

## **What's the Tweet? Distracted Driving Myths, Reality and Liability**

**David L. Fender, EdD, CSP, CSHM  
Associate Professor  
Murray State University  
Murray, KY**

### **Introduction**

According to National Highway Traffic Safety Administration (NHTSA), driver distraction is the cause of 16% of fatal crashes & 22% of injury crashes. The National Safety Council in January 2009 started a campaign to reduce distracted driving. They are using a three-prong approach by advocating legislation, educating public and businesses about the risk of cell-phone use while driving, and adding cell-phone training to the defensive driving course. In addition, the Department of Transportation has made distracted driving a major issue. This area is getting more and more attention, and individuals and employers need to understand the issues.

Objectives of this presentation:

- Review research on hazards of distracted driving.
- Make individuals more aware of their distracted driving habits.
- Discuss liability issues for companies

### **Research**

This is going to focus on what the research and data tells us and let the results guide our discussion. The definition of distracted driving is “Diversion of attention from driving because the driver temporarily focuses on non-driving object, task, event, or person which reduces awareness, decision-making, or performance leading to increased risk of crashes, near-crashes, or corrective action.” (*Source: International Conference on Distracted Driving*) Or said more simply—driving while doing other things.

The categories of distractions are:

- Visual—Eyes on road
- Mechanical—Hands on wheel
- Cognitive—Mind on driving

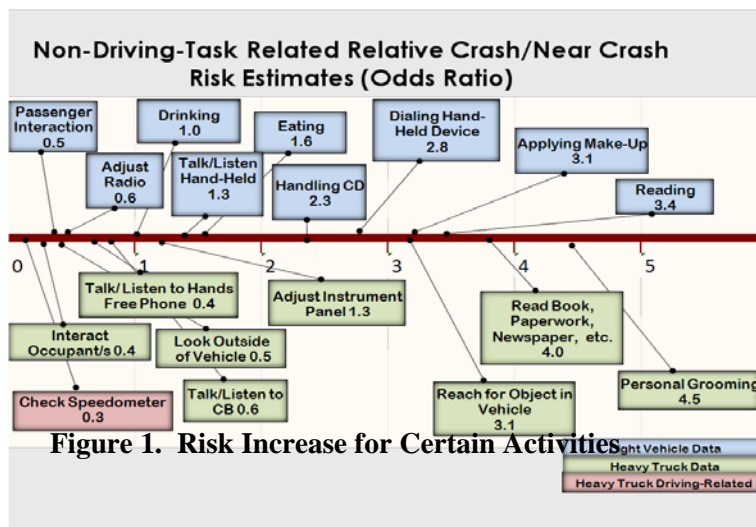
Examples of driving while focusing on something other than driving are:

- Reaching for something
- Looking at an external object
- Children
- Pets
- Grooming
- Smoking
- Using vehicle controls
- Reading and/or writing
- Eating and drinking
- Using electronic devices

According to Insurance.Com certain food items show up more frequently in accident reports. Their list of worst foods to eat while driving:

- Chocolate (messy)
- Soda (tilting your head back to drink)
- Jelly donuts (messy)
- Fried chicken (greasy steering wheel)
- Ribs and wings (greasy & messy)
- Hamburgers (greasy & messy)
- Chili dogs (messy)
- Tacos (messy)
- Soup (liquid + hot)
- Coffee (liquid + hot)

Research has not been done on all of these issues and some would be very difficult to research. One study that has addressed several of these issues is the NHTSA-sponsored Large-Scale Naturalistic Driving Study done by the Virginia Tech Transportation Institute (see Figure 1). The study used the drivers' own vehicles which were instrumented with video cameras and sensors. This study covered over 600 drivers for up to 18 months in length. They did 100,000 hours of driving, 7 million miles. One interesting finding was that 75% of drivers using cell phones committed traffic violations compared to 25% of drivers not using cell phones (Klauer, 2006).



Issues with this study:

- Hazard was noted based on how long eyes were off the road. This is not taking into account the cognitive issues.
- Some news outlets and cell-phone and auto manufacturers have used this study to say that talking on cell phones is not really that bad or that in-vehicle voice based systems are less risky because drivers do not have to take their eyes off the road to use them—this is a highly questionable conclusion because of the cognitive issues.

### Cell Phone Usage

A 1997 study published in the New England Journal of Medicine found that the crash risk was 4 times higher while using a cell phone. Reaction time indicated in Table 1 while driving and using a cell phone is worse than reaction time with driving under the influence of alcohol.

<b>Braking Distance at 70 MPH</b>		
<b>ITEM</b>	<b>Feet</b>	<b>Meters</b>
Normal reaction	102	31
Alcohol affected	114	35
Hands-free phone	128	39
Hand-held phone	148	45

**Table 1. Braking Distance**

### Hands-Held vs. Hands-Free

The theory that hands-free sets are safer has been challenged by the findings of several studies. Studies at the University of Utah published in 2001 and 2006 conclude that there is no significant difference in talking on a hands-free or hand-held cell phone and that conversations using any cell phone technology diverts the driver's mind from driving. Table 2 below shows a compilation of several studies.

<u>Variable or Condition</u>	<u>Mean Increase in Reaction Time (seconds)</u>	<u>Standard Deviation (seconds)</u>	<u>Number of Studies</u>	<u>Number of Participants</u>
<u>Task</u>				
<u>Handheld Phone</u>	<u>.21</u>	<u>.16</u>	<u>5</u>	<u>157</u>
<u>Hands-Free Phone</u>	<u>.18</u>	<u>.29</u>	<u>16</u>	<u>518</u>

**Table 2. Compilation of Hands-Free vs. Hand-Held Cell Phones Studies.**

The University of Utah conducted studies in 2003 and 2008 with 40 participants. They used a Crown Victoria simulator & hands-free phone. Conversation was on topics of interest to the driver. Tested by driving only and by driving and conversing on cell phones. Traffic density was both low and moderate as participants followed a pace car that would brake at random intervals. The results indicated that with cell phone use reaction time was increased, following distance was greater, and there were more rear-end collisions

#### Cell Phone vs. Drunk Driver—(BAC= 0.08 wt/vol)

- Compared to drunk drivers, cell-phone drivers
  - React slower
  - Increase following distance
    - Compensate by increasing following distance
    - Still more rear-end accidents
- When controlling for time on task and driving conditions, cell-phone drivers' performance is worse than that of the drunk driver

Redelmeier and Tibshirani (1997) in a study published in the New England Journal of Medicine 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. 465).

#### Text Messaging

Australian Study—while texting

- Time spent not looking at the road was 400 % greater.
- Variability in lane position increased 50 %.
- Missed lane changes increased 140 %.
- Variability in following distances increased 150 %.

#### **Summary of Texting**

- Text messaging drivers
  - Slower reaction times
  - Increased following distance
    - But: smaller minimum distance
    - Increase in rear-end accidents
- Text messaging exceeds cell phone conversations in accident risk

#### Cell Phone vs. Passenger Conversations

Study done at University of Utah (Drews, 2008) had the results that conversing with a passenger actually improved lane-keeping errors and talking on cell-phone more than doubled the errors. Drivers were instructed to take a particular interstate exit. 92% took correct exit without distractions, 88% took correct exit with a passenger, and 50% took correct exit talking on a hands-free cell phone. There were also more references to traffic with a passenger.

#### Summary

- **Cell-phone conversations**
  - More lane-keeping errors

- More navigation errors
- Fewer references to traffic
- **Passenger conversations**
  - Collaborative problem solving
  - Shared situation awareness
  - Passenger actively supports the driver

### Identify & React to a Target--Cornell University (October 2010)

Cornell technicians measured how accurately drivers recognized certain things while they heard silence, a dialogue, a halfologue and a monologue. Study showed that listening to half a conversation, such as a passenger talking on a cell phone, is most distracting, and there were more distractions and more errors than the other modes. So a passenger having a cell-phone conversation is distracting to the driver.

### **The Answers**

- Does conversing on a cell phone interfere with driving?
  - Yes
- What are the sources of the interference?
  - Peripheral interference (dialing)
  - Attentional interference (inattention blindness)
- Who is affected?
  - Younger and older drivers equally affected
- How significant is the interference?
  - Worse than listening to radio/books on tape
  - Worse than in-vehicle conversations
    - The cell conversation partner doesn't know when to keep quiet in tense driving situations
    - Passengers know when to stop talking
  - Worse than driving while legally intoxicated
    - BUT: Less significant than text messaging
- Is hands-free better than hand-held?
  - It doesn't matter which is used; it is the conversation that creates the distraction
  - The content of the conversation could be emotionally or cognitively difficult, without the conversation partner realizing it.

### How Dangerous Is Cell-Phone Distracted Driving?

- Cell phone distraction causes 5,474 deaths and 448,000 injuries in the United States every year, according to NHTSA
- *New England Journal of Medicine (1997)*
  - People that use mobile phones while driving are four times more likely to crash than those who do not.
  - The rate is equal to that of drunken driving at the .10 level. (.08 is considered legally impaired)
  - 636,000 crashes; \$43 billion, 6% of all vehicle crashes
- In an Australian study, drivers using cell phones were four times more likely to have crashes.

## Inattention Blindness



**Figure 2. Where Drivers Look When Driving.**

In a study performed by Transport Canada, the outlined blue boxes show where drivers looked. Left photo is not using a cell phone; right photo is using a cell phone. Individuals using cell phones also reduced monitoring of instruments and mirrors and made fewer glances to traffic lights and to traffic.

Inattention Blindness is a type of cognitive distraction or “looking” but not “seeing.” Hands-free drivers are less likely to see high and low relevant objects, visual cues, exits, red lights and stop signs, navigational signage, and content of objects.

## Brain Processes in Driving and Language

A study done at Carnegie Mellon University explains a lot of what is going on in the human brain when you talk while driving. They had experienced drivers steer a car in a virtual reality display while a MRI scan is being done. In some conditions, participants concurrently hear sentences that they judge to be true or false by pushing one of two mouse buttons held in their hand. The study showed that listening to a cell phone distracts drivers.

Drivers went down a winding road and had to decide whether a sentence they heard was true or false, and listening while driving led to a “significant deterioration in driving accuracy.” Drivers hit the guardrail and veered out into the other lane more often while listening. Listening resulted in a 37% decrease in parietal lobe activity. This lobe is associated with spatial processing (relating to the nature of space), so it is critical in navigation. There was also a decrease in the occipital lobe, which processes visual information. Our brains do not act in parallel, doing many things at once, but more in a serial fashion, doing one thing at a time but switching between tasks very fast.

Studies done by Vanderbilt University and Carnegie Mellon have demonstrated that when experiencing two tasks, one using visual information and one using auditory information, the auditory information takes precedent. Spoken language is especially distracting because processing is automatic; it can’t be “turned off” or ignored. Language processing takes away resources from another concurrent task. There are wide-ranging safety implications from this. You shouldn’t talk to someone performing a critical task, for their own safety.

## Walking and Cell Phones

Slightly more than 1,000 pedestrians went to emergency rooms in 2008 because of injuries received while they were using a cell phone. This is twice the number in 2007, which doubled from 2006. Distracted walking is no different than distracted driving.

The study was conducted by observing students walking through a square on the Western Washington University campus. Table below gives information regarding how distractions affect pedestrians.

Outcomes	Cell phone user	Single	Music player	Pair
Crossing time	82.5 sec	74.8 sec	73.7 sec	86.2 sec
Changed direction	29.8 %	4.7 %	11.1 %	17.3 %
Weaving	21.3 %	14.0 %	5.6 %	9.6 %
Acknowledge others	2.1 %	11.6 %	13.0 %	7.7 %
Stopped	4.3 %	2.3 %	9.3 %	11.5 %
Near collisions	4.3 %	0 %	1.9 %	0 %

**Table 3. How Distractions Affected Pedestrians.**

317 individuals were observed walking through a large open square on the university campus. Pedestrians using cell phones walked more slowly, changed directions more frequently, and were less likely to acknowledge other people. They were also less likely to notice an unusual activity along their walking route. This was shown by having someone in a clown suit riding a unicycle in the square. After individuals had passed the unicycling clown they were interviewed. When asked a general question “What did you see as you walked through the square” the cell phone users had the lowest correct percentage of those who had seen the clown. When asked directly about the clown, they were still the lowest who saw it. This corresponds to a study by Strayer (2003) that found that people in a driving simulator using a cell phone were as likely to look at objects, as someone not using a cell phone, but that they were less likely to remember the objects.

Question	Cell Phone user	Single	Music Player	Pair
What did you see?	8.3 %	32.1 %	32.1 %	57.1 %
Did you see the clown?	25.0 %	51.3 %	60.7 %	71.4 %

**Table 4. Percentage Who Recognized Clown on Unicycle.**

### Cell Phone Usage

According to NHTSA, people responded that within the past 30 days, 67% talked on cell phones while driving, 21% read or sent text or email and 40% of those 35 years old or younger text messaged. NHTSA says that in 2008 at any point in the day 12% of the drivers are on cell phones. A survey done by Nationwide Insurance showed that 81% of the drivers admitted that they had talked on their cell phone while driving.

A study at the University of Kansas study showed that among college students, 100% talk on cell phones while driving, 92% read texts while driving, 81% text while driving, 98% text at stop

lights, 75% use both hands when texting. A recent study at Murray State conducted by the ASSE Student Section showed that during 849 observations of individuals driving cars through two intersections that 20% were using some type of device (22% male, 36% of females).

Outlawing texting can have unintended consequences. A study by the Highway Loss Data Institute (2010) showed that 3 out of 4 states where texting was prohibited, crash rates increased. It is believed that people moved their phones more out of sight and thus had to divert their eyes from the road for longer periods. Just having a law is not enough; we need the law along with technology fixes and education campaigns.

### In-Vehicle Systems

A study performed at the University of Iowa demonstrated that so-called hands-free systems are not risk free. In this study individuals drove a simulator equipped with a voice-activated e-mail system. The system read e-mails received and they could speak replies. Brake reaction time increased by 30% most likely because of cognitive distraction (Lee, et al., 2001).

## **Liability and Legal Issues**

Currently, 50 countries restrict the use of cell phones while driving and 46 ban it completely. A ban on driving while talking on a hand-held cellular phone is in place in 9 states (California, Connecticut, Delaware, Maryland, New Jersey, New York, Oregon, Utah, and Washington) and the District of Columbia. As of February 2010, twenty-nine states have some restriction on cell phone usage in vehicles as well as some cities and counties. The use of all cellular phones by novice drivers is restricted in 28 states and the District of Columbia. The use of all cellular phones while driving a school bus is prohibited in 19 states and the District of Columbia.

Text messaging is banned for all drivers in 30 states (Alaska, Arkansas, California, Connecticut, Kentucky, Louisiana, Maryland, Minnesota, New Jersey, Tennessee, Utah, Virginia, and Washington) and the District of Columbia. In addition, novice drivers are banned from texting in 10 states (Delaware, Indiana, Kansas, Maine, Mississippi, Nebraska, North Carolina, Oregon, Texas, and West Virginia) and school bus drivers are banned from text messaging in 2 states (North Carolina, and Texas). 38 states currently have pending legislation on driving and cell-phone use or texting.

### Implications for Employers

Allowing employees to conduct business on cell phones while driving is to allow a 4 times increase in crash risk. One way to think of this is, Would factory or service workers be allowed to do their jobs in ways that were 4 times more likely to result in injury? Even higher risks are associated with text messaging, reading, and answering email while driving.

The issue of distracted driving has reached the courts and lawsuits are increasing, with employers being found liable for employees' distracted driving behaviors. You can assume that liability will flow to employers where it can be shown that injuries sustained by a plaintiff are due to an employee's use of a cell phone or other distraction in the course of their employment.

Employers should implement a cell-phone policy with a clear policy statement that details appropriate use, including alternatives and emergencies. Make sure you document training and



employee communication, have employees sign the policy, and enforce the policy. Although not a shield from a lawsuit, strictly enforced policies can help reduce risk of crashes, injury and costly lawsuits or settlements

The National Safety Council (NSC) recommends that company policy should at a minimum enforce state and municipal law and in addition should go beyond state law requirements to truly reduce risk for all drivers by banning all handheld and hands-free use, including talking and texting. According to NSC study 23.3% of member companies already have a policy banning both handheld and hands-free phone use while driving and another 34.6% ban hand-held devices. It is recommended that public and private institutions explore policies that cover driving on all property (National Safety Council, 2010).

### OSHA Policy

David Michaels, Assistant Secretary of Labor for OSHA in October 2010 letter to employers states that “It is your responsibility and legal obligation to have a clear, unequivocal and enforced policy against texting while driving” and “When OSHA receives a credible complaint that an employer requires texting while driving or who organizes work so that texting is a practical necessity, we will investigate and where necessary issue citations and penalties to end this practice.”

### Productivity

In a survey of NSC members, over 70% of employers saw an increase in productivity or no change following instituting a cell-phone policy. Over 65% observed increases or no change on employee morale based on the policy enactment. Only seven companies (1.5%) reported a decrease in employee productivity (National Safety Council, 2010).

The most common reason for resistance to employer policies is impact on productivity. Another common reason is employee accessibility which is related to productivity. When ExxonMobil implemented its cell-phone policy, it first implemented a pilot policy among the sales force which had concerns about productivity and revenue. The sales force was able to adapt its use of cell phones and the policy was then rolled out company-wide and ExxonMobil’s policy even requires its vendors to comply with the policy (See NSC website on distracted driving).



## Bibliography

### Risk of Using a Cell Phone While Driving: Key Research Studies

- Charlton, S., (2009). Driving while conversing: Cell phones that distract and passengers who react. *Accident Analysis & Prevention*, Volume 41, Issue 1, January 2009, Pages 160-173.
- Chen, L., Baker, S. P., Braver, E. R., & Li, G. (2000). Carrying passengers as a risk factor for crashes fatal to 16- and 17-year-old drivers. *Journal of the American Medical Association*, 283(12), 1578– 1582.
- Drews, F., Pasupathi, M., Stryer, D. Passenger and Cell Phone Conversations in Simulated Driving. *Journal of Experimental Psychology: Applied*, 2008, Vol 14, No 4, 392-400.
- Green. (2000). Crashes Induced by Driver Information Systems and What Can Be Done to Reduce Them. University of Michigan Transportation Research Institute.
- Klauer, S, Dingus, T., Neale, V. Sudweeks, J., Ramsey, D. The 100-Car Naturalistic Driving Study, Phase II - Results of the 100-Car Field Experiment. NHTSA, April 2006.
- Klauer, S; Dingus, T, Neale, V; Sudweeks, J, and Ramsey, D. (2006). Virginia Tech Transportation Institute. *The impact of driver inattention on near-crash/crash risk: An analysis using the 100-car naturalistic driving study data.* National Highway Traffic Safety Administration.
- Lissy, K.S., Cohen, J.T., Park, M.Y. & Graham, J.D. (2000). Cellular phone use while driving: Risks and benefits. Boston, MA: Harvard Center for Risk Analysis.
- Mazzae, E., Ranney, T., Watson, G., Wightman, J. Hand-Held or Hands-free? The Effects of Wireless Phone Interface Type on Phone Task Performance and Driver Preference. NHTSA.
- McEvoy, SP; Stevenson MR; McCartt AT; Woodward, M; Haworth, C; Palamara, P; and Cercarelli; R. (2005). Role of mobile phones in motor vehicle crashes resulting in hospital attendance: a case-crossover study. Insurance Institute for Highway Safety.
- Mobile phone use—Effects of Handheld and Hands Free Phones on Driving Performance. *Accident Analysis and Prevention*. 2005 Sep;37(5):902-909
- Nasar, J., Hecht, P., Wener, P. (2008). Mobile Phones, Distracted Attention and Pedestrian Safety. *Accident Analysis & Prevention*, Volume 40, Issue 1, January 2008, Pages 69-75.
- Nationwide Insurance, (2009). Driving While Distracted Public Relations Research. Fact Sheet.
- Redelmeier, D; and Tibshirani, R (1997). Association between cellular telephone calls and motor vehicle collisions. *New England Journal of Medicine*, 336; 453-458.
- Strayer, D., Johnston, W. (2001). Driven to Distraction: Dual-task studies of simulated driving and conversing on a cellular telephone. *Psychological Science*, Vol. 12, No.6, 462-466.
- Strayer, D; Drews, F; and Johnston, W. Phone-Induced Failures of Visual Attention During Simulated Driving. University of Utah. (2003). *Journal of Experimental Psychology* No. 1; 23-32.
- Strayer, D; Drews, F; and Crouch. Fatal Distraction? A Comparison of the Cell-Phone Driver and the Drunk Driver. Department of Psychology, University of Utah. PROCEEDINGS of the Second

International Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design.

Stutts, J., Reinfurt, D., Staplin, L., and Rodgman, E. [The role of driver distraction in traffic crashes](#). (2001). AAA Foundation for Traffic Safety.

### **International Symposium on Distracted Driving**

The National Safety Council and Nationwide Insurance sponsored the symposium (Oct. 14-15, 2008) to review scientific studies on the issue, gain a better understanding of the scope of distracted driving, and determine possible solutions to the problem. Below are references from this symposium.

[National Safety Council 2008 International Symposium on Distracted Driving](#)

#### **Opening Remarks**

David Teater, Co-Founder and Director, Aegis Mobility, Inc.

### **Understanding the Science of Distracted Driving**

[A meta-analysis of driving performance and crash risk associated with the use of cellular](#)  
Caird, et al. Department of Psychology University of Calgary, Honeywell, Human Factors North.  
PROCEEDINGS of the Third International Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design.

[Driver Distraction: A view from the simulator](#)

Dr. Frank Drews, Associate Professor of Cognitive Psychology, University of Utah

[Brain limitations on multitasking while driving](#)

Dr. Marcel Just, D.O. Hebb Professor of Psychology and Director, Center for Cognitive Brain Imaging, Carnegie Mellon University

### **Possible Solutions: Part I – Legislation and Laws**

[Distracted Driving: Can We Legislate the Problem Away?](#)

Dr. Anne McCartt, Vice President, Research, Insurance Institute for Highway Safety

[Distracted Driving Recommendations – Transferring Research and Investigations into Law](#)

Kevin Quinlan, Chief, Safety Advocacy Division, National Transportation Safety Board

### **Possible Solutions: Part II – Public Education**

[Nationwide Insurance Distracted Driver Survey](#)

Bill Windsor, Assistant Vice President, Office of Safety, Nationwide Insurance

[Reducing the impacts of distracted driving on fatalities and injuries through an approach based on public education and the use of multiple methods](#)

Neil Arason

### **Possible Solutions: Part III - Employer Policies**

#### [Strategies for Promoting and Supporting Wireless Communication Device Free Driving Policies](#)

Dr. Louis Francescutti, Professor, School of Public Health and Department of Emergency Medicine, University of Alberta; Coalition for Cellphone-Free Driving

#### [Hang Up For Employees](#)

John Kageorge, Media Relations Manger, AMEC

Lies, M. A., Newman, M. (2010). Addressing distracted driving: Employers need to keep their eyes on the road. Seyfarth & Shaw, Attorneys, LLP, Chicago, IL. Found at [www.seyfarth.com](http://www.seyfarth.com).

### **Possible Solutions: Part IV – Technology**

#### [Technology Solutions to Driver Distraction/Overload](#)

Dr. Paul Green, Research Professor, Human Factors Division, University of Michigan Transportation Research Institute

#### [Mediating Distracted Driving](#)

David Teater, Co-Founder and Director, Aegis Mobility, Inc.

(End Symposium Listings)

### **Text Messaging**

Drews, F.S., Yazdani, H., Godfrey, C.N., Cooper, J.M., & Strayer, D.L. (2009). Text Messaging During Simulated Driving. *Human Factors: The Journal of Human Factors and Ergonomics Society*. Vol 51, No. 5, 762-770.

Hosking, S.G., Young, K.L., & Regan, M.A. (2009). The Effects of Text Messaging on Young Drivers. *Human Factors: The Journal of Human Factors and Ergonomics Society*. Vol 51, No. 4, 582-592.

#### [The Effect of Text Messaging on Driver Behavior: A Simulator Study](#) Reed & Robbins.

Published Project Report PPR 367. Transport Research Laboratory (2008)

### **Other Studies**

Atchley, P., Atwood, S. & Boulton, A. (2010). The choice to text and drive in younger drivers: Behavior may shape attitude. *Accident Analysis and Prevention*. 43 (2011) 134-142.

Collett, C., Clarion, A., Morel, M., Chapon, A., & Petit, C. (2009). Physiological and behavioral changes associated to the management of secondary tasks while driving. *Applied Ergonomics* Vol. 40, p. 1041-1046.

Dismukes, Berman, & Loukopoulos (2007). *The Limits of Expertise: Rethinking Pilot Error and the Causes of Airline Accidents* (Ashgate Publishing)

Hedlund, J., Simpson, H. and Mayhew, D. (April, 2006) *International Conference on Distracted Driving, Summary of Proceedings and Recommendations*. Conference held in Toronto, Ontario, Canada. Retrieved from [www.distracteddriving.ca](http://www.distracteddriving.ca) .

Hyman I.E., Boss, S.M., Wise, B.M., McKenzie, K.E., & Caggiano, J.M. (2009). Did You See the Unicycling Clown? Inattentional Blindness while Walking and Talking on a Cell Phone. *Applied Cognitive Psychology*. DOI: 10.1002.

Loukopoulos, Dismukes, & Barshi (2009). *The Myth of Multitasking: Managing Complexity in Real-World Operations* (Ashgate Publishing)

Loukopoulos, Dismukes, & Barshi (August 2009). The perils of multitasking *Aviation Safety World*, 18-23.

Nelson, E., Atchley, P., (2009). The effects of perception of risk and importance of answering and initiating a cellular phone call while driving. *Accident Analysis and Prevention*, (2009), 10, 1016.

Richtel, M. (2010). Forget Gum. Walking and Using Phone is Risky. *New York Times*, January 17, 2010.

Strayer, D.L., Drews, F.A., & Crouch, D.J. (2006). A Comparison of the Cell Phone Driver and the Drunk Driver. *Human Factors: The Journal of Human Factors and Ergonomics Society*. 48, No. 2, 381-391.

Strayer, D.L., Drews, F.A. (2007). Cell-Phone–Induced Driver Distraction. *Current Directions in Psychological Science*. 16, No. 3, 128-131.

White, J.B. (October, 2009) Why Driving A Car Has Never Been Safer. *Wall Street Journal*. October 21, 2009. p. D3.

[Effects of Simulator Practice and Real-World Experience on Cell-Phone–Related Driver](#). Cooper & Strayer. *Human Factors* 2008; 50(6): pp. 893–902

[Distractions in Everyday Driving](#). Stutts, et al. University of North Carolina at Chapel Hill Highway Safety Research Center (2003) AAA Foundation for Traffic Safety.

[Mobile telephone simulator study](#). Kircher, et al. Swedish National Road and Transport Research Institute (2004)

[The Use of Mobile Phones in Road Traffic, SNRA inquiry into the use of mobile phones and other IT systems while driving](#). Patten, et al. (2003). Swedish National Road Administration.

[Predicting the effects of in-car interface use on driver performance: an integrated model approach](#) Salvucci. *Int. J. Human-Computer Studies* (2001) 55, 85}107

### **Meta-Analyses & Literature Reviews**

These studies have aggregated the results of many studies into single analysis papers.

[Is a hands-free phone safer than a handheld phone?](#) Ishigami & Klein. *Journal of Safety Research* 40 (2009) 157–164.

[Analysis of the Literature: The Use of Mobile Phones While Driving](#). Brace, Young & Regan.

Monash University Research Centre (2007).

[Cell phones and driving: review of research](#) McCartt, Hellinga, Braitman. 2006. *Traffic Injury Prevention* 7:89-106.

[The Impact of Cell Phone Conversations on Driving, A Meta-Analytic Approach](#) Horrey & Wickens. Technical Report. University of Illinois at Urbana-Champaign (2004).

[Effects of Cellular Telephones on Driving Behaviour and Crash Risk: Results of Meta Analysis](#) Caird, et al. CAA Foundation for Traffic Safety (2004).

### **Hands-Free Devices**

[Analysis of the Literature: The Use of Mobile Phones While Driving](#) Brace, Young & Regan. Monash University Research Centre (2007).

[Driving performance while using cell phones: an observational study](#) Rosenbloom. *Journal of Safety Research*, Volume 37, Issue 2, 2006, Pages 207-212

[The Impact of Auditory Tasks \(as in Hands-Free Cell Phone Use\) on Driving Task Performance](#) Insurance Corporation of British Columbia (ICBC) Transportation Safety Research (2001).

[Mobile phone use—Effects of Handheld and Handsfree Phones on Driving Performance](#) Törnros & Bolling. *Accident Analysis and Prevention*. 2005 Sep;37(5):902-9

Lee, J.D., Caven, B., Haake, S., Brown, T.L. (2001). Speech-based interaction with in-vehicle computers: The effect of speech-based e-mail on drivers' attention to the roadway. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 42, 4, pp 631-640.

### **Cognitive Distraction**

[A decrease in brain activation associated with driving when listening to someone speak](#). Just, et al. *Brain Research* 1205 (2008) 70-80.

[Telephone conversation impairs sustained visual attention via a central bottleneck](#). Kunar, et al. *Psychonomic Bulletin & Review* 2008, 15 (6), 1135-1140.

[Using mobile telephones: cognitive workload and attention resource allocation](#) Patten, et al. *Accident Analysis and Prevention* 36 (2004) 341–350.

[Cell Phone Induced Perceptual Impairments During Simulated Driving](#) Strayer, et al. Department of Psychology, University of Utah (2001).

Bellinger, D. B., Budde, B. M., Machida, M., Richardson, G. B., & Berg, W. P. (2009). The effect of cellular telephone conversation and music listening on response time in braking. *Transportation Research Part F: Traffic Psychology and Behaviour*, 6 (12), 441-451.

Emberson, L.L., Lupyán, G., Goldstein, M.H., Spivey, M.J. (2010). Overheard cell-phone conversations: when less speech is more distracting. *Psychological Science*, 21 (10), 1383-1388.

Ensar Becic, Gary S. Dell, Kathryn Bock, Susan M. Garnsey, Tate Kubose, & Arthur F. Kramer. (2010). Driving impairs talking. *Psychon Bull Rev* 2010 17:15-21; doi:10.3758/PBR.17.1.15.

Harbluk, J. L., Noy, Y. I., Trbovich, P. L., & Eizenman, M. (2007). An on-road assessment of cognitive distraction: Impacts on drivers' visual behavior and braking performance. *Accident Analysis and Prevention*, 39 (2), 372-378.

Noy, Y. I. *Human Factors Issues Related to Driver Distraction From In-Vehicle Systems*. [PowerPoint slides]. Retrieved from [http://www.safercar.gov/staticfiles/DOT/NHTSA/NRD/Multimedia/PDFs/Crash Avoidance/Driver Distraction/NoyI\\_ppt.pdf](http://www.safercar.gov/staticfiles/DOT/NHTSA/NRD/Multimedia/PDFs/CrashAvoidance/Driver%20Distraction/NoyI_ppt.pdf)

Strayer, D.L., Watson, J.M., Drews, F.A. (2011). Cognitive distraction while multi-tasking in the automobile. *Psychology of Learning and Motivation*, Vol. 54. p 29-58.

### **Prevalence & Observation Studies**

These studies estimate how many drivers are using cell phones.

[An Examination of Driver Distraction as Recorded in NHTSA Databases](#). (2009) NHTSA Traffic Safety Facts Research Note DOT HS 811 216.

[Driver Electronic Device Use in 2008](#). (2009) NHTSA Traffic Safety Facts Research Note DOT HS 811 184.

[Driver Electronic Device Use in 2007](#). (2008) NHTSA Traffic Safety Facts Research Note DOT HS 810 963.

[Driver Cell Phone Use in 2006 — Overall Results](#). Glassbrenner & Ye. (2007) NHTSA Traffic Safety Facts Research Note DOT HS 810 790.

[Driver Cell Phone Use in 2005 — Overall Results](#) Glassbrenner. (2005) NHTSA Traffic Safety Facts Research Note DOT HS 809 967.

[Passenger Vehicle Driver Cell Phone Use Results from the Fall 2000 National Occupant](#). Utter. (2001) NHTSA Research Note DOT HS 809 293

[Observed Driver Phone Use Rates in Canada](#) Burns, Lécuyer, Chouinard. Transport Canada (2008) Proceedings of the 18th Canadian Multidisciplinary Road Safety Conference.

### **Evaluations of Laws**

These papers share findings of the effectiveness of laws that address wireless device use while driving.

[Longer-term effects of Washington, DC, law on drivers' hand-held cell phone use](#). McCartt & Hellinga. *Traffic Inj Prev*. 2007 Jun;8(2):199-204.



[Effects of Washington, D.C. law on drivers' hand-held cell phone use.](#) McCartt, Hellinga, Geary. Traffic Inj Prev. 2006 Mar;7(1):1-5.

[Longer term effects of New York State's law on drivers' handheld cell phone use.](#) McCartt & Geary. Inj Prev. 2004 Feb;10(1):11-5.

[Drivers' use of handheld cell phones before and after New York State's cell phone law.](#) McCartt, Braver, Geary. Prev Med. 2003 May;36(5):629-35.

### **Public Opinion Surveys**

[2009 Traffic Safety Culture Index.](#) AAA Foundation for Traffic Safety, 2009.

[The Harris Poll. Large majority of drivers who own cell phones use them while driving even though they know this is dangerous.](#) Harris Interactive, 2009.

### **Reports**

[NHTSA Status Summary: Using Wireless Communication Devices While Driving.](#) July 2003 report. Obtained via Freedom of Information Act and published by the New York Times.

[Cell Phone Use.](#) Monteressi. ExxonMobil Biomedical Sciences Inc.

[National Safety Council.](#) (2010). Understanding the Distracted Brain. Found at [www.distracteddriving.nsc.org](http://www.distracteddriving.nsc.org).

### **Conferences and Events**

[USDOT NHTSA Distracted Driving Summit, 2009](#)

USDOT NHTSA Distracted Driving Summit, 2010

[Traffic Injury Research Foundation \(TIRF\) 2005 International Conference on Distracted Driving](#)

\* Many of these references, particularly those that have links, were provided by the National Safety Council.