanor punishable by up to 90 days' imprisonment, and entitling a defendant to a jury trial, denial of which right constitutes prejudicial error, requiring a new trial. Epperly v. State, 648 P.2d 609 (Alaska Ct. App. 1982).

Traditional use of criminal process not affected. - In the absence of express contrary declaration, the legislature did not intend by the enactment of subsection (d) to affect the traditional use of the criminal process for enforcement of traffic infractions. State v. Clayton, 584 P.2d 1111 (Alaska 1978).

This section makes no changes in the traditional mode of proceeding in criminal matters with the exception of its declaration that a person cited with an infraction does not have a right to trial by jury or to court-appointed counsel. The action is brought in the name of the state; it is commenced by the filing of a complaint by a law enforcement official; it is prosecuted by the district attorney. The exceptions appear to merely codify existing constitutional law. State v. Clayton, 584 P.2d 1111 (Alaska 1978).

Applied in Manderson v. State, 655 P.2d 1320 (Alaska Ct. App. 1983).

Stated in Francis v. Municipality of Anchorage, 641 P.2d 226 (Alaska Ct. App. 1982).

Quoted in State v. Dutch Harbor Seafoods, Ltd., 965 P.2d 738 (Alaska 1998).

Cited in Lowry v. State, 655 P.2d 780 (Alaska Ct. App. 1982); Hamilton v. State, 59 P.3d 760 (Alaska Ct. App. 2002); Walsh v. State, Op. No. 2048, 134 P.3d 366 (Alaska Ct. App. 2006).

Collateral Refs -

7A Am. Jur. 2d, Automobiles and Highway Traffic, Sec. 244.

61A C.J.S., Motor Vehicles, Sec. 1311 et seq.

Thank you Show Becky

Rep. – Here are the summaries you requested.

Cell Phones and Driving: Research Update

blue tab

Key Points blue tab contains most of the points of interest.

Studies showed:

1. Cell phones roughly quadruple crash risk.
2. Using a cell phone significantly impairs reaction time.
3. Hands-free or hand-held devices were **indistinguishable** risk-wise.

Cell phone usage:

- Over ½ U.S. drivers admitted using w/in 30 days
- 1 in 7 have texted while driving
- Age is not significant factor in usage
- Higher education = higher use and texting during driving

Large percent of complaints came from respondents who themselves talk on cell phone while driving at least occasionally.

Highway Loss Data Institute Bulletin: Hand-Held Cellphone Laws and Collision Claim Frequencies

* red tab

A number (not specified) of jurisdictions worldwide, including several U.S. states, have made it illegal to use hand-held cellphones while driving. Evidence on the effectiveness of these bans is mixed, but ***results indicate that banning cellphone use can effect phone use.*** (funny) This article had 4 figures and 2 tables. The last page seemed the most important by stating; only two of the ten estimates were significant (New York & Connecticut). *Insurance collision loss* Experience does not indicate a decrease in crash risk when hand-held cellphone laws are enacted.

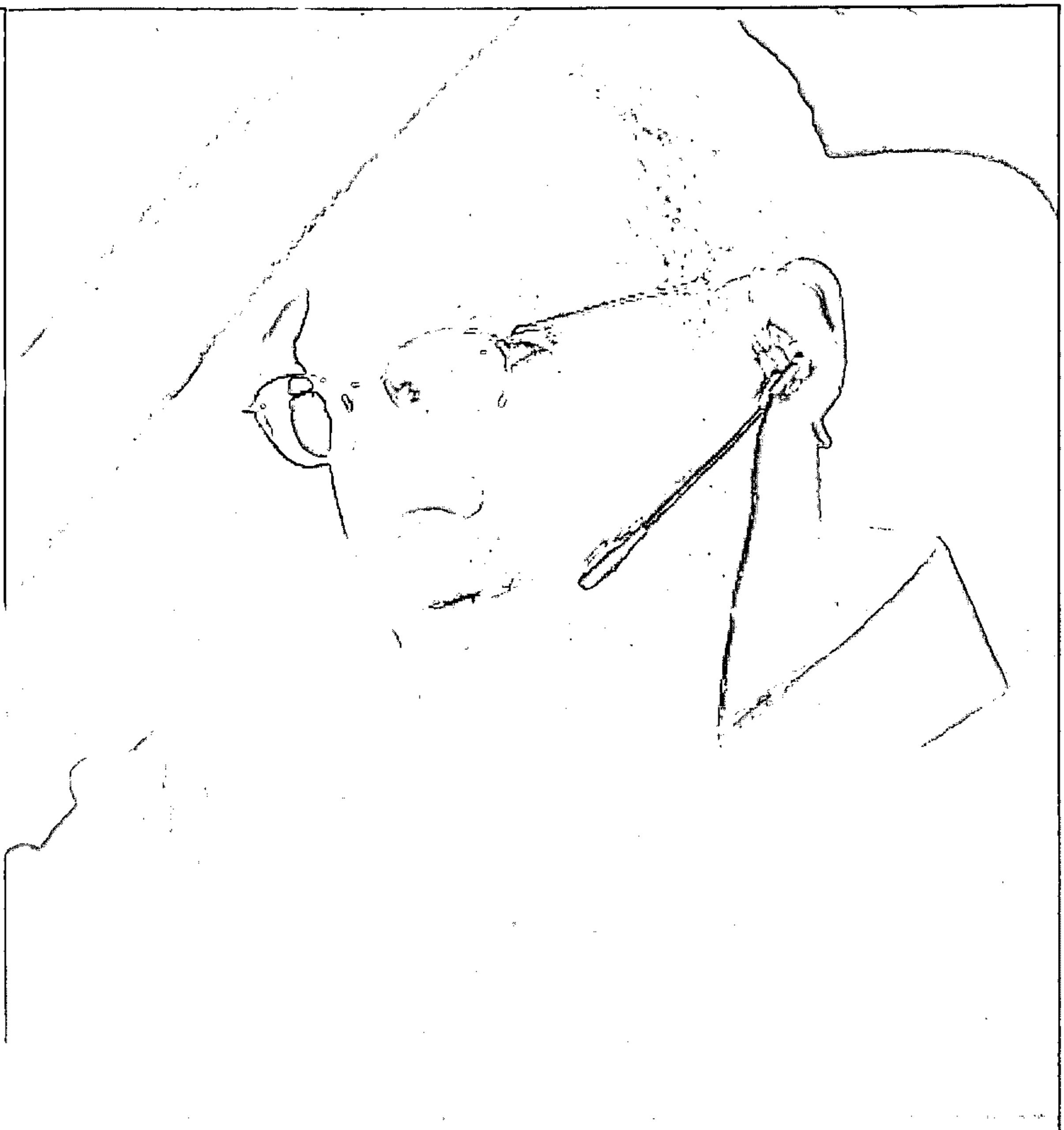
The Effect of Cellular Phone Use Upon Driver Attention

yellow tab

This article outlined a rather outdated study which occurred in 1991. It came up with four conclusions:

1. All forms of cell phone usage increased non-responses and reaction times.
2. Complex, intense conversations were more distracting than other things.
3. Older people (50+) should not make phone calls while driving.
4. Experience did not matter in the study and appeared to have no effect on overall reaction time to various distractions.

Car crashes rank among the leading causes of death in the United States.



Cell Phones and Driving: Research Update

December, 2008

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Overview

A growing body of research suggests that using a mobile telephone while driving increases a driver's risk of being involved in a crash. Studies that have analyzed the cell phone records of crash-involved drivers have reported that using a cell phone while driving is associated with roughly a quadrupling of crash risk. Studies using driving simulators have also found that cell phone use significantly impairs several aspects of driving performance, principally reaction time. Studies comparing the risks associated with using hand-held and hands-free cell phones while driving have found them indistinguishable—both increase risk. Meanwhile, available data shows that the number of cell phone subscribers, and the proportion of drivers using cell phones, is increasing.

This research update presents new data from the AAA Foundation's Traffic Safety Culture Index, a nationally-representative telephone survey of the American public, on drivers' cell phone use and their attitudes toward distracted driving, as well as data on driver cell phone use from a recent omnibus survey conducted for the AAA Foundation.

Results show that over half of U.S. drivers report having used a cell phone while driving in the past 30 days, and one in seven even admits to text messaging while driving. Young drivers were found to be overwhelmingly more likely than older drivers to text message, and somewhat more likely to talk on cell phones while driving; however, the proportion of drivers aged 35 to 44 who report talking on cell phones while driving is not significantly lower than the proportion of drivers aged 18 to 24 who report doing so. Higher levels of education were also found to be associated with higher levels of cell phone use and text messaging while driving.

A substantial proportion of the American public believes that drivers using cell phones are a serious traffic safety problem and that it is unacceptable to use a cell phone while driving. Respondents who express negative attitudes toward cell phone use while driving were found to be somewhat less likely to use cell phones while driving; however, a substantial proportion of respondents who express negative attitudes toward using a cell phone while driving still admit doing so at least occasionally. About two-thirds of drivers who use cell phones while driving believe that it is safer to talk on a hands-free cell phone than on a hand-held cell phone; however, the overwhelming majority of available evidence suggests that it is not.

Background

Research has demonstrated that drivers are susceptible to virtually innumerable distractions that can contribute to the occurrence of a crash. For example, a study conducted in 2001 for the AAA Foundation for Traffic Safety analyzed a nationally-representative sample of crashes that occurred between 1995 and 1999 and resulted in one or more passenger vehicles having to be towed due to damage, and found that 8.3% of drivers in these crashes were reported to have been distracted (Stutts, Reinfurt, Staplin, & Rodgman, 2001). The most common sources of distraction cited in these crashes were an outside person, object, or event (29.4% of crash-involved drivers); adjusting the radio, cassette, or CD (11.4%), passengers (10.9%). Distraction related to the use of a cell phone was cited in 1.5% of crashes.

In a naturalistic study conducted in 2001 for the AAA Foundation, the driving of 70 volunteers was recorded using in-vehicle cameras to identify potential sources of distraction (Stutts, Feaganes, Rodgman, et al., 2003). The researchers reviewed 3 hours of data per subject and found that the potential distractions in which the greatest proportion of drivers engaged were manipulating the vehicle controls (100% of drivers), conversing with passengers (77% of drivers), eating or drinking (71% of drivers), and grooming (46% of drivers). Thirty-four percent of drivers used cell phones during the video samples that were reviewed, and did so for 3.8% of their total observed driving time.

In a more recent naturalistic driving study, 109 volunteers drove their own vehicle or a leased vehicle, with in-vehicle cameras and other sophisticated data collection equipment, for a period of 12 to 13 months. Researchers analyzed crashes (defined by the researchers as any contact between the vehicle and another vehicle or object; the great majority of crashes in this study were very minor and not police-reported) and near-crashes (events in which a rapid evasive maneuver was required to avoid crashing) in relation to drivers' behaviors and the traffic environment. In analysis focused specifically on driver inattention (Klauer, Dingus, Neale, Sudweeks, & Ramsey, 2006), the researchers reported that driver involvement in secondary tasks contributed to 22% of all crashes and near-crashes in the study. Comparing the frequency of specific secondary tasks at the time of crashes and near-crashes to their frequency during a random sample of periods of normal driving during which no crashes or near-crashes occurred, the researchers found that the secondary task that resulted in the greatest increase in the risk of being involved in a crash or near-crash was reaching for a moving object. Reading and applying makeup while driving were both associated with more than tripling of the odds of being involved in a crash or near-crash. Eating was associated with a 57% increase in the odds of being involved in a crash or near-crash. Dialing a hand-held device was associated with nearly triple the odds of being involved in a crash or near-crash, and talking or listening to a hand-held device was associated with about a 30% increase in the odds of being involved in a crash or near-crash. Dialing hand-held devices was found to have been a contributing factor in 3.58% of crashes and near-crashes, and talking/listening on hand-held devices was a contributing factor in 3.56% of crashes and near-crashes. Both dialing and talking/listening on handheld devices contributed to significantly greater percentages of crashes and near-crashes than did any of the other secondary tasks that were studied—even though some of the other secondary tasks were associated with higher risk—because drivers dialed and talked on cell phones much more frequently than they engaged in most other secondary tasks.

Driver cell phone use has become emblematic of driver distraction—or arguably even of traffic safety—in the eyes of the public. For example, in the AAA Foundation's Traffic Safety Culture Index (2008), a nationally-representative telephone survey of the American public, respondents were asked an open-ended question regarding what they believed was "the single most effective thing that could be done to prevent serious motor vehicle accidents." Over one out of every six responses included an explicit reference to cell phones. When asked to rate "how serious of a problem" drivers using cell phones are, 83% of respondents indicated said that they were a serious or extremely serious problem, and when asked whether or not it was acceptable to talk on a cell phone while driving, half said that it was never acceptable.

Driver cell phone use has become a major research area as well. For example, a bibliography of research reports and scientific articles published between the mid-1990's and 2005 addressing driver distraction associated with the use of cell phones contained over 150 references (Goodman, Barker, & Monk, 2005).

CTIA–The Wireless Association (CTIA) reports that as of December 2007 there were over 255 million wireless telephone subscribers in the United States, comprising 84% of the population, and they spent 2.1 trillion minutes talking on cell phones and transmitted 363 billion SMS messages over the course of the year (CTIA, 2008). These statistics represented a 23% increase in subscribers, a 40% increase in annual minutes of use, and a 348% increase in annual SMS messages ("text messages"), relative to statistics from December 2005, and a 133% increase in subscribers and nearly a 300% increase in annual minutes of use relative to statistics from December 2000, suggesting the possibility of increased cell phone use while driving since the dates of the studies cited previously.

The National Highway Traffic Safety Administration (NHTSA) estimated that 6% of drivers nationwide were holding a cell phone to their ear, 0.7% of drivers were talking on visible headsets, and 0.6% of drivers were manipulating visible hand-held devices at any given daylight moment in 2007 (NHTSA, 2008). These estimates are based on NHTSA's National Occupant Protection Use Survey (NOPUS), in which data collectors standing on the side of the road at a statistical sample of roadway locations observe driver seatbelt use, cell phone use, and several factors related to driver demographics and vehicle occupancy. Thus, estimates of electronic device use include only cases in which the data collectors are able to see drivers holding a cell phone, speaking into a visible headset, or manipulating a hand-held device. Many hands-free devices, such as speaker-phones and Bluetooth devices built into the vehicle, cannot be seen by external observers, thus these estimates based on visible hand-held device use and headset use are believed to underestimate overall levels of driver cell-phone use. NHTSA (2008) estimates based on telephone surveys that 45% of drivers who use cell phones while driving use hands-free devices, thus implying that if 6% of drivers were observed using hand-held cell phones while driving, an estimated additional 5% were likely using hands-free devices, implying that roughly 11% of drivers may have been using hand-held or hands-free phones while driving at any given daylight moment in 2007.

Two studies using epidemiological methods have reported that cell phone use while driving is associated with approximately a quadrupling of crash risk. In one study, Redelmeier & Tibshirani (1997) obtained cellular billing records for a sample of drivers in Toronto who had been involved in crashes that resulted in property damage but no injury, compared their cell phone use during a ten-minute window prior to the time of the crash and during a control period at the same time on the previous day, and estimated that cell phone use while driving was associated with slightly more than a fourfold increase in the risk of being involved in a crash (relative risk 4.3). In a similar study, McEvoy *et al.* (2005) analyzed the cell phone records of a sample of crash-involved drivers in Western Australia who were seen in the hospital emergency department due to injuries sustained in a crash, compared their cell phone use during a ten-minute window prior to the time of the crash and during up to three control periods (24 hours, 72 hours, and 7 days prior to the crash), and found similarly that cell phone use while driving was associated with slightly more than a fourfold increase in crash risk (odds ratio 4.1). The former study found slightly higher risk associated with using a hands-free phone than with using a hand-held phone, and the latter found the reverse; however, the difference in risk between phone types was not statistically significant in either case.

Several studies using driving simulators have also reported that cell phone use impairs various aspects of simulated driving performance. A systematic review of 84 studies of the impact of cell phone use on driving performance concluded that cell phone use has some small or moderate impact on driving performance measures such as driving speed, lane position, and various other measures of vehicle control; however, the performance measure most impacted by cell phone use was the speed of reaction to critical events (Caird, Scialfa, Ho, & Smiley, 2005). The researchers estimated, based on data from 18 studies that reported relevant data, that cell phone use increases the time required to react to critical events approximately 0.23 seconds. They also note that the best estimates of the reaction time decrements associated with hand-held phones and hands-free phones are virtually identical.

18/84 ?

In one simulator-based study, researchers used a driving simulator to compare the driving performance of drivers using hands-free and hand-held cell phones to drivers not using cell phones who were given alcoholic beverages until their blood alcohol concentration (BAC) reached 0.08 g/dL, the threshold for a driving while intoxicated arrest in all U.S. states (Strayer, Drews, and Crouch, 2003). The study found that the reaction times of drivers using cell phones were slowed by 8.4% relative to drivers who neither had consumed alcohol nor were using phones, and that drivers using cell phones were actually more likely to have a rear-end crash than were drivers who had consumed alcohol after controlling for the difficulty and duration of the simulated driving task. The impact of using a hands-free phone on driving performance was not found to differ from the impact of using a hand-held phone, which the researchers suggest is due to, "withdrawal of attention from the processing of information in the driving environment" while engaging in cell phone conversation.

Did they test performance before + after and base on that? OR Did they base on individual's reactions compared to others?

The impact of cell phone conversation on reaction time is often explained with reference to a phenomenon referred to commonly as "inattentional blindness" or "perceptual blindness," well-documented in the psychological literature, wherein a person who is focusing his or her attention on one particular task will fail to notice an unexpected stimulus (even if he or she looks at it). Simons & Chabris (1999), for example, provide a review of experiments in which research subjects focusing on visual tasks fail to notice unexpected visual stimuli, and present their own seminal demonstration of the phenomenon. Pizzighello and Bressan (2008) conducted an experiment involving both visual and auditory tasks, and found that research subjects who were listening to verbal information were as likely as were subjects engaged in a visual task to miss an unexpected visual object. Strayer, Drews, & Johnston (2003) found that drivers conversing on hands-free phones were more likely than drivers not using phones to fail to notice traffic signals, slower to respond to the brake light of the vehicle in front of them, more likely to cause rear-end crashes, and less likely to be able to recall detailed information about specific visual stimuli—even those on which they fixated their vision—suggesting that cell phone conversation can induce inattentional blindness in the context of driving.

As of the date of this publication, the states of California, Connecticut, New Jersey, New York, and Washington, plus the District of Columbia, have laws that prohibit the use of hand-held phones while driving. Alaska, Louisiana, Minnesota, New Jersey, Washington, and the District of Columbia have laws that prohibit all drivers from text messaging while driving. Seventeen states also have laws that prohibit young drivers—drivers under the age of 18 in some cases, drivers with learner's permits or provisional licenses in other cases—from using any cell phone while driving, including a hands-free cell phone or device. Several states also have laws prohibiting drivers of school buses or transit buses from using cell phones or text messaging while driving (Insurance Institute for Highway Safety, 2008).

Although there are no published evaluations of most states' driving laws related to cell phone use, the few that have been published have had mixed results that collectively suggest that the passage of legislation is not sufficient by itself to have a significant impact on drivers' cell phone use. McCartt & Geary (2004) found that driver hand-held cell phone use decreased in four upstate New York communities immediately after the state's hand-held cell phone ban became effective, but had returned to the levels prior to implementation of the law when assessed again one year later (McCartt & Geary, 2004). McCartt, Hellinga, and Geary (2006) reported that hand-held cell phone use by drivers decreased by 44% in the District of Columbia approximately four-months after the District's law prohibiting drivers from using hand-held cell phones became effective; however, the authors note that sustained media coverage and enforcement may be necessary to sustain its effects, citing the absence of sustained effects despite initial short term effects in New York. Foss, Goodwin, McCartt, and Hellinga (2008) evaluated the immediate effects of a law prohibiting cell phone use by drivers younger than 18 in North Carolina, the proportion of teens using cell phones while driving did not change, and in surveys, only 22% of teens said that they thought the law was being enforced "fairly often" or "a lot."

In summary, it is clear that driver distraction is a serious traffic safety problem, and that driver cell phone use represents a particularly salient form of distraction. A large body of research has demonstrated that cell phone use causes measurable decrements in driving performance as measured in laboratory settings and is associated with approximately a fourfold increase in crash involvement on the road. The best available evidence suggests that it is no less hazardous for a driver to use a hands-free phone than to use a hand-held phone. Several jurisdictions now have laws prohibiting some drivers (e.g., drivers under age 18 or drivers of buses) or all drivers from using cell phones while driving; however, the limited evaluations of these laws suggest that their long-term impact is likely to be low in the absence of sustained and publicized law enforcement. Data on cell phone ownership show that more than four of every five Americans now own a cell phone, surveys show that over half of drivers admit to using a cell phone while driving at least occasionally, and over one in ten drivers on the road is likely to be using one at any given moment.

Methodology

The data reported here were collected in two national telephone surveys conducted for the AAA Foundation for Traffic Safety: the AAA Foundation's 2008 Traffic Safety Culture Index (AAA Foundation for Traffic Safety, 2008), and Opinion Research Corporation's CARAVAN® omnibus survey (Opinion Research Corporation, 2008). The 2008 Traffic Safety Culture Index was a telephone survey of 2,509 U.S. adults 18 years of age and older, conducted via landline and cellular telephone, in English and in Spanish, by NuStats, LLC, from October 25, 2007 through January 10, 2008. This survey included questions on a number of various traffic safety issues including driver distraction and cell phone use. CARAVAN is a weekly cost-shared telephone omnibus survey of adults 18 years of age and older living in private households in the continental U.S. Two-thousand and nine CARAVAN telephone interviews conducted from September 4 through September 8, 2008 included questions on driving and cell phone use which were paid for by the AAA Foundation.

In the Traffic Safety Culture Index, all respondents who were drivers were asked to indicate how often they had used a cell phone while driving in the past 30 days. A randomly-selected sample of half of the drivers was also asked how often they had read or sent a text message or an email while driving. A randomly-selected sample of half of respondents were also asked several other questions related to their attitudes toward distracted driving in general and cell phone use while driving in particular. In the CARAVAN survey, respondents were asked similar questions regarding their cell phone use and text messaging behavior while driving, and were also asked whether they believed it was safer or less safe to talk on a hands-free cell phone while driving than on a hand-held cell phone.

Multivariate logistic regression models were estimated to assess the associations between various respondent characteristics and cell phone use and text messaging while driving. In these models, cell phone use and text messaging were dichotomized as any self-reported use while driving vs. none. The following respondent-level demographic characteristics were included in the models.

- Age (16–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75+)
- Sex (male, female)
- Race & ethnicity (Non-Hispanic white, Black or African-American, Hispanic [any race], and all other races)

- Highest level of education completed (below high school, high school, some college/associate's degree/technical degree, bachelor's degree or higher)
- Marital status (never married, married, separated/divorced/widowed)
- Region (northeast, north central, northwest, southwest, southeast)

Variables not statistically significant at the 80% confidence level were removed from models one at a time, and the models were re-estimated subsequently. Variables significant at the 80% confidence level were retained in the models; however, statements that differences were statistically significant refer to significance at the 95% confidence level. Note that models are based only on data from the Traffic Safety Culture Index; subgroup analyses were not performed on the CARAVAN data due to differences between the two surveys in sample composition and data collection and weighting protocol. Logistic regression analyses were conducted using survey estimation commands in the statistical software package Stata (StataCorp, 2007).

The results of the logistic regression modeling are reported as odds ratios. An odds ratio larger than 1.0 indicates that the value of the variable being analyzed (e.g., variable: education, value: bachelor's degree) is associated with a higher probability of the outcome of interest (e.g., using a cell phone while driving), relative to the probability of the outcome in a specified reference group (e.g., respondents without a bachelor's degree). An odds ratio smaller than 1.0 indicates that the probability of the outcome of interest is lower in the group being analyzed than in the reference group. An odds ratio of 1.0 indicates that the probability of the outcome is the same in the group being analyzed as in the reference group. When an outcome measure is rare (e.g., when the outcome of interest occurs in fewer than approximately10% of cases), odds ratios are reasonably good approximations of relative risks. In such cases, an odds ratio of 2.0, for example, would suggest that the outcome was "twice as likely" in the group being analyzed as in the reference group. However, in the data analyzed here, the outcome measures (cell phone use and text messaging while driving) were not rare, thus the odds ratios reported here indicate the direction and the relative strengths of relationships, but they should not be interpreted as relative risks.

Note that whenever confidence intervals are reported, they reflect only the level of confidence that the responses of a random sample of respondents are statistically representative of the responses that would have been obtained if the entire population were to have been interviewed over the same time period. Confidence intervals do not reflect errors or biases related to systematic non-coverage of certain segments of the population, non-response due to certain individuals not being able to be contacted or refusing to participate, interviewer errors, or differences in understanding of survey questions or response options.

Also note that in the CARAVAN survey, respondents were asked whether or not they owned a cell phone. Questions regarding cell phone use and text messaging while driving were only asked of respondents who indicated that they did own a cell phone. It was assumed that respondents who reported not owning a cell phone did not talk on a cell phone or read or send text messages while driving. In the analyses that follow, these respondents were grouped with those who reported never using a cell phone while driving.

Finally, note that both surveys included non-drivers as well as drivers. When the word *respondents* is used in this report, it refers only to *respondents who were drivers*, and statements regarding percentages of respondents refer to percentages of respondents who were drivers, unless otherwise noted.

Results

Cell phone use and text messaging while driving

Respondents who were drivers were asked to report how often they had talked on a cell phone while they were driving in the past 30 days. Traffic Safety Culture Index respondents answered this question using a five-point scale on which *1* was defined to the respondent as *never* and *5* as *very often*. CARAVAN respondents reported their cell phone use while driving in the past 30 days by responding *regularly*, *sometimes*, *rarely*, or *never*. A total of 2,050 valid responses were obtained from Traffic Safety Culture Index respondents and 1,777 from CARAVAN respondents. Overall, 53% of Traffic Safety Culture Index respondents and 61% of CARAVAN respondents reported having talked on a cell phone while driving in the past 30 days. Interpreting responses of *4* as *often*, 17% of Traffic Safety Culture Index respondents reported talking on cell phones while driving often or very often; 16% of CARAVAN respondents reported talking on cell phones while driving regularly.

Half of Traffic Safety Culture Index respondents and all CARAVAN respondents were asked to report how often they had read or sent text messages or emails (hereafter referred to collectively as text messaging) while they were driving in the past 30 days, using the same response formats. A total of 979 valid responses were obtained from Traffic Safety Culture Index respondents and 1,778 from CARAVAN respondents. Overall, 14% of Traffic Safety Culture Index respondents and 17% of CARAVAN respondents reported text messaging while driving in the past 30 days. Interpreting responses of *4* as *often*, about 3% of Traffic Safety Culture Index respondents reported text messaging while driving often or very often; 3% of CARAVAN respondents reported text messaging while driving regularly.

Figure 1 shows reported cell phone use and text messaging while driving both overall and within categories of demographic variables, based on data from the Traffic Safety Culture Index. The total length of the bar represents the proportion of respondents who reported using a cell phone or text messaging while driving at all, and the shaded portion represents the proportion of respondents who reported using a cell phone or text messaging while driving often or very often.

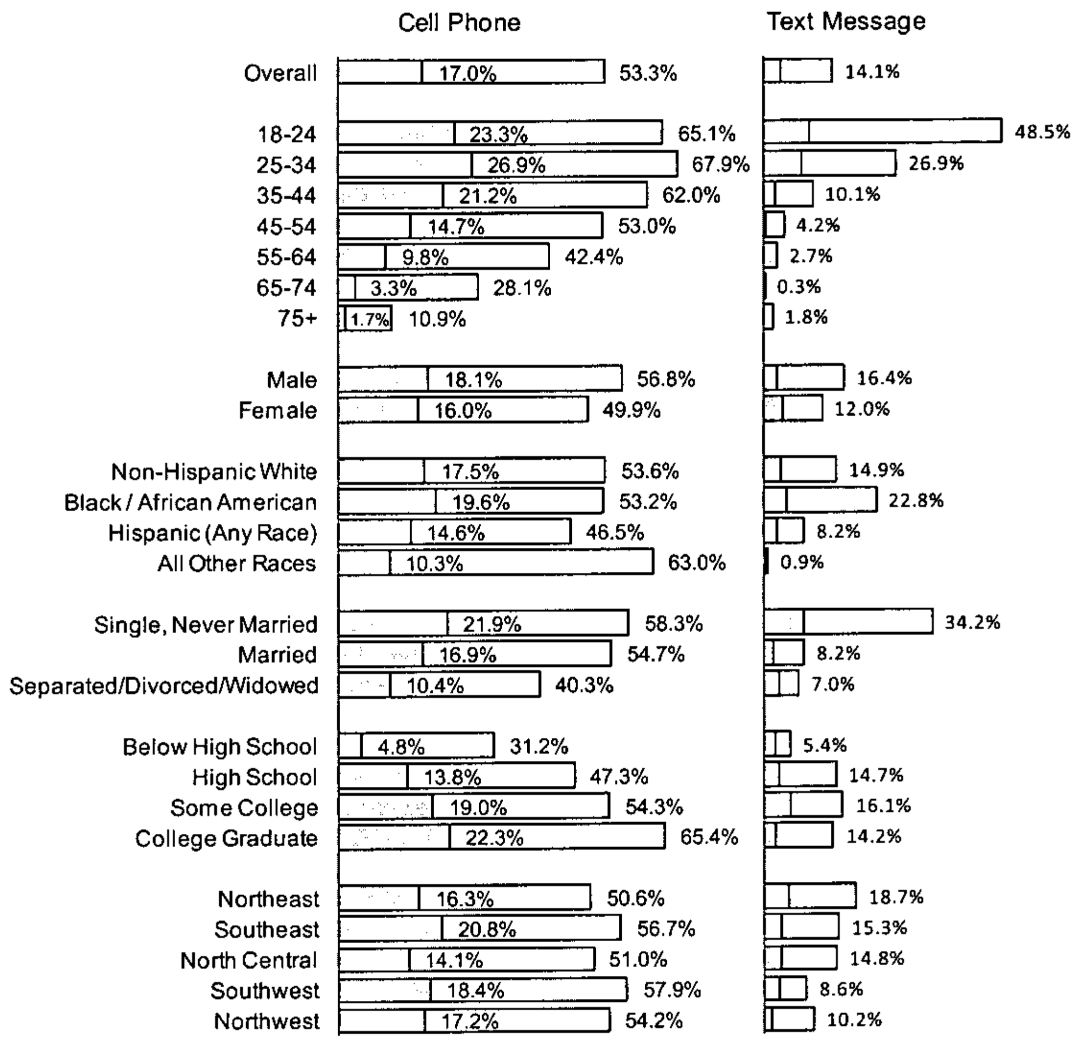

Figure 1. Percentage of drivers reporting cell phone use or text messaging in past 30 days. Full bar = any use, shaded portion = often or very often.

Multivariate logistic regression modeling of the odds of reporting using a cell phone while driving found that age, sex, and education were significantly associated with cell phone use. Marital status was retained in the model but was not significant at the 95% confidence level ($p = .158$). Region and race & ethnicity were not significant at the 80% confidence level and thus were removed from the model. The model showed that younger respondents, male respondents, and respondents with higher levels of education were more likely to report using a cell phone while driving. Odds ratios and 95% confidence intervals for cell phone use are shown in Table 1.

Modeling of the odds of text messaging while driving found that age, marital status, and race & ethnicity, were significantly associated with text messaging while driving; level of education as marginally significant ($p = .054$). Region and sex were not significant at the 80% confidence level and thus were removed from the model. The model showed that younger respondents, single respondents, non-Hispanic white respondents, and respondents with higher levels of education were more likely to report text messaging while driving. Odds ratios and 95% confidence intervals for text messaging are shown in Table 2.

Table 1. Odds ratios (OR) and 95% confidence intervals (CI) from logistic regression models of cell phone use while driving.

Variable (vs. Reference)	OR	95% CI
Age 25–34 (vs. 16–24)	0.82	0.46 – 1.43
Age 35–44 (vs. 16–24)	0.58	0.33 – 1.03
Age 45–54 (vs. 16–24)	0.40	0.23 – 0.72
Age 55–64 (vs. 16–24)	0.26	0.14 – 0.48
Age 65–74 (vs. 16–24)	0.14	0.07 – 0.28
Age 75+ (vs. 16–24)	0.05	0.02 – 0.13
Male (vs. Female)	1.36	1.03 – 1.80
Less than High School (vs. High School)	0.50	0.29 – 0.86
Some College (vs. High School)	1.29	0.92 – 1.82
College Graduate (vs. High School)	2.09	1.44 – 3.03
Married (vs. Single)	1.45	0.98 – 2.15
Separated/Divorced/Widowed (vs. Single)	1.21	0.71 – 2.06

Table 2. Odds ratios (OR) and 95% confidence intervals (CI) from logistic regression models of text messaging while driving.

Variable (vs. Reference)	OR	95% CI
Age 25–34 (vs. 16–24)	0.49	0.22 – 1.10
Age 35–44 (vs. 16–24)	0.13	0.05 – 0.35
Age 45–54 (vs. 16–24)	0.05	0.02 – 0.16
Age 55–64 (vs. 16–24)	0.03	0.00 – 0.29
Age 65–74 (vs. 16–24)	0.00	0.00 – 0.01
Age 75+ (vs. 16–24)	0.02	0.01 – 0.06
Less than High School (vs. High School)	0.29	0.05 – 1.67
Some College (vs. High School)	1.30	0.64 – 2.63
College Graduate (vs. High School)	2.27	1.02 – 5.06
Hispanic (vs. Non-Hispanic White)	0.45	0.23 – 0.88
African American (vs. Non-Hispanic White)	1.21	0.48 – 3.03
Married (vs. Single)	0.41	0.21 – 0.79
Separated/Divorced/Widowed (vs. Single)	0.56	0.19 – 1.64

It is possible that some of these results are confounded by differences in cell phone ownership that are correlated with the variables under investigation. For example, if college graduates are more likely to have access to cell phones than are people who have not completed high school, then it is possible that future changes in cell phone ownership would attenuate the relationships observed here. Respondents interviewed via landline were not asked whether or not they owned a cell phone, thus the possibility of that these results are confounded by cell phone ownership could not be tested formally; however, an informal test was conducted by re-estimating the models described previously using only the data obtained respondents who were interviewed via cell phone. This reduced the number of observations in each model by more than two-thirds, thus most relationships that were statistically significant in the models based on the full sample were no longer statistically significant when analyzing only the cell phone sub-sample. However, the magnitudes of the estimated odds ratios generally were generally similar in both sets of models, suggesting that the relationships observed here are unlikely to be biased severely by differences in cell phone ownership.

Use of hand-held and hands-free phones while driving

Respondents in both the Traffic Safety Culture Index survey and the CARAVAN omnibus survey who reported any cell phone use while driving were asked whether they used a hand-held or hands-free cell phone while driving. A total of 1,020 valid responses were obtained from Traffic Safety Culture Index respondents and 989 from CARAVAN respondents. Overall, 56% of Traffic Safety Culture Index respondents and 60% of CARAVAN respondents reported using a hand-held phone, 35% of the Traffic Safety Culture Index respondents and 34% of the CARAVAN respondents reported using a hands-free phone, and 9% of the Traffic Safety Culture Index respondents and 5% of the CARAVAN respondents reported using both types.

CARAVAN respondents were also asked, "Do you think talking on a hands-free cell phone while driving is much less safe, a little bit less safe, a little bit safer, or much safer than talking on a hand-held cell phone while driving, or do you think they're about the same?" Nearly one-third (30.3%) of all drivers and over one-third (36.2%) of drivers who report using a cell phone while driving responded that using a hands-free phone while driving is much safer than using a hand-held phone. Overall, nearly two-thirds (63.5%) of all drivers and over two-thirds (68.4%) of drivers who report using a cell phone while driving responded that using a hands-free phone is safer.

Attitudes toward cell phone use and distracted driving

A random sample of half of the Traffic Safety Culture Index respondents were asked to rate the seriousness of a number of different traffic safety issues, using a five-point scale on which the respondent was instructed to use *1* to indicate that the issue was *not a problem at all* and *5* to indicate that it was *an extremely serious problem.* Overall, 83% of drivers rated distracted drivers and drivers using cell phones both as serious (interpreting responses of *4* as *serious*) or extremely serious problems. Only drinking drivers were rated as serious problem by a greater proportion of drivers—88% rated drinking drivers as a serious or extremely serious problem. Distracted drivers and drivers using cell phones both rated above aggressive drivers, excessive speeding, and drivers running red lights in terms of public perceptions of their seriousness.

Surprisingly, the relationship between drivers' ratings of the seriousness of distracted drivers and their self-reported cell phone use while driving was not statistically significant ($F[3.63, 3620.93] = 0.95, p = .43$); however, the relationship between respondents' ratings of the seriousness specifically of drivers using cell phones and their own self-reported cell phone use was stronger and statistically significant ($F[3.87, 3873.72] = 11.30, p < .001$). As expected, drivers who believe that drivers using cell phones are an extremely serious traffic safety problem are less likely to report that they themselves use their cell phone while driving; however, 46% of those who said that drivers using cell phones was an extremely serious problem still reported that they had used a cell phone while driving in the past 30 days.

Half of the Traffic Safety Culture Index respondents were also asked to rate how acceptable they considered talking on a cell phone while driving, using a five-point scale on which *1* was defined as *never acceptable* and *5* as *always acceptable*. There was substantial variation in responses, with 48% of drivers reporting that using a cell phone while driving was never acceptable, 49% providing a middle rating of 2, 3, or 4, and 2% reporting that using a cell phone while driving was always acceptable. Respondents' opinions regarding the acceptability of talking on a cell phone while driving were significantly associated with their self-reported cell phone use ($F[3.73, 3881.15] = 24.34, p < .001$). Drivers who said that it was never acceptable to talk on a cell phone while driving were much less likely to report that they themselves had used a cell phone while driving: 29% of drivers who said that it was never acceptable to talk on a cell phone while driving reported having done so in the past 30 days, as compared to 71% of drivers who gave any other rating for the acceptability of this behavior.

Finally, near the beginning of the Traffic Safety Culture Index survey, before respondents had been asked any questions about cell phones or any other specific traffic safety issues, respondents were asked to indicate in their own words what they believed was "the single most effective thing that could be done to prevent serious motor vehicle accidents." Sixteen percent of responses specifically mentioned cell phone use. A few examples of responses to this question include:

- "Do something about the cell phones"
- "Stop using cell phones while driving"
- "Drivers paying more attention rather than talking on their cell phones"
- "Making new laws to ban cell phone usage while in a car"
- "They should make it illegal to talk on the phone while driving"

Having specifically mentioned cell phones in response to this question was associated with significantly lower probability of reporting cell phone use while driving ($F[1, 1761] = 5.37, p = .021$); however, 45% of drivers who specifically mentioned cell phones still reported that they had used a cell phone while driving in the past 30 days. Even one of the respondents whose response is shown above reported often using a cell phone while driving.

Key Points

- ✓ Studies using driving simulators have found that using a cell phone while driving significantly impairs several aspects of driving performance, principally reaction time.
- ✓ Studies of the cell phone records of crash-involved drivers suggest that using a cell phone while driving is associated with roughly a quadrupling of crash risk.
- ✓ Two out of every three drivers believe that using a hands-free cell phone while driving is safer than using a hand-held phone; however, the overwhelming majority of available evidence suggests that it is not.
- ✓ Over half of all drivers admit using a cell phone while driving at least occasionally; 16–17% report doing so regularly.
- ✓ Younger people report higher levels of cell phone use while driving than older people do; however, the proportion of drivers aged 35 to 44 who report using cell phones while driving is not significantly lower than the proportion of drivers ages 18 to 24 who report doing so.
- ✓ One in seven drivers admits to text messaging while driving.
- ✓ Younger people are overwhelmingly more likely than older people to text message while driving—nearly half of survey respondents aged 18 to 24 admit doing so, whereas fewer than 5% of drivers aged 45 and older admit doing so.
- ✓ More than four out of five drivers rate drivers using cell phones as a serious or extremely serious traffic safety problem, over half say that it is unacceptable, and one in seven even mention reducing or eliminating driver cell phone use in an open-ended question seeking ideas for ways to prevent motor vehicle crashes. Drivers who express these attitudes are less likely than average to report using a cell phone while driving; however between 29% and 46% of these same drivers report that they themselves have used a cell phone while driving at least occasionally in the past month.

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Highway Loss Data Institute Bulletin

Hand-Held Cellphone Laws and Collision Claim Frequencies

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INTRODUCTION

Cellphone use in the United States has grown quickly during the past decade. According to the Cellular Telecommunications and Internet Association (2009), cellphone subscribers increased 42 percent between 2005 and 2009. Minutes of use surged from 195 billion in June 2000 to more than 1.1 trillion in June 2008. There is growing public concern about the contribution of cellphone use and/or text messaging to distracted driving.

A number of jurisdictions worldwide, including several US states, have made it illegal to use hand-held cellphones while driving. Evidence on the effectiveness of these bans is mixed. The Insurance Institute for Highway Safety (IIHS) has studied driver response to three of the statewide bans on hand-held phone use (McCartt and Geary, 2004; McCartt and Hellinga, 2007; McCartt et al., in press). In November 2001, New York became the first state to implement a ban on hand-held cellphone use for drivers, and driver phone use immediately declined by an estimated 47 percent. The District of Columbia passed a ban in 2004, and driver cellphone use dropped 41 percent. Connecticut's ban took effect in 2005, and hand-held phone use declined by an estimated 76 percent. The estimated effects of these three cellphone laws differ considerably, but results indicate that banning hand-held cellphone phone use can affect phone use. Funny!

The purpose of this Highway Loss Data Institute (HLDI) bulletin was to examine state level automobile insurance collision claim frequencies to determine if the reduction in hand-held cellphone use was accompanied by measurable changes in claim frequency after enactment of cellphone bans. Trends for Connecticut, New York, and the District of Columbia were examined because IIHS has documented that hand-held cellphone use decreased after these jurisdictions enacted bans. California also is included in the analysis because it is a large state and its ban is fairly recent.

RESULTS

Monthly collision claim frequencies (measured in claims per 100 insured vehicle years) were calculated by state for vehicles 0-3 years old (i.e., calendar year 2008 would include model years 2007-09). Claim frequencies for study jurisdictions, those with hand-held cellphone bans, were compared with neighboring jurisdictions that did not enact similar bans. This method of analysis was used to control for possible changes in claim frequency unrelated to the bans: e.g., economic downturn, change in miles driven, and seasonality. Results of these comparisons are illustrated in Figures 1-4.

California's hand-held cellphone ban took effect in July 2008. Figure 1 shows collision claim frequencies for California for the months before and after the ban. Aggregate claim frequencies for the neighboring states of Arizona, Nevada, and Oregon are shown as control states. Monthly fluctuations in claim frequencies for California were very similar to those for the comparison states. Although claim frequencies for California fluctuated monthly, no notable change was apparent coincident with enactment of the state's hand-held cellphone ban.

Figures 2 and 3 show collision claim frequencies for Connecticut and the District of Columbia compared with control states. Due to the urban nature of the District of Columbia, claim frequencies for the District were compared with those for Baltimore City in Maryland as well as the states of Virginia and Maryland. Results for Connecticut and the District were similar to California in that, following enactment of hand-held cellphone bans, monthly collision claim frequencies did not trend differently compared with control states. Trends in collision claim frequencies for Connecticut and the District essentially paralleled those for the respective control states.

Figure 4 shows collision claim frequencies for the state of New York compared with control states. Suffolk, Westchester, and Nassau counties were excluded from analysis because these jurisdictions enacted cellphone bans prior to the statewide ban. Monthly claim frequencies for New York after the ban ultimately trended lower than those for the control states. However, the decreasing trend for New York had begun before the ban.

To further examine trends in collision claim frequencies, a simple time-based regression model was developed, and the model was applied to loss data for each of the study states and their respective control states. The regression models used a Poisson distribution and the following variables:

- MonthIndex: continuous, sequential variable to identify each month in the time series
- StateType: categorical variable used to identify a state as the study state or part of the control states
- BanStatus: categorical variable also used to identify the status of a ban for each month.

One value was used to identify months during the period before the ban, and another was used to identify months during the period after the ban.

I can't tell which ones are which.

FIGURE 1 COLLISION CLAIM FREQUENCIES FOR NEW VEHICLES BY MONTH
CALIFORNIA VS. CONTROL STATES (ARIZONA, NEVADA, OREGON)

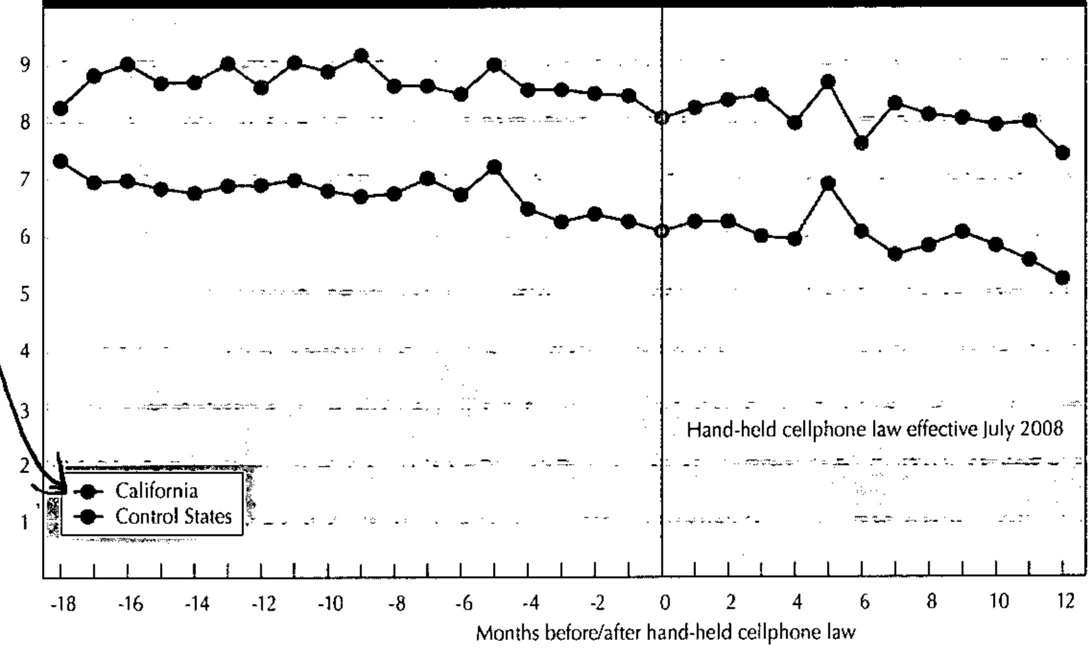


FIGURE 2 COLLISION CLAIM FREQUENCIES FOR NEW VEHICLES BY MONTH
CONNECTICUT VS. CONTROL STATES (MASSACHUSETTS, NEW YORK)

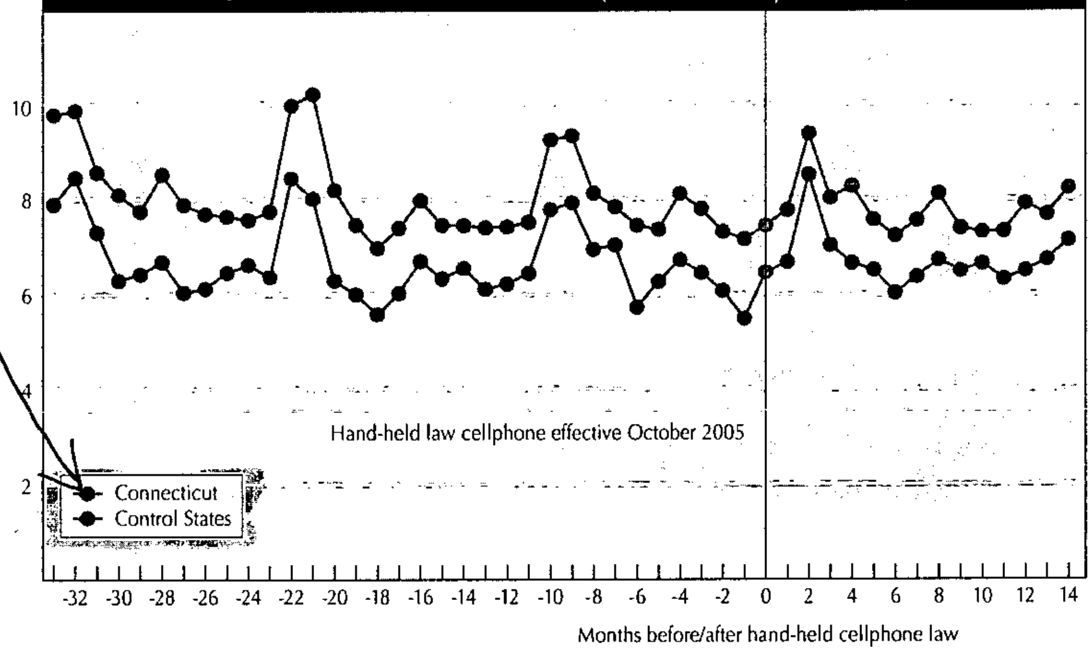


FIGURE 3 COLLISION CLAIM FREQUENCIES FOR NEW VEHICLES BY MONTH DISTRICT OF COLUMBIA VS. CONTROL STATES (MARYLAND, VIRGINIA) AND BALTIMORE CITY

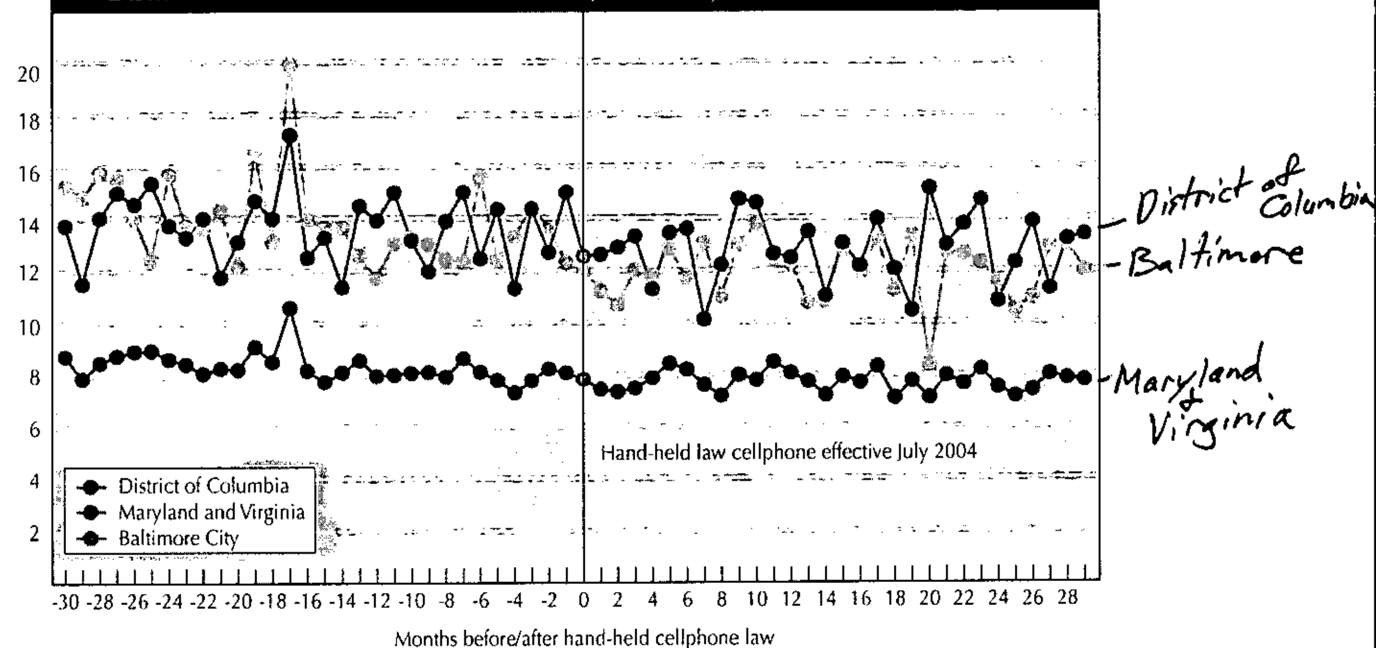
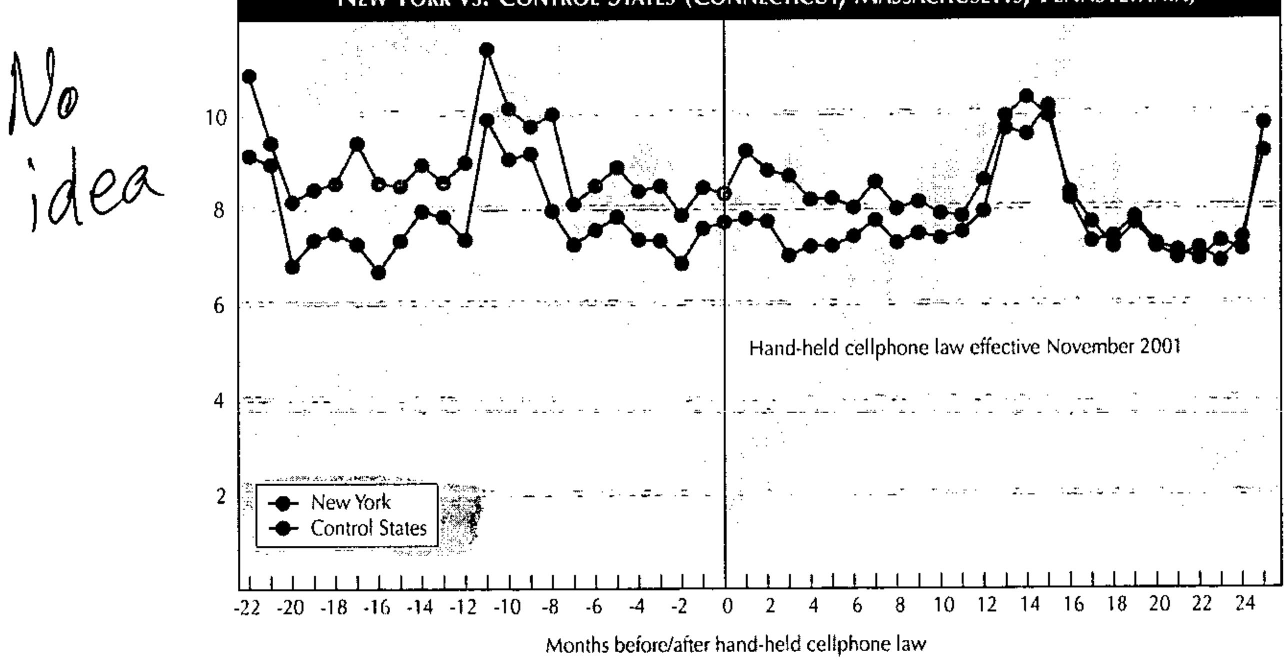


FIGURE 4 COLLISION CLAIM FREQUENCIES FOR NEW VEHICLES BY MONTH NEW YORK VS. CONTROL STATES (CONNECTICUT, MASSACHUSETTS, PENNSYLVANIA)



Two interactions were used in the model. The first interaction, MonthIndex and StateType, estimated trend lines for both the study state and control states. The estimate for the MonthIndex variable represents the trend for the control states, whereas the estimate for the MonthIndex and StateType interaction is the difference between trends for the study state and control states. The second, more critical, interaction, StateType and BanStatus, provided a simple test of the ban's effect on collision claim frequencies in the study state. A p-value less than 0.05 for this interaction indicates the ban had a measurable effect on collision claim frequency.

To account for the possibility of more complex trend lines, terms corresponding to MonthIndex squared and MonthIndex cubed were attempted in the model. Results produced by these more complex terms did not alter the findings for the key interaction and therefore were excluded from the model.

Table 1 lists results of the regression model for California using Arizona, Nevada, and Oregon as control states. The negative estimate for MonthIndex indicates a decreasing trend for the control states, whereas the estimate for the interaction of MonthIndex and StateType indicates a slower decline for California. The positive estimate for StateType indicates that, without regard to the ban, collision claim frequencies were higher for California than for control states. The estimate for the interaction StateType and BanStatus was not statistically significant, indicating the model did not detect an effect of the ban on collision claim frequencies for California.

TABLE 1 RESULTS OF THE TIME-BASED REGRESSION MODEL FOR CALIFORNIA VS. CONTROL STATES (ARIZONA, NEVADA, OREGON)

PARAMETER	DEGREES OF FREEDOM	ESTIMATE	STANDARD ERROR	WALD 95% CONFIDENCE LIMITS		CHI-SQUARE	P-VALUE
Intercept	1	-8.657	0.0073	-8.671	-8.643	1417516	<0.0001
MonthIndex	1	-0.007	0.0006	-0.008	-0.005	101.91	<0.0001
StateType	1	0.293	0.0086	0.276	0.310	1168.89	<0.0001
BanStatus	1	-0.019	0.0114	-0.042	0.003	2.8	0.0943
MonthIndex*StateType	1	0.004	0.0008	0.003	0.006	30.17	<0.0001
StateType*BanStatus	1	-0.015	0.0135	-0.042	0.011	1.25	0.2635

Table 2 summarizes estimates for the interaction of StateType and BanStatus for regression models using data for California, Connecticut, District of Columbia (compared with control states), and New York. Additional models examined data restricted to youthful drivers (ages 16-24).

TABLE 2 EFFECT ESTIMATES OF HAND-HELD CELLPHONE BANS ON COLLISION CLAIM FREQUENCY

BAN STATE	GROUP	ESTIMATE OF STATETYPE*BANSTATUS	BAN EFFECT	P-VALUE
California	All Ages	-0.0151	-1%	0.2635
California	Age <25	-0.0158	-2%	0.1116
Connecticut	All Ages	0.0351	4%	0.0317
Connecticut	Age <25	0.0513	5%	0.2835
District of Columbia (vs. Maryland and Virginia)	All Ages	-0.0461	-5%	0.1753
District of Columbia (vs. Maryland and Virginia)	Age <25	-0.0141	-1%	0.9117
District of Columbia (vs. Baltimore City)	All Ages	-0.0011	0%	0.9810
District of Columbia (vs. Baltimore City)	Age <25	-0.2309	-21%	0.1670
New York	All Ages	0.0324	3%	0.0052
New York	Age <25	0.0166	2%	0.6208

Only two of the ten estimates were statistically significant: all drivers in New York and all drivers in Connecticut. Positive estimates for the interaction of StateType and BanStatus indicate cellphone bans in these states were associated with higher collision claim frequencies. It is possible the predictions were a statistical artifact rather than an indication of a true disbenefit of hand-held cellphone laws. However, it is noteworthy that the model did not detect a benefit of hand-held cellphone laws on collision claim frequency for any of the states or any age group within the states.

DISCUSSION

Insurance collision loss experience does not indicate a decrease in crash risk when hand-held cellphone laws are enacted. Crashes in this bulletin included all collision claims reported to HLDI, whereas ideally crashes would have been restricted to claims involving driving while using hand-held cellphones. This information is not known to HLDI, nor to the insurance companies that supply data to HLDI, and is a clear limitation of the analysis. However, prior estimates of the effects of cellphone use on crash risk were so large, and reductions in observed hand-held cellphone use following the laws were so substantial, that reductions even in aggregate crashes would be expected after enactment of hand-held cellphone laws.

Data presented in this bulletin indicate that, during a time of large growth in the purchase of cellphones and in the use of these phones, collision claim rates either were flat or already decreasing before enactment of the laws. Claim frequencies for control states without laws also were declining and generally continued to trend in the same way as claim frequencies for the study states after the laws. There is no evidence that bans on hand-held cellphone use by drivers has affected these trends in collision claims.

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The Highway Loss Data Institute is a nonprofit public service organization that gathers, processes, and publishes insurance data on the human and economic losses associated with owning and operating motor vehicles.

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The Effect of Cellular Phone Use Upon Driver Attention

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A. Scott McKnight
1991

Somewhat OutDated

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Performed under a grant from the AAA Foundation for Traffic Safety

One of the most popular innovations in automotive travel in the past decade has nothing to do with the automobile itself, the people who drive them, or the roads over which they operate. Rather, it is the ability to carry on telephone conversations while driving.

What CB radios were to the '70s, cellular phones were to the '80s. From early 1984, when the first complete systems became operational, the number of cellular phone users has grown to over two million. By the mid-'90s, when cellular service will be available throughout most population centers in the United States, the number of subscribers is expected to grow to between ten and twenty million.

While cellular phones are really elements of communication rather than transportation, their potential impact upon the latter is sizable. The prospect of twenty million drivers having the opportunity to place, receive, or handle a telephone call while driving is not something easily ignored.

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EXECUTIVE SUMMARY

Research has shown that use of cellular phones does not interfere significantly with the ability to control an automobile except among the elderly, where potentially dangerous lane excursions can occur. However, the effect of cellular phones as a possible distraction has not been investigated.

In this study, 151 subjects observed a 25-minute video driving sequence containing 47 situations to which drivers would be expected to respond by manipulation of the vehicle's controls. Each situation occurred equally often under five conditions of distraction: placing a cellular phone call, carrying on a simple cellular phone conversation, carrying on a complex cellular phone conversation, tuning a radio, and no distraction (i.e., none of the preceding). The radio tuning task was included simply to provide a familiar benchmark. The degree of distraction was measured by comparing responses under each distraction with those occurring in the absence of any distraction. Response was measured in terms of both whether the subject responded and how long it took (with a time penalty for those who did not respond at all).

All of the distractions led to significant increases in both the number of situations to which subjects failed to respond and the time it took to respond to them. Complex phone conversations created the greatest distraction and simple conversations the least, with tuning the radio falling in between. Placing a phone call was no more deleterious than a simple conversation in causing situations to go unnoticed, but delayed responses to about the same degree as did complex calls. Relative increase in chances of a highway-traffic situation going unnoticed ranged from approximately 20% for placing a call in simple conversations to 29% for complex conversations.

The effect of cellular phone use upon response to highway-traffic situations was the most deleterious for the older age group (i.e., 50-80). Overall, the increase in likelihood that some highway-traffic situation will go unnoticed while calling or conversing on a cellular phone was (for the older group) about twice that of their younger counterparts. Older subjects were no more distracted by radio tuning than the middle-age group (26-49 years) and considerably less than the youngest group (17-25 years). As far as time to respond is concerned, age only effected the placing of cellular phone calls.

3105

While a cellular telephone conversation is no more distracting than a conversation of the same intensity with a passenger, the availability of a cellular phone is almost certain to increase significantly the number of conversations in general and the more distracting, intense, business conversation in particular. Older drivers, in particular, should be cautioned against placing calls

INTRODUCTION

One of the most popular innovations in automotive travel in the past decade has nothing to do with the automobile itself, the people who drive them, or the roads over which they operate. Rather, it is the ability to carry on telephone conversations while driving.

What CB radios were to the '70s, cellular phones were to the '80s. From early 1984, when the first complete systems became operational, the number of cellular phone users has grown to over two million. By the mid-'90s, when cellular service will be available throughout most population centers in the United States, the number of subscribers is expected to grow to between ten and twenty million.

While cellular phones are really elements of communication rather than transportation, their potential impact upon the latter is sizable. The prospect of twenty million drivers having the opportunity to place, receive, or handle a telephone call while driving is not something easily ignored.

Cellular Phones and Safety

Thus far, there is no evidence that the use of earphones poses a hazard to the motoring public. What makes the paucity of evidence less than reassuring is the absence of rigorous research in the area. There is the chance of finding out about the involvement of cellular phones in accidents from the reports that are ordinarily prepared by police or drivers. An early study by Brown, Tickner and Simmonds (1969) found that use of the telephone while driving had the effect upon routine driving skills, but did impair the perception of gaps in traffic. At the same time, driving impaired performance on tasks carried on over the telephone. A more recent study by Stein, Parseghian and Allen (1987) studied lane keeping and found significant degradation when placing phone calls in straight driving or on curves with older drivers showing the greater performance degradation. The practical implications of the variation in lane keeping were negligible except for the older age group (over 55), where the likelihood of exceeding the lane edge boundary was over 7%, which the authors translate "to a very high probability of striking an object outside the traveled lane, and thus a high probability of accident involvement." The risk of lane excursions and crashes decreased when the cellular phone was moved from console to dash, although the risk of crash was not eliminated.

The effect of phone use upon the perceptual responses of drivers is likely to constitute a greater threat to safety than its interference with vehicle control. First, perceptual processes play a far greater role in automobile accidents than does vehicle control. "Improper lookout" and "inattention" are the two leading contributors to automobile accidents (Treat et. al. 1977). Second, the extent to which cellular telephone calling interferes with vehicle control can be reduced by dialing aides (e.g., speed dial) and by placing calls only when conditions permit relaxation of vehicle control requirements. The effect of phone use upon perceptual processes, however, is not so readily ameliorated. There is nothing that can be done to the phone to lessen the disruptive effect that mere telephone conversation seems to have on perceptual processes in the Brown et. al. study. Nor can one arrange to schedule telephone conversations around what are primarily unpredictable perceptual tasks. Third, among the population whose driving is most effected by telephone use - older drivers, it is the perceptual processes that undergo the greatest decline. Research has shown significant age-related decrement in general attention, selective attention, attention sharing and spatial judgment.

While Brown, Tickner and Simmonds discovered an effect of telephone use upon perceptual performance, the scope of that performance was limited to judging gaps in traffic. Certainly the criticality of this task to safe driving cannot be questioned. However, other perceptual processes are equally or more critical. The relation of lapses in visual search (lookout and attention) to accidents has already been mentioned.

The interference of telephone calling with the perceptual and cognitive processes involved in driving a car is primarily physical and has to do with the location of the dialing mechanism, the visibility of the keys, and so on. The distraction that results from the carrying on the telephone conversation, on the other hand, is largely mental and is greatly influenced by the nature of the conversation itself particularly, the amount of attention it demands. Casual social conversation is probably no more distracting than talking to a passenger. However, an intense business conversation could well divert a driver's attention to the point that cues of potential danger may be overlooked. A survey of cellular phone users conducted in connection with this study showed that, on the average, 72% of conversations are for business purposes.

Age Related Effects

The attentional processes that must be shared when placing, receiving, or carrying on telephone conversations while driving are known to be vulnerable to age-related effects. The ability to share attention, as between the phone and the road, has demonstrated a relationship to age in studies by Craik (1973), Parkison, Lindholm and Urell, (1980), Temple (1989), and Ranney and Pulling (1990). Deficiencies in the ability to share attention have also been found in drivers over-involved in accidents (Mihal and Barrett 1976, Kahneman 1973). A somewhat less obvious but also relevant variable would be selective attention, the ability to focus selectively upon one set of stimuli in the presence of others. This ability has also been shown to decline with age (Clay 1956, Layton 1975, Rabbitt 1980 and Temple 1989). The studies by Kahneman and by Mihal and Barrett just cited also found declines in selective attention to be associated with over-representation in accidents.

Age has evidenced relationships with a number of psychophysical processes that bear tangentially upon use of cellular phones while driving. Age-related declines have been noted in information processing (Braune et. al. 1985; Welford 198 1; Rackoff 1974; and Ranney and Pulling, 1990),problem solving (Case, Hulbert and Beers, 1970; and Arenberg 1982) and short term memory (Miller 1979; Welford 1981; and Temple 1989).

Purpose of the Study

The effect of placing and receiving telephone calls upon the ability to control the motion of the vehicle and the interaction of this relationship with age seems sufficiently well-established by Stein, Parseghian, and Allen to obviate the need for further study. 'The same cannot be said for the effect of telephone use upon the perceptual and cognitive aspects of driving, often referred to as vehicle "guidance", in contrast to the control function. While Brown and Tickner showed that perceptual processes can be degraded by simultaneous telephone conversation, they did not address the full range of cognitive and perceptual functions involved in driving; nor did they examine the important age question.

The purpose of the study described in this report was to assess the effect of telephone use upon the driver's ability to meet the perceptual and cognitive demands of the highway traffic environment. Specifically, it attempted to answer the following research questions:

- What effect do placing calls and carrying on conversations have upon perceptually- and cognitively-mediated responses to highway-traffic situations?
- How do these effects relate to the complexity of the conversation?
- How do these effects vary across highway traffic situations?
- How do any of these effects vary with age?

METHODS

The effects of cellular phone usage upon the ability of drivers to cope with the perceptual and cognitive demands of driving was studied by confronting samples of drivers with highway and traffic conditions calling for certain vehicle control responses and comparing the responses occurring under ordinary driving to the responses when drivers are handling telephone conversations.

General Approach

Any attempt to study the effect of cellular phone use upon driver cognitive and perceptual processes is challenged by the varied and unexpected nature of the demands that are placed upon these processes. A truly empirical assessment of the cellular phone's effects requires a measure of the driver's ability to meet various perceptual-cognitive demands with and without concurrent use of the phone. Such comparisons can be made without great difficulty when the demands upon the driver come from fixed characteristics of the highway environment, such as intersections or signs along the highway. But, much of what drivers have to respond to involves the actions of other road users - a driver who may pull out from a side road, or a child who might enter the street.

In actual driving, the actions of individual road users are one-time events and therefore do not lend themselves to comparisons. While they can and have been deliberately staged for research purposes (McPherson, McKnight, and Wiedman, 1983), the cost of doing so severely limits the number of events that can be presented to the subjects and the number of subjects who can be exposed to the events. Therefore, in situ studies are suitable for registering only those salient influences that can be counted on to manifest their effects in small sample studies. The effects of phone conversations upon driving, on the other hand, are likely to be very subjective Yet, because of the vast opportunity for such distractions to occur, and because of the enormous opportunity for injury to arise, the effects can have serious consequences.

Types of Distraction

The independent variable under study was distraction. In this discussion, the term "distraction" refers to a diversion of attention from driving produced by some situation. The situation of primary concern is, of course, use of a cellular telephone. The car phone itself involves minimum distraction. The only time a driver is distracted by the apparatus is during the act of placing a call. Even when the dialing pad is placed on the dashboard and cut close to the line of sight, attention must be diverted from the path ahead. There is evidence that when people focus their attention upon one stimulus, they may fail to perceive another stimulus separated from the first by but a few degrees of visual angle. To assess the effect of placing a call upon driver attention, subjects were required (at various points of the test procedure) to dial a number given them orally by the experimenter.

The conversations taking place on the telephone are also a possible distraction. As we pointed out in the Introduction, what distinguishes cellular phones from in-person conversations is the higher instance of calls carried on for business rather than social reasons. It seems likely that calls involving business would be somewhat more attention demanding than purely social conversations. To allow differences in the intensity of conversation to evidence any effects upon degree of distraction, conversation took place at two levels, casual conversation, in which subjects talked with the experimenter about a variety of largely inconsequential topics, and intense conversation in which the subjects engaged in a set of problem-solving exercises. Testing distraction at two levels of conversation does not assume that the intense cellular phone conversations are truly more intense than conversations with passengers -only that level of Conversation intensity is a variable that warrants study.

A distraction with which operation of any in-vehicle equipment is often compared is that of tuning a radio. The comparison is typically invited by someone defending introduction of a particular piece of equipment and using radio tuning as a lawyer might use a legal precedent. It has been used so often as to become something of a benchmark in studying in-car distraction. For this reason, it was included among the "distractions" with which telephone conversations were compared.

To gauge the effect of various acts in distracting attention, we need to be able to compare them with a condition that offers no distraction, that is, simply driving the car. The people in this situation might find things to occupy their attention other than driving, they would be at least free of any planned distraction.

To summarize, the five conditions creating different types and degrees of distraction were as follows:

No Distraction -The absence of any planned distraction

Placing a Call -Dialing a telephone number on a key pad located close to the driver's line of sight

Casual Conversation - Social chit-chat between subject and experimenter

Intense Conversation-Subjects solving problems presented orally by the experimenter

Tuning a Radio - Adjusting a car radio to pre-determined station

Dependent Variable

The effect of cellular phone use under study was the degree of distraction from primary driving tasks. Distraction itself is not directly observable. It is a hypothetical construct that explains why performance of some task is degraded in the presence of certain conditions. 'The performance degradation becomes the measure of distraction.

The performance of concern in the present study was the driver's perception of those elements of the highway-traffic environment that require the driver to do something. Of primary concern are those situations in which the driver must do something to prevent an accident. A somewhat lesser concern to society (but important to the driver) are those responses that enable drivers to get where they are going. In this study, both were valuable as indicators of perception and therefore any distracting effect of cellular phone use.

The extent to which cellular phones become a distraction can be assessed through measures of response to changes in the highway-traffic environment that require the driver to do something; such as a car ahead slowing down or a pedestrian about to step into the street. The presence of a distraction could be inferred from failure to respond when one would otherwise do so, or from taking longer to respond. Of course, we could simply ask drivers if they actually saw whatever it is they were supposed to respond to. However, in this study, such a response would alert subjects to what we were looking for and quite possibly change the very behavior we were trying to measure. Therefore, distraction was measured by comparing vehicle control responses of drivers to simulated highway-traffic safety scenes.

The scenes that were presented to drivers in the study all involved situations to which they would normally be expected to respond by some adjustment to the speed and/or direction of the vehicle. One category of such situations would be normal responses to changes in the route, such as turning a corner at an intersection in order to follow a predetermined route. Another would involve responses to traffic controls, such as, traffic lights or stop signs. Situations presenting possible danger, when perceived, should lead to some reduction in speed. Where the probability of actual danger is relatively small, or the distance to it is relatively large, the normal reaction is simply to take the foot off the accelerator until the danger becomes imminent. Where the danger is close at hand, and speed reduction more urgent, the appropriate response is brake application or, in some cases, steering the vehicle away from danger. If the use of cellular telephones is having a distracting effect, the distraction should be apparent in a difference between vehicle control responses when the potentially distracting influence of the telephone is present versus the response which occurs in the absence of any distraction.

The measure of distraction was the difference between responses occurring when no distracting condition was present and those that occurred under the four distraction conditions making up the independent variable. Two response measures were employed:

Response Occurrence - Whether or not the driver responded
Response Time -How long it took the driver to respond

These two measures made up the dependent variable under study. The distraction attributable to any one of the potential Distractors was a function of the difference between that condition and the no-distraction condition relative to response occurrence and response time.

Study Parameters

Of the many variables that might influence the distraction resulting from cellular phone use the one of most concern was age. Of course age, as the mere passage of time, would not be expected to influence anything. However, age has demonstrated a relationship to deficiencies in a number of mental functions likely to affect distraction including information processing, attention sharing, selective attention, useful field of view, and memory. To allow the relationship between age and distraction to be examined, subjects for the study were recruited from a wide range of age levels; with quotas established such as to assure sufficient numbers of older drivers to permit any difficulties associated with advanced years to reveal themselves.

Another variable we might expect to influence the effect of cellular phones upon any aspect of driving would be experience in their use. Practice in placing calls could lead to dialing without having to look, while conversing at length could lead to greater facility in attention sharing. To permit distraction to be analyzed in terms of experience, an effort was also made to recruit substantial numbers of cellular phone users for the study.

Study Sample

To study the relationship between cellular phone use and the driver's ability to respond to the demands of the highway traffic environment, we needed a sample that was generally representative of the driving population at large with respect to those relationships. Samples of subjects can be quite different from the at-large population with respect to many variables, including the variables under study, and still be reasonably representative with respect to relationships among variables. The only requirements for entry into the subject pool were experience in driving and the absence of any known problems that would have adversely affected their response to highway hazards.

A total sample of 150 was believed necessary to provide a reliable outcome. To assure that the age distribution was not severely biased in one direction or another, one-third of the sample was to come from each of the following age groups: Young (25 and under), mid-range (26-49), and older (50 and older). Since ages were not known until the subjects arrived, the division could only be approximated. The final sample included 45 young, 57 mid-aged, and 49 older, for a total of 151 subjects. The mean age of the sample was 39 years, corresponding exactly to that reported for cellular phone users by Sextro (1989). In order to permit experience to be studied as a variable, we established a quota of 50 cellular phone users, a quota that was met.

Subjects for the study were recruited primarily through posters placed in neighborhood stores and offices. The announcement offered a payment of $20 for one half-hour's participation in a study involving operation of an automobile simulator. Since older drivers and cellular phone users were likely to be underrepresented in the population reached by the announcement, additional efforts were made to recruit subjects from these sources. A route to older drivers was offered by the American Association for Retired Persons "55 Alive" Driver Improvement Program at which we made in-person solicitations. To attract cellular phone users, we placed flyers under the windshields of parked vehicles sporting cellular phone antennas.

Test Procedure

To study the possible distractive effect of cellular phones, subjects observed a series of videotaped driving scenes to which they responded by manipulating a set of simulated vehicle controls. The conditions under which the activity took place were varied systematically across the five conditions of distraction mentioned earlier (none, placing a call, tuning a radio, simple conversation, and intense conversation).

Simulation

The only practical means of presenting large numbers of drivers with the same array of traffic conditions is through simulation. Stein, Parseghian, and Allen employed simulation to measure the effects of phone use upon lane keeping. Because lane keeping requires continuous interaction between what drivers see and what they do, the simulator was of the interactive variety.

At the present time, interactive simulators are severely limited in the complexity that their displays provide. The most sophisticated type of interactive simulator, and about the only type currently in use, generates images by means of a computer. Since each image must be individually programmed, the amount of programming rises sharply with the number of images. The static aspects of the highway environment-road delineations, highway structures, traffic controls - are obviously easier to handle than are cars, pedestrians, and other road users, who not only must be programmed to move but must move in a way that responds to the acts of the driver. Highways filled with oncoming, overtaking, and intersecting traffic, and sidewalks teaming with pedestrian s, are simply beyond the computer power or programming capabilities of present-day art -at least within the realm of what is affordable. Yet, if use of cellular phones affects cognitive and perceptual processes, the effects are most likely to manifest themselves under conditions of high stimulus complexity. Even distracted drivers are not likely to overlook a pedestrian entering the street when it is the only thing moving for miles around.

Simulating the complexities of the highway traffic environment with any fidelity at all requires the use of cameras rather than computers. In this study, we videotaped a series of scenes through the windshield of a moving automobile to create the driving tasks to which subjects of the study would respond. Each 30 seconds of video tape contained at least one highway or traffic condition requiring a driver control response to change vehicle speed or direction.

When played back to subjects, each highway-traffic condition was made to coincide with a task involving some degree of possible distraction from use of cellular phones, including no distraction, making a cellular phone call, engaging in a casual phone conversation and engaging in an intense phone conversation. The effect of the cellular phone could then be assessed by comparing responses to the highway, traffic conditions which arose during calling or conversing on the phone with responses to conditions that arose when no distractions occurred. A radio tuning task was included as a reference aide, to allow any distraction associated with cellular phones to be compared with a form of distraction that i s generally familiar. The effect of the distraction upon the driver's perceptual and cognitive functioning would be assessed by studying whether and how quickly people respond to various highway traffic conditions. The greater the distraction from a cellular phone, the less likely the subject would be to respond or the longer it would take for response to be initiated.

Driving Scenes

The scenes presented to subjects involved some 47 situations to which drivers might ordinarily be expected to respond. The situations included the following:

Vehicles -Stopping, turning, entering, crossing, etc. (18)
Road Configuration - Lane drop, lane control, narrow bridge, etc. (10)
Pedestrians or Animals - (4)
Route Change - (4)
Road Sight Limitations - (3)
Roadside Construction - (3)
Traffic Control Signal - (3)
Road Surface Conditions - (2)

A Betacam video camera was mounted in the rear seat area of a Mazda 626 at about the height of a short driver. The camera was approximately equidistant between the left and right sides of the car. A rear-view mirror was placed in the camera' s field of view providing a view of the area to the rear of the car corresponding to the view normally seen in a driver's rear-view mirror with the exception that this mirror also reflected a very small portion of the camera itself. The presence of the camera, however, had the affect on the ability to see and understand what was happening to the rear. All routes were identified in advance of the day of shooting as well as the location and nature of certain pre-planned conditions to occur along that route. In addition to pre-planned situations there were many naturally-occurring events that were recorded along the routes. Indeed, most of the situations appearing in the video involved characteristics of the route or traffic situations that just happened to arise during the videotaping.

The four route changes were brought about by superimposition of an arrow in the upper-right corner of the video image. The arrow pointed upward, indicating no direction change, except at the four points along the route where a turn was to be made; that is, where a turn occurred in the video image. Originally, we had intended to plant route sign facsimiles along the side of the road as a means of guiding subjects. However, many of the subjects were familiar with the stretches of road employed in the test, and were aware that no such routes existed. Superimposing an arrow upon the image allowed us to test the subject's ability to perceive route changes without requiring them to remember or respond to a designated route.

A 3/4" copy of the Betacam master was played back from 3/4"deck into a 50" screen rear-projection television. Footage was viewed to identify sections containing a variety of hazards which occurred frequently and at timely intervals. The "best" sections were edited and spliced together to create a program that ran approximately 25 minutes. This program was then screened to identify all highway-traffic conditions that could be used to test reactions. A pilot group of available & "subjects" drove the simulator along with the video. The situations that drew reactions from one or more of the subjects were noted. This information was used to determine which situations were worthwhile for use in the video. A situation was eliminated where two situations occurred too closely to one another. This did not allow sufficient time for the termination of one distraction after the first situation and the beginning of a new distraction before the next situation began. This culling process resulted in a list of 47 evenly-spaced situations to which subjects could be reasonably expected to react.

Response Recording

The perceptual responses to the highway-traffic environment that might be affected by cellular phones are observable only by those doing the perceiving. Distraction was therefore measured through observation of a subject's physical response to the various situations pictured in the video scenes that were presented to them. As a subject "drove along" with the video scene, a video camera and VCR recorded the subject's:

Accelerator use, by means of a voltage meter connected to a potentiometer that was, in turn, connected to the accelerator pedal

- Braking, by means of a light that was connected to a brake light switch
- Steering and turn signal use which were visible to the camera

The accelerator meter and brake light were mounted behind the camera and reflected into the camera's view with a mirror mounted in front of the camera.

Cellular Phone Tasks

The three telephoning tasks, and the "benchmark" radio tuning task were controlled by the test administrator in the following manner:

> Radio Tuning -To initiate the radio tuning task the administrator would press a button that turned on a radio next to the subject. This would be the cue to the subject to turn on the simulator radio and to try to match the test administrator's station. The radio was left on until the situation section was over. In the event that there was sufficient time between the end of one situation and the next, the radio would be left on a while longer to give the subject as much time as possible to find the correct station. We felt that subjects who were successful in finding the station would be less likely to become discouraged and would therefore take the task more seriously.

Call Placing-To initiate a call-placing task the administrator would press a button that lit a light just under the TV screen. This was the cue to the subject to place a call to his or her home phone number. If it was necessary to extend the length of the call-placing task to make it last through a longer situation section, the subject would be told that the line was busy, which was a cue to call a second number, such as his or her work number.

Simple Conversations-These generally involved discussions on subjects including, but not limited to, the gathering of demographic information (age, car phone experience, familiarity with the route, etc.), what the subject did for a living, what t he subject did with his or her free time (e.g., what they did during the previous weekend or what they might be doing after work that evening). It was not generally difficult to keep an active conversation going throughout the situation section and terminate it quickly at the end of the situation section.

Complex Conversations-These consisted of either math problems or short-term memory problems. The math problems consisted of a string of simple computations (e.g., 2 + 3 + 4 + 1 / 2 x 3 + 4 + 6). Each computation was simple enough that subjects with limited math abilities could reasonably be expected to perform them. However, since subjects were required to keep a running total in their heads, they needed to maintain attention for the duration of the problem to get a correct answer. In the short-term memory task subjects were read a list of five or six digits and were then asked whether certain digits were in that list.

Simple and complex conversations were generally preceded by a call-placing task which acted as a natural lead-in to a conversation. Since it takes longer to get into and out of conversations, these distractions were generally programmed to stretch over two situation sections.

There was nothing administrators had to do to initiate a no-distraction situation except to assure that the previous distraction was terminated by the time the no-distraction section began.

Test Forms

The individual subjects could not be exposed to every highway traffic situation under all five distractions without being exposed to the same situation five times, an undesirable state of affairs. In order to limit subjects to a single exposure, the distracting conditions were introduced in five different sequences such that each sequence matched a particular highway traffic situation with a different distracting condition. The different sequences or "forms" were rotated among subjects in such a way that each form was given equally often. This meant that, across the entire sample, each distraction condition was paired equally often with each highway traffic situation.

Administrative Procedure

The test was administered from a room, separated from the simulator by a twenty foot hallway and a closed door. The test administrator's main function was to control the presence and type of distractors. The administrator observed the simulator video via one video monitor and the data collection video via a second monitor. This made it possible to view what the subject was watching on the simulator which, in turn, facilitated the timing of distractors to the appropriate hazards. Monitoring the data collection video made it possible to assure that the camera was capturing the necessary information, the assorted meters and lights were functioning properly, and that the subject was "driving" in a realistic manner. The test administrator also monitored the beginning and end of the hazard sections via speaker from the audio track of the 3/4" deck and addressed the test subject via microphone to a commercial stereo tuner/amplifier which was connected to a speaker in the testing room. An audio signal on the simulator video tape that identified the beginning and end of each hazard section was sent to the test administrator to help the administrator control which distraction was in place during each hazard. This audio program was also sent to an audio mixer that mixed it with a microphone in the simulator room and sent it to the data video recorder. This made it possible for the person reducing the data to time reactions from the same point for each hazard, for every subject.

A noise gate was connected between the microphone and the amplifier to turn the microphone off automatically when administrator was not speaking. This was necessary to prevent the subject from hearing the radio station being tuned prior to tuning task s and hazard section cues being sent into the administration room.

The test administrator had an instruction sheet for each subject which served as a guide to which distractions should be given during each highway-traffic situation.

Data Reduction

All data reduction was performed from the data video tape, that is, the video of the subject's performance. Data reducers used a stopwatch to time the reactions to the hazards and noted cases where the subject did not react at all. Performance in the distracting tasks was also recorded. Subjects were scored high on distraction tasks for:

-
    - Completing calls quickly
    - Searching for radio stations continuously, with no apparent need to stop tuning to deal with the hazard
    - Engaging in simple conversations continuously, with no apparent need to stop talking to deal with the hazard
    - Correctly solving math problems and correctly identifying numbers that were or were not included in the list of numbers given in the short-term memory task

Data Analysis

The analysis involved comparing different forms of cellular phone use and radio tuning with respect to the degree of distraction in responding to various highway traffic situations. A measure of distraction was obtained by subtracting an individual subject's "scores" (response time and proportion of situations responded to) under no distraction from the scores under each distracting condition. The difference between the two scores became the measure of distraction. These scores were then aggregated across subjects, separately for response time and proportion not responded to.

The analysis employed was a factorial Analysis of Variance, in which the independent variable - the four potential distractors - formed the factor of primary interest. Two other factors included in the analysis were age and form. The importance of age as a parameter was discussed earlier. For any analytic purposes, subjects were divided into the three age groups noted previously: 25 and under, 26-49, 50 and over. The oldest age group actually ran up to age 80, with a median age of 61 years.

Test "form" was isolated as a factor for purely statistical reasons; since the test forms are entirely arbitrary, their relation to any of the variables in question was not an item of interest. While each test form consisted of the same high way-traffic situations, the way the situations interacted with the various distracting conditions was such that forms might differ somewhat with respect to the two dependent variables. Since it was not possible to balance the test forms across the different age groups, failure to control for the effects of test form could end up introducing a relationship between distractor and age that was truly an artifact. Treating the test form as a factor prevented any differences in forms from effecting the other comparisons.

RESULTS

- Effects of Distractions
- Effects Of Age
- Effects Of Experience
- Relative Performance Decrements
- Specific Situations and Distractions
- Performance on Distractors

Effects of Distractions

Figure 3 displays, for each of the four potential distractors, the level of distraction with respect to response time and whether or not subjects responded. The two distraction variables displayed in the figure are not independent of one another; where subjects failed to respond to a situation, the maximum response time taken by any subject exposed to that particular situation under that distraction was entered as the response time. Had this not been done, the non-responders would not have app eared in the response time data and the results would have been meaningless.

FIGURE 3 INCREASE IN REACTION TIME AND NON-RESPONSES BY DISTRACTION TYPE

Click here for Figure 3

All of the potentially distracting conditions yielded some degree of distraction, that is, they produced reaction times and non-responses that were different from the no distraction condition. The overall level of distraction was highly significant for both non-responses ($F = 36.07$; $DF = 1,136$; $P<.01$) and for response time ($F = 286.75$; $DF = 1,136$; $P<.01$) and under all four potential distractors ($P = <.01$). Overall, the various distractions increased the length of time needed to respond to highway traffic conditions by from .4 to .9 seconds, and the proportion of situations missed entirely from .06 to .09.

When it comes to which condition led to the greatest distraction, the results varied somewhat from one of the two distraction variables to the other. Looking at the proportion of subjects who were distracted from responding at all, the complex conversations yielded the greatest interference, while placing calls and carrying on simple calls yielded the least interference and tuning the radio fell somewhere in between. The differences among all distractors were only marginally significant(F=2.133;DF=3,1 34;P=.10). However, complex conversations were significantly more distracting than simple conversations (F = 4.12, DF = 1, 134; P =.04).

Turning to the time it took to respond, we see that placing a telephone call rose from one of the least distracting to one of the most distracting conditions. The differences across distractions are statistically significant (F=4.37;DF=3,134 ;P<.l0). Considering that those who failed to respond are included within the response times, it is clear that it is the delay in responding among those who actually responded that account for the difference in outcomes. What the results seem to say is that the act of placing a cellular phone call may be no more distracting than carrying on a casual conversation in so far as noticing highway traffic conditions is a concern. However, it does seem to extend somewhat the delay in responding. When a non-urgent situation arose while a call was being placed, many subjects delayed responding until they had completed the call. But they did respond, indicating that the situation had not gone unnoticed.

Effects Of Age

FIGURE 4 INCREASE IN REACTION BY AGE AND DISTRACTION TYPE

Click here for Figure 4

Figure 4 displays the proportion of drivers failing to respond to highway traffic conditions as subdivided by age. It is evident that drivers in the over-50 category show strikingly higher proportions of failing to respond to highway traffic situations. The overall effect across distraction conditions is not statistically significant (F = 2.22; DF = 2,136; P. 1 13). However, the deficiencies of older drivers significantly exceed those of the other two age groups in telephone calling (F = 7.96; DF = 1, 14 1; P <.01), and simple phone calls (F = 5.13; DF = 1, 14 1; P <.05), but not complex phone calls (F = 2.34; DF = 1, 14 1; P =. 13). Also, in tuning the radio, age differences were not statistically significant (F =.73; DF = 1,141; P =.39).

Part of the explanation for the failure of the radio tuning task to show significant age effects is the relatively high degree of distraction evidenced by the 17-25 year age group. The results suggest that this age group is somewhat more preoccupied with tuning the radio than with telephone calls, a hypothesis that most parents having children in this age group would have little difficulty accepting. But why significant age differences didn't appear in complex cal s lacks a ready explanation. It may b e that complex conversations are more or less equally distracting to everyone, while placing calls and carrying on simple conversations only distracts the older subjects. Perhaps a more parsimonious explanation is that age amplifies the effects of all telephone-related distractions and that the differences among the three types of distractions are largely the result of chance.

Turning from whether drivers respond to how long it takes them to do so, Figure 5 shows the effects of age to be somewhat attenuated. Over all distraction conditions, the effects of age are statistically non-significant (F = 1. 14; DF = 2,136; P = < ;.32). The only two conditions showing a marked increase in reaction time for the older age group are placing telephone calls and carrying on simple conversations, of which only placing calls achieves significance (F = 3.01; DF = 2,136; P =.05). The effect of phone use upon older drivers seems more to prevent them from noticing various highway traffic conditions rather than to retard their response to them.

FIGURE 5 INCREASE IN RESPONSE TIME BY AGE AND SITUATION TYPE

Click here for Figure 5

Effects Of Experience

Prior experience with cellular phones appeared to have no significant effect upon distraction resulting from phone use or tuning the radio. Across all distractions, differences between experienced and inexperienced subjects were statistically non significant for response time (F=1.55; DF=4,114; P=<.19), or for the likelihood of responding at all (F=0.39; DF=4,114;P=<.81). What slight differences occurred seemed to favor the inexperienced, although such differences, if they exist, can be attributed to the fact that the experienced subjects tended to respond more quickly when there was no distraction and might therefore tend to evidence a slightly greater difference between the undistracted and distracted conditions. In looking simply at raw reaction times under the various distractions, the experienced subjects responded as quickly or more quickly than the inexperienced subjects. In any case, it is clear that prior experience with cellular phones has no real impact upon the degree to which one is distracted by its use.

Relative Performance Decrements

The decrements in performance that have been discussed amount to greater response time and the probability of not responding as compared with the results obtained in the absence of any distracting condition. Just how bad these decrements are can only be understood in relation to just how slow or unlikely to respond people are in the absence of any distraction. For comparison purposes, it is necessary to know that the mean response time in the absence of any distraction (across all highway traffic conditions) was 4.45 seconds, across all situations, while the proportion not responding at all was .343, again across all situations.

Considering the proportion of subjects not responding, the relative decrements experienced by the older age group in placing calls was (. 127/.343 =) 37%, simple telephone conversations (.108/.343 =) 31%, and complex phone conversation (.123/.343 =) 36%. For the other two age groups, performance decrements were much smaller, the largest being a (.072/.343 =) 21 % greater probability of not responding for the 17-25 year age group when making complex phone calls.

The condition leading to marked increases in response time was where the oldest age group had an increase of 1.417 seconds in placing calls. Expressed as a percent of the response lag under no distractions, this translates to increase in response time of 32%. Decrements in the remaining cases were considerably smaller, falling largely between .4 seconds (9%) and .8 seconds (18%).

Specific Situations and Distractions

The effect of using the telephone or tuning the radio upon response to highway traffic situations was not uniform across all situations. Interaction between the effects of distractions and various highway traffic situations was evident as a highly significant difference across the five "forms" i.e., the ten combinations of distractions and conditions occurring in the video. Recall that five different forms were needed to allow each of the five phone conditions to be matched with each of the highway traffic conditions without exposing the same subject to the test route more than once. Since the forms do not differ with respect to either distractors or highway traffic situations but only in the way they were combined, the significant differences among forms means that certain combinations of the two variables were particularly problematic.

To see if there was any pattern to these aberrant combinations of potential distractors with highway traffic conditions, they were examined individually. Specifically, those combinations leading to proportion of non-response that were discrepant from what would be expected from the effects of the distractors or highway traffic conditions alone were identified through a logit analysis.

The results were not at all revealing. The number and nature of aberrant combinations followed a chance pattern. As to the number, only four of 235 combinations fell beyond a .05 confidence interval around the expected results, whereas one would have expected (235 x .05 =) almost 12 by chance alone. As to the nature, no logical pattern could be discerned in the results. It should be noted, that with 150 subjects and five conditions, each condition was only replicated 30 times for a particular highway traffic situation.

Performance on Distractors

Thus far, our concern for the effect of various potential distractors upon response to highway-traffic situations has been limited to whether or not simply engaging in the task influenced driving performance. The distracting effect of cellular phone use or radio tuning tasks upon the response to highway-traffic conditions might be expected to vary as a function of the amount of attention devoted to the tasks. A measure of the amount of attention paid to the distracting tasks would be performance on those tasks themselves. This aspect of performance was assessed as follows:

Radio Tuning -Whether the tuning process was continuous or whether it was interrupted by the associated highway-traffic situation

Placing Calls - Length of time required to complete placing the call

Simple Conversation -Any interruptions in the conversation coincident with appearance of a highway traffic situation

Complex Conversation - Incorrect answers to the problems being solved

Time to complete the radio tuning task could not be used as a criterion since it was largely determined by how much the dial had to be manipulated to reach the target station, something that varied by chance from one trial to another.

If differences in quality of performance on the distracting tasks influenced responsiveness to highway traffic conditions, chance differences in quality of performance could obscure relationships under study unless a it was used as a covariate when analyzing those relationships. However, when quality of performance on the distracting task was compared to amount of measured distraction, no significant relationships materialized. For example, whether or not subjects answered to problem solving questions correctly during complex conversation was unrelated to the distraction the problem solving caused itself.

DISCUSSION

The three tasks associated with use of cellular phones -placing calls, simple conversations, and complex conversations -all led to significant increases in time to respond to highway traffic conditions and in the likelihood in failure to respond at all. As might be expected, complex conversations involving problem solving led to the greater degree of performance decrement - about on par with tuning a radio. The act of placing cellular phone calls yielded increases in response time similar to that of complex conversations, but increases in non-response that were similar to simple conversations.

The overall results conceal large age differences. The proportion of drivers age 50 and over failing to respond to highway traffic conditions while using cellular phones was two to three times greater than that of younger subjects. Among those responding, the oldest subjects took significantly longer to respond than their younger counterparts when placing calls, but evidenced no slower response time than the two other age groups when conversing on the phone. Tuning the radio, while a highly distracting task, appeared equally so for all age groups. Prior experience with cellular phones appeared unrelated to the degree of distraction involved in using cellular phones.

Magnitude of Problem

How concerned should we be with the distraction created by use of cellular phones? Of the two dependent variables, non-response and response time, the former is certainly the more important. First, whether or not drivers notice and respond to elements of their highway-traffic environment is certainly more important than how long it takes them to do so. We are not dealing with emergencies, where time is of the essence. The situations to which subjects were expected to respond became evident almost five seconds before the average subject felt it was necessary to do anything. The decrements of less than a second that result from use of cellular phones represent a relatively small increment in total response time. Second, the response time measure employed in the present study was somewhat artificial, including what amounted to a penalty for failing to respond.

For the driving population at large, simple casual conversation seems to have little impact upon the ability of people to notice and respond to the demands of the highway and its other users. Nor does the act of placing calls seem to divert attention, although drivers may take some fraction of a second longer on the average to respond. It is those conversations that require intense concentration on the part of the driver that appear to be most distracting. When confronted by those highway-traffic situations presented in this study, their chances of not responding increase by almost .10, which is approximately a 30% increase over the non-response rate when no distractor is present. An increase of this magnitude and the chances of not noticing something, while small, is nonetheless cause for concern. Someone might point out that the performance decrement it represents is no worse than that which occurs when tuning a radio. However, the amount of time during driving that is devoted to tuning a radio may be considerably less than the time spent in intense phone conversation by those who use cellular phones for business purposes.

The greatest deficit in ability to respond to highway-traffic situations is experienced by the older drivers. The frequency of non-response was from almost two times to over three times that evidenced by their younger counterparts. The degree of deficit was rather similar across the three phone tasks (calling, simple, and complex conversation), increasing the likelihood of non-response by. 1 1-. 13, representing a 33-38% increase over non-responses in the absence of any distraction. Among the older drivers, the distraction resulting from the use of cellular phones was again half as large as that involved in tuning a radio, which was actually the most distracting for the youngest age groups.

One legitimate question might be to what extent the distractions from casual and complex conversations are truly a cellular phone problem. While placing a call is a phone-specific task, the carrying on of conversations is not. Under the "hands off type of cellular phone simulated in the present study, conversations were really no different from those that might be carried on with another passenger. But, what a cellular phone can do is bring into the vehicle conversations that are more frequent and more likely to be intense than those that would occur with passengers. From accident statistics we know that drivers are unaccompanied about two-thirds of the time. lit seems very likely that introduction of a cellular phone brings about a significant increase in the likelihood of intense phone conversations.

Implications

The results of the study that has been described carry two significant implications for use of cellular phones. First, all users of cellular phones should be advised not to engage in intense phone conversations while the vehicle is moving. Businesses whose employees regularly carry on transactions by means of cellular phones might advise, or even direct that protracted dealings over the phone be avoided while the vehicle is underway.

The second implication has to do with older drivers. Not only is the performance deficit of drivers over 50 years of age significantly greater than that of younger drivers, but it prevails over all three of the cellular phone tasks studied. If there is any group that should not be using cellular phones while driving, it is those in the older age group. Gerontological research in general shows that the severe deterioration in mental processes tends to become more and more prevalent beyond age 70. One might therefore expect markedly greater instances of failure to respond to Ha!

highway-traffic situations at these advanced years. Unfortunately, the number of test subjects in this age category was not sufficient to permit this possibility to be tested.

There is no reason to discourage older drivers from having cellular phones in their vehicles. Phones provide them with a very valuable way of summoning help in the event of illness or mechanical breakdown without advertising their plight over a CB radio. However, the diversion of attention, coupled with the difficulties in vehicle control found by Stein, Parseghin and Allen (1987) contraindicates their use while the vehicle is in motion.

Conclusions

From the results of the study that has been described in this report, the following conclusions may be offered.

1. All forms of cellular phone usage lead to significant increases in the establishment of non-response to highway-traffic situations and increase in time to respond.

2. Complex, intense conversation leads to the greatest increases in likelihood of overlooking significant highway traffic conditions, and the time to respond to them. The distracting effect is similar to that of tuning a radio. The effect of placing calls or engaging in casual conversation is less of a problem, although, calling tends to retard responses.

3. The distracting effect of cellular phone use among drivers over age 50 is two- to three-times as great as that of younger drivers and encompasses all three aspects of cellular phone use - placing calls and carrying on simple and complex conversations. The effect is to increase non-response by 33-38%.

4. Prior experience with cellular phones appears to bear no relation to the distracting effect of cellular phone use.

ACKNOWLEDGEMENTS

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Revised 7/26

Rebecca Rooney

From: Pennington, Diane [dianepennington@DWT.com]
Sent: Thursday, February 25, 2010 3:21 PM
To: Rep. Peggy Wilson
Subject: HB 257

I am in support of your HB 257. Time and again I have seen accidents or near accidents as a result of those on cell phones. I believe that people cannot pay full attention when they are concentrating on dialing and chatting. Additionally, there are so many people business people that use them to conduct business, I see delivery people, trades people, real estate people etc talking and actually writing things down rather than paying attention to light changes and lane changes. People say kids are the worst - I disagree - I think it is business people.

Please let me know what more can be done to encourage this bill through the process.

Thank you for your service,

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PRESS IMAGES

A student talks on a hands-free cell phone while operating a high-tech driving simulator. The simulator was used during a University of Utah study that found motorists who talk on cell phones while driving are as impaired as drunken drivers with blood-alcohol levels at the legal limit of 0.08 percent.

Photo Credit: Jim Moulin

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DRIVERS ON CELL PHONES ARE AS BAD AS DRUNKS

UTAH PSYCHOLOGISTS WARN AGAINST CELL PHONE USE WHILE DRIVING

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June 29, 2006 -- Three years after the preliminary results first were presented at a scientific meeting and drew wide attention, University of Utah psychologists have published a study showing that motorists who talk on handheld or hands-free cellular phones are as impaired as drunken drivers.

"We found that people are as impaired when they drive and talk on a cell phone as they are when they drive intoxicated at the legal blood-alcohol limit" of 0.08 percent, which is the minimum level that defines illegal drunken driving in most U.S. states, says study co-author Frank Drews, an assistant professor of psychology. "If legislators really want to address driver distraction, then they should consider outlawing cell phone use while driving."

Psychology Professor David Strayer, the study's lead author, adds: "Just like you put yourself and other people at risk when you drive drunk, you put yourself and others at risk when you use a cell phone and drive. The level of impairment is very similar."

"Clearly the safest course of action is to not use a cell phone while driving," concludes the study by Strayer, Drews and Dennis Crouch, a research associate professor of pharmacology and toxicology. The study was set for publication June 29 in the summer 2006 issue of *Human Factors: The Journal of the Human Factors and Ergonomics Society*.

The study reinforced earlier research by Strayer and Drews showing that hands-free cell phones are just as distracting as handheld cell phones because the conversation itself – not just manipulation of a handheld phone – distracts drivers from road conditions.

Human Factors Editor Nancy J. Cooke praised the study: "Although we all have our suspicions about the dangers of cell phone use while driving, human factors research on driver safety helps us move beyond mere suspicions to scientific observations of driver behavior."

The study first gained public notice after Strayer presented preliminary results in July 2003 in Park City, Utah, during the Second International Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design. It took until now for the study to be completed, undergo review by other researchers and finally be published.

Key Findings: Different Driving Styles, Similar Impairment

Each of the study"s 40 participants "drove" a PatrolSim driving simulator four times: once each while undistracted, using a handheld cell phone, using a hands-free cell phone and while intoxicated to the 0.08 percent blood-alcohol level after drinking vodka and orange juice. Participants followed a simulated pace car that braked intermittently.

Both handheld and hands-free cell phones impaired driving, with no significant difference in the degree of impairment. That "calls into question driving regulations that prohibited handheld cell phones and permit hands-free cell phones," the researchers write.

The study found that compared with undistracted drivers:

- Motorists who talked on either handheld or hands-free cell phones drove slightly slower, were 9 percent slower to hit the brakes, displayed 24 percent more variation in following distance as their attention switched between driving and conversing, were 19 percent slower to resume normal speed after braking and were more likely to crash. Three study participants rear-ended the pace car. All were talking on cell phones. None were drunk.

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- Drivers drunk at the 0.08 percent blood-alcohol level drove a bit more slowly than both undistracted drivers and drivers using cell phones, yet more aggressively. They followed the pace car more closely, were twice as likely to brake only four seconds before a collision would have occurred, and hit their brakes with 23 percent more force. "Neither accident rates, nor reaction times to vehicles braking in front of the participant, nor recovery of lost speed following braking differed significantly" from undistracted drivers, the researchers write.

"Impairments associated with using a cell phone while driving can be as profound as those associated with driving while drunk," they conclude.

Are Drunken Drivers Really Less Accident-Prone than Cell Phone Users?

Drews says the lack of accidents among the study's drunken drivers was surprising. He and Strayer speculate that because simulated drives were conducted during mornings, participants who got drunk were well-rested and in the "up" phase of intoxication. In reality, 80 percent of all fatal alcohol-related accidents occur between 6 p.m. and 6 a.m. when drunken drivers tend to be fatigued. Average blood-alcohol levels in those accidents are twice 0.08 percent. Forty percent of the roughly 42,000 annual U.S. traffic fatalities involve alcohol.

While none of the study's intoxicated drivers crashed, their hard, late braking is "predictive of increased accident rates over the long run," the researchers wrote.

One statistical analysis of the new and previous Utah studies showed cell phone users were 5.36 times more likely to get in an accident than undistracted drivers. Other studies have shown the risk is about the same as for drivers with a 0.08 blood-alcohol level.

Strayer says he expects criticism "suggesting that we are trivializing drunken-driving impairment, but it is anything but the case. We don't think people should drive while drunk, nor should they talk on their cell phone while driving."

Drews says he and Strayer compared the impairment of motorists using cell phones to drivers with a 0.08 percent blood-alcohol level because they wanted to determine if the risk of driving while phoning was comparable to the drunken driving risk considered unacceptable.

"This study does not mean people should start driving drunk," says Drews. "It means that driving while talking on a cell phone is as bad as or maybe worse than driving drunk, which is completely unacceptable and cannot be tolerated by society."

University of Utah Cell Phone Research

Previous research by Strayer, Drews and colleagues include:

- A 2001 study showing that hands-free cell phones are just as distracting as handheld cell phones.
- A 2003 study showing that the reason is "inattention blindness," in which motorists look directly at road conditions but don't really see them because they are distracted by a cell phone conversation. And such drivers aren't aware they are impaired.
- A 2005 study suggesting that when teenagers and young adults talk on cell phones while driving, their reaction times are as slow as those of elderly drivers.

The University of Utah psychologists conducted the alcohol study because a 1997 study by other researchers evaluated the cell phone records of 699 people involved in motor vehicle accidents and found one-fourth of them had used their phone in the 10 minutes before their accident – a four-fold increase in accidents compared with undistracted motorists.

Those researchers speculated there was a comparable risk from drunken driving and cell phone use while driving. So Strayer and Drews conducted a controlled laboratory study.

The study included 25 men and 15 women ages 22 to 34 who were social drinkers (three to five drinks per week) recruited via newspaper advertisements. Two-thirds used a cell phone while driving. Each participant was paid $100 for 10 hours in the study.

The driving simulator has a steering wheel, dashboard instruments and brake and gas pedals from a Ford Crown Victoria sedan. The driver is surrounded by three screens showing freeway scenes. Each simulated daylight freeway drive lasted 15 minutes. The pace car intermittently braked to mimic stop-and-go traffic. Drivers who fail to hit their brakes eventually rear-end the pace car. Other simulated vehicles occasionally passed in the left lane, giving the impression of steady traffic flow.

Each study participant drove the simulator during three sessions – undistracted, drunk or talking to a research assistant on a cell phone – each on a different day.

The simulator recorded driving speed, following distance, braking time and how long it would take to collide with the pace car if brakes were not used.

The study was funded by a $25,000 grant from the Federal Aviation Administration – which is interested in impaired attention among pilots – and by Strayer's and Drews' salaries. The Utah Highway Patrol loaned the researchers a device to measure blood-alcohol levels.

Driving while Distracted: A Growing Problem

The researchers cited figures from the Cellular Telecommunications Industry Association indicating that more than 100 million U.S. motorists use cell phones while driving. The National Highway Transportation Safety Administration estimates that at any given moment during daylight hours, 8 percent of all drivers are talking on a cell phone.

"Fortunately, the percentage of drunk drivers at any time is much lower," Drews says. "So it means the risk of talking on a cell phone and driving is probably much higher than driving intoxicated because more people are talking on cell phones while driving than are driving drunk." The main reason there are not more accidents is that "92 percent of drivers are not on a cell phone and are compensating for drivers on cell phones," he adds.

Cell phone use is far from the only distraction for motorists. The researchers cite talking to passengers, eating, drinking, lighting cigarettes, applying makeup and listening to the radio as the "old standards" of driver distraction.

"However, over the last decade many new electronic devices have been developed, and they are making their way into the vehicle," the researchers write. "Drivers can now surf the Internet, send and receive e-mail or faxes, communicate via a cellular device and even watch television. There is good reason to believe that some of these new multitasking activities may be substantially more distracting than the old standards because they are more cognitively engaging and because they are performed over longer periods of time."

News media may obtain a copy of the study by emailing leesiegel@ucomm.utah.edu or, starting June 29, by going to http://hfes.org and clicking on "What's New"

Other studies by Strayer and colleagues on cell phones and driving may be downloaded from: http://www.psych.utah.edu/AppliedCognitionLab/

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A Comparison of the Cell Phone Driver and the Drunk Driver

David L. Strayer, Frank A. Drews, and **Dennis J. Crouch,** University of Utah, Salt Lake City, Utah

Objective: The objective of this research was to determine the relative impairment associated with conversing on a cellular telephone while driving. **Background:** Epidemiological evidence suggests that the relative risk of being in a traffic accident while using a cell phone is similar to the hazard associated with driving with a blood alcohol level at the legal limit. The purpose of this research was to provide a direct comparison of the driving performance of a cell phone driver and a drunk driver in a controlled laboratory setting. **Method:** We used a high-fidelity driving simulator to compare the performance of cell phone drivers with drivers who were intoxicated from ethanol (i.e., blood alcohol concentration at 0.08% weight/volume). **Results:** When drivers were conversing on either a handheld or hands-free cell phone, their braking reactions were delayed and they were involved in more traffic accidents than when they were not conversing on a cell phone. By contrast, when drivers were intoxicated from ethanol they exhibited a more aggressive driving style, following closer to the vehicle immediately in front of them and applying more force while braking. **Conclusion:** When driving conditions and time on task were controlled for, the impairments associated with using a cell phone while driving can be as profound as those associated with driving while drunk. **Application:** This research may help to provide guidance for regulation addressing driver distraction caused by cell phone conversations.

INTRODUCTION

Although they are often reminded to pay full attention to driving, people regularly engage in a wide variety of multitasking activities when they are behind the wheel. Indeed, data from the 2000 U.S. census indicates that drivers spend an average of 25.5 min each day commuting to work, and there is a growing interest in trying to make the time spent on the roadway more productive (Reschovsky, 2004). Unfortunately, because of the inherent limited capacity of human attention (e.g., Kahneman, 1973; Navon & Gopher, 1979), engaging in these multitasking activities often comes at a cost of diverting attention away from the primary task of driving. There are a number of more traditional sources of driver distraction. These "old standards" include talking to passengers, eating, drinking, lighting a cigarette, applying makeup, and listening to the radio (Stutts et al., 2003). However, over the last decade many new electronic devices have been developed, and they are making their way into the vehicle. In many cases, these new technologies are engaging, interactive information delivery systems. For example, drivers can now surf the Internet, send and receive E-mail or faxes, communicate via a cellular device, and even watch television. There is good reason to believe that some of these new multitasking activities may be substantially more distracting than the old standards because they are more cognitively engaging and because they are performed over longer periods of time.

The current research focuses on a dual-task activity that is commonly engaged in by more than 100 million drivers in the United States: the concurrent use of cell phones while driving (Cellular Telecommunications Industry Association, 2006; Goodman et al., 1999). Indeed, the National Highway Transportation Safety Administration

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estimated that 8% of drivers on the roadway at any given daylight moment are using their cell phone (Glassbrenner, 2005). It is now well established that cell phone use impairs the driving performance of younger adults (Alm & Nilsson, 1995; Briem & Hedman, 1995; Brookhuis, De Vries, & De Waard, 1991; I. D. Brown, Tickner, & Simmonds, 1969; Goodman et al., 1999; McKnight & McKnight, 1993; Redelmeier & Tibshirani, 1997; Strayer, Drews, & Johnston, 2003; Strayer & Johnston, 2001). For example, drivers are more likely to miss critical traffic signals (traffic lights, a vehicle braking in front of the driver, etc.), slower to respond to the signals that they do detect, and more likely to be involved in rear-end collisions when they are conversing on a cell phone (Strayer et al., 2003). In addition, even when participants direct their gaze at objects in the driving environment, they often fail to "see" them when they are talking on a cell phone because attention has been directed away from the external environment and toward an internal, cognitive context associated with the phone conversation. However, what is lacking in the literature is a clear benchmark with which to evaluate the relative risks associated with this dual-task activity (e.g., Brookhuis, 2003).

In their seminal article, Redelmeier and Tibshirani (1997) reported epidemiological evidence suggesting that "the relative risk [of being in a traffic accident while using a cell phone] is similar to the hazard associated with driving with a blood alcohol level at the legal limit" (p. 456). These estimates were made by evaluating the cellular records of 699 individuals involved in motor vehicle accidents. It was found that 24% of these individuals were using their cell phone within the 10-min period preceding the accident, and this was associated with a fourfold increase in the likelihood of getting into an accident. Moreover, these authors suggested that the interference associated with cell phone use was attributable to attentional factors rather than to peripheral factors such as holding the phone. However, there are several limitations to this important study. First, although the study established a strong association between cell phone use and motor vehicle accidents, it did not demonstrate a *causal* link between cell phone use and increased accident rates. For example, there may be self-selection factors underlying the association: People who use their cell phone while driving may be more likely to engage in risky behavior, and this increase in risk taking may be the cause of the correlation. It may also be the case that being in an emotional state may increase one's likelihood of driving erratically and may also increase the likelihood of talking on a cell phone. Finally, limitations on establishing an exact time of the accident lead to uncertainty regarding the precise relationship between talking on a cell phone while driving and increased traffic accidents.

If the relative risk estimates of Redelmeier and Tibshirani (1997) can be substantiated in a controlled laboratory experiment and there is a causal link between cell phone use and impaired driving, then these data would be of immense importance for public safety and legislative bodies. Here we report the result of a controlled study that directly compared the performance of drivers who were conversing on either a handheld or hands-free cell phone with the performance of drivers with a blood alcohol concentration at 0.08% weight/volume (wt/vol). Alcohol has been used as a benchmark for assessing performance impairments in a variety of other areas, including aviation (Billings, Demosthenes, White, & O'Hara, 1991; Klein, 1972), anesthesiology (Thapar, Zacny, Choi, & Apfelbaum, 1995; Tiplady, 1991) nonprescription drug use (Burns & Moskovitz, 1980), and fatigue (Williamson, Feyer, Friswel, & Finlay-Brown, 2001). Indeed, the World Health Organization recommended that the behavioral effects of drugs be compared with those of alcohol under the assumption that performance on drugs should be no worse than that at the legal blood alcohol limit (Willette & Walsh, 1983).

We used a car-following paradigm (see also Alm & Nilsson, 1995; Lee, Vaven, Haake, & Brown, 2001; Strayer et al., 2003) in which participants drove on a multilane freeway following a pace car that would brake at random intervals. We measured a number of performance variables (e.g., driving speed, following distance, brake reaction time, time to collision) that have been shown to affect the likelihood and severity of rear-end collisions, the most common type of traffic accident reported to police (T. L. Brown, Lee, & McGehee, 2001; Lee et al., 2001). Three counterbalanced conditions were studied using a within-subjects design: single-task driving (baseline condition), driving while conversing on a cell phone (cell phone condition), and driving with a blood alcohol concentration of 0.08% wt/vol (alcohol condition). The driving tasks were performed on a high-fidelity driving simulator.

METHOD

Participants

Forty adults (25 men, 15 women), recruited via advertisements in local newspapers, participated in the Institutional Review Board approved study. Participants ranged in age from 22 to 34 years, with an average age of 25 years. All had normal or corrected-to-normal vision and a valid driver's license with an average of 8 years of driving experience. Of the 40 participants, 78% owned a cell phone, and 87% of the cell phone owners reported that they have used a cell phone while driving. A further requirement for inclusion in the study was that participants were social drinkers, consuming between three and five alcoholic drinks per week. The experiment lasted approximately 10 hr (across the three days of the study), and participants were remunerated at a rate of $10/hr.

A preliminary comparison of male and female drivers found greater variability in following distance for female drivers, $F(1, 38) = 10.9, p < .01$; however, this gender effect was not modulated by alcohol or cell phone use. No other effects of gender were significant in the current sample. Additional analyses comparing the driving performance of participants who owned a cell phone with that of those who did not own a cell phone failed to find any significant differences (all $ps > .60$). Similarly, there was no significant difference in driving performance between participants who reported that they used a cell phone while driving and those who did not use a cell phone while driving (all $ps > .70$).

Stimuli and Apparatus

A PatrolSim high-fidelity driving simulator, illustrated in Figure 1 and manufactured by GE-ISIM, was used in the study. The simulator is composed of five networked microprocessors and three high-resolution displays providing a 180° field of view. The dashboard instrumentation, steering wheel, gas pedal, and brake pedal are from a Ford Crown Victoria® sedan with an automatic transmission. The simulator incorporates proprietary vehicle dynamics, traffic scenario, and road surface software to provide realistic scenes and traffic conditions.

A freeway road database simulated a 24-mile (38.6-km) multilane interstate with on- and off-ramps, overpasses, and two- or three-lane traffic in each direction. Daytime driving conditions with good visibility and dry pavement were used. A pace car, programmed to travel in the right-hand

Figure 1. A participant talking on a cell phone while driving in the GE-ISIM driving simulator.

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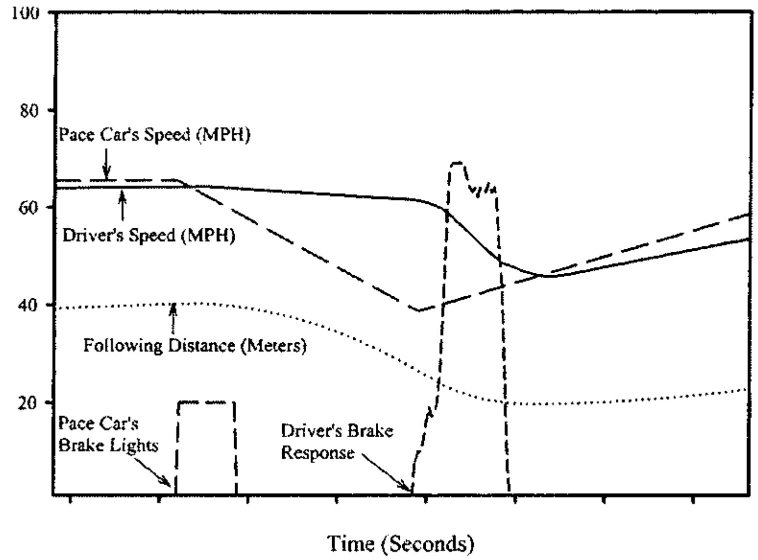

Figure 2. An example of the sequence of events occurring in the car following paradigm.

lane, braked intermittently throughout the scenario. Distractor vehicles were programmed to drive between 5% and 10% faster than the pace car in the left lane, providing the impression of a steady flow of traffic. Unique driving scenarios, counterbalanced across participants, were used for each condition in the study. Measures of real-time driving performance, including driving speed, distance from other vehicles, and brake inputs, were sampled at 30 Hz and stored for later analysis. Cellular service was provided by Sprint PCS. The cell phone was manufactured by LG Electronics Inc. (Model TP1100). For hands-free conditions, a Plantronics M135 headset (with earpiece and boom microphone) was attached to the cell phone. Blood alcohol concentration levels were measured using an Intoxilyzer 5000, manufactured by CMI Inc.

Procedure

The experiment used a within-subjects design and was conducted in three sessions on different days. The first session familiarized participants with the driving simulator using a standardized adaptation sequence. The order of subsequent alcohol and cell phone sessions was counterbalanced across participants. In these latter sessions, the participant's task was to follow the intermittently braking pace car driving in the right-hand lane of the highway. When the participant stepped on the brake pedal in response to the braking pace car, the pace car released its brake and accelerated to normal highway speed. If the participant failed to depress the brake, he or she would eventually collide with the pace car. That is, as in real highway stop-and-go traffic, the participant was required to react in a timely and appropriate manner to a vehicle slowing in front of them.

Figure 2 presents a typical sequence of events in the car-following paradigm. Initially both the participant's car (solid line) and the pace car (long-dashed line) were driving at about 62 miles/hr (mph) with a following distance of 40 m (dotted line). At some point in the sequence, the pace car's brake lights illuminated for 750 ms (short-dashed line) and the pace car began to decelerate at a steady rate. As the pace car decelerated, following distance decreased. At a later point in time, the participant responded to the decelerating pace car by pressing the brake pedal. The time interval between the onset of the pace car's brake lights and the onset of the participant's brake response defines the brake onset time. Once the participant depressed the brake, the pace car began to accelerate, at which point the participant removed his or her foot from the brake and applied pressure to the gas pedal. Note that in this example, following distance decreased by about 50% during the braking event.

In the alcohol session, participants drank a mixture of orange juice and vodka (40% alcohol by volume) calculated to achieve a blood alcohol concentration of 0.08% wt/vol. Blood alcohol concentrations were verified using infrared spectrometry breath analysis immediately before and after the alcohol driving condition. Participants drove in the 15-min car-following scenario while legally intoxicated. Average blood alcohol concentration before driving was 0.081% wt/vol and after driving was 0.078% wt/vol.

In the cell phone session, three counterbalanced conditions, each 15 min in duration, were included: single-task baseline driving, driving while conversing on a handheld cell phone, and driving while conversing on a hands-free cell phone. In both cell phone conditions, the participant and a research assistant engaged in naturalistic conversations on topics that were identified on the first day as being of interest to the participant. As would be expected with any naturalistic conversation, they were unique to each participant. The task of the research assistant in our study was to maintain a dialog in which the participant listened and spoke in approximately equal proportions. However, given that our cell phone conversations were casual, they probably underestimate the impact of intense business negotiations or other emotional conversations conducted over the phone. To minimize interference from manual components of cell phone use, the call was initiated before participants began driving.

RESULTS

In order to better understand the differences between conditions, we created driving profiles by extracting 10-s epochs of driving performance that were time locked to the onset of the pace car's brake lights. That is, each time that the pace car's brake lights were illuminated, the data for the ensuing 10 s were extracted and entered into a 32 × 300 data matrix (i.e., on the *j*th occasion that the pace car brake lights were illuminated, data from the 1st, 2nd, 3rd, ..., and 300th observations following the onset of the pace car's brake lights were entered into the matrix $X_{[j,1]}, X_{[j,2]}, X_{[j,3]}, \ldots X_{[j,300]}$, in which j ranges from 1 to 32 reflecting the 32 occasions in which the participant reacted to the braking pace car). Each driving profile was created by averaging across j for each of the 300 time points. We created profiles of the participant's braking response, driving speed, and following distance.

Figure 3 presents the braking profiles. In the baseline condition, participants began braking within 1 s of pace car deceleration. Similar braking profiles were obtained for both the cell phone and alcohol conditions. However, compared with baseline, when participants were intoxicated they tended to brake with greater force, whereas participants' reactions were slower when they were conversing on a cell phone.

Figure 4 presents the driving speed profiles. In the baseline condition, participants began decelerating within 1 s of the onset of the pace car's brake lights, reaching minimum speed 2 s after the pace car began to decelerate, whereupon participants began a gradual return to prebraking driving speed. When participants were intoxicated they drove slower, but the shape of the speed

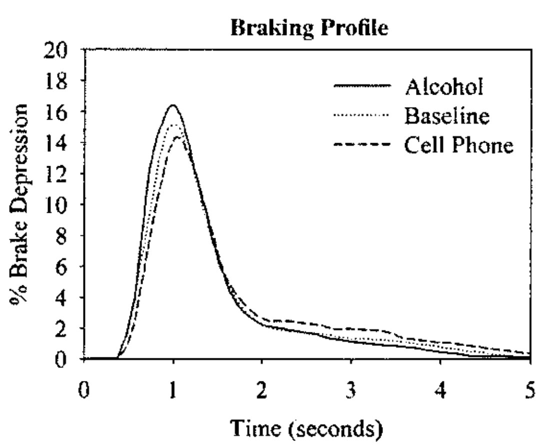

Figure 3. The braking profile.

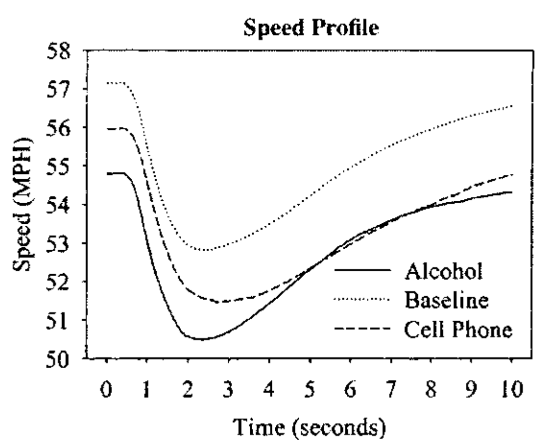

Figure 4. The speed profile.

profile did not differ from baseline. By contrast, when participants were conversing on a cell phone it took them longer to recover their speed following braking.

Figure 5 presents the following distance profiles. In the baseline condition participants followed approximately 28 m behind the pace car, and as the pace car decelerated the following distance decreased, reaching nadir approximately 2 s after the onset of the pace car's brake lights. When participants were intoxicated, they followed closer to the pace car, whereas participants increased their following distance when they were conversing on a cell phone.

Table 1 presents the nine performance variables that were measured to determine how participants reacted to the vehicle braking in front of them. *Brake reaction time* is the time interval between the onset of the pace car's brake lights and the onset of the participant's braking response (i.e., defined as a minimum of 1% depression of the participant's brake pedal). *Maximum braking force* is the maximum force that the participant applied to the brake pedal in response to the braking pace car (expressed as a percentage of maximum). *Speed* is the average driving speed of the participant's vehicle (expressed in miles per hour). *Mean following distance* is the distance prior to braking between the rear bumper of the pace car and the front bumper of the participant's car. *SD following distance* is the standard deviation of following distance.

Time to collision (TTC), measured at the onset of the participant's braking response, is the time

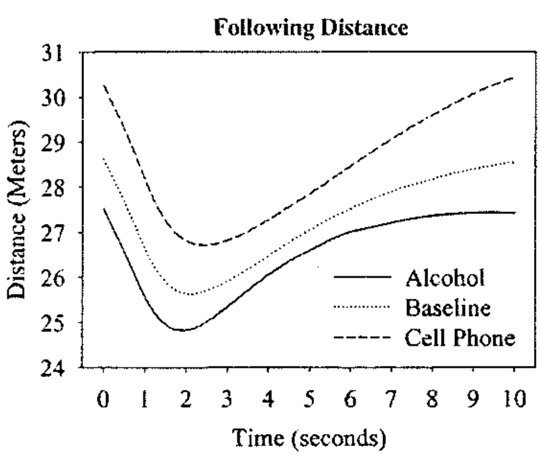

Figure 5. The following distance profile.

remaining until a collision between the participant's vehicle and the pace car if the course and speed were maintained (i.e., had the participant failed to brake). Also reported are the frequency of trials with TTC values below 4 s, a level found to discriminate between cases in which the drivers find themselves in dangerous situations and those in which the driver remains in control of the vehicle (e.g., Hirst & Graham, 1997). *Half recovery time* is the time for participants to recover 50% of the speed that was lost during braking (e.g., if the participant's car was traveling at 60 mph [96.5 km/hr] before braking and decelerated to 40 mph [64.4 km/hr] after braking, then half recovery time would be the time taken for the participant's vehicle to return to 50 mph [80.4 km/hr]). Also shown in the table is the total number of collisions in each phase of the study. We used a multivariate analysis of variance (MANOVA) followed by planned contrasts (shown in Table 2) to provide an overall assessment of driver performance in each of the experimental conditions.

We performed an initial comparison of participants driving while using a handheld cell phone versus a hands-free cell phone. Both handheld and hands-free cell phone conversations impaired driving. However, there were no significant differences in the impairments caused by these two modes of cellular communication (all $ps > .25$). Therefore, we collapsed across the handheld and hands-free conditions for all subsequent analyses reported in this article. The observed similarity between handheld and hands-free cell phone conversations is consistent with earlier work (e.g., Patten, Kircher, Ostlund, & Nilsson, 2004; Redelmeier & Tibshirani, 1997; Strayer & Johnston, 2001) and calls into question driving regulations that prohibit handheld cell phones and permit hands-free cell phones.

MANOVAs indicated that both cell phone and alcohol conditions differed significantly from baseline, $F(8, 32) = 6.26$, $p < .01$, and $F(8, 32) = 2.73$, $p < .05$, respectively. When drivers were conversing on a cell phone, they were involved in more rear-end collisions, their initial reaction to vehicles braking in front of them was slowed by 9%, and the variability in following distance increased by 24%, relative to baseline. In addition, compared with baseline, participants who were talking on a cell phone took 19% longer to recover the speed that was lost during braking.

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TABLE 1: Means and Standard Errors (in Parentheses) for the Alcohol, Baseline, and Cell Phone Conditions

	Alcohol	Baseline	Cell Phone
Total accidents	0	0	3
Brake reaction time (ms)	779 (33)	777 (33)	849 (36)
Maximum braking force	69.8 (3.7)	56.7 (2.6)	55.5 (3.0)
Speed (mph)	52.8 (2.0)	55.5 (0.7)	53.8 (1.3)
Mean following distance (m)	26.0 (1.7)	27.4 (1.3)	28.4 (1.7)
SD following distance (m)	10.3 (0.6)	9.5 (0.5)	11.8 (0.8)
Time to collision (s)	8.0 (0.4)	8.5 (0.3)	8.1 (0.4)
Time to collision < 4 s	3.0 (0.7)	1.5 (0.3)	1.9 (0.5)
Half recovery time (s)	5.4 (0.3)	5.3 (0.3)	6.3 (0.4)

By contrast, when participants were intoxicated, neither accident rates, nor reaction time to vehicles braking in front of the participant, nor recovery of lost speed following braking differed significantly from baseline. Overall, drivers in the alcohol condition exhibited a more aggressive driving style. They followed closer to the pace vehicle, had twice as many trials with TTC values below 4 s, and braked with 23% more force than in baseline conditions. Most importantly, our study found that accident rates in the alcohol condition did not differ from baseline; however, the increase in hard braking and the increased frequency of TTC values below 4 s are predictive of increased accident rates over the long run (e.g., T. L. Brown et al., 2001; Hirst & Graham, 1997).

The MANOVA also indicated that the cell phone and alcohol conditions differed significantly from each other, $F(8, 32) = 4.06, p < .01$. When drivers were conversing on a cell phone, they were involved in more rear-end collisions and took longer to recover the speed that they had lost during braking than when they were intoxicated. Drivers in the alcohol condition also applied greater braking pressure than did drivers in the cell phone condition.

To sharpen our understanding of the differences between the cell phone and alcohol conditions, we

TABLE 2: *T* Test Values for the Pair-Wise Comparisons

		Alcohol	Baseline
Brake reaction time (ms)	Alcohol		0.34
	Cell phone	1.74*	5.46***
Maximum braking force	Alcohol		4.40***
	Cell phone	4.13***	0.67
Speed (mph)	Alcohol		1.41
	Cell phone	0.47	1.69*
Mean following distance (m)	Alcohol		0.87
	Cell phone	1.11	1.06
SD following distance (m)	Alcohol		1.25
	Cell phone	1.59	4.18***
Time to collision (s)	Alcohol		1.18
	Cell phone	0.16	1.76*
Time to collision < 4 s	Alcohol		2.06**
	Cell phone	1.44	1.10
Half recovery time (s)	Alcohol		0.32
	Cell phone	1.96*	3.68***

Note. All comparisons have a *df* of 39 and are evaluated with a two-tailed significance level.
$^*p < .10$. $^{**}p < .05$. $^{***}p < .01$.

entered the driving performance measures obtained for each participant into a discriminant function analysis. The discriminant analysis determines which combination of variables maximally discriminates between the groups. The larger the standardized coefficient, the greater the contribution of that variable to the discrimination between the groups. Three of the obtained coefficients were negative, affected primarily by alcohol consumption: maximum braking force (–0.674), mean following distance (–0.409), and TTC less than 4 s (–0.311). Four of the obtained coefficients were positive, affected primarily by cell phone conversations: speed (0.722), *SD* of following distance (0.468), half recovery time (0.438), and brake reaction time (0.296). Average TTC did not differentiate between groups (coefficient = 0.055). Taken together, the discriminant analysis indicates that the pattern of impairment associated with the alcohol and cell phone conditions is qualitatively different.

Finally, the accident data were analyzed using a nonparametric chi-square statistical test. The chi-square analysis indicated that there were significantly more accidents when participants were conversing on a cell phone than in the baseline or alcohol conditions, $\chi^2(2) = 6.15, p < .05$.

DISCUSSION

Taken together, we found that both intoxicated drivers and cell phone drivers performed differently from baseline and that the driving profiles of these two conditions differed. Drivers using a cell phone exhibited a delay in their response to events in the driving scenario and were more likely to be involved in a traffic accident. Drivers in the alcohol condition exhibited a more aggressive driving style, following closer to the vehicle immediately in front of them, necessitating braking with greater force. With respect to traffic safety, the data suggest that the impairments associated with cell phone drivers may be as great as those commonly observed with intoxicated drivers.

However, the mechanisms underlying the impaired driving in the alcohol and cell phone conditions clearly differ. Indeed, the discriminant function analysis indicates that the driving patterns of the cell phone driver and the drunk driver diverge qualitatively. On the one hand, we found that intoxicated drivers hit the brakes harder, had shorter following distances, and had more trials with TTC values less than 4 s. On the other hand, we found that cell phones drivers had slower reactions, had longer following distances, took longer to recover speed lost following a braking episode, and were involved in more accidents. In the case of the cell phone driver, the impairments appear to be attributable, in large part, to the diversion of attention from the processing of information necessary for the safe operation of a motor vehicle (Strayer et al., 2003; Strayer & Johnston, 2001). These attention-related deficits are relatively transient (i.e., occurring while the driver is on the cell phone and dissipating relatively quickly after attention is returned to driving). By contrast, the effects of alcohol persist for prolonged periods of time, are systemic, and lead to chronic impairment.

Also noteworthy was the fact that the driving impairments associated with handheld and hands-free cell phone conversations were not significantly different. This observation is consistent with earlier reports (e.g., Patten et al., 2004; Redelmeier & Tibshirani, 1997; Strayer & Johnston, 2001) and suggests that legislative initiatives that restrict handheld devices but permit hands-free devices are not likely to eliminate the problems associated with using cell phones while driving. This follows because the interference can be attributed in large part to the distracting effects of the phone conversations themselves, effects that appear to be attributable to the diversion of attention away from driving. It should be pointed out that our study did not examine the effects of dialing or answering the phone on driving performance; however, Mazzae, Ranney, Watson, and Wightman (2004) compared handheld with hands-free devices and found the former to be answered more quickly, dialed faster, and associated with fewer dialing errors than the latter.

Our study also sheds light on the role that experience plays in moderating cell-phone-induced dual-task interference. Participants' self-reported estimates of the amount of time spent driving while using a cell phone averaged 14.3% with a range from 0% to 60%. When real-world usage was entered as a covariate into analyses comparing baseline and cell phone conditions, there was no evidence that practice altered the pattern of dual-task interference (i.e., all main effects and interactions associated with real-world

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usage had $ps > .40$). That is, practice in this dual-task combination did not result in improved performance. Given the attentional requirements of these two activities, it is not surprising that practice failed to moderate the dual-task interference. Because both naturalistic conversation and driving (at least reaction to unpredictable or unexpected events) have task components that are variably mapped, there are likely to be few benefits from practicing these two tasks in combination. Indeed, there is overwhelming evidence in the literature that performance on components of a task with a variable mapping do not benefit from practice (e.g., Shiffrin & Schneider, 1977).

Furthermore, the lack of differences in dual-task interference as a function of real-world usage suggests that drivers may not be aware of their own impaired driving. Indeed, when we debriefed participants at the end of the experiment, many of the drivers with higher levels of real-world cell phone usage while driving indicated that they found it no more difficult to drive while using a cell phone than to drive without using a cell phone. Thus, there appears to be a disconnect between participants' self-perception of driving performance and objective measures of their driving performance. Elsewhere, we have suggested that one consequence of using a cell phone is that it may make drivers insensitive to their own impaired driving behavior (Strayer et al., 2003).

One factor that is often overlooked when considering the overall impact of cell phone driving is the effect these drivers have on traffic flow. In our study, we found that drivers using a cell phone took 19% longer (than baseline) to recover the speed that was lost following a braking episode. In situations where traffic density is high, this pattern of driving behavior is likely to decrease the overall traffic flow, and as the proportion of cell phone drivers increases, these effects are likely to be multiplicative. That is, the impaired reactions of a cell phone driver make them less likely to travel with the flow of traffic, potentially increasing overall traffic congestion.

In the current study, the performance of drivers with a blood alcohol level at 0.08% differed significantly from their performance in both the cell phone and baseline conditions. In particular, when participants were in the alcohol condition, they followed the pace car more closely, had a greater frequency of trials with TTC less than 4 s, and depressed the brake with more vigor when the lead vehicle began to decelerate. However, the difference in brake onset time between the alcohol and baseline conditions was not significant in the current study. The precise reason for the lack of an effect on reaction time is unclear; although the literature on the effects of alcohol on reaction time has produced mixed results (see Moskovitz & Fiorentino, 2000). One possibility is that drivers in the alcohol condition may have reacted with alacrity out of necessity; given their shorter following distance, they may have been pressed into action sooner than in the other conditions. Indeed, an examination of the relationship between reaction time and following distance yielded significant correlations for the baseline ($r = .47$, $p < .01$) and cell phone ($r = .56$, $p < .01$) conditions, but not for the alcohol condition, ($r = .07$, *ns*). That is, for both the baseline and cell phone conditions, reaction time tended to increase with following distance, but this pattern was not observed in the alcohol condition.

No accidents were observed in the alcohol sessions of our study. Nevertheless, alcohol clearly increases the risk of accidents in real-world settings. For example, the U.S. Department of Transportation (2002) estimated that alcohol was involved in 41% of all fatal accidents in 2002; however, it is important to note that in 81% of these cases the blood alcohol level was higher than 0.08% wt/vol and that the average blood alcohol level of drivers involved in a fatal crash was twice the legal limit (i.e., 0.16% wt/vol). For cases in which the blood alcohol level was at or below the legal limit, the total number of fatalities in 2002 was 2818.

Another way to determine the effect of alcohol on driving is to estimate the risk of an accident when driving with a specific blood alcohol concentration as compared with baseline conditions when the driver is not under the influence of alcohol. Using odds ratios, Zandor, Krawchuk, and Voas (2000) estimated the relative risk of a passenger vehicle accident for drivers 21 to 34 years old. At blood alcohol concentrations between 0.05% and 0.79%, the odds ratio was estimated to be 3.76, and at blood alcohol concentrations between 0.08% and 0.99%, the odds ratio was estimated to be 6.25. Unfortunately, the precise odds ratio for a blood alcohol concentration of 0.08% is not readily discernable from the tabular information in the Zandor et al. (2000) study, but presumably it falls somewhere between 3.76 and 6.25.

By comparison, this is the third in a series of studies that we have conducted evaluating the effects of cell phone use on driving using the car-following procedure (see also Strayer & Drews, 2004; and Strayer et al., 2003). Across these three studies, 120 participants performed in both baseline and cell phone conditions. Two of the participants in our studies were involved in an accident in baseline conditions, whereas 10 participants were involved in an accident when they were conversing on a cell phone. A logistic regression analysis indicated that the difference in accident rates for baseline and cell phone conditions was significant, $\chi^2(1) = 6.1, p = .013$, and the estimated odds ratio of an accident for cell phone drivers was 5.36, a relative risk similar to the estimates obtained by Zandor et al. (2000) for drivers with a blood alcohol level of 0.08% wt/vol.

One factor that may have contributed to the absence of accidents in the alcohol condition of our study is that the alcohol and driving portion of the study was conducted during the daytime (between 9:00 a.m. and noon). Data from the National Highway Transportation Safety Administration (National Highway Traffic Safety Administration, 2001) indicates that only 3% of fatal accidents on U.S. highways occur during this time interval. In fact, in the real world there is a natural confounding of alcohol consumption and fatigue such that nearly 80% of all fatal alcohol-related accidents on U.S. highways occur between 6:00 p.m. and 6:00 a.m. In the current study, participants were well rested prior to the consumption of alcohol, potentially lowering the relative risk factors.

The objective of the present research was to help to establish a clear benchmark for assessing the relative risks associated with using a cell phone while driving. We compared the cell phone driver with the drunk driver for two reasons. First, there are now clear societal norms associated with intoxicated driving, and laws in the United States expressly prohibit driving with a blood alcohol level at or above 0.08%. Logical consistency would seem to dictate that any activity that leads to impairments in driving equal to or greater than the drunk driving standard should be avoided (Willette & Walsh, 1983). Second, the epidemiological study by Redelmeier and Tibshirani (1997) suggested that "the relative risk [of being in a traffic accident while using a cell phone] is similar to the hazard associated with driving with a blood alcohol level at the legal limit" (p. 456). The data presented in this article are consistent with this estimate and indicate that when driving conditions and time on task are controlled for, the impairments associated with using a cell phone while driving can be as profound as those associated with driving with a blood alcohol level at 0.08%. With respect to cell phone use, clearly the safest course of action is to not use a cell phone while driving. However, regulatory issues are best left to legislators who are provided with the latest scientific evidence. In the long run, skillfully crafted regulation and better driver education addressing driver distraction will be essential to keep the roadways safe.

ACKNOWLEDGMENTS

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Supertaskers: Profiles in Extraordinary Multi-tasking Ability

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Abstract

Theory suggests that driving should be impaired for all motorists when they concurrently talk on a cell phone. But is everybody impaired by this dual-task combination? We tested 200 participants in a high-fidelity driving simulator in both single- and dual-task conditions. The dual-task involved driving while concurrently performing a demanding auditory version of the operation span (OSPAN) task. Whereas the vast majority of participants showed significant performance decrements in dual-task conditions (compared to single-task conditions for both driving and OSPAN tasks), 2.5% of the sample showed absolutely no performance decrements when comparing single- and dual-tasks. In single-task conditions, these "supertaskers" scored in the top quartile on all dependent measures associated with driving and OSPAN tasks, and Monte Carlo simulations indicated that the frequency of supertaskers was significantly greater than chance. These individual differences help to sharpen our theoretical understanding of attention and cognitive control in naturalistic settings.

One of the most robust findings in cognitive science is that attention has a limited capacity (Kahneman, 1973; for a review, see Strayer & Drews, 2007a). There is a well-established association between attention and performance, such that allocating more attention to a task improves performance unless floor or ceiling effects mask the relationship (Norman & Bobrow, 1975). Nowhere are these limitations more evident than in situations where people attempt to perform two or more attention-demanding tasks concurrently. In these situations, a reciprocal pattern emerges wherein performance on one task prospers at the expense of the other (Siervaag et al., 1989; Wickens, 1980, 1984). Conventional wisdom suggests that people cannot multi-task without performance decrements on one or more of the constituent tasks and this may be due, in part, to bottlenecks in central processing (Pashler, 1992; Pashler, Johnson, & Ruthruff, 2001), response competition (Navon, 1984; Navon & Miller, 1987) or overlap in resource utilization (Wickens, 1984).

Nevertheless, it is not uncommon for people to multi-task in everyday situations (e.g., Ophir, Nass, & Wagner, 2009; Wallis, 2006). One common form of multi-tasking involves the concurrent use of a cell phone while driving. In fact, estimates suggest that at any daylight hour over 10% of drivers on US roadways are talking on their cell phone (Glassbrenner, 2005). Consistent with the attention literature, research has demonstrated that driving performance is significantly degraded by cell phone conversations. For example, when drivers talk on either a hand-held or hands-free cell phone, brake reaction times are delayed, object detection is impaired, traffic-related brain potentials are suppressed, and accident rates are increased (Strayer, Drews, & Johnston, 2003; Strayer & Johnston, 2001). Elsewhere it has been demonstrated that cell phone conversations lead to a form of inattention blindness causing drivers to fail to see up to half of the information in the driving environment that they would have noticed had they not been conversing on the phone (Strayer & Drews, 2007b).

In fact, the National Highway Transportation Safety Association estimated that in 2008 at least 20% of all accidents and fatalities on US highways were caused by driver distraction (Ascomb & Lindsey, 2009). Thus, despite the overwhelming evidence that multi-tasking impairs driving, large segments of the population regularly engage in these activities. Over the years, we have encountered a great many people who adamantly claim that they are not impaired when they use a cell phone while driving, although they readily admit that they have seen others who drive erratically when they use their cell phone (Strayer, Drews, & Johnston, 2003; see also Nationwide, 2009). We have suggested that the inattention blindness associated with cell phone conversations makes these drivers unaware of their own driving impairments (Strayer & Drews, 2007b), although it is also possible that the claim stems, in part, from a general tendency of many to believe that their driving performance is above the average (i.e., a Lake Wobegone effect; cf., Horswill, Waylen, & Tofield, 2004; Svenson, 1981).

Given these driver distraction findings, it would seem that the general rules of attention would apply to everyone. But recent interest in individual differences encourages researchers to go beyond group averages and examine profiles that may emerge for different individuals. In the present context, it is theoretically possible that a small segment of the population may be capable of performing complex multi-tasking with little or no apparent costs. The idea that some individuals may have extraordinary multi-tasking abilities does not seem so far fetched, if one considers well-documented cases of individuals demonstrating extraordinary memory abilities (e.g., Price & Davis, 2008). Are there, in fact, "supertaskers" in our midst, individuals who can drive while simultaneously conversing on a cell phone without noticeable impairment? If so, what allows them to exhibit behavior that seemingly violates cognitive scientists' current understanding of attention and dual-task control?

Our search for supertaskers begins by considering neuropsychological evidence that the dorsolateral prefrontal cortex (dlPFC) plays an important role in attentional control and goal maintenance (e.g., Braver, Gray, & Burgess, 2007). Indeed, models of executive attention highlight the role of the frontally-mediated capacity to maintain task goals and avoid conflicting distractions (Kane & Engle, 2002). Recently, Engle and colleagues (Conway et al., 2005; Engle, 2002; Kane & Engle, 2003) developed a simple but elegant operation span (OSPAN) task that has been shown to be sensitive to individual differences in executive attention and is thought to recruit the dlPFC. The OSPAN task involves maintaining the task goal of memorizing items and recalling them in the correct serial order while concurrently performing distracting math problems. Individual differences in OSPAN performance have been shown to predict behavior on a wide range of classic cognitive tasks thought to require frontal executive attention such as dichotic listening, the anti-saccade task, Stroop color naming, and associative false memory paradigms (see Conway, Cowan, & Bunting, 2001; Kane, Bleckley, Conway, & Engle, 2001; Kane & Engle, 2003; Watson, Bunting, Poole, & Conway, 2005, respectively). To identify individuals with extraordinary multi-tasking ability, we paired the task of driving using a high-fidelity driving simulator with an auditory version of the OSPAN task. Participants performed the driving and OSPAN tasks in combination and also performed each of the tasks separately. We predicted that most individuals will show substantial performance declines in driving and OSPAN when performed together compared to the single-task baseline measures. This pattern would highlight the role that executive attention and the dlPFC play in driving and would also provide evidence that the dual-task interference was bi-directional (i.e., costs are observed for both driving and OSPAN tasks). By contrast, individuals with extraordinary multi-tasking ability, if they exist, might be able to perform these two tasks in combination without impairment.

Methods

Participants. 200 undergraduates (90 male and 110 female) from the University of Utah participated in the IRB approved study. Participants ranged in age from 18 to 43, with an average age of 23.6. All had normal or corrected-to-normal vision and a valid driver's license.

Stimuli and Apparatus. A PatrolSim high-fidelity driving simulator, manufactured by L3 Communications/I-SIM, was used in the study. A freeway road simulated a 32-mile multi-lane highway with on and off-ramps, overpasses, and two and three-lane traffic in each direction. A pace car, programmed to travel in the right-hand lane, braked intermittently throughout the scenario. Distractor vehicles were programmed to drive in the left lane between 5% and 10% faster than the pace car, providing the impression of a steady flow of traffic. Unique driving scenarios, counterbalanced across participants, were used for the single- and dual-task conditions in the study. Cellular service was provided by Sprint PCS. The cell phone was manufactured by LG Electronics inc. (model TP1100) and an earpiece and boom microphone was attached to the cell phone for hands-free communication.

Procedure. The experiment was conducted in a single 1.5 hour session. Participants were first familiarized with the driving simulator using a 15-minute standardized adaptation sequence. In the driving portions of the task, participants followed an intermittently braking pace car driving in the right-hand lane of the highway. When the participant stepped on the brake pedal in response to the braking pace car, the pace car released its brake and accelerated to normal highway speed. If participants failed to depress the brake, they would eventually collide with the pace car. That is, like real highway stop and go traffic, participants were required to react in a timely and appropriate manner to a vehicle slowing in front of them. Measures of brake reaction time and following distance from the pace car were recorded for subsequent analysis.

In the cell phone conditions, the participant performed an auditory version of the OSPAN task. Before the main portion of the study began, participants were given practice in a computerized version of the OSPAN (Turner & Engle, 1989) to familiarize them with the procedure (performance on the computerized OSPAN task was significantly correlated with performance on the single-task auditory OSPAN task, $r = 0.55$, $p < .01$). In the OSPAN task, participants were asked to remember a series of 2-5 words that were interspersed with math verification problem (e.g., given "is (3/1) -1 = 2?": "cat": "is (2*2) + 1 = 4?": "box": RECALL, the participant should have answered "true" and "false" to the math problems when they were presented and recalled "cat" and "box" in the order that they were presented when given the recall probe). Measures of memory and math performance were recorded for subsequent analysis. The highest possible score for OSPAN memory performance was 74 and the highest possible score for OSPAN math was 74. To eliminate interference from manual components of cell phone use, we used a hands-free headset and initiated the call before driving began.

Participants performed both the driving and auditory OSPAN tasks as single-tasks and also performed both tasks concurrently in the dual-task condition. In the dual-task condition, participants were instructed to prioritize performance on the driving task and to perform the concurrent OSPAN task as accurately as possible.

Results

At the group level (see Figure 1), dual-task performance was inferior to single-task performance for brake reaction time, $F(1,199) = 51.3$, $p <.01$, $\eta^2 = 0.204$, following distance, $F(1,199) = 10.2$, $p <.01$, $\eta^2 = 0.49$, OSPAN memory performance, $F(1,199) = 66.4$, $p <.01$, $\eta^2 = 0.249$, and OSPAN math performance $F(199) = 30.6$, $p <.01$, $\eta^2 = 0.133$. This pattern of performance is consistent with the well-established pattern of dual-task performance decrements associated with limited capacity attention (for a review, consult Strayer & Drews, 2007a). Moreover, the data indicate bi-directional interference such that both driving and OSPAN measures suffered in dual-task conditions. To the extent that the dlPFC is truly recruited in the performance of the OSPAN task (e.g., Kane & Engle, 2002), the dual-task decrements imply that driving also recruits this region of frontal cortex, most likely coordinating the component sub-tasks associated with driving.

Further scrutiny revealed a small subset of participants (n=5; 3 male and 2 female) scoring in the upper quartile of the OSPAN memory task (i.e., "high-spans") and showing no performance decline from single-task to dual-task across all the dependent measures. We developed a stringent set of criteria for classifying participants as a "supertasker". The first requirement was that performance on each of the 4 dependent measures was in the top 25% of the single-task scores for that variable, ensuring that the absence of dual-task costs could not be attributed to "sandbagging" in single-task conditions. The second requirement was that dual-task performance could not differ from single-task levels by more than the single-task standard error of the mean for that measure (e.g., brake reaction time in dual-task conditions could not increase by more than 40 msec from single-task levels, following distance in dual-task conditions must be within 1 meter of single-task levels, and

OSPAN math and memory performance in dual-task conditions could not decrease by more than 1 item from single-task levels). Participants received a score ranging from 0 to 4, reflecting the number of measures in which they showed no dual-task decrement. Participants who earned a score of 3 (N=4) or 4 (N=1) were classified as supertaskers (i.e., participants who performed *both* tasks at the same time with high levels of proficiency on each task), and those earning a score of 0-2 were classified as controls. Note that a score of 2 or lower indicates that one or both of the tasks was not performed as well in dual-task conditions as in single-task conditions.

As illustrated in Figure 2, the dual-task cost for these supertaskers was zero; they performed as well, if not better, in the dual-task condition than they did in the single-task conditions. Independent sample *t*-tests comparing the difference between single-task and dual-task conditions indicated significantly smaller costs for supertaskers than for the control group in brake reaction time, $t(198) = 5.0$, $p < .01$, $d = 0.72$; following distance, $t(198) = 3.1$, $p < .01$, $d = 0.44$; OSPAN memory performance, $t(198) = -4.6$, $p < .01$, $d = 0.65$, but OSPAN math performance did not differ ($p > .10$). We also compared performance of supertaskers with the subset of participants who scored in the top quartile of the OSPAN task (i.e., high spans). Independent sample *t*-tests comparing the difference between single-task and dual-task revealed significantly smaller costs for supertaskers in brake reaction time $t(49)=3.5$, $p<.01$. $d = 0.96$ and OSPAN memory performance $t(49)=4.8$, $p<.01$, $d = 1.37$. There was also a trend for smaller costs in following distance for supertaskers $t(49)=1.9$, $p< .06$, $d = 0.53$, whereas the costs in OSPAN math performance did not differ ($p>.20$). Note also that the supertaskers also had single-task performance that was superior to that of the control group, making their performance in dual-task conditions all that more impressive and ruling out theoretically uninteresting "regression to the mean" interpretations of the data. That is, supertaskers began in single-task conditions in the upper quartile of the distribution and became an even more extreme outlier in dual-task conditions. In addition, supertaskers were tested using different counterbalancing orders and by different research assistants, ruling out order and experimenter causes for the difference.

To ensure that this pattern of data did not arise by chance alone, we performed a Monte Carlo simulation in which randomly selected single-dual task pairs of variables from the existing data set were obtained for each of the 4 dependent measures and then subjected to the same algorithm that was used to classify the supertaskers. The Monte Carlo procedure simulated 100,000 participants, and we found that by chance alone 0.16% of the cases resulted in performance criteria that matched those of the supertaskers (compared to the obtained 2.5% cases; a 15-fold difference). Logistic regression found that the frequency of supertaskers was significantly greater than chance $X^2(1) = 17.9$, $p < .01$. Given that this pattern cannot be attributed to chance, it suggests that an important individual difference variable underlies the effect. We suggest that this individual difference is associated with differences in executive attention as mediated, at least in part, by frontal cortex.

Discussion

Supertaskers have a strikingly remarkable ability to successfully perform two attention-demanding tasks that over 97% of the population cannot perform without incurring substantial costs in performance. The behavioral characteristics of supertaskers are likely to be important in other activities that require coordinating a number of concurrent tasks (e.g., flying a high-performance aircraft). Paradoxically, a recent study examining multi-tasking ability found that individuals who report multi-tasking more frequently do so *less* well than those who are less frequent multi-taskers (Ophir, Nass, & Wagner, 2009). Indeed, our studies over the last decade have found that a great many people have the belief that the laws of attention do not apply to them (e.g., they have seen other drivers who are impaired while multi-tasking, but they are the exception to the rule). In fact, some readers may also be wondering if they too are supertaskers; however, we suggest that the odds of this are against them. The illusion that people harbor about their superior multi-tasking ability is likely to stem from inattention blindness, whereby attention is diverted from sources of evidence that would indicate that their driving is impaired (Strayer & Drews, 2007b).

Why are we all not supertaskers? We suggest two possibilities. First, there may be some cost associated with being a supertasker. Elsewhere, Grossberg (1987) suggested that organisms are faced with a stability/plasticity dilemma in which they must strike a delicate balance between being overly rigid and overly flexible in their processing style. Indeed, many clinical disorders are associated with an imbalance, being either overly rigid or overly flexible (DSM-IV, 1994). It may be that supertaskers excel at multi-tasking at the expense of other processing abilities. By contrast, Parasuraman and Greenwood (2007) identified one individual (i.e., the "odd man out") who was able to perform a sustained attention task without exhibiting the classic vigilance decrement that is commonly observed at the group level. We suggest that supertaskers and the odd man out lie at opposite ends of the stability/plasticity continuum. Second, there may be few costs (and possibly benefits) associated with being a supertasker, but the environmental and technological demands that favor this ability are relatively new and any selective advantage for being a supertasker has yet to propagate throughout the population. Indeed, it has only been in the last few generations that technology has placed high value on multi-tasking ability. This time-scale is too short for any selective advantage to spread through the population.

It is fair to say that the OSPAN task is not the topic of the typical cell phone conversation.

However, it was not the intent of the current research to mimic naturalistic conversations (as has been done elsewhere; e.g., Drews, Pasupathi, & Strayer, 2008). The rationale for using the OSPAN task was based upon the link to executive attention and the likely recruitment of dlPFC in the context of multi-tasking (e.g., Kane & Engle, 2002). In addition, the rules for scoring OSPAN performance are objective and easily quantifiable (in contrast to naturalistic conversations), and thus the dual-task combination provides a clear-cut demonstration of the bi-directional interference. Using the dual-task logic developed by Baddeley and colleagues (e.g., Baddeley & Hitch, 1974), the decline in OSPAN scores for the majority of participants implies that operating a motor vehicle also places demands on frontal-mediated control networks.

Conclusions and Future Directions

Current theories of attention in cognitive science focus on group-level behavior and often neglect differences between individuals. Consistent with Engle and colleagues, we suggest that incorporating an individual differences perspective will significantly improve our theoretical understanding of attention and performance in both traditional laboratory settings and more applied contexts. In particular, individuals who perform significantly better (or worse) than the group average may help to shed light on the mechanisms of attention and cognitive control in a similar fashion to how failures of perception or memory (e.g., illusions) help us to understand the rules governing normal perception/memory (see Roediger, 1996). As we gain a better understanding of the neural bases of supertasker performance, we are likely to gain a better understanding of normal multi-tasking performance.

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Figure 1. Group average performance for single- and dual-task conditions for brake reaction time (upper left panel), following distance (lower left panel), OSPAN memory performance (upper right panel) and OSPAN math performance (lower right panel). Error bars indicate standard error of the mean.

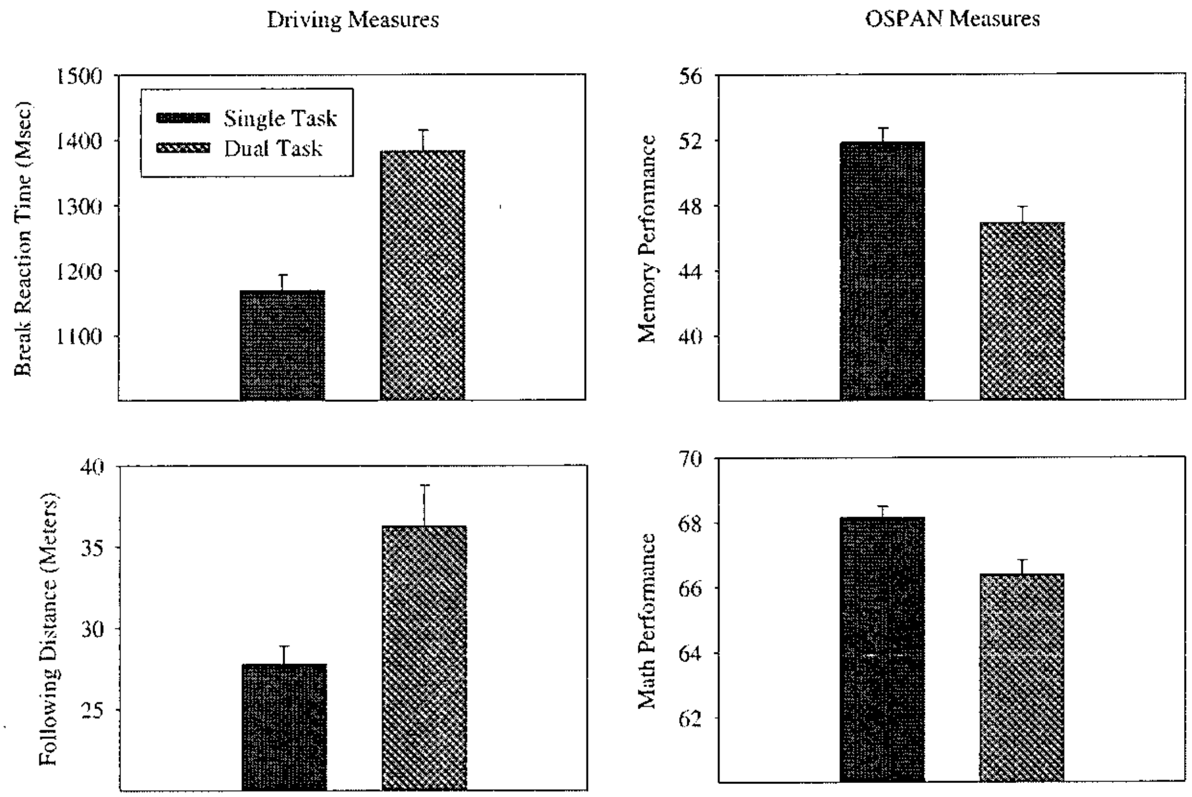
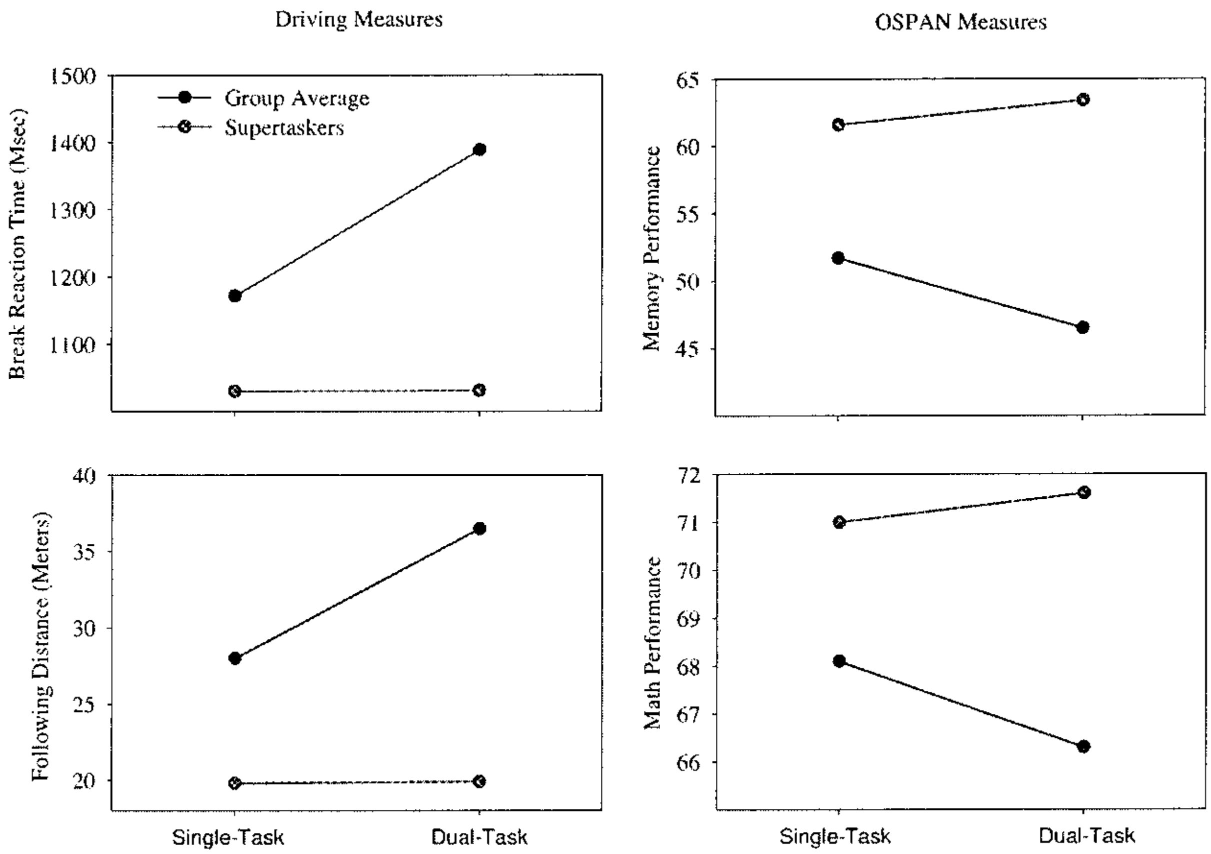


Figure 2. Single-task and dual-task performance for the group average and for supertaskers. Brake reaction time (upper left panel), following distance (lower left panel), OSPAN memory performance (upper right panel) and OSPAN math performance (lower right panel).



AN OVERVIEW OF THE 100-CAR NATURALISTIC STUDY AND FINDINGS

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ABSTRACT

A key to the development of effective crash countermeasures is an understanding of pre-crash causal and contributing factors. This research effort was initiated to provide an unprecedented level of detail concerning driver performance, behavior, environment, driving context and other factors that were associated with critical incidents, near crashes and crashes for 100 drivers across a period of one year. A primary goal was to provide vital exposure and pre-crash data necessary for understanding causes of crashes, supporting the development and refinement of crash avoidance countermeasures, and estimating the potential of these countermeasures to reduce crashes and their consequences.

The 100-Car Naturalistic Driving Study database contains many extreme cases of driving behavior and performance, including severe fatigue, impairment, judgment error, risk taking, willingness to engage in secondary tasks, aggressive driving, and traffic violations. The data set includes approximately 2,000,000 vehicle miles, almost 43,000 hours of data, 241 primary and secondary drivers, 12 to 13 months of data collection for each vehicle, and data from a highly capable instrumentation system including five channels of video and vehicle kinematics. From the data, an "event" database was created, similar in classification structure to an epidemiological crash database, but with video and electronic driver and vehicle performance data. The events are crashes, near crashes and other "incidents." Data was classified by pre-event maneuver, precipitating factor, event type, contributing factors, and the avoidance maneuver exhibited. Parameters such as vehicle speed, vehicle headway, time-to-collision, and driver reaction time are also recorded.

This paper presents the 100-Car Naturalistic Driving Study method, including instrumentation and vehicle characteristics, and a sample of study results. Presented analyses address the driver characteristics, the role of inattention and distraction in rear-end and lane change events. In addition, the methodological attributes of naturalistic data collection and the implications for a larger-scale naturalistic data collection effort are provided.

INTRODUCTION

Although the crash rate is declining, the number of driving related deaths is approximately 43,000 per year. While the development of mechanistic safety features, such as seat belts, air bags, and collapsible steering wheels, have been extremely important in lowering the vehicle-related death rate, it is plausible that the next significant decrease in roadway fatalities will require systems to assist drivers in preventing crashes. However, driver assistance systems require a more precise understanding of the driver behaviors prior to an adverse driving event to be more effective.

Data collected to study driver behavior have historically relied on epidemiological, simulator, and test track studies. While these are valuable techniques that certainly have their place in the study of driver behavior, they are not well suited to explain the combination of factors leading to an adverse driving event. For example, a police crash report form might list the cause of a rear-end collision as "following too close." However, contributing factors might be fatigue, distraction, traffic backed up from the intersection, and/or a blind corner leading up to the same intersection. For this hypothetical case, there are both driver and infrastructure related causes of the event. Likewise, simulator and test track studies cannot mimic the combination of complex driving environments and the simultaneous array of driver behaviors that lead to many events.

As demonstrated in only a small handful of studies, naturalistic data collection fills the gap in current data collection methods. "Naturalistic" data includes data from a suite of vehicle sensors and unobtrusively placed video cameras. The drivers are given no special instructions, no experimenter is present, and the data collection instrumentation is unobtrusive. This naturalistic data collection method was applied to study fatigue and resulting driver performance in truck drivers making local/short haul deliveries [1] In this study, 42 drivers drove 4 instrumented vehicles while they made deliveries. The study resulted in approximately 1000 hours of data that included five video views and a host of vehicle sensor data.

In a long-haul truck driving study, naturalistic data was collected from 56 single and team drivers who drove one of two instrumented vehicles [2]. Data was collected to assess sleep quality, driver alertness, and driver performance on normal revenue-producing trips averaging up to eight days in length. This data collection effort resulted in 250 hours of data that was triggered based upon vehicle sensor data. The results showed that single drivers suffered the worst bouts of fatigue and had the most severe critical incidents (by about 4 to 1).

A key to the development of effective crash countermeasures is an understanding of pre-crash causal and contributing factors. This research effort was initiated to provide an unprecedented level of detail concerning driver performance, behavior, environment, driving context and other factors that were associated with critical incidents, near crashes and crashes for 100 drivers across a period of one year. A primary goal was to provide vital exposure and pre-crash data necessary for understanding causes of crashes, supporting the development and refinement of crash avoidance countermeasures, and estimating the potential of these countermeasures to reduce crashes and their consequences.

The 100-Car Naturalistic Driving Study (100-Car Study) was the first instrumented vehicle study undertaken with the primary purpose of collecting large-scale naturalistic driving data. Unique to the 100-Car Study was that the majority of the drivers drove their own vehicles (78 out of 100 vehicles). There is every indication that the drivers rapidly disregarded the presence of the instrumentation, as is indicated by the resulting database containing many extreme cases of driving behavior and performance including: severe fatigue, impairment, judgment error, risk taking, willingness to engage, aggressive driving, and traffic violations (just to name a few). These types of driving events have been heretofore greatly attenuated by other empirical techniques.

Due to the scale of the 100-Car Study and the fact that private vehicles were instrumented, new techniques had to be created and existing methods modified to make the study successful. The data collection effort resulted in the following data set contents:

- Approximately 2,000,000 vehicle miles
- Almost 43,000 hours of data
- 241 primary and secondary drivers participated
- 12 to 13 month data collection period for each vehicle
- Five channels of video and many vehicle state and kinematic variables

This paper presents a sample of the analysis results from the 100-Car Study data collected. The full study report is available through the National Highway Traffic Safety Administration [3].

METHOD

Instrumentation

The 100-Car instrumentation package was engineered by VTTI to be rugged, durable, expandable, and unobtrusive. It constituted the seventh generation of hardware and software, developed over a 15 year period that has been deployed for a variety of purposes. The system consisted of a Pentium-based computer that received and stored data from a network of sensors distributed around the vehicle. Data storage was achieved via the system's hard drive, which was large enough to store data for several weeks of driving before requiring data downloading.

Each of the sensing subsystems in the car was independent, so that any failures that occurred were constrained to a single sensor type. Sensors included a vehicle network box that interacted with the vehicle network, an accelerometer box that obtained longitudinal and lateral kinematic information, a headway detection system to provide information on leading or following vehicles, side obstacle detection to detect lateral conflicts, an incident box to allow drivers to flag incidents for the research team, a video-based lane tracking system to measure lane keeping behavior, and video to validate any sensor-based findings. The video subsystem was particularly important as it provided a continuous window into the happenings in and around the vehicle. This subsystem included five camera views monitoring the driver's face and driver side of the vehicle, the forward view, the rear view, the passenger side of the vehicle, and an over-the-shoulder view for the driver's hands and surrounding areas. An important feature of the video system is that it was digital, with software-controllable video compression capability. This allowed synchronization, simultaneous display, and efficient archiving and retrieval of 100-Car data. A frame of compressed 100-Car video data is shown in Figure 1.

The modular aspect of the data collection system allowed for integration of instrumentation that was not essential for data collection, but which provided the research team with additional and important information. These subsystems included automatic collision notification that informed the research team of the possibility of a collision; cellular communications that were used by the research team to communicate with vehicles on the road to determine system status and position; system initialization equipment that automatically controlled system status; and a GPS positioning subsystem that collected information on vehicle position. The GPS positioning subsystem and the cellular communications were often used in concert to allow for vehicle localization and tracking.

Figure 1. A compressed video image from the 100-Car data. The driver's face (upper left quadrant) is distorted to protect the driver's identity. The lower right quadrant is split with the left-side (top) and the rear (bottom) views.

The system included several major components and subsystems that were installed on each vehicle. These included the main Data Acquisition System (DAS) unit that was mounted under the package shelf for the sedans (Figure 2) and behind the rear seat in the SUVs.

Doppler radar antennas were mounted behind special plastic license plates on the front and rear of the vehicle (Figure 3). The location behind the plates allowed the vehicle instrumentation to remain inconspicuous to other drivers.

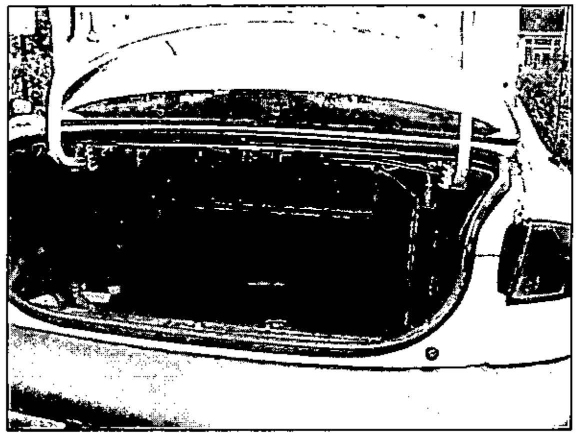

Figure 2. The main Data Acquisition System (DAS) unit mounted under the "package shelf" of the trunk.

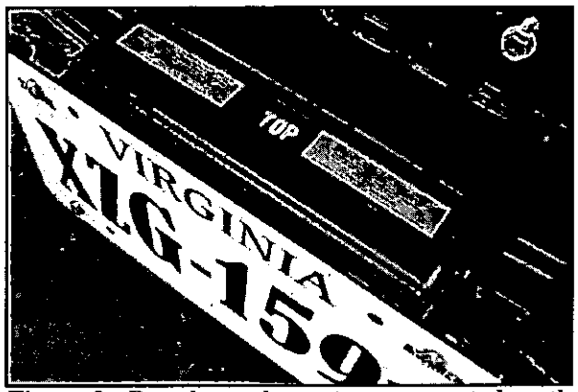

Figure 3. Doppler radar antenna mounted on the front of a vehicle, covered by one of the plastic license plates used for this study.

The final major components in the 100-Car hardware installation were mounted above and in front of the center rear-view mirror. These components included an "incident" pushbutton box which housed a momentary pushbutton that the subject could press whenever an unusual event happened in the driving environment. Also contained in the housing was an unobtrusive miniature camera that provided the driver face view. The camera was invisible to the driver since it was mounted behind a "smoked" Plexiglas cover.

Mounted behind the center mirror were the forward-view camera and the glare sensor (Figure 4). This location was selected to be as unobtrusive as possible and did not occlude any of the driver's normal field of view.

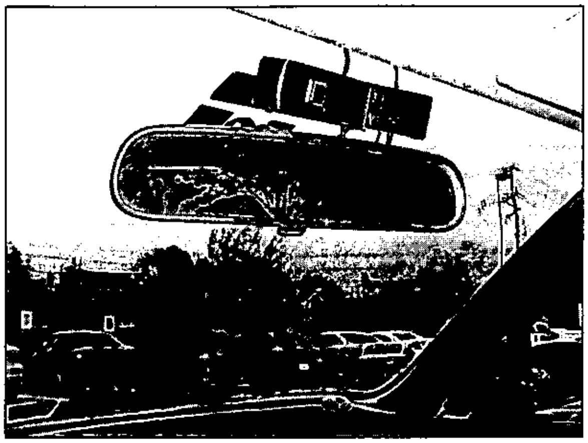

Figure 4. The incident push button box mounted above the rearview mirror. The portion on the right contains the driver face/left vehicle side camera hidden by a smoked plexiglass cover.

Subjects

One-hundred drivers who commuted into or out of the Northern Virginia/Washington, DC metropolitan area were initially recruited as primary drivers to have their vehicles instrumented or receive a leased vehicle for this study. Drivers were recruited by placing flyers on vehicles as well as by placing newspaper announcements in the classified section. Drivers who had their private vehicles instrumented (78) received $125.00 per month and a bonus at the end of the study for completing necessary paperwork. Drivers who received a leased vehicle (22) received free use of the vehicle, including standard maintenance, and the same bonus at the end of the study for completing necessary paperwork. Drivers of leased vehicles were insured under the Commonwealth of Virginia policy.

As some drivers had to be replaced for various reasons (for example, a move from the study area or repeated crashes in leased vehicles), 109 primary drivers were included in the study. Since other family members and friends would occasionally drive the instrumented vehicles, data were collected on 132 additional drivers.

A goal of this study was to maximize the potential to record crash and near-crash events through the selection of subjects with higher than average crash- or near-crash risk exposure. Exposure was manipulated through the selection of a larger sample of drivers below the age of 25, and by the selection of a sample that drove more than the average number of miles. The age by gender distribution of the primary drivers is shown in Table 1. The distribution of miles driven by the subjects during the study appears as Table 2. As presented, the data are somewhat biased compared to the national averages in each case, based on TransStats, 2001 [4]. Nevertheless, the distribution was generally representative of national averages when viewed across the distribution of mileages within the TransStats data.

One demographic issue with the 100-Car data sample that needs to be understood is that the data were collected in only one area (i.e., Northern Virginia/Metro Washington, DC). This area represents primarily urban- and suburban driving conditions, often in moderate to heavy traffic. Thus, rural driving, as well as differing demographics within the U.S., are not well represented.

Table 1. Driver age and gender distributions.

	Gender		
Age N % of total	Female	Male	Grand Total
18-20	9 8.3%	7 6.4%	16 14.7%
21-24	11 10.1%	10 9.2%	21 19.3%
25-34	7 6.4%	12 11.0%	19 17.4%
35-44	4 3.7%	16 14.7%	20 18.3%
45-54	7 6.4%	13 11.9%	20 18.3%
55+	5 4.6%	8 7.3%	13 11.9%
Total N Total Percent	43 39.4%	66 60.6%	109 100.0%

Table 2. Actual miles driven during the study.

Actual miles driven	Number of Drivers	Percent of Drivers
0-9,000	29	26.6%
9,001-12,000	22	20.2%
12,001-15,000	26	23.9%
15,001-18,000	11	10.1%
18,001-21,000	8	7.3%
More than 21,000	13	11.9%

A goal of the recruitment process was to attempt to avoid extreme drivers in either direction (i.e., very safe or very unsafe). Self reported historical data indicate that a reasonably diverse distribution of drivers was obtained.

Vehicles

Since 100 vehicles had to be instrumented with a number of sensors and data collection hardware, and since the complexity of the hardware required a number of custom mounting brackets to be manufactured, the number of vehicle types had to be limited for this study. Six different vehicle models were selected based upon their prevalence in the Northern Virginia area. These included five sedan models (Chevrolet Malibu and Cavalier, Toyota Camry and Corolla, and Ford Taurus) and one SUV model (Ford Explorer). The model years were limited to those with common body types and accessible vehicle networks (generally 1995 to 2003). The distribution of these vehicle types was:

- Toyota Camry – 17%
- Toyota Corolla – 18%
- Chevy Cavalier – 17%
- Chevy Malibu – 21%
- Ford Taurus – 12%
- Ford Explorer – 15%

Classification of events

Table 3 provides definitions of traffic "events" that served as a basis for the classifications that follow. The distinction between *near crashes* and *incidents* was based on the subjective assessment of reviewers in concert with kinematic and proximity data associated with adjacent vehicles or objects.

RESULTS

Table 4 shows the relative frequency of crashes, near-crashes, and incidents for each conflicts type. Of the 82 crashes, 13 either occurred while the system was initializing after the vehicle ignition was started (approximately 90 seconds), or has incomplete data for other reasons (e.g., camera failure), leaving a total of 69 crashes for which data could be completely reduced. These data also included 761 near-crashes and 8,295 incidents. The first eight conflict types shown in Table 4 accounted for all of the crashes, 87 percent of the near-crashes and 93 percent of the incidents.

Table 3. Classification of Events.

Event Category	Definition
Crashes	Any contact between the subject vehicle and another vehicle, fixed object, pedestrian pedacyclist, animal
Near Crashes	Defined as a conflict situation requiring a rapid, severe evasive maneuver to avoid a crash.
Incidents	Conflict requiring an evasive maneuver, but of lesser magnitude than a near crash

It is important to note that all of the crashes, including low speed collisions that were not police reported, are shown in Table 5. A "crash" was operationally defined as "any measurable dissipation or transfer of energy due to the contact of the subject vehicle with another vehicle or object." A benefit of the naturalistic approach is that it was possible to record all of these events; however the severity of the crashes must be delineated to better understand the data. Thus, the 69 crashes are parsed into the following four crash categories. Note that 75 percent of the single vehicle crashes were low-g force physical contact or tire strikes; in other words, most of the crashes involved very minor physical contact.

- Level I: Police-reported air bag deployment and/or injury
- Level II: Police-reported property damage only
- Level III: Non-police-reported property damage only
- Level IV: Non-police-reported low-g physical contact or tire strike (greater than 10 mph)

Since it was possible to detect all crashes regardless of severity, it is interesting to note the large number of drivers who experienced one or more collisions during the 12 to 13 month data collection period. Of all drivers, 7.5% of drivers never experienced an event of any severity. In contrast, 7.4% of the drivers experienced many incidents and 3 or 4 crashes. Thus, a handful of subjects were either very risky drivers or very safe, with the majority of drivers demonstrating a relatively normal distribution of events across the data collection period.

Table 4. Number of crashes, near-crashes, and incidents for each conflict type.

Conflict Type	Crash	Near-crash	Incident
Single vehicle	24	48	191
Lead-vehicle	15	380	5783
Following vehicle	12	70	766
Object/obstacle	9	6	394
Parked vehicle	4	5	83
Animal	2	10	56
Vehicle turning across subject vehicle path in opposite direction	2	27	79
Adjacent vehicle	1	115	342
Other	0	2	13
Oncoming traffic	0	27	184
Vehicle turning across subject vehicle path in same direction	0	3	10
Vehicle turning into subject vehicle path in same direction	0	28	90
Vehicle turning into subject vehicle path in opposite direction	0	0	1
Vehicle moving across subject vehicle path through intersection	0	27	158
Merging vehicle	0	6	18
Pedestrian	0	6	108
Pedalcyclist	0	0	16
Unknown	0	1	3

Table 5. Crash type by crash severity level.

Conflict Type	Total	Level I	Level II	Level III	Level IV
Single vehicle	24	1	0	5	18
Lead-vehicle	15	1	3	5	6
Following vehicle	12	2	2	5	3
Object/obstacle	9	0	1	3	5
Parked vehicle	4	0	0	2	2
Animal	2	0	0	0	2
Oncoming vehicle turning across subject vehicle path	2	1	1	0	0
Adjacent vehicle	1	0	0	1	0

Characterization of Driver Inattention

Historically, driver distraction has been typically discussed as a secondary task engagement. Fatigue has also been described as relating to driver inattention. In this study, it became clear that the definition of driver distraction needed to be expanded to a more encompassing 'driver inattention' construct that includes *secondary task engagement* and *fatigue* as well as two new categories, '*Driving-related inattention to the forward roadway*' and '*non-specific eye glance*'. '*Driving-related inattention to the forward roadway*' involves the driver checking rear-view mirrors or their blind spots. This new category was added after viewing multiple crashes, near-crashes, and incidents for which the driver was clearly paying attention to the driving task, but was not paying attention to the *critical aspect* of the driving task (i.e., forward roadway) at an inopportune moment involving a precipitating factor.

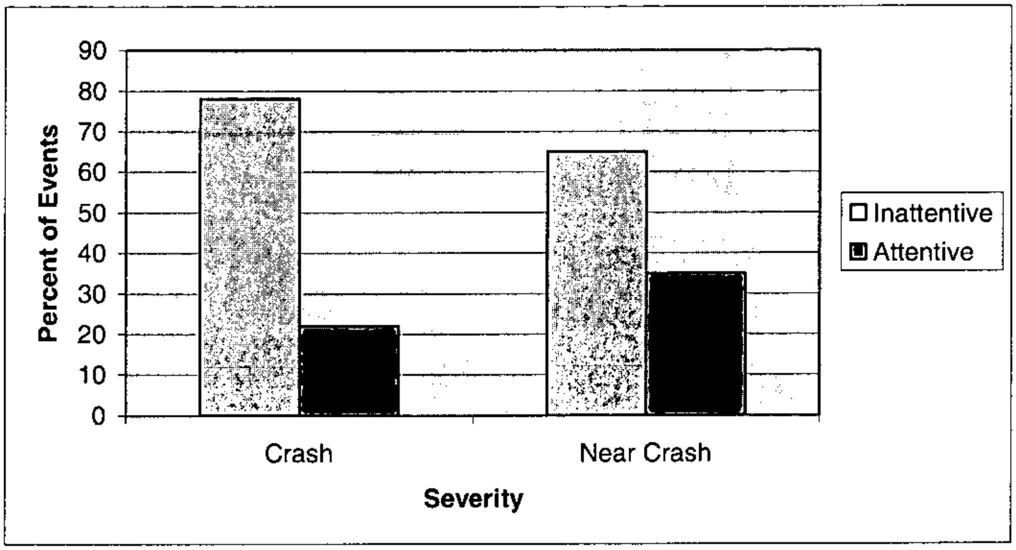

Figure 5. Percentage of events for attention by severity level.

A second analysis of the crashes and near-crashes in the 100-Car database was also conducted using the eye glance analysis performed manually by data reductionists. The '*non-specific eyeglance away from the forward roadway*' describes cases for which drivers glanced, usually momentarily, away from the roadway, but at no discernable object or person. For this project, eye glance reduction was accomplished for crash and near-crash events only, so this category can only be used for the more severe events. The four inattention categories identified above and considered together, suggested that driver's glances away from the forward roadway potentially contribute to a much greater percentage of events than has been previously thought. As shown in Figure 5, 78 percent of the crashes and 65 percent of the near crashes had one of these four inattention categories as a contributing factor.

An analysis of these types of inattention revealed that secondary task distraction was the largest of the four categories. The sources of inattention that generally contributed to the highest percentages of events (Figure 6) were wireless devices (primarily cell phones) internal distractions, and passenger-related secondary tasks (primarily conversations). It is important to note that "exposure," the frequency and duration of inattention associated with each source of inattention, is not considered in these data. Since it is exposure that determines the overall risk of a distraction source, an analysis of frequency of device use is currently being conducted for a future report that will allow calculations of event rates to determine estimates of the relative risk associated with these tasks.

Figure 7 shows a breakdown of the wireless device tasks and associated events. For these data, all of the crashes (about 8.7 percent of total study crashes) and a majority of the near crashes and incidents occurred during a cell phone conversation, although the dialing task was relatively high in term of total conflicts and was associated with the largest number of near crashes for this source of inattention. Although these data are important in that they represent the factors that contribute to events, they also highlight the need for the exposure data described above to establish the degree of risk.

Inattention for Rear End Lead-Vehicle Scenarios

Of particular interest in the analyses of rear-end conflict contributing factors was the prevalence of distraction. An important aspect in rear-end crash countermeasure development is the degree to which an un-alerted driver can be warned and make a proper response. Of course, the 100-Car data can provide great insight into the degree to which distraction is an issue in such conflicts. The important finding in this regard is that 93 percent of all lead vehicle crashes (13 out of 14) involved *inattention to the forward roadway* as a contributing factor (Figure 8). Note also that a majority (68 percent) of the near crashes have inattention identified as a contributing factor.

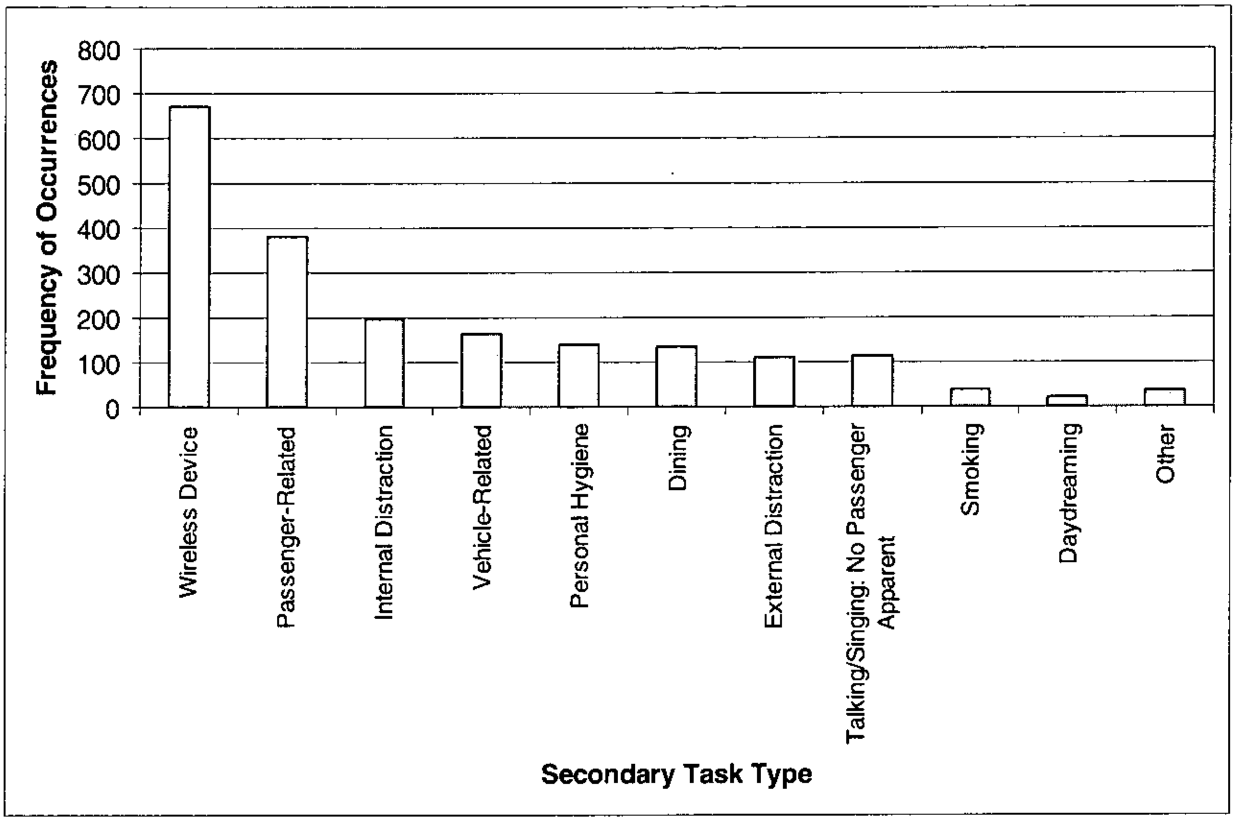

Figure 6. Frequency of occurrence of secondary tasks for crashes, near crashes and incidents.

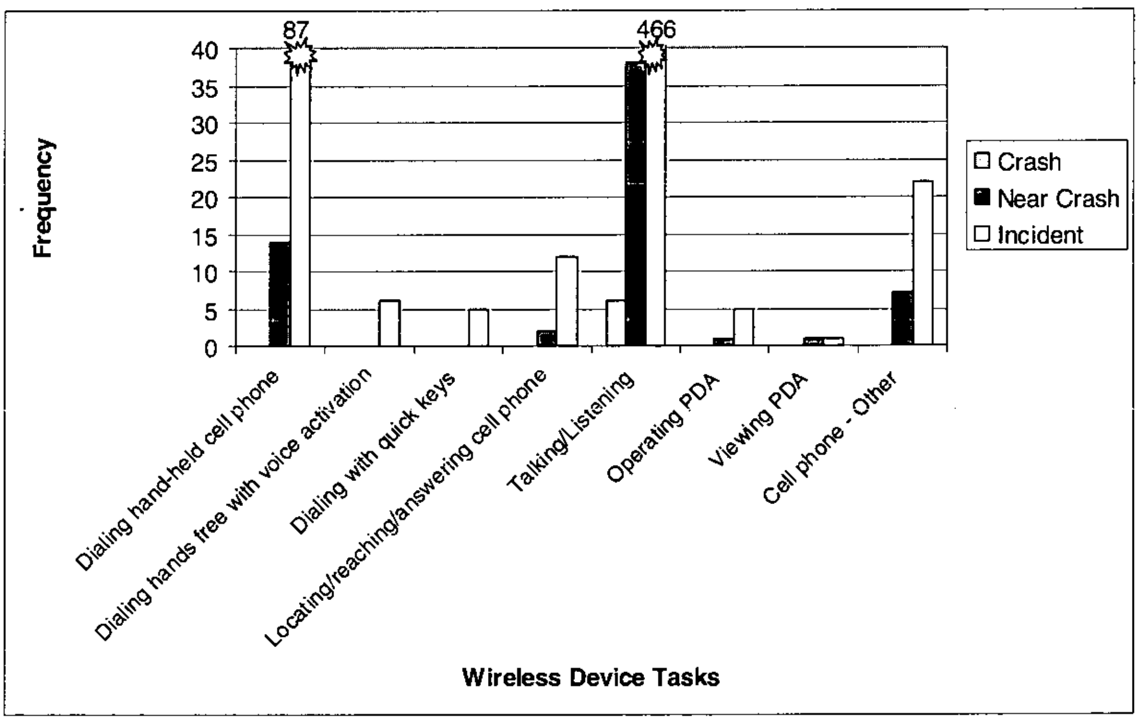

Figure 7. Frequency of occurrences in which the contributing factor was wireless device use by level of severity.

Figure 9 shows the frequency of each source of inattention for each of the secondary tasks. This allows comparison of the actual contribution of each of these sources of inattention to lead vehicle conflicts. Wireless devices (primarily cell phones, but also including PDAs) were the most frequent contributing factor for lead vehicle events, followed by passenger-related inattention. The trend was very similar for near-crashes. Interior distractions were the most frequent source of inattention for crashes.

While cell phone use contributed much more frequently to incidents and near-crashes than any other secondary task, cell phone use did not contribute to any lead vehicle conflict crashes. Nevertheless, cell phone use did contribute to other types of crashes, such as run off road, single vehicle conflict (driver ran into a barricade), and following vehicle conflict (subject vehicle was struck).

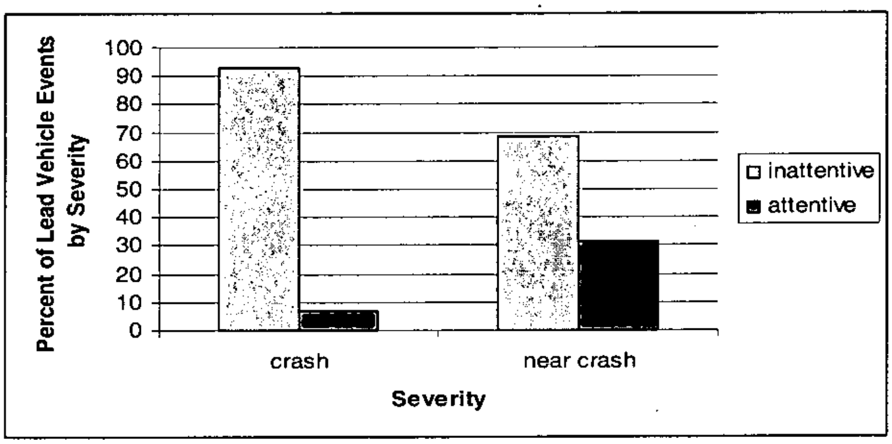

Figure 8. Percent of lead vehicle events for which inattention was listed as a contributing factor (includes the non-specific eye glance events for crashes and near crashes).

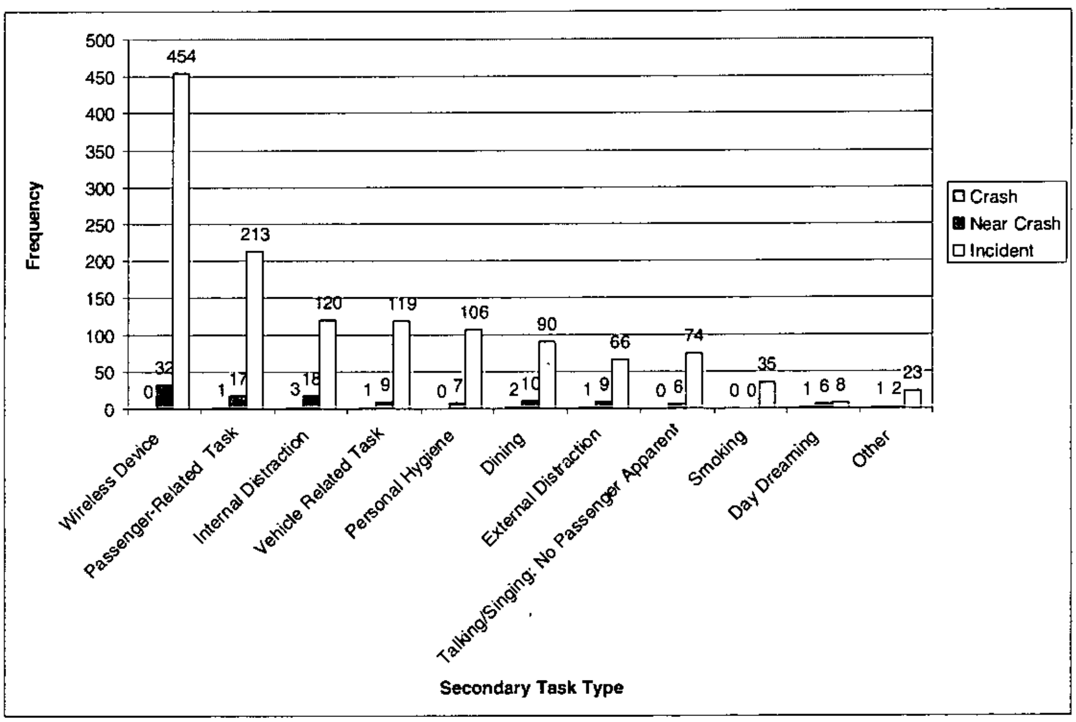

Figure 9. Total frequency of secondary task type by severity.

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SUMMARY AND CONCLUSIONS

The event database that was created during the 100-Car Study can be useful for a variety of purposes; for example, evaluation of risky driving behavior and crash risk, calculation of relative risk of engaging in secondary tasks, and evaluation of driver response to lead vehicle brake lights. To facilitate this process, the initial event database will be made publicly accessible via the Internet. In addition, the initial event database can be expanded to address additional issues, since all of the video and electronic data for the entire study have been archived. The 100-Car Study contract specified ten objectives or goals that would be addressed through the initial analysis of the event database. However, as of the time of this writing, there are three additional data reduction and analysis efforts underway for the purpose of addressing another eight goals, and there is considerable interest in using the data for even more purposes. Progressing toward this potential for a multi-purpose, highly flexible and adaptable tool for driving safety may be the most important aspect of this study.

Despite the massive scope of the current effort, it was designed to serve as an exploratory study to a determine the feasibility, value, and methods for initiating a larger, more representative study. From an epidemiological viewpoint, the study was small with the presence of 15 police-reported and 82 total crashes, including minor collisions. Furthermore, drivers were represented from one area of the country (Northern Virginia/Washington, DC metro area). One purpose of a large-scale study would be to have a statistically representative sample of crashes (perhaps 2,000) and a more representative driver/environment sample.

The challenge of a large-scale study is not only the expense of such data collection but the management and analysis of such a large body of data. Nevertheless, it is believed that a large-scale database would be an enormous asset and would be used by transportation researchers for many years to gain insight and understanding into a wide array of driving behavior issues and potentially serve as a basis for decision making and program development within both the government and business sectors. This belief is based upon the robustness of the study results and the expectation that these data will continue to be analyzed and the results made available, from a variety of researchers and research organizations. Clearly, these data can provide unique insights into issues that have eluded the highway safety community for years.

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Long-Term Effects of Hand-Held Cellphone Laws on Driver Hand-Held Cellphone Use

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ABSTRACT

Objectives: As of September 2009, seven US states and the District of Columbia (DC) ban driving while talking on a hand-held cellphone. The current study examined the long-term effects of such bans on driver use of hand-held phones in DC, New York State, and Connecticut.

Methods: The percentage of drivers talking on hand-held cellphones was measured over time based on daytime observation surveys in the three jurisdictions with bans and in comparison jurisdictions without bans. Trends in phone use rates over time were modeled using Poisson regression to estimate differences between actual rates and rates that would have been expected without a ban.

Results: The ban in DC immediately lowered the percentage of drivers talking on hand-held cellphones by 41%. Nearly 5 years after the ban, the phone use rate was 43% lower than would have been expected without the ban. Cellphone use in Connecticut declined an estimated 76% immediately after the ban; 3½ years later, phone use was 65% lower than would have been expected without a ban. In New York, cellphone use declined an estimated 47% immediately after the ban; when measured more than 7 years later, phone use was 24% lower than would have been expected without the ban. Fifteen months after the laws took effect, compliance in New York was lower than in DC, and the difference appeared due to more intensive enforcement in DC. However, this linkage is no longer clear because enforcement in New York has picked up such that levels of enforcement in 2008 appeared comparable in DC and New York, whereas enforcement in Connecticut lagged behind. In all of the jurisdictions, the likelihood was low that a driver violating the ban would receive a citation, and there were no publicized targeted enforcement campaigns in any of the three jurisdictions.

Conclusions: Jurisdictional bans on driver use of hand-held cellphones have reduced hand-held phone use and appear capable of maintaining reductions for the long term. However, it is unknown whether overall driver phone use has been reduced because many drivers may have switched to hands-free devices. Further research is needed to determine whether the reductions in hand-held cellphone use have reduced driver crash risk.

Keywords: Cellphones; Hand-held cellphones; Cellphone driving laws

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INTRODUCTION

Surveys of US drivers indicate that many are talking on cellphones. Observational surveys conducted by the National Highway Traffic Safety Administration (NHTSA) at intersections controlled by stop signs or stop lights indicate that, at any given time during daylight hours in 2008, 6% of drivers were talking on hand-held phones; this was double the rate observed in 2000 (Glassbrenner, 2005; NHTSA, 2009). This means that about 812,000 passenger vehicle drivers on the road at any given daylight moment in 2008 were talking on hand-held phones. The phone use rate for the youngest drivers estimated to be ages 16-24 was 8%, significantly higher than the use rates for drivers estimated to be ages 25-69 (6%) or 70 and older (1%). The rate of visible headset cellphone use was 0.6%, and the rate of visible manipulation of hand-held devices was 1%. Precise measurements of hands-free cellphone use cannot be obtained through observation surveys, but many drivers report using hands-free phones in telephone surveys (Boyle and Lampkin, 2008; Harris Interactive, 2006; Nationwide Insurance, 2008).

A large body of research has addressed the risk of talking on a cellphone while driving (McCartt et al., 2006a). Two controlled epidemiologic studies directly linked talking on a cellphone to increased crash risk. It is important that studies of crash risk verify the phone use of crash-involved drivers independent of police crash reports or driver self-reports, which are unreliable sources of information. One source for verifying phone use is cellphone company billing records. Such records have been unavailable in the United States, but studies conducted elsewhere have found a fourfold increase in the risk of a property-damage-only crash associated with cellphone use (Redelmeier and Tibshirani, 1997) and a fourfold increase of a crash serious enough to injure the driver (McEvoy et al., 2005). The increase in crash risk did not differ significantly between male and female drivers or between younger and older drivers, and the increased risk was similar for hand-held and hands-free phones. The studies were unable to estimate crash risk from different types of hands-free devices. Nor were they able to determine whether there was any benefit associated with hands-free devices while placing a call.

A review of more than 120 cellphone studies reported that experimental studies found impairment in simulated or test-track driving performance measures among users of hand-held and hands-free cellphones (McCartt et al., 2006a). Phone conversation tasks typically decreased reaction times and increased lane deviations and steering wheel movements. Statistical analyses that aggregated the results of multiple studies reported similar findings (Caird et al., 2008; Horrey and Wickens, 2006). There are fewer experimental studies of the effects of dialing on performance measures, and the evidence is mixed with regard to whether hands-free dialing is less impairing than manual dialing (Jenness et al., 2002; McCartt et al., 2006a; Schreiner, 2006).

Other evidence comes from "naturalistic" research involving drivers observed in their own vehicles that are outfitted with cameras and other technologies. In a study of 100 vehicles monitored for about a year, cellphone use was a common source of driver distraction (Klauer et al., 2006). The odds of an at-fault near-crash/crash was 2.8 times higher when dialing a hand-held device than when phones were not being used; the odds when talking on a hand-held phone was 1.3 times higher, a nonsignificant increase. However, the sample of crashes was small and only a few were serious enough to be reported to police.

There is growing concern about the dangers of text messaging while driving. A 2008 survey of drivers found that 40% of drivers 30 and younger who own cellphones said they send or read text messages while driving (Nationwide Insurance, 2008). There has not been a lot of research on texting and driving, but two 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 (Hosking et al., 2006; Reed and Robbins, 2008). A soon-to-be-released naturalistic study reports a 23-fold increase in the risk of crashing, nearly crashing, traffic conflicts, or drifting from the driving lane among truckers who texted while they drove (Hanowski et al., 2009; Virginia Tech Transportation Institute, 2009). Most of the incidents involved lane drifts.

A number of jurisdictions worldwide, including several US states, make it illegal to use a hand-held cellphone while driving. Such bans are in effect in California, Connecticut, New Jersey, New York State, Oregon, Utah, Washington, and the District of Columbia (DC) (Insurance Institute for Highway Safety, 2009). More common in the United States are laws that restrict young drivers from using any type of cellphone or school bus drivers from using all cellphones. Text messaging is banned for all drivers in 18 states and DC. In addition, young drivers are banned from texting in 9 states, and school bus drivers are banned from texting in 1 state.

Prior research has evaluated the effects of restrictions on driver cellphone use. New York was the first state to ban drivers talking on hand-held phones. A study of the New York law found that the proportion of drivers talking on hand-held phones declined by about half during the first few months after the law was implemented in November 2001, relative to changes in use rates in Connecticut, an adjacent state with no such law at that time (McCartt et al., 2003). Much of this decrease had dissipated 1 year later (McCartt and Geary, 2004). In contrast, soon after DC began banning hand-held cellphone use while driving in July 2004, driver hand-held phone use dropped by about half, and this decline was largely sustained about a year later (McCartt and Hellinga, 2007). It appeared that stronger enforcement of the DC ban may have led to the sustained lower use rates compared with New York: citations for cellphone violations represented 8% of all moving violations in DC compared with 4% in New York (McCartt and Hellinga, 2007). A study of a North Carolina law prohibiting use of any mobile communication device by drivers younger than 18 found that the law had little effect on observed teenage driver cellphone use shortly after the law took effect (Foss et al., 2008). The proportion of teenagers using cellphones rose slightly from 11% before the law took effect to almost 12% shortly after. In post-law interviews, only 22% of teenagers and 13% of parents believed the law was being enforced fairly often or a lot.

The laws in New York and DC are mature. New York's law has been in effect for nearly 8 years; the DC law has been in place for almost 5 years. The current study focused on the longer term effects of the DC and New York laws on driver hand-held cellphone use. On October 1, 2005, a law prohibiting hand-held phone use while driving took effect in Connecticut, which had served as a comparison state in the earlier studies of New York's law. By comparing current observed hand-held cellphone use rates among drivers in Connecticut to earlier use rates, the effects of the Connecticut law on driver hand-held phone use also are estimated.

METHODS

Patterns of changes in the rates of drivers talking on hand-held cellphones in New York State, the DC metro area, and Connecticut were examined before and after laws in these jurisdictions took effect. Driver hand-held phone use was observed in spring 2009 using the methods followed in prior observation surveys in New York and Connecticut (McCartt et al., 2003; McCartt and Geary, 2004) and in the DC metro area (McCartt et al., 2006b; McCartt and Hellinga, 2007).

Laws in the three jurisdictions are similar. All prohibit talking on hand-held cellphones when the vehicle is moving; dialing a hand-held phone and talking when the vehicle is stopped are allowed. Violations result in a fine up to $100; no license penalty points are assessed. Driver hands-free phone use is permitted in all three jurisdictions; fines are waived for the first offense in DC and Connecticut upon proof that a hands-free device has been obtained. Connecticut and DC prohibit all phone use by school bus drivers; Connecticut bans all phone use by drivers younger than 18, and DC bans all phone use by learner's permit holders. All three jurisdictions have an all-driver ban on texting; New York's texting law takes effect on November 1, 2009.

DC Metro Area: Observations and Analyses

Changes in the rates of hand-held cellphone use among drivers in DC before and after the DC law were compared with rate changes among drivers in nearby areas of Virginia and Maryland, states without bans. Observations were conducted simultaneously in all three jurisdictions in March 2004 (several months before the law took effect in July 2004), October 2004 (3 months after), October 2005 (15 months after), and April-June 2009. Observations were conducted in April 2009 rather than March 2009 because daylight saving time began in early March, and it would have been too dark to conduct the early morning observations. Observations also were scheduled to avoid Easter holidays and school recesses, which may have affected travel patterns. When the data were being prepared for analysis, low sample sizes and anomalies were identified for the DC sites. These data had been collected by a person who had not gathered data for the previous surveys; although the observer was thoroughly trained, a review of the data indicated they were not accurate. Therefore, in early June a second complete round of observations in DC was conducted by two experienced observers.

In each jurisdiction, daytime observations were conducted Tuesday-Friday at eight signalized intersections located on major arterial roads. In Virginia and Maryland, sites were located approximately 1-5 miles from the DC border on roads with heavy traffic traveling to and from DC. Only moving vehicles were observed, and emergency vehicles (police, fire, or ambulance), tractor-trailers, buses, and vehicles with diplomatic license plates were excluded. Observers recorded whether or not the driver was talking on a hand-held cellphone; the jurisdiction of vehicle registration (DC, Maryland, Virginia, other), based on the license plate; and whether the vehicle was a passenger vehicle, taxicab, or commercial vehicle, defined as a vehicle with a commercial license plate or commercial signage.

Estimates of the proportions of drivers who were talking on hand-held cellphones in each jurisdiction were derived, and percentage changes were computed between each post-law survey and the pre-law survey. To derive rigorous estimates of the effects of the DC ban on phone use in DC, relative to patterns of phone use in nearby areas of Maryland and Virginia, a Poisson regression model was used to estimate cellphone use over time (the GENMOD procedure in SAS). It was assumed that cellphone use rates increased exponentially over time when there were no restrictions, and the relative month-to-month increase was the same for DC and for the nearby areas of Maryland and Virginia. It also was assumed that cellphone use rates increased exponentially over time when there were restrictions. The month-to-month trend for the period when there were restrictions was not necessarily the same as that when there were no restrictions. The dependent variables in the model were an indicator of the jurisdiction (1=DC, 0=MD/VA), an indicator of cellphone restriction (1=restriction, 0=no restriction), time (measured in months since December 2000), and the interaction of time and restriction.

New York and Connecticut: Observations and Analyses

Daytime observations of drivers were conducted at controlled intersections on geographically dispersed, heavily traveled roads in four small to medium-size communities in upstate New York (Albany County, cities of Binghamton and Kingston, Village of Spring Valley) and in two communities in central Connecticut (Town of Hamden, City of Hartford). Areas considered for observation in New York excluded the downstate counties of Nassau, Suffolk, and Westchester due to pre-existing local bans on cellphone use while driving; New York City because of its unusual traffic patterns, major congestion, and difficulty in finding suitable observation sites; and the western and northernmost counties due to inclement winter weather conditions. Limited access highways were excluded. Observations were conducted on a Thursday or Friday. Emergency vehicles, tractor-trailer trucks, and buses were excluded. Cellphone use was recorded as "yes" only if the driver was talking on a hand-held cellphone while the vehicle was moving.

Observations were conducted about 1 month before New York's warning period began on November 1, 2001; immediately after a fine-with-waiver phase took effect on December 1, 2002;

immediately after a fine-without-waiver phase took effect on March 1, 2002; during March 2003; and during April 2009. Thirty-five minutes of each observation period focused on recording cellphone use. A hand-held counter recorded drivers not using a hand-held cellphone. For drivers using phones, the following information was recorded: estimated age (younger than 25, 25-59, 60 or older), gender, and vehicle type (car, pickup truck, SUV, van or minivan, large single-unit truck with more than four tires). During the 5 minutes before and 5 minutes after the 35-minute cellphone observations, age category, gender, cellphone use, and vehicle type were recorded for a sample of drivers in passing traffic.

Estimates were derived of the proportion of drivers who were talking on hand-held cellphones. For each community and for the communities combined in each state, cellphone use rates for the December 2001 and March 2002 surveys were not significantly different; thus, data for these surveys were combined to measure short-term compliance. Percentage differences in state use rates (i.e., with communities combined) were compared between each of the post-law surveys and the pre-law survey. To derive the proportions of observed cellphone use for the recorded driver characteristics, the percentage distributions of driver characteristics observed during the 10-minute observations of passing traffic were applied to the total vehicles counted during the 35-minute cellphone observation periods. The formulae for these calculations and associated 95% confidence intervals (CIs) are provided in (McCartt et al., 2003).

Observations in Connecticut were not available for the months immediately before and after the restriction began on October 1, 2005. However, if it is assumed that trends in use rates over time were similar for Connecticut and New York, then these missing observations can be estimated. A Poisson regression model was used to accomplish these estimations. The dependent variable was the logarithm of the cellphone use rate. The independent variables in the model were an indicator of the state (1=NY, 0=CT), an indicator of cellphone restriction (1=restriction, 0=no restriction), the interaction of state and restriction (1=NY after restriction began, 0=all other), time (measured in months since December 2000), and the interaction of time and restriction. In these models, data for the December 2001 and March 2002 surveys were not combined.

RESULTS

Results for DC

When drivers were observed several months before the DC law took effect in July 2004, 6.1% were talking on hand-held cellphones (Table 1). Post-law use rates were 3.5% shortly after the law in October 2004, 4% 1 year later in October 2005, and 4.2% in spring 2009. The percentage difference in post-law use rates compared with the pre-law rate declined over time, from 43% in October 2004 to 31% in spring 2009, and all three differences were statistically significant. Hand-held phone use in nearby areas of Maryland did not follow a consistent pattern. The use rate declined slightly from 6.3% before the law to 5.7% shortly after the law took effect, increased substantially (to 8%) a year later, and then declined to 5.2% in spring 2009. In nearby areas of Virginia, the use rate increased steadily from the pre-law rate of 4.7% to the spring 2009 rate of 8.5%.

Table 2 summarizes the rates of talking on hand-held cellphones in DC based on the jurisdiction of vehicle plate registration. Although trends in the post-law surveys varied by jurisdiction, use rates for all three post-law surveys were significantly lower than the pre-law rates for DC, Virginia, and Maryland drivers.

A Poisson regression model estimated the effects of the DC law on driver hand-held cellphone use rates (Table 3); the predicted trends in use rates for DC and Maryland/Virginia sites combined are shown in Figure 1. According to the model, use rates increased by an estimated 0.31% per month (100(exp(0.0031)-1)) in both DC and at Maryland/Virginia sites before the restriction took effect. The restriction on driver phone use immediately lowered rates by an estimated 41% (100(1-exp(-0.5266))) in DC. Use rates then began to rise in DC by approximately 0.28% per month (100(exp(0.0031-0.0003)-1)). If there was no cellphone ban in DC, the model predicted that the April 2009 use rate would have been 7.41% ($100\times\exp(-2.9477+0.0348+0.0031(100))$); the observed rate of 4.22% was 43% lower than the expected rate of 7.41%. Thus, when measured against the phone use rates that would have been expected without the ban, initial reductions in phone use in DC have been largely sustained.

Results for New York and Connecticut

Table 4 shows rates of hand-held cellphone use in New York and Connecticut during each of the four observation periods spanning September 2001-April 2009. For the New York communities combined, the New York pre-law use rate of 2.3% declined to 1.1% immediately after the law took effect. Use then rose during the following year to 2.1% in March 2003. During the same time period, the rate for the Connecticut communities combined was 2.9% before the New York law and immediately after the law, and 3.3% about a year later. In surveys conducted in April 2009, 3.7% of drivers observed in New York were talking on hand-held phones. This was 64% higher than the pre-law rate of 2.3% and also substantially higher than the prior survey in March 2003. In Connecticut, where a law prohibiting hand-held cellphone use took effect in October 2005, 2.1% of drivers were observed talking on hand-held phones in April 2009. This was 35% lower than the use rate observed in March 2003 and 25% lower than the use rate of 2.9% observed in September 2001, prior to New York's law.

A Poisson regression model estimated the effects of the New York and Connecticut laws on driver hand-held cellphone use rates (Table 5); the predicted trends in use rates for New York and Connecticut are shown in Figure 2. According to the model, use rates increased by an estimated 0.84% per month (100(exp(0.0084)-1)) in Connecticut and New York before the restrictions took effect. Restrictions on driver phone use immediately lowered rates by an estimated 76% (100(1-exp(-1.4229))) in Connecticut and an estimated 47% (100(1-exp(-1.4229+0.7885))) in New York. Use rates then began to rise again in both Connecticut and New York by approximately 1.23% per month (100(exp(0.0084+0.0038)-1)). If there was no cellphone ban in Connecticut, the model predicted that the April 2009 use rate would have been 6.04% (100×exp(-3.6471+100(0.0084))); the observed rate of 2.14% was 65% lower than the expected rate of 6.04%. If there was no cellphone ban in New York, the model predicted that the April 2009 use rate would have been 4.91% (100×exp(-3.4671-0.2072+100(0.0084))); the observed rate of 3.74% was 24% lower than the expected rate of 4.91%.

Thus, if trends in use rates over time were similar for Connecticut and New York, the model indicated that the bans reduced driver hand-held cellphone use in both states. Although compliance faded over time, use rates still were lower than would have been expected without the laws, particularly in Connecticut.

Cellphone Use Rates by Driver Gender, Age, and Vehicle Type

In New York and Connecticut, cellphone use rates by driver characteristics were calculated for the April 2009 survey (Table 6). Differences were judged significant if the 95% confidence intervals of the estimated use rates did not overlap. In both states, the cellphone use rate was higher for females than for males. The difference among New York drivers was marginally significant. Also in both states, use rates were substantially higher for drivers younger than 25 than for drivers ages 25-59; in New York, this difference was significant. In both states, less than 1% of drivers ages 60 and older were talking on hand-held phones, and this rate was significantly lower than rates for the younger drivers. Use rates were higher for SUV drivers in both states, but differences by vehicle type were not statistically significant.

DISCUSSION

The current study is a continuation of research assessing how bans on driver hand-held cellphone use affect such use. As of September 2009, seven US states and DC ban talking on hand-held cellphones while driving. Rates of driver hand-held phone use were tracked in New York, Connecticut, and DC. For all three jurisdictions, there were substantial declines in driver hand-held phone use immediately after the ban. When observed several years after the ban, phone use still was lower than would have been expected without the ban, but the size of the reduction varied.

Determining the effects of a ban was most straightforward in DC, where one pre-law observation survey and three post-law surveys were conducted in DC and in nearby areas of Virginia and Maryland, states without bans. Relative to trends in driver cellphone use in Maryland and Virginia, the ban produced an estimated 41% reduction in phone use immediately after the law and an estimated 43% reduction nearly 5 years later. Long-term reductions were observed among drivers in DC no matter in which jurisdiction the vehicles were registered.

In earlier studies of the effects of New York's ban on hand-held cellphone use, patterns of use in New York before and after the ban were compared with patterns of use in Connecticut, which had no law (McCartt et al., 2003; McCartt and Geary, 2004). However, in October 2005 Connecticut implemented its own ban, so effects of the bans in New York and Connecticut were modeled by assuming similar increases over time in the two states before the ban, and similar increases after the ban. The rate of phone use observed in Connecticut in April 2009 was much lower than the observed rate in prior surveys, and the model also predicted large immediate (76%) and longer term (65%) reductions in phone use compared with the expected use without a ban. In New York, observed phone use fell by about half after the ban, but use then increased in subsequent surveys. However, the observed phone use rate for April 2009 (more than 7 years after the law) was 24% lower than would have been expected without the ban.

It is unclear why the effects of the bans appear stronger in DC and Connecticut than in New York. Earlier research found that compliance was lower in New York than in DC 15 months after the laws took effect (McCartt and Geary, 2004; McCartt and Hellinga, 2007). It was hypothesized that this difference was due at least in part to more intensive enforcement in DC. Cellphone citations represented 4% of citations for all moving traffic violations in New York, but 8% in DC. Based on traffic citation data provided by Connecticut, DC, and New York, enforcement of the hand-held cellphone ban in New York has picked up such that levels of enforcement in 2008 appear comparable in DC and New York, whereas enforcement in Connecticut lagged behind. In 2008, cellphone citations represented 6% of citations for all moving violations in Connecticut (data from the Office of Chief Court Administrator) compared with 15% in New York State (data from the Department of Motor Vehicles) and 11% in DC (data from the Department of Motor Vehicles). DC also maintains records of cellphone warning tickets; in 2008, there were 7,519 warnings issued for cellphone violations in addition to 12,936 citations issued. When measured per capita or per licensed driver, rates of cellphone citations also were lower in Connecticut than in New York or DC (Federal Highway Administration, 2007; US Census Bureau, 2008a).

Patterns of observed driver hand-held cellphone use rates varied among the four New York communities. The percentage of drivers talking on hand-held phones in April 2009 ranged from 2.9% in Kingston to 4.8% in Binghamton. Information was obtained on citations issued in the four counties in which observations were conducted. As a percentage of citations issued for all moving violations in 2008, the rates of cellphone citations in all four counties were lower than the statewide rate of 15%: 6% in Broome County, where Binghamton is located; 8% in Ulster County, where Kingston is located; 9% in Rockland County, where Spring Valley is located; and 11% in Albany County. Although the lowest rates of cellphone citations and the lowest rates of driver hand-held phone use occurred in Broome County, it is unclear to what extent enforcement was a factor in the higher rate of phone use. The phone use rates observed in April 2009 were similar in the two Connecticut communities; information on citations issued in the Connecticut counties in which observations were conducted was not available.

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The review of citation data indicate that cellphone citation rates and hand-held phone use rates do not line up well among the three jurisdictions. Enforcement levels were higher in New York than in Connecticut, but the effects of the ban on phone use appeared stronger in Connecticut than in DC, and particularly in New York. However, citations are an imperfect measure of enforcement effort because they reflect both the amount of resources devoted to enforcement and levels of compliance with a law. Regardless of the relative intensity of enforcement in the study jurisdictions, the chance was very low in all of them that a driver violating the cellphone ban would receive a citation. None of the jurisdictions has had well-publicized, sustained enforcement campaigns directed at cellphone violations.

Considerable research has found that neither education alone nor the enactment of a law is sufficient to achieve longer-term compliance with a law intended to change driver behavior. Publicized, targeted enforcement campaigns are needed. An example is the US experience with seat belt use. Early education on the safety benefits of seat belts increased belt use only a little (Williams and Wells, 2004). When seat belt laws first were enacted in the 1980s, there were initial increases in belt use even in the absence of vigorous enforcement. However, compliance faded over time (Williams and Lund, 1988). Numerous studies have shown that vigorous, well-publicized enforcement campaigns are needed to achieve high levels of seat belt use (Solomon et al., 2002; Williams et al., 2000).

Even if bans on driver hand-held cellphone use are effective in reducing such use, effects of the bans on traffic crashes are unknown. Controlled studies of the effects of bans on crashes are difficult to conduct because police reports do not reliably report cellphone use as a crash factor. In addition, epidemiologic studies have found that the increased crash risk associated with talking on cellphones is similar for hands-free as well as hand-held devices. If many drivers switch to hands-free cellphones following a ban on hand-held phone use, this would dilute any effects of the bans on safety. However, driver use of hands-free phones, especially fully hands-free devices, cannot be measured reliably with observers standing at the roadside. Some evidence of patterns of hands-free cellphone use following a ban comes from statewide telephone surveys of drivers in New York conducted before and after that state's ban (Dowling et al., 2005). Among drivers who said they talk on a cellphone at least some of the time while driving, the percentage who said they use hands-free features or adapters most or all of the time increased from 64% before the ban took effect in November 2001 to 77% in 2005. However, the overall percentage of drivers who said they ever talk on phones of any type while driving declined from 66% in 2001 to 57% in 2005; 12% in 2001 said they did so very often, compared with 8% in 2005. Although a ban on all cellphone use while driving makes sense based on the epidemiologic studies of crash risk associated with phone use, enforcement of a hands-free ban would be problematic. Enforcement or court officials could obtain cellphone billing records of a driver involved in a crash, but general traffic enforcement of a hands-free ban would be nearly impossible. Texting while driving is dangerous and appears to be common (Nationwide Insurance, 2008), but laws banning this behavior also are difficult to enforce. Thus, compliance with laws targeting hands-free phone use or texting will be hard to achieve.

Devices are being developed that prevent driver cellphone use while vehicles are moving. Some systems use the GPS feature in cellphones to prevent calls from being placed or answered when the driver's vehicle exceeds a certain speed threshold. There are challenges in making these systems practical for widespread use. For example, some systems have an override feature that allows a passenger to use the cellphone while the vehicle is in motion. However, it is unclear whether drivers can be prevented from activating the passenger mode to circumvent the purpose of the system. The main use of such technology may be among fleet managers to control phone use by employees or among parents who want to monitor their teenage drivers. The technology is not yet in widespread use, and the effects are not known. Thus, although the preponderance of research shows that talking on cellphones while driving increases crash risk, it is not clear that laws that ban such use can solve the problem.

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Table I Rates of talking on hand-held cellphones for drivers in the District of Columbia (DC) and in nearby locations in Maryland and Virginia before and after DC hand-held cellphone law

	Percent cellphone use: % (N)				Percent differences in use rates (95% CI)		
	Pre-law March 2004	Post-law 1 October 2004	Post-law 2 October 2005	Post-law 3 Spring 2009	Post-law 1 vs. pre-law	Post-law 2 vs. pre-law	Post-law 3 vs. pre-law
District of Columbia (DC)	6.1 (19,906)	3.5 (16,185)	4.0 (15,854)	4.2 (18,112)	-43 (-48, -37)	-35 (-41, -29)	-31 (-37, -24)
Maryland suburbs of DC	6.3 (12,951)	5.7 (12,200)	8.0 (11,645)	5.2 (15,098)	-9 (-18, 1)	27 (15, 40)	-18 (-25, -9)
Virginia suburbs of DC	4.7 (15,262)	6.2 (13,221)	6.5 (14,550)	8.5 (17,428)	34 (21, 48)	39 (26, 53)	82 (66, 99)

Table II Rates of talking on hand-held cellphones for drivers in the District of Columbia (DC) by plate of vehicle registration before and after DC hand-held cellphone law

	Percent cellphone use: % (N)				Percent differences in use rates (95% CI)		
Vehicle plate jurisdiction	Pre-law March 2004	Post-law 1 October 2004	Post-law 2 October 2005	Post-law 3 Spring 2009	Post-law 1 vs. pre-law	Post-law 2 vs. pre-law	Post-law 3 vs. pre-law
District of Columbia (DC)	5.3 (6,114)	2.8 (5,016)	2.7 (4,934)	3.9 (5,127)	-47 (-56, -35)	-50 (-59, -39)	-26 (-38, -12)
Maryland	6.2 (7,943)	4.1 (6,267)	5.3 (5,706)	4.3 (7,245)	-34 (-44, -23)	-14 (-26, -1)	-30 (-40, -20)
Virginia	6.7 (4,766)	3.4 (3,833)	3.3 (4,213)	4.1 (4,316)	-49 (-58, -38)	-51 (-60, -40)	-39 (-49, -27)
Other	7.7 (1,083)	3.5 (1,066)	5.7 (1,001)	5.2 (1,424)	-55 (-69, -34)	-26 (-47, 3)	-33 (-51, -8)

Table III Results of Poisson regression on cell phone use rates of drivers in the District of Columbia (DC) and nearby locations in Maryland and Virginia

Parameter	Estimate	Standard error	p-value
Intercept	-2.9477	0.0323	<0.0001
Jurisdiction (DC)	0.0348	0.0332	0.2938
Restriction (yes)	-0.5266	0.0784	<0.0001
Time (months)	0.0031	0.0005	<0.0001
Time × restriction	-0.0003	0.0011	0.7761

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Table IV Rates of talking on hand-held cellphones for drivers in New York and Connecticut before and after New York hand-held cellphone law

	Percent cellphone use: % (N)				Percent differences in use rates (95% CI)			
	Pre-law Sep 2001	Post-law 1 Dec 2001/ Mar 2002	Post-law 2 Mar 2003	Post-law 3 Apr 2009	Post-law 1 vs. pre-law	Post-law 2 vs. pre-law	Post-law 3 vs. pre-law	Post-law 3 vs. post-law 2
Connecticut (2 cities combined)	2.9 (7,110)	2.9 (14,205)	3.3 (6,992)	2.1 (6,651)	2 (-14, 20)	14 (-5, 38)	-25 (-40, -7)	-35 (-47, -19)
Hamden	2.9 (3,884)	2.8 (7,634)	2.8 (3,976)	2.1 (3,999)	-3 (-23, 22)	-1 (-24, 28)	-28 (-46, -4)	-27 (-45, -3)
Hartford	2.8 (3,226)	3.0 (6,571)	3.8 (3,016)	2.2 (2,652)	8 (-16, 38)	35 (3, 78)	-21 (-43, 9)	-42 (-57, -20)
New York (4 cities combined)	2.3 (11,768)	1.1 (25,694)	2.1 (12,571)	3.7 (12,962)	-51 (-59, -42)	-10 (-24, 7)	64 (41, 90)	81 (56, 110)
Albany	2.2 (3,537)	0.8 (8,328)	2.1 (3,917)	3.3 (4,423)	-66 (-76, -53)	-7 (-32, 26)	61 (23, 109)	73 (34, 125)
Binghamton	2.2 (3,327)	0.8 (6,198)	0.7 (2,872)	4.8 (2,843)	-65 (-76, -50)	-70 (-82, -51)	117 (63, 187)	628 (351, 1077)
Kingston	1.9 (2,805)	1.1 (6,329)	2.1 (2,901)	2.9 (2,663)	-44 (-61, -20)	9 (-24, 58)	55 (9, 120)	42 (1, 98)
Spring Valley	3.0 (2,099)	2.3 (4,839)	3.5 (2,881)	4.0 (3,033)	-25 (-45, 2)	16 (-16, 59)	34 (-1, 82)	16 (-11, 51)

Table V Results of Poisson regression on cellphone phone use rates of drivers in New York and Connecticut

Parameter	Estimate	Standard error	p-value
Intercept	-3.6471	0.0869	<0.0001
State (NY)	-0.2072	0.0784	0.0082
Restriction (yes)	-1.4229	0.1427	<0.0001
State × restriction	0.7885	0.1233	<0.0001
Time (months)	0.0084	0.0049	0.0882
Time × restriction	0.0038	0.0050	0.4482

Table VI Percentage of drivers in Connecticut and New York observed using cell phones by driver demographics (April 2009)

State	Demographic	Proportion of sample	Number using cellphones	Use rate	95% confidence limits Lower	Upper
Connecticut	Male	0.59	75	1.9	1.4	2.3
	Female	0.41	66	2.4	1.8	3.1
	<25 yrs	0.02	7	6.0	1.0	11.1
	25-59 yrs	0.93	134	2.2	1.8	2.5
	60+ yrs	0.05	1	0.3	-0.3	0.9
	Car	0.61	85	2.1	1.6	2.6
	Pickup	0.08	8	1.4	0.4	2.5
	SUV	0.23	40	2.6	1.8	3.5
	Van	0.08	9	1.8	0.6	3.0
New York	Male	0.55	233	3.3	2.8	3.7
	Female	0.45	252	4.3	3.7	4.9
	<25 yrs	0.12	104	6.8	5.2	8.3
	25-59 yrs	0.80	373	3.6	3.2	4.0
	60+ yrs	0.08	8	0.8	0.2	1.3
	Car	0.55	245	3.4	3.0	3.9
	Pickup	0.10	48	3.5	2.4	4.6
	SUV	0.24	144	4.6	3.7	5.5
	Van	0.10	48	3.6	2.5	4.7

Figure I Predicted percentage of drivers in the District of Columbia and nearby locations in Maryland and Virginia using cellphones, January 2001-April 2009; Observed values are labeled

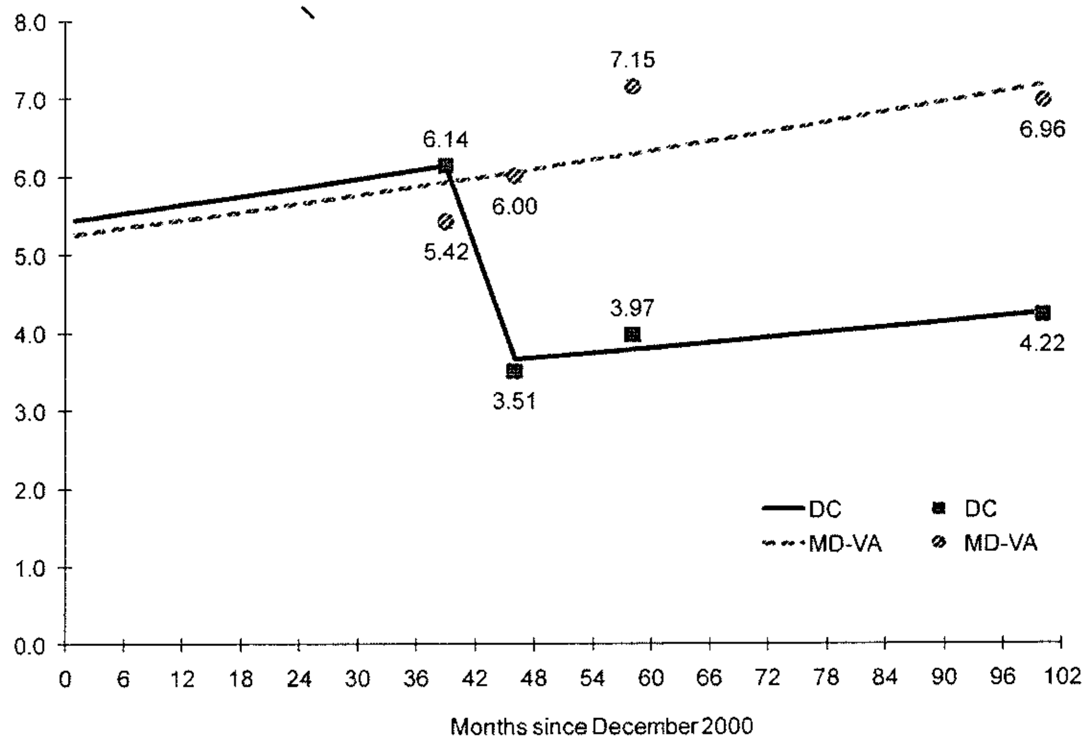
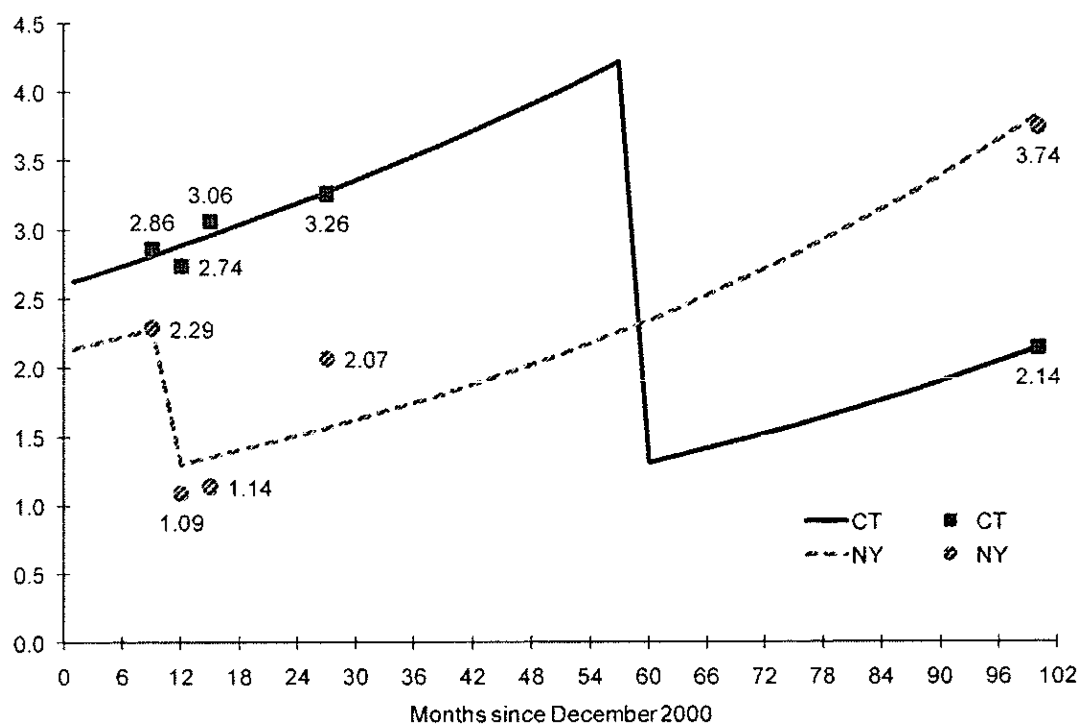


Figure II Predicted percentage of drivers in Connecticut and New York using cell phones, January 2001-April 2009; Observed values are labeled



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LEGISLATIVE RESEARCH SERVICES

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February 22, 2010

Memorandum

TO: Representative Max Gruenberg
FROM: Tim Spengler, Legislative Analyst
RE: State Bans on Cell Phone Use by Drivers

You asked for the annotated statutes from the seven states (and the District of Columbia) that impose state-wide bans on driving while using hand-held cell phones. We attach the relevant statutes from California, Connecticut, the District of Columbia, New Jersey, New York, Oregon, Utah, and Washington.

Please let us know if you need additional information.

Connecticut General Statutes Annotated Currentness
Title 14. Motor Vehicles. Use of the Highway by Vehicles. Gasoline
Chapter 248. Vehicle Highway Use (Refs & Annos)

→§ 14-296aa. Use of hand-held mobile telephones and mobile electronic devices by motor vehicle operators and school bus drivers, prohibited or restricted, when. Penalties

(a) For purposes of this section, the following terms have the following meanings:

(1) "Mobile telephone" means a cellular, analog, wireless or digital telephone capable of sending or receiving telephone communications without an access line for service.

(2) "Using" or "use" means holding a hand-held mobile telephone to, or in the immediate proximity of, the user's ear.

(3) "Hand-held mobile telephone" means a mobile telephone with which a user engages in a call using at least one hand.

(4) "Hands-free accessory" means an attachment, add-on, built-in feature, or addition to a mobile telephone, whether or not permanently installed in a motor vehicle, that, when used, allows the vehicle operator to maintain both hands on the steering wheel.

(5) "Hands-free mobile telephone" means a hand-held mobile telephone that has an internal feature or function, or that is equipped with an attachment or addition, whether or not permanently part of such hand-held mobile telephone, by which a user engages in a call without the use of either hand, whether or not the use of either hand is necessary to activate, deactivate or initiate a function of such telephone.

(6) "Engage in a call" means talking into or listening on a hand-held mobile telephone, but does not include holding a hand-held mobile telephone to activate, deactivate or initiate a function of such telephone.

(7) "Immediate proximity" means the distance that permits the operator of a hand-held mobile telephone to hear telecommunications transmitted over such hand-held mobile telephone, but does not require physical contact with such operator's ear.

(8) "Mobile electronic device" means any hand-held or other portable electronic equipment capable of providing data communication between two or more persons, including a text messaging device, a paging device, a personal digital assistant, a laptop computer, equipment that is capable of playing a video game or a digital video disk, or equipment on which digital photographs are taken or transmitted, or any combination thereof, but does not include any audio equipment or any equipment installed in a motor vehicle for the purpose of providing navigation, emergency assistance to the operator of such motor vehicle or video entertainment to the passengers in the rear seats of such motor vehicle.

(b) (1) Except as otherwise provided in this subsection and subsections (c) and (d) of this section, no person shall operate a motor vehicle upon a highway, as defined in subsection (a) of section 14-1, while using a hand-held mobile telephone to engage in a call or while using a mobile electronic device while such vehicle is in motion. (2) An operator of a motor vehicle who holds a hand-held mobile telephone to, or in the immediate proximity of, his or her ear while such vehicle is in motion is presumed to be engaging in a call within the meaning of this section. The presumption established by this subdivision is rebuttable by evidence tending to show that the operator was not engaged in a call. (3) The provisions of this subsection shall not be construed as authorizing the seizure or forfeiture of a hand-held mobile telephone or a mobile electronic device, unless otherwise provided by law. (4) Subdivision (1) of this subsection does not apply to: (A) The use of a hand-held mobile telephone for the sole purpose of communicating with any of the following regarding an emergency situation: An emergency response operator; a hospital, physician's office or health clinic; an ambulance company; a fire department; or a police department, or (B) any of the following persons while in the performance of their official duties and within the scope of their employment: A peace officer, as defined in subdivision (9) of section 53a-3, a firefighter or an operator of an ambulance or authorized emergency vehicle, as defined in subsection (a) of section 14-1, or a member of the armed forces of the United States, as defined in section 27-103, while operating a military vehicle, or (C) the use of a hands-free mobile telephone.

(c) No person shall use a hand-held mobile telephone or other electronic device, including those with hands-free accessories, or a mobile electronic device while operating a moving school bus that is carrying passengers, except that this subsection does not apply to (1) a school bus driver who places an emergency call to school officials, or (2) the use of a hand-held mobile telephone as provided in subparagraph (A) of subdivision (4) of subsection (b) of this section.

(d) No person under eighteen years of age shall use any hand-held mobile telephone, including one with a hands-free accessory, or a mobile electronic device while operating a moving motor vehicle on a public highway, except as provided in subparagraph (A) of subdivision (4) of subsection (b) of this section.

(e) Except as provided in subsections (b) to (d), inclusive, of this section, no person shall engage in any activity not related to the actual operation of a motor vehicle in a manner that interferes with the safe operation of such vehicle on any highway, as defined in subsection (a) of section 14-1.

(f) Any law enforcement officer who issues a summons for a violation of subsection (b), (c), (d) or (i) of this section shall record, on any summons form issued in connection with the matter, the specific nature of any distracted driving behavior observed by such officer that contributed to the issuance of such summons.

(g) Any person who violates subsection (b) of this section shall be fined not more than one hundred dollars, except that the fine shall be suspended for a first time violator who provides proof of acquisition of a hands-free accessory subsequent to the violation but prior to the imposition of a fine.

(h) Any person who violates subsection (c) or (d) of this section shall be fined not more than one hundred dollars.

(i) An operator of a motor vehicle who commits a moving violation, as defined in subsection (a) of section 14-111g, while engaged in any activity prohibited under subsection (e) of this section shall be fined one hundred dollars in addition to any penalty or fine imposed for the moving violation.

CREDIT(S)

(2005, P.A. 05-159, §§ 1 to 7;2005, P.A. 05-220, §§ 2, 3;2006, P.A. 06-196, § 284, eff. June 7, 2006; 2009, P.A. 09-54, § 1, eff. May 21, 2009.)

HISTORICAL AND STATUTORY NOTES

2006 Main Volume

Codification

The 2006 Supplement to the Connecticut General Statutes codified 2005, P.A. 05-159, §§ 1 to 7, inclusive, as C.G.S.A. § 14-296aa.

Amendments

2005 Amendment. 2005, P.A. 05-220, § 3, rewrote § 2 of public act 05- 159 [codified as subsections (c) and (d) of this section] which prior thereto read:

"(a) No person shall use a hand-held mobile telephone or other electronic device, including those with hands-free accessories, while operating a moving school bus that is carrying passengers, except that this section does not apply to (1) a school bus driver who places an emergency call to school officials, or (2) the use of a hand-held mobile telephone as provided in subparagraph (A) of subdivision (4) of subsection (b) of section 1 of this act.

"(b) No person who holds a learner's permit or any holder of a motor vehicle license subject to the requirements of subsection (d) of section 14-36 of the general statutes shall use any hand-held mobile telephone, including one with a hands-free accessory, while operating a moving motor vehicle on a public highway except as provided in subparagraph (A) of subdivision (4) of subsection (b) of section 1 of this act."

2006 Amendment. 2006, P.A. 06-196, § 284, deleted "subsection and subsections (b), (c) and (d) of this" preceding "section," in the introductory paragraph of subsec. (a); deleted "(a)," preceding "(c) and (d) of this section," in subd. (b)(1); deleted "and subsection (a) of this section" following "this subsection" in the introductory clause of subd. (b)(3); substituted "(b)" for "(a)" in subsec. (e); substituted "subsection" for "subsections (a)," in subsec. (f); deleted "(a) or" preceding "(b) of this section" in subsec. (g); and made other nonsubstantive changes.

09 Electronic Pocket Part Update.

Amendments

2009 Amendment. 2009, P.A. 09-54, § 1, inserted "or a member of the armed forces of the United States, as defined in section 27-103, while operating a military vehicle," in subpara. (b)(4)(B).

CROSS REFERENCES

Cellular mobile telephone service, regulations, see C.G.S.A. § 16-250b.

Moving violation defined, see C.G.S.A. § 14-111g.

Student possession and use of telecommunication devices, see C.G.S.A. § 10- 233j.

Suspension or revocation of registration or license, see C.G.S.A. § 14-111.

LIBRARY REFERENCES

2006 Main Volume

Automobiles ⚿324, 359.1.
Westlaw Topic No. 48A.

C.G.S.A. § 14-296aa

C.J.S. Motor Vehicles §§ 1311 to 1313, 1315 to 1317, 1442, 1455, 1486 to 1487, 1523, 1526 to 1527, 1543 to 1544, 1546 to 1547, 1550.

C. G. S. A. § 14-296aa, CT ST § 14-296aa

Current through the 2010 Supplement to the Connecticut General Statutes.

END OF DOCUMENT

C
District of Columbia Official Code 2001 Edition Currentness
Division VIII. General Laws.
Title 50. Motor and Non-Motor Vehicles and Traffic. (Refs & Annos)
Subtitle VI. Safety.
Chapter 17A. Distracted Driving Prevention.
→§ 50-1731.04. Restricted use of mobile telephone and other electronic devices.

(a) No person shall use a mobile telephone or other electronic device while operating a moving motor vehicle in the District of Columbia unless the telephone or device is equipped with a hands-free accessory.

(b) The provisions of this section shall not apply to the following:

(1) Emergency use of a mobile telephone, including calls to 911 or 311, a hospital, an ambulance service provider, a fire department, a law enforcement agency, or a first-aid squad;

(2) Use of a mobile telephone by law enforcement and emergency personnel or by a driver of an authorized emergency vehicle, acting within the scope of official duties; or

(3) Initiating or terminating a telephone call, or turning the telephone on or off.

CREDIT(S)

(Mar. 30, 2004, D.C. Law 15-124, § 4, 51 DCR 1541.)

HISTORICAL AND STATUTORY NOTES

Legislative History of Laws

For Law 15-124, see notes following § 50-1731.01.

LIBRARY REFERENCES

Key Numbers

Automobiles 330.

Westlaw Topic No. 48A.

Encyclopedias

C.J.S. Motor Vehicles §§ 1354 to 1362.

DC CODE § 50-1731.04

Current through January 3, 2010

END OF DOCUMENT

Effective: March 1, 2008

New Jersey Statutes Annotated Currentness
Title 39. Motor Vehicles and Traffic Regulation
Subtitle 1. Motor Vehicle and Traffic Laws
Chapter 4. Traffic Regulation
Article 12. Speed (Refs & Annos)

→39:4-97.3. Use of hands-free and hand-held wireless communication devices while driving; when permitted; penalty

a. The use of a wireless telephone or electronic communication device by an operator of a moving motor vehicle on a public road or highway shall be unlawful except when the telephone is a hands-free wireless telephone or the electronic communication device is used hands-free, provided that its placement does not interfere with the operation of federally required safety equipment and the operator exercises a high degree of caution in the operation of the motor vehicle. For the purposes of this section, an "electronic communication device" shall not include an amateur radio.

b. The operator of a motor vehicle may use a hand-held wireless telephone while driving with one hand on the steering wheel only if:

(1) The operator has reason to fear for his life or safety, or believes that a criminal act may be perpetrated against himself or another person; or

(2) The operator is using the telephone to report to appropriate authorities a fire, a traffic accident, a serious road hazard or medical or hazardous materials emergency, or to report the operator of another motor vehicle who is driving in a reckless, careless or otherwise unsafe manner or who appears to be driving under the influence of alcohol or drugs. A hand-held wireless telephone user's telephone records or the testimony or written statements from appropriate authorities receiving such calls shall be deemed sufficient evidence of the existence of all lawful calls made under this paragraph.

As used in this act, "hands-free wireless telephone" means a mobile telephone that has an internal feature or function, or that is equipped with an attachment or addition, whether or not permanently part of such mobile telephone, by which a user engages in a conversation without the use of either hand; provided, however, this definition shall not preclude the use of either hand to activate, deactivate, or initiate a function of the telephone.

"Use" of a wireless telephone or electronic communication device shall include, but not be limited to, talking or listening to another person on the telephone, text messaging, or sending an electronic message via the wireless telephone or electronic communication device.

c. (Deleted by amendment, P.L.2007, c. 198).

d. A person who violates this section shall be fined $100 .

e. No motor vehicle points or automobile insurance eligibility points pursuant to section 26 of P.L.1990, c. 8 (C.17:33B-14) shall be assessed for this offense.

f. The Chief Administrator of the New Jersey Motor Vehicle Commission shall develop and undertake a program to notify and inform the public as to the provisions of this act.

g. Whenever this section is used as an alternative offense in a plea agreement to any other offense in Title 39 of the Revised Statutes that would result in the assessment of motor vehicle points, the penalty shall be the same as the penalty for a violation of section 1 of P.L.2000, c. 75 (C.39:4-97.2), including the surcharge imposed pursuant to subsection f. of that section, and a conviction under this section shall be considered a conviction under section 1 of P.L.2000, c. 75 (C.39:4-97.2) for the purpose of determining subsequent enhanced penalties under that section.

CREDIT(S)

L.2003, c. 310, § 1, eff. July 1, 2004. Amended by L.2007, c. 198, § 1, eff. March 1, 2008.

ASSEMBLY LAW AND PUBLIC SAFETY COMMITTEE STATEMENT

2010 Electronic Update

SENATE, No. 1099

STATE OF NEW JERSEY

DATED: JUNE 14, 2007

The Assembly Law and Public Safety Committee reports favorably and with committee amendments Senate Bill No. 1099 (1R).

As amended and reported by the committee, Senate Bill No. 1099 (1R) makes it a primary motor vehicle offense to use a hand-held wireless telephone or electronic communication device while driving, including using these devices to send a text message.

Current law prohibits the use of a hand-held wireless telephone while operating a motor vehicle, but this law may only be enforced as a secondary offense. In other words, law enforcement officers must stop a motorist for some other offense or violation before they may issue a ticket for this offense. Under the amended bill, motorists could be stopped and ticketed solely for illegally using a hand-held wireless telephone or electronic communication device.

The amended bill also expands the current law to prohibit the use while driving of an electronic communication device, unless it is used hands-free and also prohibits text messaging or sending an electronic message via a wireless telephone or electronic communication device. Under the amended bill, illegally sending a text message while driving also would constitute a primary offense. The amended bill specifies that electronic communication devices do not include amateur radios.

The amended bill further provides that whenever the offense of unlawfully using a hand-held wireless telephone or electronic communication device to talk, listen, or send a text message while driving is used as an alternative offense in a plea agreement for another motor vehicle offense that would result in the assessment of motor vehicle points, the penalty is to be the same as the penalty that would be imposed for driving or operating a motor vehicle in an unsafe manner.

Finally, the amended bill sets the fine for a violation of its provisions at $100. Under current law, the fine for using a hand-held cell phone while driving ranges from $100 to $250. If the fine is paid through the violations bureau, it is $100, plus $30 court costs. If a person chooses not to pay the fine through the mail and attend court, the court has the discretion to impose a fine of up to $250, plus $30 court costs.

As amended and reported by the committee, this bill is identical to Assembly Bill No. 4146, also amended and reported by the committee on this same date.

COMMITTEE AMENDMENTS:

The committee amended the bill to:

1) expand the bill's provisions to apply to electronic communication devices;

2) specify that electronic communication devices do not include amateur radios;

3) prohibit text messaging while driving;

4) clarify that the fine is $100; the current fine is from $100 to $250; and

5) make technical corrections.

HISTORICAL AND STATUTORY NOTES

2010 Electronic Update

2003 Legislation

L.2003, c. 310, § 4, approved January 20, 2004, provides:

"This act shall take effect on the first day of the sixth month after enactment."

2007 Legislation

L.2007, c. 198, eff. March 1, 2008, provides:

"[Section] 3. This act shall take effect on the first day of the fourth month following enactment."

RESEARCH REFERENCES

2010 Electronic Update

ALR Library

36 ALR 6th 443, Civil Liability Arising from Use of Cell Phone While Driving.

Treatises and Practice Aids

35 Causes of Action 2d 151, Causes of Action Arising Out of Cell Phone Use While Operating a Motor Vehicle.

N. J. S. A. 39:4-97.3, NJ ST 39:4-97.3

Current with laws effective through L.2009, c. 300 and J.R. No. 13.

END OF DOCUMENT

Effective: December 1, 2001

Mckinney's Consolidated Laws of New York Annotated Currentness
Vehicle and Traffic Law (Refs & Annos)
Chapter Seventy-One. Of the Consolidated Laws (Refs & Annos)
Title VII. Rules of the Road
Article 33. Miscellaneous Rules (Refs & Annos)
→§ 1225-c. Use of mobile telephones

1. For purposes of this section, the following terms shall mean:

(a) "Mobile telephone" shall mean the device used by subscribers and other users of wireless telephone service to access such service.

(b) "Wireless telephone service" shall mean two-way real time voice telecommunications service that is interconnected to a public switched telephone network and is provided by a commercial mobile radio service, as such term is defined by 47 C.F.R. § 20.3.

(c) "Using" shall mean holding a mobile telephone to, or in the immediate proximity of, the user's ear.

(d) "Hand-held mobile telephone" shall mean a mobile telephone with which a user engages in a call using at least one hand.

(e) "Hands-free mobile telephone" shall mean a mobile telephone that has an internal feature or function, or that is equipped with an attachment or addition, whether or not permanently part of such mobile telephone, by which a user engages in a call without the use of either hand, whether or not the use of either hand is necessary to activate, deactivate or initiate a function of such telephone.

(f) "Engage in a call" shall mean talking into or listening on a hand-held mobile telephone, but shall not include holding a mobile telephone to activate, deactivate or initiate a function of such telephone.

(g) "Immediate proximity" shall mean that distance as permits the operator of a mobile telephone to hear telecommunications transmitted over such mobile telephone, but shall not require physical contact with such operator's ear.

2. (a) Except as otherwise provided in this section, no person shall operate a motor vehicle upon a public highway while using a mobile telephone to engage in a call while such vehicle is in motion.

(b) An operator of a motor vehicle who holds a mobile telephone to, or in the immediate proximity of his or her ear while such vehicle is in motion is presumed to be engaging in a call within the meaning of this section. The presumption established by this subdivision is rebuttable by evidence tending to show that the operator was not engaged in a call.

(c) The provisions of this section shall not be construed as authorizing the seizure or forfeiture of a mobile telephone, unless otherwise provided by law.

3. Subdivision two of this section shall not apply to (a) the use of a mobile telephone for the sole purpose of communicating with any of the following regarding an emergency situation: an emergency response operator; a hospital, physician's office or health clinic; an ambulance company or corps; a fire department, district or company; or a police department, (b) any of the following persons while in the performance of their official duties: a police officer or peace officer; a member of a fire department, district or company; or the operator of an authorized emergency vehicle as defined in section one hundred one of this chapter, or (c) the use of a hands-free mobile telephone.

4. A violation of subdivision two of this section shall be a traffic infraction and shall be punishable by a fine of not more than one hundred dollars.

CREDIT(S)

(Added L.2001, c. 69, § 1, eff. Dec. 1, 2001.)

HISTORICAL AND STATUTORY NOTES

2010 Electronic Update

L.2001, c. 69 legislation

L.2001, c. 69, §§ 2 to 8, provide:

"§ 2. Except as otherwise provided in section three of this act, no municipal corporation, as defined in section 2 of the general municipal law, shall, after May 8, 2001, enact any local law, ordinance or code relating to the operation of a motor vehicle while using a mobile telephone unless the terms of such law, ordinance or code are identical to section 1225-c of the vehicle and traffic law, as added by section one of this act. The provisions of this act shall invalidate and preempt any such local law, ordinance or code, enacted after May 8, 2001 unless the terms of such law, ordinance or code are identical to section 1225-c of the vehicle and traffic law, as added by section one of this act.

"§ 3. The provisions of this act shall preempt any local law, ordinance, code, rule or regulation relating to the operation of a motor vehicle while using a mobile telephone, except that nothing in this act shall preclude any state or local agency, which, by permit, license or registration regulates the business or professional activities of individuals from imposing more stringent restrictions than provided in this act for the use of mobile telephones upon such individuals during the course of engaging in the business or professional activity that is the subject of such agency's permit, license or registration.

"§ 4. For the purpose of informing and educating persons who operate motor vehicles in this state, any law enforcement official authorized to issue appearance tickets pursuant to the vehicle and traffic law may, during the period commencing November 1, 2001 and ending November 30, 2001, stop motor vehicles and issue verbal warnings to persons who would be in violation of the provisions of section 1225-c of the vehicle and traffic law, as added by section one of this act, were the provisions thereof effective on the day such warning is issued.

"§ 5. The court shall waive any fine for which a person who violates the provisions of section 1225-c of the vehicle and traffic law, as added by section one of this act, would be liable if such person supplies the court with proof that, between the date on which he or she is charged with having violated such section and the appearance date for such violation, he or she possesses a hands-free mobile telephone as defined in paragraph (e) of subdivision 1 of section 1225-c of the vehicle and traffic law, as added by section 1 of this act; provided, however, that such waiver of fine shall not apply to a second or subsequent violation under such section.

"§ 6. The commissioner of motor vehicles, in consultation with the superintendent of the state police, shall study the effects of the use of mobile telephones and similar equipment in conjunction with the operation of a motor vehicle, and the effects of other forms of driver inattention and distraction, on highway and traffic safety, and shall submit a report of his or her findings to the governor, the majority leader of the senate, the speaker of the assembly, the minority leader of the senate, the minority leader of the assembly, and the chairs of the transportation committees of the senate and the assembly, not later than 4 years from the effective date of this act. Such report shall include, but not be limited to:

"1. an examination of motor vehicle accident, fatality and injury statistics relating to the use of mobile telephones or similar equipment while operating a motor vehicle;

"2. an examination of motor vehicle accident, fatality and injury statistics relating to other forms of driver inattention and distraction;

"3. a review and analysis of studies examining the effects of the use of mobile telephones or similar equipment on highway and traffic safety;

"4. a review and analysis of studies and statistics relating to other types of driver inattention and distraction which affect highway and traffic safety; and

"5. recommendations for improving highway and traffic safety and reducing motor vehicle accidents, if any, related to driver inattention and distraction.

"§ 7. The commissioner of motor vehicles shall include in the department of motor vehicles' annual summary of motor vehicle accident statistics information relative to the types of driver inattention by the operator of a motor vehicle which contributed to, or were a factor in, such accidents.

"§ 8. This act shall take effect immediately, except that sections one, three and five of this act shall take effect December 1, 2001; section two shall expire and be deemed repealed December 1, 2001; section four of this act shall take effect November 1, 2001 and shall expire and be deemed repealed December 1, 2001; section five of this act shall expire and be deemed repealed March 1, 2002; and section seven shall take effect December 31, 2003, provided, however, that effective immediately the commissioner of motor vehicles is hereby authorized and directed to promulgate rules and regulations necessary for the implementation of the provisions of section seven of this act."

SUPPLEMENTARY PRACTICE COMMENTARIES

2010 Electronic Update

by Joseph R. Carrieri

2003

Rebuttable Presumption

Subdivision 2b provides that when an operator of a motor vehicle holds a mobile telephone to, or in the immediate proximity of, his or her ear while such vehicle is in motion is presumed to be engaging in a call within the meaning of this section. Subdivision b goes on to provide that this presumption is rebuttable by evidence tending to show that the operator was not engaged in a call. The issue of rebuttable presumption was discussed in the case entitled Village of Floral Park v. Cusmai which was reported in New York Law Journal, January 5, 2004, p. 20, c. 1. In this case, the defendant, while driving a motor vehicle on a public highway, was given a ticket pursuant to § 1225-c2(a) where the police officer testified that he saw the defendant with a cell phone about six inches from the defendant's ear. The defendant testified that he indeed had the cell phone near his ear, but that he picked up the cell phone thinking he had a incoming call. The defendant testified that he did not take the call, and did not make a call, but was simply viewing his cell phone to determine if an incoming call was made. While the court stated that the prosecution did carry its burden in a satisfactory manner, and the court finds the officer's testimony credible, at the same time, the court found that the defendant did rebut the presumption that he was not engaged in a call but simply looking at his cell phone to see if an incoming call was made. The troubling part of the decision, however, is that the court wrote

> "at trial, the defendant maintained that the telephone records if presented would demonstrate that no call was made or received at the time of the offense."

Since the telephone records were at the disposal of the defendant, one would ask why those records were not produced. If these records were in the control of the defendant and not produced, was the presumption rebutted? In the last analysis, however, it was the credibility of the defendant that was evaluated by the court and found to be persuasive.

PRACTICE COMMENTARIES

2010 Electronic Update

by Joseph R. Carrieri

2002

Section 1225-c was added to prohibit drivers from using mobile telephones while operating a motor vehicle.

REBUTTABLE PRESUMPTION

This section provides that a driver who holds a mobile telephone in the immediate proximity of his/her ear while driving is presumed to be engaging in a call prohibited by this section but the presumption is rebuttable by evidence tending to show that the driver was not engaged in a call.

EXEMPT CALLS

Certain calls are exempt from this section, including a call made regarding an emergency situation to an emergency response operator, a hospital, a physician's office, a health clinic, an ambulance company or corps, a fire department, a fire district, a fire company, or a police department.

HANDS-FREE CALLS PERMITTED

Drivers are not prohibited from using a hands-free mobile telephone while operating a motor vehicle.

EFFECTIVE DATE OF THE NEW LAW

The new law permitted a grace period so that starting with November 1, 2001, drivers were not permitted to use a handheld phone while driving but for thirty (30) days, police would issue verbal warnings to help educate drivers about the new law. After December 1, 2001, the police could issue a summons for a violation of this law, which is a traffic infraction and a fine up to $100.00.

After December 1, 2001, a driver may still use a mobile phone, but it must be a hands-free phone such as a phone with a speaker, earpiece or other device that allows the driver to make calls without using his/her hands. Numerous municipalities had enacted laws relating to mobile telephones, however, this section preempts any local law, ordinance or code relating to the operation of a motor vehicle while using a mobile telephone.

Certain it is that this new law will be found to be constitutional. Driving has been considered a privilege and not a right by the Court's of the State of New York and as such, the State has the right and the obligation to enact laws consistent with safety and due process. It should be remembered that cellular phone and mobile phones are not prohibited in a motor vehicle, but the use of handheld phones is prohibited. The use of hands-free phones is still permitted and hence is a reasonable regulation of the safe operation of a motor vehicle. This new law was designed to reduce traffic accidents to save lives and, at the same time, eliminate the confusion caused by the patchwork of local laws that often impose different restrictions from municipality to municipality.

PRACTICE COMMENTARIES CITED

2010 Electronic Update

People v. Campanaro, City Ct., Jefferson Co., N.Y., N.Y.Law J., May 2, 2008, p. 31.

RESEARCH REFERENCES

2010 Electronic Update

ALR Library

36 ALR 6th 443, Civil Liability Arising from Use of Cell Phone While Driving.

Encyclopedias

40 Am. Jur. Proof of Facts 2d 411, Driver's Failure to Maintain Proper Lookout.

61 Am. Jur. Proof of Facts 3d 115, Proof that Driver was "Operating" Motor Vehicle While Intoxicated.

97 Am. Jur. Trials 1, Telecommunications and Other Litigation: Call Detail Records and Fraud.

NY Jur. 2d, Automobiles & Other Vehicles § 638, Applicability; Highways and Other Places.

NY Jur. 2d, Automobiles & Other Vehicles § 651, Operating Motor Vehicle With Television, Earphone, or Audio Amplification System.

NY Jur. 2d, Disclosure § 228, Miscellaneous Matters.

Forms

Carmody-Wait, 2d § 42:320, Miscellaneous Matters.

Treatises and Practice Aids

Guide to Employment Law and Regulation 2d § 53:11, Safety and Health.

Handling the DWI Case in New York § 3:5, Roadways Upon Which Reckless Driving Statute Applies.

NOTES OF DECISIONS

Discovery 4
Equal protection 2
Public highway 3
Validity 1

1. Validity

Statute prohibiting the use of a cellular mobile telephone by a person operating a motor vehicle, while the vehicle is in motion, was not vague or overbroad; the statute distinguished between the permissible "hands free mobile phone" and other mobile phones and limited police action to issuance of verbal warnings for an initial time period. People v. Neville, 2002, 190 Misc.2d 432, 737 N.Y.S.2d 251. Constitutional Law 4509(19); Telecommunications 1067

Law prohibiting the use of hand held cellular mobile telephone by operator of motor vehicle, during the operation of the vehicle, was reasonable in its intentions, and thus was a valid use of the legislature's police authority and did not violate right to privacy; the law was intended to protect citizens from motor vehicle accidents and injuries that resulted from use of such phones, and the law required the waiver of the fine if a defendant provided proof of purchase of a hands free device. People v. Neville, 2002, 190 Misc.2d 432, 737 N.Y.S.2d 251. Constitutional Law 1236; Telecommunications 1030

2. Equal protection

Exceptions for professionals who were needed to make emergency cellular telephone calls as part of their employment and for ordinary citizens who needed to make emergency cellular telephone calls, in statute prohibiting the use of hand held cellular telephones by an operator of a motor vehicle, during the operation of vehicle, bore reasonable relation to the desired legislative purpose of promoting safety as required by equal protection. People v. Neville, 2002, 190 Misc.2d 432, 737 N.Y.S.2d 251. Constitutional Law 3781; Telecommunications 1030

Exclusions in statute prohibiting the use of a cellular mobile telephone by the operator of a vehicle, while the vehicle was in motion, were not based on race, sex, age, or national origin, and thus no strict scrutiny test requiring compelling governmental interest was necessary in an analysis to determine whether the statute violated the Equal Protection Clause. People v. Neville, 2002, 190 Misc.2d 432, 737 N.Y.S.2d 251. Constitutional Law 3781

3. Public highway

Parking lot of privately owned shopping center was not "public highway" within meaning of Vehicle and Traffic Law section prohibiting operation of a motor vehicle upon a public highway while using a cell phone to engage in a call while the vehicle was in motion, and thus defendant could not be charged with violating the law for talking on cell phone while driving in parking lot. People v. Moore, 2003, 196 Misc.2d 340, 765 N.Y.S.2d 218. Automobiles

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4. Discovery

Motorcyclist seeking car driver's cellular phone records was entitled to the portion of driver's phone records which would disclose calls transmitted or received by her on date of accident, limited to the estimated time of subject accident, given that use of cellular phones while driving was prohibited by law and motorcyclist filed affidavit indicating that immediately prior to the accident he saw driver "with an object in her hand held to her head." Morano v. Slattery Skanska, Inc., 2007, ___ Misc.3d ___, 846 N.Y.S.2d 881. Pretrial Procedure 372

McKinney's Vehicle and Traffic Law § 1225-c, NY VEH & TRAF § 1225-c

Current through the Laws of 2009.

END OF DOCUMENT

West's Oregon Revised Statutes Annotated Currentness
Title 59. Oregon Vehicle Code
Chapter 811. Rules of the Road for Drivers
General Driving Rules
(Miscellaneous)

→811.507. Person under 18 operating a motor vehicle while using a mobile communication device

<Text subject to final change by the Oregon Office of the Legislative Counsel.>

(1) As used in this section:

(a) "Hands-free accessory" means an attachment or built-in feature for or an addition to a mobile communication device, whether or not permanently installed in a motor vehicle, that when used allows a person to maintain both hands on the steering wheel.

(b) "Mobile communication device" means a text messaging device or a wireless, two-way communication device designed to receive and transmit voice or text communication.

(2) A person commits the offense of operating a motor vehicle while using a mobile communication device if the person, while operating a motor vehicle on a highway, uses a mobile communication device.

(3) This section does not apply:

(a) To a person who is summoning medical or other emergency help if no other person in the vehicle is capable of summoning help;

(b) To a person using a mobile communication device for the purpose of farming or agricultural operations;

(c) To a person operating an ambulance or emergency vehicle;

(d) To a person 18 years of age or older who is using a hands-free accessory;

(e) To a person operating a motor vehicle while providing public safety services or emergency services as a volunteer;

(f) To a person operating a motor vehicle while acting in the scope of the person's employment as a public safety officer, as defined in ORS 348.270;

(g) To a person operating a motor vehicle in the scope of the person's employment if operation of the motor vehicle is necessary for the person's job;

(h) To a person activating or deactivating the mobile communication device or a function of the device;

(i) To a person who holds a valid amateur radio operator license issued or any other license issued by the Federal

Communications Commission and is operating an amateur radio;

(j) To a person who operates a two-way radio device that transmits radio communication transmitted by a station operating on an authorized frequency within the citizens' or family radio service bands in accordance with rules of the Federal Communications Commission; or

(k) To a person using a function of the mobile communication device that allows for only one-way voice communication while the person is:

(A) Operating a motor vehicle in the scope of the person's employment;

(B) Providing transit services to persons with disabilities or to senior citizens; or

(C) Participating in public safety or emergency service activities.

(4) The offense described in this section, operating a motor vehicle while using a mobile communication device, is a Class D traffic violation.

CREDIT(S)

Added by Laws 2007, c. 870, § 2, eff. Jan. 1, 2008; Laws 2009, c. 834, § 1, eff. Jan. 1, 2010.

HISTORICAL AND STATUTORY NOTES

2009 Electronic Update

2009 Legislation

Laws 2009, c. 834, § 1, rewrote the section, which formerly read:

"(1) A person under 18 years of age commits the offense of operating a motor vehicle while using a mobile communication device if the person, while operating a motor vehicle on a highway, uses a mobile communication device and the person holds:

"(a) A provisional driver license issued under ORS 807.065;

"(b) A special student driver permit issued under ORS 807.230; or

"(c) An instruction driver permit issued under ORS 807.280.

"(2) For purposes of this section, 'mobile communication device' means a text messaging device or a wireless, two-way communication device designed to receive and transmit voice or text communication.

"(3) This section does not apply:

"(a) To a person who is summoning medical or other emergency help if no other person in the vehicle is capable of summoning help; or "(b) To a person using a mobile communication device for the purpose of farming or agricultural operations.

"(4) Notwithstanding ORS 810.410, a police officer may enforce this provision only as a secondary action when a driver of a motor vehicle has been detained for a suspected traffic violation or some other offense.

"(5) The offense described in this section, operating a motor vehicle while using a mobile communication device, is a Class D traffic violation."

O. R. S. § 811.507, OR ST § 811.507

Current through End of the 2009 Reg. Sess. Revisions to Acts made by the Oregon Reviser were unavailable at the time of publication.

END OF DOCUMENT

West's Utah Code Annotated Currentness
Title 41. Motor Vehicles
Chapter 6A. Traffic Code (Refs & Annos)
Part 17. Miscellaneous Rules
→ § 41-6a-1715. Careless driving defined and prohibited

(1) A person operating a motor vehicle is guilty of careless driving if the person:

(a) commits two or more moving traffic violations under this chapter in a series of acts within a single continuous period of driving covering three miles or less in total distance; or

(b) commits a moving traffic violation under this chapter other than a moving traffic violation under Part 6, Speed Restrictions, while being distracted by one or more activities taking place within the vehicle that are not related to the operation of a motor vehicle, including:

(i) using a wireless telephone or other electronic device unless the person is using hands-free talking and listening features while operating the motor vehicle;

(ii) searching for an item in the vehicle; or

(iii) attending to personal hygiene or grooming.

(2) A violation of this section is a class C misdemeanor.

CREDIT(S)

Laws 2007, c. 52, § 7, eff. April 30, 2007;Laws 2009, c. 292, § 3, eff. May 12, 2009.

HISTORICAL AND STATUTORY NOTES

Laws 2009, c. 292, § 3, in subsec. (1), inserted "covering three miles or less in total distance".

U.C.A. 1953 § 41-6a-1715, UT ST § 41-6a-1715

Current through 2009 General Session and 2009 First Special Session

END OF DOCUMENT

West's Revised Code of Washington Annotated Currentness
Title 46. Motor Vehicles (Refs & Annos)
Chapter 46.61. Rules of the Road (Refs & Annos)
Miscellaneous Rules

46.61.667. Using a wireless communications device while driving

(1) Except as provided in subsection (2) of this section, a person operating a moving motor vehicle while holding a wireless communications device to his or her ear is guilty of a traffic infraction.

(2) Subsection (1) of this section does not apply to a person operating:

(a) An authorized emergency vehicle, or a tow truck responding to a disabled vehicle;

(b) A moving motor vehicle using a wireless communications device in hands-free mode;

(c) A moving motor vehicle using a hand-held wireless communications device to:

(i) Report illegal activity;

(ii) Summon medical or other emergency help;

(iii) Prevent injury to a person or property;

(d) A moving motor vehicle while using a hearing aid.

(3) Subsection (1) of this section does not restrict the operation of an amateur radio station by a person who holds a valid amateur radio operator license issued by the federal communications commission.

(4) For purposes of this section, "hands-free mode" means the use of a wireless communications device with a speaker phone, headset, or earpiece.

(5) The state preempts the field of regulating the use of wireless communications devices in motor vehicles, and this section supersedes any local laws, ordinances, orders, rules, or regulations enacted by a political subdivision or municipality to regulate the use of wireless communications devices by the operator of a motor vehicle.

(6) Enforcement of this section by law enforcement officers may be accomplished only as a secondary action when a driver of a motor vehicle has been detained for a suspected violation of this title or an equivalent local ordinance or some other offense.

(7) Infractions that result from the use of a wireless communications device while operating a motor vehicle under this section shall not become part of the driver's record under RCW 46.52.101 and 46.52.120. Additionally, a finding that a person has committed a traffic infraction under this section shall not be made available to insurance companies or employers.

CREDIT(S)

[2007 c 417 § 2, eff. July 1, 2008.]

HISTORICAL AND STATUTORY NOTES

Intent--2007 c 417: "The use of wireless communications devices by motorists has increased in recent years. While wireless communications devices have assisted with quick reporting of road emergencies, their use has also contributed to accidents and other mishaps on Washington state roadways. When motorists hold a wireless communications device in one hand and drive with the other, their chances of becoming involved in a traffic mishap increase. It is the legislature's intent to phase out the use of hand-held wireless communications devices by motorists while operating a vehicle." [2007 c 417 § 1.]

Effective date--2007 c 417: "This act takes effect July 1, 2008." [2007 c 417 § 3.]

West's RCWA 46.61.667, WA ST 46.61.667

Current with 2010 Legislation effective through February 15, 2010

END OF DOCUMENT

Effective: July 01, 2011

West's Annotated California Codes Currentness
Vehicle Code (Refs & Annos)
Division 11. Rules of the Road
Chapter 12. Public Offenses
Article 1. Driving Offenses (Refs & Annos)

→§ 23123. Driving a motor vehicle while using a wireless telephone; penalty; exceptions

<Section operative July 1, 2011. See, also, section operative until July 1, 2011.>

(a) A person shall not drive a motor vehicle while using a wireless telephone unless that telephone is specifically designed and configured to allow hands-free listening and talking, and is used in that manner while driving.

(b) A violation of this section is an infraction punishable by a base fine of twenty dollars ($20) for a first offense and fifty dollars ($50) for each subsequent offense.

(c) This section does not apply to a person using a wireless telephone for emergency purposes, including, but not limited to, an emergency call to a law enforcement agency, health care provider, fire department, or other emergency services agency or entity.

(d) This section does not apply to an emergency services professional using a wireless telephone while operating an authorized emergency vehicle, as defined in Section 165, in the course and scope of his or her duties.

(e) This section does not apply to a person driving a schoolbus or transit vehicle that is subject to Section 23125.

(f) This section does not apply to a person while driving a motor vehicle on private property.

(g) This section shall become operative on July 1, 2011.

CREDIT(S)

(Added by Stats.2006, c. 290 (S.B.1613), § 5, operative July 1, 2011. Amended by Stats.2007, c. 214 (S.B.33), § 3, operative July 1, 2011.)

HISTORICAL AND STATUTORY NOTES

2010 Electronic Update

2006 Legislation

For short title, legislative findings and declarations, and cost reimbursement provisions relating to Stats.2006, c. 290

(S.B.1613), see Historical and Statutory Notes under Vehicle Code § 12810.3.

2007 Legislation

Stats.2007, c. 214 (S.B.33), in subd. (b), substituted "A" for "Notwithstanding subdivision (a) of Section 42001 or any other provision of law, a".

For cost reimbursement provisions relating to Stats.2007, c. 214 (S.B.33), see Historical and Statutory Notes under Vehicle Code § 12810.3.

CROSS REFERENCES

Conviction of violation of this section, giving of violation points, see Vehicle Code § 12810.3.

West's Ann. Cal. Vehicle Code § 23123, CA VEHICLE § 23123

Current with all 2009 Reg.Sess. laws; all 2009-2010 1st through 5th and 7th Ex.Sess. laws; urgency legislation through Ch. 4 of the 2010 Reg.Sess.; and propositions on the 6/8/2010 ballot received as of 1/1/2010.

END OF DOCUMENT

LEGISLATIVE RESEARCH REPORT

FEBRUARY 18, 2010 — REPORT NUMBER 10.179

STATE BANS ON CELL PHONE USE BY DRIVERS

PREPARED FOR REPRESENTATIVE MAX GRUENBERG

BY TIM SPENGLER, LEGISLATIVE ANALYST

You wanted to know what states have done regarding limiting or banning the use of cellular (cell) phones by individuals operating motor vehicles.

Alaska Legislation Regarding Driver Cell Phone Usage

Under Alaska law (AS 28.35.161), enacted September 1, 2008, drivers are effectively banned from text messaging while operating a motor vehicle. Alaska is one of the 19 states (and the District of Columbia) to ban text messaging for drivers—thought by many experts to be the most distracting cell phone activity. There have also been several attempts in Alaska this decade to limit or ban the use of cell phones by all drivers, but none has been successful.

Currently, the legislature is considering House Bill 15, which would prohibit the use of cellular telephones by minors (under age 18) while driving. Also under consideration in the legislature is House Bill 257, which would prohibit the use of cell phones by all drivers, regardless of age.

Legislation in Other States

According to the Insurance Institute for Highway Safety (IIHS), as of February 2010 the following cell phone bans or restrictions are in place across the nation: [1]

- Seven states (and the District of Columbia) impose state-wide bans on driving while talking on hand-held cell phones;[2]
- Seventeen states (and the District of Columbia) prohibit the use of cell phones while operating a school bus; [3]

[1] The Insurance Institute for Highway Safety is an independent, nonprofit organization focused on reducing the losses — deaths, injuries, and property damage — from crashes on the nation's highways (*http://www.iihs.org/*).

[2] The seven states that impose state-wide bans on driving while using hand-held cell phones are California (Vehicle Code 23123), Connecticut (Public Act No. 05-159), New Jersey (N.J.S.A. 30:4-97.3), New York (Vehicle and Traffic Law Section 1225c), Oregon (ORS 811.507), Utah (UT Code 41-6a-1715), and Washington (RCW 46.61.667).

- Twenty one states (and the District of Columbia) prohibit novice drivers—usually defined as drivers under 18 years old—from using cell phones when operating a vehicle;[4] and, as mentioned above,

- Nineteen states (and the District of Columbia) ban drivers from text messaging.[5]

We include, as Attachment A, a table from the Institute for Highway Safety that presents an overview of states' cell phone laws. Also in Attachment A, we include a *question and answer* sheet from the IIHS on cell phones and driving. It provides a summary of the myriad issues surrounding this topic.

Arthur Goodwin, senior research associate at the Highway Safety Research Center, contends that laws banning or limiting cell phone use while operating a motor vehicle are of vital importance and are gaining momentum nationwide.[6] He likened the situation to when seat belt laws came to the fore in the United States; it took some time to educate the public, and for people to change their habits, but eventually most did. Mr. Goodwin believes this will be the case with cell phone laws—that it will take time and continued efforts for these laws to become solidified in our national consciousness.

All the experts with whom we spoke, and the literature we reviewed, support states enacting laws restricting the use of cell phones while driving.[7] While difficult to enforce, such legislation does highlight the reality that the behavior is unsafe.

We hope you find this information to be useful. Please let us know if you have questions or need additional information.

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[3] School bus drivers in the following states are banned from using cell phones: Arizona, Arkansas, California, Connecticut, Delaware, Georgia, Illinois, Kentucky, Louisiana, Massachusetts, Minnesota, New Jersey, North Carolina, Rhode Island, Tennessee, Texas, and Virginia.

[4] Novice drivers are banned from using cell phones in the following states: Arkansas, California, Colorado, Connecticut, Delaware, Illinois, Indiana, Kansas, Louisiana, Maine, Maryland, Minnesota, Nebraska, New Jersey, North Carolina, Oregon, Rhode Island, Tennessee, Texas, Virginia, and West Virginia.

[5] A ban on texting while driving is in place in the following states: Alaska, Arkansas, California, Colorado, Connecticut, Illinois, Louisiana, Maryland, Minnesota, New Hampshire, New Jersey, New York, North Carolina, Oregon, Rhode Island, Tennessee, Utah, Virginia, and Washington.

[6] The Highway Safety Research Center's stated mission is to improve the safety, security, access and efficiency of all surface transportation modes through a balanced, interdisciplinary program of research, evaluation and information dissemination (*http://www.hsrc.unc.edu/index.cfm*). Arthur Goodwin can be reached at (919) 843-5038.

[7] *In addition to Mr. Goodwin, we also contacted Anne McCartt, Senior Vice President of the Insurance Institute for* Highway Safety (703) 247-1534, and Dr. David Strayer of the University of Utah who has studied distracted drivers issues for more than ten years (801) 581-5037.

Attachment A

Cellphone Laws, Insurance Institute for Highway Safety, February 2010

Q&As: Cellphones and Driving, Insurance Institute for Highway Safety, June 2009

Cellphone laws

February 2010

A jurisdiction-wide ban on driving while talking on a hand-held cellphone is in place in 7 states (California, Connecticut, New Jersey, New York, Oregon, Utah, and Washington) and the District of Columbia. Utah has named the offense careless driving. Under the Utah law, no one commits an offense when speaking on a cellphone unless they are also committing some other moving violation other than speeding.

Local jurisdictions may or may not need specific state statutory authority to ban cellphones. Localities that have enacted restrictions on cellphone use include: Oahu, HI; Chicago, IL; Brookline, MA; Detroit, MI; Santa Fe, NM; Brooklyn, North Olmstead, and Walton Hills, OH; Conshohocken, Lebanon, and West Conshohocken, PA; Waupaca County, WI; and Cheyenne, WY.

The use of all cellphones while driving a school bus is prohibited in 17 states and the District of Columbia.

The use of all cellphones by novice drivers is restricted in 21 states and the District of Columbia.

Text messaging is banned for all drivers in 19 states and the District of Columbia. In addition, novice drivers are banned from texting in 9 states (Delaware, Indiana, Kansas, Maine, Mississippi, Missouri, Nebraska, Texas, and West Virginia) and school bus drivers are banned from text messaging in 1 state (Texas).

The table below shows the states that have cellphone laws, whether they specifically ban text messaging, and whether they are enforced as primary or secondary laws. Under secondary laws, an officer must have some other reason to stop a vehicle before citing a driver for using a cellphone. Laws without this restriction are called primary.

Table   Map: hand-held bans   Map: young driver bans   Map: bus driver bans   Map: texting bans

Laws restricting cellphone use and texting

State	Hand-held ban	Young drivers all cellphone ban	Bus drivers all cellphone ban	Texting ban	Enforcement
Alabama	no	no	no	no	not applicable
Alaska	no	no	no	all drivers	primary
Arizona	no	no	school bus drivers	no	primary
Arkansas	drivers ages 18 through 20	drivers younger than 18	school bus drivers	all drivers	primary: texting by all drivers and cellphone use by school bus drivers; secondary: cellphone use by young drivers[1]
California	all drivers	drivers younger than 18	school and transit bus drivers	all drivers	primary; secondary for hands-free cellphone use by young drivers[1]
Colorado	no	drivers younger than 18	no	all drivers	primary
Connecticut	all drivers	drivers younger than 18	school bus drivers	all drivers	primary
Delaware	no	learner's permit and intermediate license holders	school bus drivers	learner's permit and intermediate license holders	primary
District of Columbia	all drivers	learner's permit holders	school bus drivers	all drivers	primary
Florida	no	no	no	no	not applicable
Georgia	no	no	school bus drivers	no	primary
Hawaii	no	no	no	no	not applicable
Idaho	no	no	no	no	not applicable

Illinois	drivers in construction and school speed zones	drivers younger than 19 and learner's permit holders younger than 19	school bus drivers	all drivers	primary
Indiana	no	drivers younger than 18	no	drivers younger than 18	primary
Iowa	no	no	no	no	not applicable
Kansas	no	learner's permit and intermediate license holders	no	learner's permit and intermediate license holders	primary
Kentucky	no	no	school bus drivers	no	primary
Louisiana	with respect to novice drivers, see footnote[4]	with respect to novice drivers, see footnote[2]	school bus drivers	all drivers	secondary; primary for school bus drivers
Maine	no	learner's permit and intermediate license holders	no	learner's permit and intermediate license holders	primary
Maryland	no	learner's permit and intermediate license holders	no	all drivers	secondary; primary for texting
Massachusetts	no	no	school bus drivers	no	primary
Michigan	no	no	no	no	not applicable
Minnesota	no	learner's permit holders and provisional license holders during the first 12 months after licensing	school bus drivers	all drivers	primary
Mississippi	no	no	no	learner's permit and intermediate license holders	primary
Missouri	no	no	no	drivers 21 and younger	primary
Montana	no	no	no	no	not applicable
Nebraska	no	learner's permit and intermediate license holders younger than 18	no	learner's permit and intermediate license holders younger than 18	secondary
Nevada	no	no	no	no	not applicable
New Hampshire	no	no	no	all drivers	primary
New Jersey	all drivers	learner's permit and intermediate license holders	school bus drivers	all drivers	primary
New Mexico	no	no	no	no	not applicable
New York	all drivers	no	no	all drivers	primary; secondary for text messaging
North Carolina	no	drivers younger than 18	school bus drivers	all drivers	primary
North Dakota	no	no	no	no	not applicable
Ohio	no	no	no	no	not applicable
Oklahoma	no	no	no	no	not applicable

Oregon	all drivers	drivers younger than 18	no	all drivers	primary
Pennsylvania	no	no	no	no	not applicable
Rhode Island	no	drivers younger than 18	school bus drivers	all drivers	primary
South Carolina	no	no	no	no	not applicable
South Dakota	no	no	no	no	not applicable
Tennessee	no	learner's permit and intermediate license holders	school bus drivers	all drivers	primary
Texas	drivers in school crossing zones	intermediate license holders for the first twelve months	bus drivers when a passenger 17 and younger is present	bus drivers when a passenger 17 and younger is present; intermediate license holders for first twelve months; drivers in school crossing zones	primary
Utah	all drivers	no	no	all drivers	primary for texting; secondary for talking on a hand-held cellphone[3]
Vermont	no	no	no	no	not applicable
Virginia	no	drivers younger than 18	school bus drivers	all drivers	secondary; primary for school bus drivers
Washington	all drivers	no	no	all drivers	secondary
West Virginia	no	drivers younger than 18 who hold either a learner's permit or an intermediate license	no	drivers younger than 18 who hold either a learner's permit or an intermediate license	primary
Wisconsin	no	no	no	no	not applicable
Wyoming	no	no	no	no	not applicable

Alabama - Florida Georgia - Louisiana Maine - Montana Nebraska - North Dakota Ohio - South Dakota Tennessee - Wyoming Show All

[1]The laws in Arkansas and California prohibit police from stopping a vehicle to determine if a driver is in compliance with the law. Clearly, that language prohibits the use of checkpoints to enforce the law, but it has been interpreted as the functional equivalent of secondary provisions that typically state the officer may not stop someone suspected of a violation unless there is other, independent, cause for a stop.

[2]In Louisiana, all learner's permit holders, irrespective of age, and all intermediate license holders are prohibited from driving while using a hand-held cellphone and all drivers younger than 18 are prohibited from using any cellphone. Effective April 1, 2010 all drivers, irrespective of age, issued a first driver's license will be prohibited from using a cellphone for one year.

[3]Utah's law defines careless driving as committing a moving violation (other than speeding) while distracted by use of a hand-held cellphone or other activities not related to driving.

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Q&As: Cellphones and driving

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Hide all answers

1 | **How many people use cellphones?**

Cellphone use in the United States has grown quickly during the past decade. There were more than 262 million wireless cellphone subscribers, representing 84 percent of the US population, as of June 2008, according to the Cellular Telecommunications and Internet Association.[1] That's up 35 percent from 194 million in June 2005 and nearly three times more than the 97 million wireless subscribers in June 2000. Minutes of use have surged to more than 1 trillion in June 2008 from 195 billion in June 2000.

2 | **Do drivers frequently use phones behind the wheel?**

Yes, though it's hard to accurately determine just how many drivers use phones. Observational data from the federal government indicate that 6 percent of drivers in 2007 were using hand-held phones at any moment during the day. The 2007 use rate means that about 1 million passenger vehicles on the road at any moment during the day are driven by people talking on hand-held phones.[2]

3 | **Who is most likely to talk on a cellphone while driving?**

Female drivers across all age groups more frequently use hand-held cellphones than male drivers (8 percent vs. 5 percent), according to daytime observational surveys of drivers conducted nationwide in 2007. Young drivers ages 16 -24 also are much more likely than other drivers to talk on hand-held cellphones. Nine percent of drivers ages 16-24 were observed talking on hand-held phones, compared with 6 percent of those ages 25-69 and 1 percent of drivers 70 and older.[2]

4 | **Does using a cellphone while driving increase crash risk?**

Yes. Two controlled studies now link talking on a cellphone directly to increased crash risk. A 2005 Institute study of drivers in Western Australia found cellphone users four times as likely to get into crashes serious enough to injure themselves.[3] The study used cellphone billing records to verify phone use of crash-involved drivers. Increased risk was similar for males and females, drivers younger than 30 and those 30 and older, and hands-free and hand-held phones. The findings were consistent with 1997 research that showed phone use among Canadian drivers was associated with a fourfold increase in the risk of a property damage crash. This study also used cellphone billing records.[4]

5 | **Are hands-free cellphones safer?**

No, at least not after the conversation begins. Both studies of crashes using cellphone billing records to verify phone use found about a fourfold increase in crash risk with conversing on both hands-free and hand-held phones.[3,4] The studies were unable to estimate crash risk from different types of hands-free devices. They also were unable to determine whether there was any benefit associated with hands-free devices while placing the call. Experimental research using driving simulators indicates that phone conversation tasks, whether using hand-held or hands-free devices, affect some measures of driving performance.[5,6] Hands-free phones may eliminate some of the physical distraction of handling phones, but the cognitive distraction from phone conversations remains.

6 | **How does cellphone use affect driving performance?**

An Institute review of more than 120 cellphone studies, about half of which were experimental studies using driving simulators or instrumented vehicles, found that nearly all reported that some measures of driver performance were affected by the cognitive distractions associated with cellphone tasks.[6] Phone conversation tasks typically decreased reaction times and travel speeds and increased lane deviations and steering wheel movements. Statistical analyses that aggregated the results of 33 studies and 23 studies, respectively, reported similar findings.[5,7] Some studies have found that older drivers' performance is more affected by cellphone tasks, particularly their reaction time. Few studies included drivers younger than 18, and evidence is mixed on the effects of phone use for teenage drivers compared with adult drivers. Findings also are mixed on whether driving performance while talking on a cellphone improves with practice. Some simulator studies suggest that the negative impact of phone use on driving performance may lessen with experience.[8,9] Other simulator research has found no change in performance with practice.[10]

Using functional magnetic resonance imaging, researchers at Carnegie Mellon University found a 37 percent reduction in brain activity associated with driving when research subjects listened via a headset to spoken sentences that they judged as true or false while steering in a driving simulator. Researchers concluded that listening and processing information from a phone conversation can draw mental resources away from driving, worsening driving performance, even when drivers are not holding or dialing a phone.[11]

Further evidence comes from a few studies of small samples of people observed during their everyday driving. One study included drivers of 100 vehicles instrumented with video cameras and other monitoring technologies. Only a few serious crashes occurred, but researchers calculated the odds of being in a near-crash or crash were higher when dialing a hand-held phone than when phones weren't being used.[12]

7 | **Are government restrictions on drivers' cellphone use common?**

Not in the US, but bans are widespread in other countries. 7 states (California, Connecticut, New Jersey, New York, Oregon, Utah, and Washington) and the District of Columbia have enacted laws that ban drivers of all ages from using hand-held cellphones. More common in the US are laws that restrict young drivers from using any type of cellphone. Teenage drivers in 21 states and the District of Columbia, are barred from talking on any type of cellphone. School bus drivers in 17 states and the District of Columbia, are restricted from using all cellphones while driving a bus. A number of jurisdictions world-wide including Australia, Japan, most European countries, and several Canadian provinces ban hand-held phones while driving.

Text messaging is banned for all drivers in 18 states and the District of Columbia. In addition, novice drivers are banned from texting in 9 states (Delaware, Indiana, Kansas, Maine, Mississippi, Missouri, Nebraska, Texas, and West Virginia) and school bus drivers are banned from text messaging in 1 state (Texas).

Cellphone laws in the US

8 | **Do bans on hand-held phones work?**

Their effect on crashes hasn't been determined, but Institute studies have documented how bans enacted in the US have affected driver hand-held cellphone use. New York was the first state to implement a ban on hand-held cellphones for drivers. Driver hand-held cellphone use dropped by half immediately following implementation of the 2001 law, but this decline had substantially dissipated one year later.[13] In contrast, soon after Washington, DC, began banning hand-held phone use while driving in 2004, driver hand-held cellphone use dropped by about half, and this decline was sustained about a year later. It's likely that stronger enforcement of the DC ban led to the sustained lower use rates compared with New York. Citations for cellphone violations represented 8 percent of all moving violations in DC compared with 4 percent in New York.[14]

Given that crash risk increases substantially with drivers' use of either hand-held or hands-free phones, bans on hand -held cellphones will not eliminate the problem entirely. Laws prohibiting hands-free phones are difficult to enforce.

9 | **Why do more laws cover only teenage drivers?**

Cellphone bans for young drivers are becoming more common amid concerns about the role distractions play in teenagers' elevated crash risk. Distractions of any type are a common factor in crashes of newly licensed 16-year-old drivers.[15] Some research also shows teenage drivers tend to use cellphones and other emerging technologies more than adult drivers.[16] States increasingly have graduated licensing laws that place restrictions on newly licensed drivers, e.g., limiting nighttime driving and the number of passengers a novice driver can carry. Cellphone bans are being added to those restrictions.

See Q&A: Teenagers — graduated driver licensing

More about the licensing law in your state or any state

10 | **Do teenagers comply with cellphone bans?**

Young drivers often ignore cellphone restrictions, according to a 2008 Institute study of North Carolina's cellphone ban for young beginning drivers. The state bans the use of any telecommunications device by drivers younger than 18 under its graduated licensing system. Observed cellphone use by teenagers leaving high schools in the afternoon changed little from 1-2 months before and 5 months after the restriction took effect on Dec. 1, 2006. About 11 percent of teenage drivers were seen using phones before the law. That percentage rose slightly to 12 percent in the postlaw survey. Cellphone use remained steady at about 13 percent at comparison sites in South Carolina, which doesn't restrict teenage drivers' phone use. When observed postlaw, less than 1 percent of teenage drivers in North Carolina were using hands-free phones. About 2 percent were observed dialing or texting and about 9 percent were holding a phone to their ear.

The study coupled driver observations with telephone surveys of North Carolina parents and their teenagers. In postlaw surveys, about two-thirds of teenagers said they knew about their state's law, compared with 39 percent of parents. Three-quarters of teenagers and 95 percent of parents said they approved of the law. The proportion of teenagers who reported using phones while driving declined somewhat following the law. However, of those who owned a phone and admitted to ever talking on the phone while driving, about half admitted they used their phones, if they had driven, on the day prior to the interview. There was no evidence of focused enforcement or publicity of the law. Only 22 percent of teenagers and 13 percent of parents believed the ban was being enforced fairly often or a lot.[17]

11 | **Is cellphone use more distracting to drivers than other tasks?**

Evidence is mixed. For example, some experimental studies found that phone conversations are more disruptive than conversations with passengers or adjusting a radio.[6] However, two statistical analyses combining the results of multiple experimental studies found similar decrements in reaction time for conversation tasks with passengers and with hand-held or hands-free phones.[5,7] Two studies suggest that talking on cellphones or having a 0.08 percent blood alcohol concentration (BAC) — the legal threshold for impairment — has a comparable effect on some simulated driving tasks.[18,19] However, the risks associated with alcohol impairment accumulate over the entire duration of a trip, whereas the risks of cellphone use generally apply for only a portion of a trip. In addition, crash risk increases substantially at very high BACs, and the implications of the experimental studies for drivers in their own vehicles is unknown.

12 | **Is texting while driving a problem?**

Over 600 billion text messages were sent in 2008. This is up nearly 4 times from the number sent in 2006, according to the Cellular Telecommunications and Internet Association.[1] Among drivers 30 and younger who own cell phones, nearly 40 percent said they send or read text messages while driving, based on the findings from a survey by Nationwide Insurance. There hasn't been a lot of research on texting and driving, but two studies of young drivers using driving simulators all found that receiving, and especially sending, text messages, led to decrements in driving behavior, particularly reaction time and lane keeping ability.[20,21]

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