

Testimony of Dr. Sheila Klauer, Ph. D.

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**to the Transportation Committee
of the Pennsylvania House of Representatives**

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Mr. Chairman, I would like to thank you, and the other members of the Transportation Committee, for the opportunity to testify before you today on the very important topic of distracted driving. I am hopeful that my testimony will give you a unique and valuable perspective as you weigh the important policy decisions surrounding this issue.

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My name is Sheila Klauer. I am a senior research associate at the Virginia Tech Transportation Institute, and I am testifying before you today as a driving safety researcher with unique experience in the collection of naturalistic instrumented vehicle data. Recently, I served as the project manager for the 100-Car Naturalistic Driving Study and as a Principal Investigator for several studies involving the subsequent analyses of these data. These analyses constitute the most comprehensive analysis of driving distraction, to-date. Currently, I am the Co-Principal Investigator of the 40 Teen Naturalistic Driving Study where we are studying the driving behaviors and performance of teenagers beginning at licensure and continuing over an 18 month period.

My work in the field of driver inattention has resulted in 24 technical reports and publications. During this time I have worked with the National Highway Traffic Safety Administration, AAA Foundation for Traffic Safety, the National Institutes of Health, and the Transportation Research Board- a branch of the National Academies of Science in the conduct of research and evaluation activities associated with the issue under consideration today.

There are several important points that must be carefully considered in determining an appropriate action to solve this growing problem. I would like to highlight the importance of these points for your consideration.

THE DISTRACTION ISSUES THAT WE FACE TODAY ARE MUCH DIFFERENT, AND HAVE THE POTENTIAL TO BE A MUCH GREATER PUBLIC HEALTH RISK, THAN THE DISTRACTION ISSUES THAT WE HAVE FACED IN THE PAST. There are two reasons for this:

First, many of the electronic devices now used, and planned for use, in automobiles require greater visual and cognitive attention from the driver than do conventional tasks. Driving distraction, an old problem, has entered a new dimension. Historically, secondary tasks performed in a moving vehicle have been, for the most part, relatively simple. Tuning a radio or eating represent some of these common tasks. While it is true that these tasks divert attention away from the roadway and cause crashes, analyses of some of the more current and popular electronic devices and those under development for use in automobiles, show that they increase the risk of a crash more significantly than the simpler common tasks just described. The results of the 100 Car Study, which observed driver behavior in the seconds leading up to a crash, indicated that when drivers are

engaging in tasks that involve multiple eyeglances away from the forward roadway and/or multiple button presses, the driver's crash risk is increased by 2-3 times that of an alert driver. Simple tasks, like drinking morning coffee, adjusting the radio, or talking to an adult passenger do not increase crash risk significantly.

With the proliferation of electronic devices in our culture including cell phones, MP3 players, and blackberries, both the visual and cognitive aspects of distraction are much greater and more dangerous than ever before. Even more concerning is how ubiquitous these devices are in our teenage culture. Teens, who represent 24% of all traffic fatalities, and are the most inexperienced drivers on the roadway, are using these devices frequently. The results from the 100 Car Study indicated that the 18-20 year old drivers were involved in 4 times the number of inattention related crashes and near-crashes than any other age group.

I would like to demonstrate this by showing the following video clip that was identified as a near-crash in the 100-Car Study. There were 5 cameras in the vehicle including the forward view, the driver's face view, an over-the-shoulder view, and the fourth quadrant is split once again with the top half representing a look backward out the passenger window, and the bottom half showing the rear-view of the vehicle. This particular driver is 19 years old and is apparently lost in a middle class suburban neighborhood. She picks up her phone to dial but please pay attention to the forward view... Had she not looked up at that critical moment, this could have been a devastating life event.

The second clip is a teen driver from the 40 Teen Study. In this clip, the lower, right quadrant shows the rear-view only. This teen driver frequently drives while talking on her cell phone, texting, using her iPod, etc. Please pay close attention to the rear-view...she is using her iPod, puts it down, adjusts the radio and nearly misses the fact that traffic is suddenly stopping in front of her. The truck also nearly hits her...she braked at 0.9g to stop in time which is a very aggressive braking maneuver. How this truck avoided her and did not go off the road on the other side is amazing. Notice that he was completely on the shoulder in his attempt to recover from the maneuver.

The second reason that distraction issues are a much greater health risk today is due to the rate of deployment. The rate of deployment of this technology is occurring at a record setting pace that is outpacing our full understanding of the public health impacts. For all practical purposes, we are allowing many devices to be used in moving vehicles without fully understanding how they affect safety. In many ways, this is analogous to allowing a drug company to release a new drug on the market without fully understanding its side effects.

Many will argue that the true extent of this threat to public safety cannot currently be estimated precisely and therefore action is not appropriate. Using the new drug analogy, one could argue that action is necessary *because* we do not fully understand the threat to public safety. To be certain about the safety impact of these devices, vehicle crash data must be collected in the proper form for a period of several years. Even the process of determining what data to collect and how to collect it is considerably slow. For example,

many states still do not collect data indicating whether or not a cell phone was in use at the time of the crash. Thus, if we wait until we have very accurate data to act, the data will likely tell us that hundreds of thousands of crashes and thousands of fatalities have resulted from delayed action.

Despite our inability to make a precise estimate about the true risk to public health, a growing number of studies and analyses are in existence that shed light on this important issue. Specifically, a number of studies have investigated the risk associated with the recent "explosion" in cell phone use over the past several years. The 100- Car Study suggested that cell phone use contributes to approximately 6% of the crashes and near-crashes occurring in an urban area or over 100,000 crashes per year nationwide, based on GES, a national crash database.

The most methodologically sound estimates for fatalities associated with cell phone use range between 300 and 1,000 for last year with estimates as high as 2,000 fatalities per year. It is important to note that these estimates represent only the "tip-of-the-iceberg" since: 1) the use of cell phones is increasing at a rapidly accelerating rate, and, 2) the figures do not include the impact of other rapidly emerging technologies such as MP3 players and mobile internet devices.

WHILE THERE ARE SAFETY BENEFITS THAT WILL BE REALIZED WITH THE DEPLOYMENT OF ELECTRONIC DEVICES, THESE BENEFITS CAN BE ATTAINED ONLY IN VEHICLES ENGINEERED TO MINIMIZE DRIVER DISTRACTION.

Many in-vehicle technologies promise to make driving safer. These technologies include collision-warning systems, night vision systems, and "Mayday" alert systems. In addition, studies have shown that cell phones do in fact have significant safety benefits such as reducing the response time of emergency personnel in the case of a crash.

However, while these electronic devices have shown some safety benefits, these benefits can be fully realized only when they are incorporated in systems that are designed to minimize distraction in a moving vehicle. That is, with prudent design and selective restrictions, it may be possible to enhance safety as part the electronic revolution in the automobile instead of increasing crashes and fatalities. For example, a cell phone that can only be used to contact emergency or law enforcement personnel by using a simple interface would allow an obvious safety benefit to be realized while minimizing the associated safety decrement.

THE PROBLEM OF DRIVER DISTRACTION ASSOCIATED WITH ELECTRONIC DEVICES IS MULTI-DIMENSIONAL, REQUIRING MULTIPLE SOLUTIONS.

There are important differences in the deployment of electronic technology in the automobile. Specifically, the major differences exist between devices that are designed to be used in-vehicle and portable devices that are carried by consumers into vehicles.

In-vehicle devices. Automotive stakeholders in this mobile information revolution have recognized the potential risk to the public. Automobile manufacturers and suppliers have already taken measures to improve design and provide the appropriate functionality of *in-vehicle* systems. It is important for the government to continue to support the ongoing efforts by these stakeholders to address the distraction issue through *design and implementation of safer devices*. Specifically, the following considerations are important for in-vehicle devices:

- Human factors design principles should be followed, such as limiting visual information complexity and maximizing display legibility and speech intelligibility.
- Provide appropriate functionality of devices, including limiting functionality in some cases, in a moving vehicle. This will be necessary as more electronic convenience features become commonplace.
- Develop a consistent driver interface among manufacturers for selected driver interface functions. This can significantly reduce the task load required and therefore can reduce distraction.
- Use properly designed “hands-free” devices when effective. Hands-free operation can reduce visual distraction relative to manual-control/visual display devices. However, Voice Activated Control (VAC), as any other interface, requires careful design and development. When properly implemented, VAC can provide an appropriate alternative method of input.
- Hands-free devices, although advantageous in many instances, may also pose risk. Where feasible, care should be taken to limit “cognitive distraction” through simplification of design and messaging.

I believe that in general the automotive industry is currently taking appropriate action to protect public safety. Most automobile manufacturers and some major suppliers are actively engaged in research, product evaluation, and standards development activities aimed at safely deploying electronic devices. As long as this activity continues and results in devices that limit functionality and minimize driver distraction, I believe that no regulatory action is necessary.

Portable devices. Of greater concern than the design of in-vehicle devices is the introduction of portable devices into cars and trucks. These devices include standard cell phones, cell phones that have additional wireless features such as internet access, personal digital assistants and portable computers.

In general, portable devices are not designed to be safely used by the driver in a moving vehicle. In addition, unlike in-vehicle devices, vehicle manufacturers and suppliers do not have any control over their functionality or design.

PUBLIC AWARENESS AND EDUCATION PROGRAMS ARE AN IMPORTANT PART OF THE SOLUTION TO THE DRIVER DISTRACTION PROBLEM, BUT THEY WILL BE INSUFFICIENT IN AND OF THEMSELVES.

Many organizations, including the wireless communication industry, have recognized the hazards associated with electronic devices. Several are embarking upon public awareness programs aimed at reducing distraction-induced crashes by educating drivers about the consequences of distraction and persuading them to limit associated activities. There are many historical examples of the effectiveness of such public awareness campaigns. Examples include seat belts, drinking and driving, motorcycle helmets, and many non-driving related public health initiatives. This historical perspective tells us that such a campaign will help reduce unsafe behavior associated with electronic devices. However, the effectiveness, in terms of people influenced to behave safely, for even a successful public persuasion program will be in the range of 20-25%. Therefore, while such endeavors are important and should be supported, they will not be sufficient in and of themselves.

From this perspective, I believe that additional laws and enforcement methods aimed at limiting the use of portable devices in moving vehicles may be necessary to provide a complete set of countermeasures to the distraction problem and provide adequate protection for the driving public.

CONCLUSION

Driving distraction associated with electronic devices has the potential to pose a serious public health risk. Due to this potential risk and the rapid rate of deployment of this technology, quick and decisive action is needed. However, in-vehicle devices also have been shown to enhance safety in some cases. Therefore, measured action is also warranted so that solutions enacted with good intent do not stifle the improvements in driving safety. Based upon this logic I recommend the following:

- **Enhance support of government and government/industry cooperative research to determine the causes and effects of driver distraction and the promotion of safe electronic technologies.** Driver distraction is a complex issue that requires further research to effectively support the rapid evolution of technology development. A critical part of this activity includes the improvement of pre-crash and crash data collection methods to better understand distraction as a causal and contributing factor in crashes. It is important that such legislation does nothing to stifle the continued development of technologies that can potentially improve driving safety.
- **Continue the support and development of public awareness and persuasion campaigns to lessen the impact of the distraction problem.** Such programs can have a positive impact and can be instituted relatively quickly.
- **Consider measured legislation limiting the use of portable hand held devices in moving automobiles.** I believe that the use of any portable hand held device should be banned for drivers under the age of 18 years. This wireless device ban should also be passed as a primary offense with consequences. Research has shown that without enforcement or true consequences, such a ban will not significantly alter teen drivers?

behavior. This measured legislation should contain a caveat for a true emergency situation which would allow a teen to call 911 or parents without penalty. The extensive research on teen drivers' inability to accurately detect hazards coupled with the knowledge that they are using electronic devices while driving will undoubtedly lead to increased crash rates. Based on recent trends, these devices will become more common and with ever-increasing functions which can distract the driver (functions such as video, text-messaging, and internet access). Teenagers are already over-represented in automobile fatality rates and we should not allow this situation to become worse.

Again, thank you very much for giving me the opportunity to testify before you on this important issue. I will be willing to answer any questions that you have regarding this issue. Feel free to contact me at the address on the cover page of my written testimony, (540) 231-1564, or cklauer@vti.vt.edu.