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VTTI releases new study results on distraction in commercial trucks and buses

Blacksburg, Va., October 28, 2010 –The Federal Motor Carrier Safety Administration (FMCSA) recently released key findings from a naturalistic driving study recently conducted by the Virginia Tech Transportation Institute (VTTI) aimed at further analyzing risk of commercial truck and bus drivers’ activities or actions that distract their attention away from the driving task.

With this particular study, using an existing naturalistic data set to document the prevalence and risk of commercial truck and bus drivers’ activities, Rich Hanowski, director of VTTI’s Center for Truck & Bus Safety states “this real-world data set comprised over 13,000 commercial motor vehicles, both trucks and buses, and provides a wealth of additional data including video of driver behavior preceding safety-critical events.”

Data was collected over a consecutive one-year period and the data set included 1,085 crashes, 8,375 near crashes, 30,661 crash-relevant conflicts, and 211,711 baselines. The data set was collected by DriveCam® a vendor of onboard safety monitoring systems aimed at reducing risky driving behaviors. The data from the DriveCam® onboard safety monitoring system captured video of the driver’s face and forward road view from fleets in real-world operations.

Dr. Jeff Hickman, principal investigator of the study said, “the results from this study support those results previously reported in another FMCSA-funded study (released July 2009) also conducted by VTTI (Olson, Hanowski, Hickman, & Bocanegra, 2009).”

The table below shows a comparison of the odds ratio for selected non-driving tasks in this study as well as those found in the study previously conducted by VTTI. As was found in the previous VTTI study, using a cell phone to text, e-mail or access the internet while driving is in a category of risk all by itself. The data suggests that truck and bus drivers who use their cell phone to text, e-mail, or access the Internet *are very likely* be involved in a safety-critical event.

Texting/emailing/accessing the internet was associated with a very high odds ratio (a measure of association not unlike a correlation). In this case, the odds ratio was high due to the finding that 90 of the 93 instances where truck and bus drivers were using a mobile device for texting/emailing/accessing the internet while driving were involved in a safety-critical event.

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The table below shows the odds ratios for selected non-driving tasks in the current study and those reported in Olson et al. (2009). An odds ratio compares the odds of some outcome occurring (e.g., a safety-critical event), given the presence of some predictor factor, condition, or classification (e.g., reaching for a cell phone). Using data from the table, it can be interpreted that truck and bus drivers in the current study who dialed a cell phone while driving significantly increased their odds of involvement in a safety-critical event by 3.51 compared to a baseline, than if they were not dialing a cell phone while driving. The first column in the table lists the specific non-driving tasks, the second column shows the odds ratios for selected non-driving tasks in the current study (across all vehicles), the third column shows the odds ratio for non-driving tasks in the current study (using only tractor trailers/tankers), and the fourth column shows the odds ratios for selected non-driving tasks in the Olson et al. (2009) study. Tractor trailers were the only vehicle types included in Olson et al. (2009); thus, the primary comparison between the current study and Olson et al. (2009) involves columns three and four.

A second noteworthy finding was that when “cell phone use” was treated as a “yes” or “no” variable, the odds of being involved in a safety-critical event were 1.14 times greater while the driver was using a cell phone than when the driver was not using a cell phone. A follow-up analysis was conducted to examine what specifically about “cell phone use” was risky. The cell phone task was segmented into sub-tasks that included reaching, dialing, and talking/listening. Analysis at the sub-task level indicated that reaching and dialing sub-tasks have a high degree of risk, whereas talking/listening does not. In other words, although talking on the cell phone did not show an increased risk, a driver must take several risk-increasing steps in order to use the electronic device for conversation. This is an important finding suggesting that much of this risk may be addressed through improved system interface design.

Non-Driving Task	Odds Ratios Across all Vehicles in this Study	Odds Ratios for Tractor Trailers/Tankers Only in this Study	Odds Ratios in Olson et al. (2009)
Any Cell Phone Use	1.14*	1.08	1.04
Dialing Cell Phone	3.51*	5.44*	5.93*
Talking/Listening Hands-Free Cell Phone	0.65*	0.58*	0.44*
Talking/Listening Hand-Held Cell Phone	0.89	1.01	1.04
Reaching for Headset/Earpiece	3.38*	4.43*	6.72*
Reaching for Cell Phone	3.74*	7.60*	Included in dialing cell phone
Texting/E-mailing/Accessing the Internet	163.6*	Was only calculated across all vehicles	23.24*

Note: Asterisk indicates a significant odds ratio.

Odds ratios were also calculated to approximate the effectiveness of a fleet cell phone policy and state cell phone law regarding cell phone use while driving. As shown in the table below, drivers' odds of using a cell phone while driving were 17 percent less likely under a fleet cell phone policy compared to no fleet cell phone policy. However, the state cell phone law did not significantly impact drivers' likelihood in using their cell phone while driving compared to a state that did not have a law prohibiting cell phone use. Hanowski noted, "the results support Secretary LaHood's position that the first step must be legislation and instituting good policy and the second step must focus on education and enforcement of that policy. When enforcement and policy are both in place, as we see with the fleet cell phone policy results from this study, driver behavior can be meaningfully changed."

Cell Phone Policy	Odds Ratio	Lower Confidence Limit	Upper Confidence Limit
Fleet Cell Phone Policy	0.83*	0.78	0.87
State Cell Phone Policy	0.97	0.94	1.01

* Asterisk indicates a significant odds ratio

It is important to note this was an observational study that evaluated associations between various non-driving related tasks (such as cell phone sub-tasks) and involvement in a safety-critical event. The study did not evaluate cause and effect (i.e., whether cell phone use caused a safety-critical event), but rather showed which non-driving tasks increased the odds of commercial truck and bus drivers being involved in a safety-critical event if they engaged in those non-driving tasks while driving. As has been found in other naturalistic driving studies, non-driving tasks that take the driver's eyes away from the roadway had the greatest risk (e.g., texting/e-mailing/accessing the internet, dialing a cell phone, reaching for cell phone, and reaching for a headset/earpiece).

It appears that a key difference between these high-risk and low-risk non-driving tasks involves the **amount of visual distraction**. Non-driving tasks associated with high visual attention have the highest odds of involvement in a safety-critical event. Hanowski notes that "the take-away message is that drivers must keep their eyes on the road and tasks or activities that divert eyes from the road are risky."

Tom Dingus, director of VTTI points out that "we need to continue to study distracted driving in the naturalistic setting to shed further light on the risks associated with all forms of distraction while behind the wheel of a vehicle. Technology is developing at lightning speed with more and more technological devices out there to grab our attention."

Dingus states, "there are many national campaigns advocating no cell phone use at all while driving however it may not be realistic in today's multi-tasking society. The results from this study indicate that Secretary LaHood's focus on driver behavior, in general, and distracted driving, specifically, are right on the mark. VTTI looks forward to continuing to work with FMCSA and the US DOT on research aimed at further understanding driver behavior and reducing crashes on our nation's roadways."

The current study used a naturalistic data set where drivers' real-world behavior was recorded via video cameras. As such, the data used in the current study reflects actual driving situations and real-world daily pressures. If the primary intention of transportation safety research is to understand driver behavior in the real-world, then naturalistic studies, conducted in the real-world, must be considered the gold standard.

Investigating cell phone use as a series of subtasks provides a more complete picture of the driving safety issues associated with cell phone interaction and also provides important information to system designers pertaining to driver-system interface development.

VTTI was commissioned by FMCSA to conduct this important research.

For the full final report and technical brief, go to:

www.fmcsa.dot.gov/facts-research/art-public-reports.aspx

References:

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