National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: February 8, 2012

In reply refer to: H-11-39

50 states[1] and District of Columbia
(See attached distribution list.)

The National Transportation Safety Board (NTSB) is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, and making recommendations to prevent similar accidents from occurring. We are providing the following information to urge you to take action on the safety recommendation in this letter. The NTSB is vitally interested in this recommendation because it is designed to prevent accidents and save lives.

The recommendation addresses the need to ban the nonemergency use of portable electronic devices (other than those designed to support the driving task) for all drivers, supported by high visibility enforcement and targeted communication campaigns. This recommendation is derived from the NTSB's investigation of a multivehicle collision that occurred near Gray Summit, Missouri, on August 5, 2010, as traffic slowed in the approach to an active work zone on eastbound Interstate 44 (I-44), and motor vehicles merged from the closed left lane to the right lane. A 2007 Volvo truck-tractor with no trailer was traveling eastbound in the right lane and had slowed or stopped behind traffic. About 10:11 a.m. central daylight time, a 2007 GMC Sierra extended cab pickup truck merged from the left to the right lane and struck the rear of the Volvo tractor. This collision was the first in a series of three.

A convoy of two school buses from St. James High School, St. James, Missouri, was traveling eastbound in the right lane of I-44, approaching the slowed traffic and the collision ahead. Their destination was the Six Flags St. Louis amusement park in Eureka, Missouri. The lead bus was a 71-passenger school bus, occupied by 23 passengers. Following closely behind the lead bus was a 72-passenger school bus, occupied by 31 passengers. Seconds after the lead bus passed a motorcoach that had pulled over and stopped on the shoulder, it struck the rear of the GMC pickup. This collision—the second in the series—pushed the pickup forward, overturning it onto the back of the Volvo tractor. The front of the lead bus was ramped upward,

[1] The state of Missouri received a separate recommendation letter, which contained this recommendation as well as six other recommendations unrelated to the use of portable electronic devices.

as it came to rest on top of the GMC pickup and the Volvo tractor. Moments later, the following school bus struck the right rear of the lead bus.

The driver of the GMC pickup and one passenger seated in the rear of the lead school bus were killed. A total of 35 passengers from both buses, the 2 bus drivers, and the driver of the Volvo tractor received injuries ranging from minor to serious. Eighteen people were uninjured.[2] As a result of this investigation, the NTSB has issued 13 safety recommendations, 1 of which is addressed to the 50 states and the District of Columbia. The recommendation is consistent with the evidence we found and the analysis we performed. Information supporting this recommendation is discussed below. The NTSB would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendation.

The NTSB determined that the probable cause of the initial Gray Summit collision was distraction, likely due to a text messaging conversation being conducted by the GMC pickup driver, which resulted in his failure to notice and react to a Volvo tractor that had slowed or stopped in response to a queue that had developed in a work zone. The second collision, between the lead school bus and the GMC pickup, was the result of the bus driver's inattention to the forward roadway due to excessive focus on a motorcoach parked on the shoulder of the road. The final collision was due to the driver of the following school bus not maintaining the recommended minimum distance from the lead school bus in the seconds preceding the accident. Contributing to the severity of the accident was the lack of forward collision warning systems on the two school buses.

There is evidence that the driver of the GMC pickup may have been distracted immediately before the initial collision. Records from the cellular telephone provider indicate that from 9:58–10:09 a.m., the driver received 5 text messages and sent 6—for a total of 11 messages. Because the records do not document transmission times to the second, the final incoming message could have arrived at any time between 10:09:00–10:09:59 a.m. This pattern of communication strongly suggests that the driver was in an active text messaging conversation; because the final exchange was an incoming text, it can be assumed that it was the driver's turn to reply.

A witness traveling near the GMC pickup reported that the driver appeared to lean to the right before the pickup struck the rear of the Volvo tractor. The witness stated that he did not see brake lights illuminate, which is consistent with data from the pickup's sensing and diagnostic module, indicating that the brakes were not applied in the last second prior to impact. The driver of the pickup might have been engaged in reading an incoming text, typing an outgoing text, or leaning to the right to retrieve his cell phone. The NTSB concluded that the absence of a timely brake application, the cellular provider records indicating frequent texting while driving, the temporal proximity of the last incoming text message to the collision, and the witness statement regarding the driver's actions indicate that the GMC pickup driver was most likely distracted from the driving task by a text messaging conversation at or near the time of the accident.

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[2] For additional information, see *Multivehicle Collision, Interstate 44 Eastbound, Gray Summit, Missouri, August 5, 2010*, Highway Accident Report NTSB/HAR-11/03 (Washington, DC: National Transportation Safety Board, 2011), which is available on the NTSB website at <http://www.ntsb.gov/>.

The National Highway Traffic Safety Administration (NHTSA) estimates that in the year 2009, nearly 5,500 people died and 450,000 people were injured in distraction-related accidents.[3] The findings from analysis of police-reported crashes indicate that 11 percent of crashes involve some form of distraction. NHTSA's "100-car study" found that 23 percent of recorded crashes can be attributed to driver distraction.[4] Texting while driving is one distraction that has consistently been found to impair driving performance. A study of commercial driver distraction conducted by the Virginia Tech Transportation Institute (VTTI) found that drivers were 23 times more likely to experience a safety-critical event when they were involved in texting.[5] In one simulator study, drivers engaged in text messaging had slower reaction times (35 percent slower) and poor lateral vehicle control.[6] Another simulator study found that sending and receiving text messages led to poorer performance on safety-critical driving measures, including lateral position maintenance, detection of road signs, and time with eyes off the road.[7] A fourth study reported that texting drivers in a simulator responded more slowly to the onset of brake lights and demonstrated forward and lateral control impairments. In addition, text-messaging drivers were involved in more simulated crashes.[8] A Texas Transportation Institute study found that drivers responded more slowly when either reading or writing text messages.[9]

In addition to texting devices, the use of other forms of portable electronic devices[10] (such as music players and gaming units, cell phones, and computer tablets) has been found to result in visual, auditory, manual, and cognitive distractions—which have been shown to increase the likelihood of an accident. A VTTI study found that, among light vehicle drivers, the use of handheld wireless devices was the most common type of distraction and resulted in the most near crashes.[11] A safety-critical event was 6.7 times more likely when a driver was reaching for or using an electronic device, such as a cell phone.[12] A VTTI study of commercial drivers found that a safety-critical event was 163 times more likely if a driver was texting, e-mailing, or

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[3] See <http://distraction.gov/stats_and_facts/index.html>, accessed October 26, 2011.

[4] S. Klauer and others, *The Impact of Driver Inattention on Near-Crash/Crash Risk, An Analysis Using the 100-Car Naturalistic Driving Study Data*, Report No. DOT-HS-810-594 (Washington, DC: National Highway Traffic Safety Administration, 2006).

[5] R. Olson and others, *Driver Distraction in Commercial Vehicle Operations*, Report No. FMCSA-RRR-09-042 (Washington, DC: Federal Motor Carrier Safety Administration, 2009).

[6] N. Reed and R. Robbins, *The Effect of Text Messaging On Driver Behavior: A Simulator Study* (Berkshire, UK: Transport Research Laboratory, 2008).

[7] S. Hosking, K. Young, and M. Regan, "The Effects of Text Messaging on Young Novice Driver Performance," *Distracted Driving* (Sidney, NSW: Australasian College of Road Safety, 2007), pp. 155–187.

[8] F. Drews and others, "Text Messaging During Simulated Driving," *Human Factors*, vol. 51, no. 2 (2009).

[9] J. Cooper, C. Yager, and S. Chrysler, *An Investigation of the Effects of Reading and Writing Text-Based Messages While Driving*, Report No. 476660-00024-1 (College Station, Texas: Texas Transportation Institute, August 2011).

[10] This use includes, but is not limited to, dialing, answering, e-mailing, accessing the Internet, and viewing, reaching, locating, and operating portable electronic devices.

[11] T. Dingus and others, *The 100-Car Naturalistic Driving Study, Phase II: Results of the 100-Car Field Experiment* (Washington, DC: National Highway Traffic Safety Administration, 2006).

[12] FMCSA-RRR-09-042.

accessing the Internet.[13] This research also found that portable music players can divert a driver's attention from the driving task for prolonged periods.

Many states have enacted laws ranging from banning texting for younger drivers to banning the use of portable electronic devices by all drivers because of the associated driving risks.[14] In addition to the 35 states that ban texting, 30 states ban all cell phone use for novice drivers, and 10 states ban the use of handheld cell phones. The District of Columbia has bans for all three usages. However, a recent study by the Insurance Institute for Highway Safety (IIHS) found that these bans have not reduced vehicle accident insurance claims accordingly.[15] Some states that enacted bans actually experienced increases in accident insurance claims. The IIHS suggests that the bans may not have shown their intended benefits because drivers continued to text but in a more discreet manner, or drivers switched to a nonbanned activity that can also be distracting. The IIHS study did not attempt to examine the effects of enforcement or education along with the bans.

Other IIHS studies have found that cell phone and texting bans were effective in reducing observed handheld cell phone or texting behavior.[16] Observational studies conducted in New York, Connecticut, and Washington, DC, found that cell phone and texting bans reduced cell phone and texting behavior by more than 40 percent immediately after taking effect. Although cell phone use while driving trended upward in all three cases following implementation of the bans, it is still much lower than would be expected without the bans. A little over 1 year after going into effect, compliance with the bans was lower in New York than in Washington, DC.[17] One explanation for this discrepancy in the rates of compliance may be differing levels of enforcement and media attention.[18]

Past safety campaigns have shown that laws aimed at changing behavior are much more likely to experience long-term success when combined with highly visible enforcement and public information campaigns,[19,20] such as the "Click It Or Ticket" campaign for promoting seat belt use. A recent study analyzing the first 7 years of the campaign found that states that had enacted primary laws (where a motorist could be cited solely for being unbelted) had substantially higher seat belt use and higher levels of enforcement than states with only

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[13] J. Hickman, R. Hanowski, and J. Bocanegra, *Distraction in Commercial Trucks and Buses: Assessing Prevalence and Risk in Conjunction With Crashes and Near Crashes*, Report No. FMCSA-RRR-10-049 (Washington, DC: Federal Motor Carrier Safety Administration, 2010).

[14] Connecticut General Statutes 14-296aa bans the use of mobile electronic devices (such as 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) while such vehicle is in motion.

[15] "Texting Laws and Collision Claim Frequencies," *Highway Data Loss Institute*, vol. 27, no. 11 (Arlington, Virginia: Insurance Institute for Highway Safety, September 2010).

[16] A. McCartt and others, "Long-Term Effects of Handheld Cell Phone Laws on Driver Handheld Cell Phone Use," *Traffic Injury Prevention*, vol. 11, no. 2 (2010), pp. 133–141.

[17] See <http://www.iihs.org/research/topics/cell_phones.html>, accessed October 26, 2011.

[18] A. McCartt, L. Hellinga, and K. Bratiman, "Cell Phones and Driving: Review of Research," *Traffic Injury Prevention*, vol. 7, no. 2 (2006), pp. 89–106.

[19] A. McCartt and others, 2010.

[20] See <http://www.ntsb.gov/doclib/recletters/1997/H97_1_6.pdf>, accessed October 26, 2011.

secondary enforcement (where a motorist could be cited for being unbelted only if stopped for a different violation).[21] The study found that seat belt use had increased in states that converted from secondary to primary laws and was higher among states with high visibility enforcement. Additionally, communication campaigns have been found to improve long-term shifts in attitudes and behavior, especially when implemented in conjunction with laws and high visibility enforcement.[22,23,24] The European Union recently completed a project to assist policymakers in implementing and evaluating road safety communication campaigns to inform motorists about new laws, educate them on the safety risks of unwanted behaviors, and ultimately decrease the frequency and severity of accidents.[25]

The U.S. Department of Transportation (DOT)—along with the Governors Highway Safety Association (GHSA) and other organizations—has long recognized the benefits of combining laws, high visibility enforcement, and communication campaigns. Examples of past campaigns in which the DOT has used this approach include the aforementioned "Click It or Ticket," as well as the "Over the Limit Under Arrest" campaign to reduce drinking and driving. The DOT driver distraction program calls for evaluating laws and high visibility enforcement, developing targeted media messages, drafting sample laws for states, publishing guidance on banning texting while driving for Federal workers, evaluating training programs, and developing resources through the World Health Organization.[26,27]

In 2010, the GHSA examined distracted driving as a state priority, data collection, outreach to novice drivers, education, public/private collaborations, state laws, and enforcement. Missouri has banned drivers under 21 years of age from texting and driving, implemented an enforcement campaign, made distracted driving a priority issue, developed traditional and electronically based educational materials for young drivers and their parents,[28] and conducted public awareness campaigns. However, Missouri's enforcement campaign has been hindered by the difficulty law enforcement has had in identifying and stopping only drivers who are

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[21] J. Tison and A. Williams, *Analyzing the First Years of the "Click It or Ticket" Mobilizations*, Report No. DOT-HS-811-232 (Washington, DC: National Highway Traffic Safety Administration, 2010).

[22] M. Regan, K. Young, and J. Lee, "Driver Distraction Injury Countermeasures, Part 1: Data Collection, Legislation and Enforcement, Vehicle Fleet Management, and Driver Licensing," in M. Regan, J. Lee, and K. Young, eds., *Driver Distraction: Theory, Effects, and Mitigation* (Boca Raton, Florida: CRC Press, 2009).

[23] B. Elliot, *Road Safety Mass Media Campaigns: A Meta Analysis*, Federal Office of Road Safety, Report No. CR 118 (Canberra, Australia: Federal Office of Road Safety, 1993).

[24] P. Delhomme and others, *Evaluated Road Safety Media Campaigns: An Overview of 265 Evaluated Campaigns and Some Meta-Analysis on Accidents*, GADGET Project (Bron, France: National Institute for Transport and Safety Research, 2000).

[25] P. Delhomme and others, *Manual for Designing, Implementing, and Evaluating Road Safety Communication Campaigns* (Brussels, Belgium: Belgium Road Safety Institute, 2009).

[26] For additional information on DOT programs, see <www.distraction.gov>.

[27] Overview of the National Highway Traffic Administration's Driver Distraction Program, <http://www.distraction.gov/files/dot/6835_DriverDistractionPlan_4-14_v6_tag.pdf>, accessed October 26, 2011.

[28] *Curbing Distracted Driving: 2010 Survey of State Safety Programs* (Washington, DC: Governors Highway Safety Association, 2011).

underage.[29] Recent efforts to change the law so that it applies to all drivers failed in the state legislature.

Although there is recognition that combining laws, enforcement, and communication campaigns is the most effective way to change driver behavior, not all states have fully adopted this multifaceted approach to mitigate the risks associated with portable electronic devices. In fact, many states are just beginning to address distracted driving. Several state efforts to curb distracted driving are limited to reaching out to novice drivers and driver education. Three states have not developed any programs; and six states have implemented only one of the three approaches. The NTSB concluded that a combination of enforceable state laws, high visibility enforcement, and supporting communication campaigns can reduce the number of accidents caused by drivers distracted by the use of portable electronic devices.

Therefore, as a result of its investigation of the Gray Summit accident, the National Transportation Safety Board makes the following safety recommendation to the 50 states and the District of Columbia:

> (1) Ban the nonemergency use of portable electronic devices (other than those designed to support the driving task) for all drivers; (2) use the National Highway Traffic Safety Administration model of high visibility enforcement to support these bans; and (3) implement targeted communication campaigns to inform motorists of the new law and enforcement, and to warn them of the dangers associated with the nonemergency use of portable electronic devices while driving. (H-11-39)

The NTSB also issued new safety recommendations to the National Highway Traffic Safety Administration, the state of Missouri, the Missouri Department of Elementary and Secondary Education, CTIA–The Wireless Association and the Consumer Electronics Association, and the National Association of State Directors of Pupil Transportation Services, the National Association for Pupil Transportation, and the National School Transportation Association. The NTSB reiterated previously issued recommendations to the Federal Motor Carrier Safety Administration, the National Highway Traffic Safety Administration, and the American Association of Motor Vehicle Administrators.

In response to the recommendation in this letter, please refer to Safety Recommendation H-11-39. If you would like to submit your response electronically rather than in hard copy, you may send it to the following e-mail address: correspondence@ntsb.gov. If your response includes attachments that exceed 5 megabytes, please e-mail us asking for instructions on how to use our secure mailbox. To avoid confusion, please use only one method of submission (that is, do not submit both an electronic copy and a hard copy of the same response letter).

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[29] (a) See <http://www.mshp.dps.missouri.gov/MSHPWeb/Root/DistractedDrivingFeaturedStatute.html>, accessed January 20, 2011. (b) See <http://www.mshp.dps.missouri.gov/MSHPWeb/Root/Anti-textingstickrelease.html>, accessed January 20, 2011.

Chairman HERSMAN, Vice Chairman HART, and Members SUMWALT, ROSEKIND, and WEENER concurred in this recommendation. Chairman Hersman, Vice Chairman Hart, and Member Sumwalt each filed concurring statements, which are appended to the accident report.

[Original Signed]

By: Deborah A.P. Hersman
Chairman

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Safety Recommendation Reiteration List

SR Number	Reiteration Number	Report Number	Report Date	Accident Description	Accident City	Accident State	Accident Date
H-11-039	1	HAR-14-02	10/8/2014	Highway-Railraod Grade Crossing Collision	Rosedale	MD	5/28/2013
H-11-039	2	HAR-21-02	12/22/2021	Collision between Sport Utility Vehicle and Medium-Size Bus Transporting Adult Passengers with Disabilities and Special Needs	Belton	SC	12/17/2019