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XXXX

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MCSA-5870

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2012 TRB ART Forum Topic Selection Questionnaire

Dear ART Forum Past Attendees and Interested Parties:

The Federal Motor Carrier Safety Administration (FMCSA) Office of Analysis, Research and Technology (ART) is seeking your input on possible topics to be presented as part of the ART Forum at the Transportation Research Board's (TRB) 91st Annual Meeting in January 2012.

Please take a moment to review the topics below and their descriptions which follow the list of topics. You will note the topics are divided by the ART Divisions. Please select one topic from each Division of most interest and importance to you. If there is a particular topic you would like to have included in the program that is not listed in the Questionnaire, please let us know by listing it under "Other."

Your response is critical in the planning of this event. Please make every attempt to respond no later than Friday, October 14, 2011 in order to help us determine the agenda for the 2012 ART Forum!

Thank you in advance for taking the time to provide your input into this process. We look forward to an informative and productive meeting, and we hope that you will participate in it.

Kelly Leone, Ph.D.

Associate Administrator for Research and Information Technology and

Chief Information Officer

Federal Motor Carrier Safety Administration

U.S. Department of Transportation

Please limit your selections to one topic from each Division. A summary of each topic is included at the end of the list of options.

Analysis Division

- Estimating Cost of CMV Crashes
- UMTRI CSA Operational Model Test Evaluation Report
- Data Quality Performance Measures

Other: _____

Research Division

- Impact of Driving, Non-Driving Work, and Rest breaks on Driving Performance in CMV Operations
- Phase II of 34-Hour Restart Evaluation Study
- Safety Impacts of Speed Limiter Devices
- 270 Truck Onboard Monitoring Project - Update and Overview
- Fostering Adoption of a Safety Culture by Motor Carriers

Other: _____

Technology Division

- Wireless Intermodal Truck Application FOT Results as Part of the Kansas City Cross-Town Improvement Program
- FMCSA Truck and Bus Connected Vehicle Development and Testing Activities
- Wireless Roadside Inspection (WRI) Phase II Pilot Test Findings
- Commercial Vehicle Information Systems and Networks (CVISN) Program Status Report

- CMV Industry Real World Experience with Onboard Safety Systems
- Onboard Safety Systems Research under the Small Business Innovation Research (SBIR) Program

Other: _____

Summary of Proposed Topics for 2011 TRB ART Forum

Analysis Division Topics

1. Estimating Cost of CMV Crashes

This project uses groundbreaking methods to determine time delay and air emissions from congestion caused by a commercial motor vehicle (CMV) crash. Using advanced traffic models and real traffic flow data, FMCSA produces the most accurate picture of congestion for various crashes allowing for factors such as rural or urban, time of day, and type of highway. The estimates produced in this report will be used by the Analysis Division in determining congestion costs and environmental impacts from CMV crashes when calculating impacts of rules that prevent CMV crashes. In addition, the methodology developed in this report will allow for better estimates of congestion for a variety of other analytical purposes.

2. UMTRI CSA Operational Model Test Evaluation Report

This presentation will highlight some of the findings from the Compliance, Safety & Accountability (CSA) Operational Model Test evaluation conducted by the University of Michigan Transportation Research Institute which occurred in the states of New Jersey, Georgia, Missouri, and Colorado. Through the Operational Model Test, these states were the first to use and test the new CSA protocols for both identifying problem carriers, and for intervening with them. These interventions included warning letters, off-site investigations, on-site focused investigations, cooperative safety plans, notices of violation, and on-site comprehensive investigations.

3. Data Quality Performance Measures

The Motor Carrier Management Information System (MCMIS) Crash file was developed to serve as a census of trucks and buses involved in traffic crashes meeting a specific crash severity threshold. Each state is responsible for identifying and reporting cases that meet the MCMIS Crash file criteria. As part of the data quality performance measurement program, FMCSA and the University of Michigan Transportation Research Institute have developed an updated model to predict the number of non-fatal crash involvements a state should be reporting. In the new model, data from 16 states that provide all the information necessary to identify MCMIS-reportable cases were used. A log-linear model was fit to MCMIS data for the states that have information recorded for both fatal and nonfatal

crashes. The model is then used to predict the number of nonfatal crashes for a new state in which the number of fatal crashes and the rural/urban factor are known. Ninety percent prediction intervals provide a range of nonfatal crash values to be used for guidance. The new model provides more accurate prediction than previous models and is expected to be updated as data from additional states become available.

Research Division Topics

1. Impact of Driving, Non-Driving Work, and Rest Breaks on Driving Performance in CMV Operations

This initiative analyzed several issues regarding the commercial motor vehicle hours-of-service regulations. The analysis included an assessment of driver's daily activities and the relationship between safety critical events (SCEs) and driving hours, work hours, and breaks. The study found that on average, drivers spent 66 percent of their shift driving, 23 percent in non-driving work, and 11 percent resting. In addition, the study found a general time-on-task effect for driving time and work time, but a specific effect for each additional hour was not found. The risk of SCE involvement increased as non-driving activities pushed driving hours towards the end of the 14-hour shift. Breaks from driving were found to be beneficial in reducing SCEs and were effective to counteract the negative effects of time-on-task.

2. Phase II of 34-Hour Restart Evaluation Study

This study examined the effectiveness of the current 34-hour restart provision in the hours of service governing property-carrying commercial motor vehicle drivers in restoring performance. A two-phase, in-laboratory, experimental approach was used. In Phase 1, the effectiveness of the current 34-hour restart provision was evaluated using a best case / worst case design. The study found that the 34-hour restart was effective at mitigating sleep loss and consequent performance impairment for day-time drivers, but not effective for night-time drivers. In Phase 2, the effect of two nocturnal sleep periods during the restart for night-time drivers was examined. The study found that for nighttime work schedules, there was no significant difference in performance between the pre-restart and post-restart work periods overall, indicating that a restart period which includes two nights was effective at maintaining performance.

3. Safety Impacts of Speed Limiter Devices

The purpose of this research was to determine the impacts of implementing speed limiter programs on the motor carrier industry. These impacts can be economic through increased fuel economy and reduced maintenance, as well as related to safety through a reduction in the number and severity of crashes. The researcher collected both quantitative and qualitative data to evaluate the impacts of speed limiters. Data were collected from carriers that have implemented speed limiters in recent years as well as from carriers that haven't implemented speed limiters in order to account for changes over time which have influenced highway safety. The final report has been completed and is pending publication.

4. 270 Truck Onboard Monitoring Project—Update and Overview

The primary objective of the field operational test (FOT) of the 270 Truck Onboard Monitoring Project is to determine whether on-board monitoring will reduce at-risk behavior among commercial motor vehicle (CMV) drivers and improve driver safety performance. Its secondary objective is to support future CMV safety research efforts utilizing the over 35 million miles of naturalistic large truck driving data that will be collected. The commercial onboard monitoring system being utilized for this FOT integrates a number safety technologies and applications together into a single system. These include: Driver behavior monitoring, Lane/Roadway departure warning, Forward collision warning, Fatigue monitoring, Alcohol detection, Electronic on-board recorder and Continuous naturalistic data collection.

5. Fostering Adoption of a Safety Culture by Motor Carriers

This research is evaluating the impact of proactive training of interstate new entrant motor carriers. Measures include improvement in: the number that pass the required Safety Audit; various measures of safety performance; and crash rate. Last year we reported this training made a positive, significant improvement for about half the new entrants who took the training seriously and adopted a safety culture. The improved curriculum is achieving a much higher rate of full engagement by new entrants, which is expected to lead to higher safety improvement. The research also recommended the training curriculum be improved to more effectively deal with imparting knowledge about the FMCSRs. 49 U.S.C 31144, Safety Fitness, requires a process for evaluating safety fitness, prior to issuing an interstate USDOT number. FMCSA is starting a program evaluation of the new entrant program that is projected to be completed within a year. A new and different concept for promoting motor carrier safety culture is being explored by the Transportation Safety Board's (TRB) Alternative Compliance Committee which is submitting a paper to TRB recommending that FMCSA consider a demonstration to test its effectiveness.

Technology Division Topics

1. Wireless Intermodal Truck Application FOT Results as Part of the Kansas City Cross-Town Improvement Program

As part of the Motor Carrier Efficiency Study, FMCSA partnered with Federal Highway Administration (FHWA) and other DOT agencies to identify promising wireless technologies that address specific motor carrier inefficiencies. Specifically, FHWA is conducting the Cross-Town Improvement Program (C-TIP) in Kansas City, Missouri in partnership with several other state and local organizations. The C-TIP program utilizes wireless technologies to address certain key inefficiencies including: empty intermodal truck trips; incident-related congestion; and waiting to load and unload truck trailers.

2. FMCSA Truck and Bus Connected Vehicle Development and Testing Activities

The opportunities, challenges and deployment scenarios associated with the wirelessly connected vehicles architecture are research topics of major interest to the transportation safety community. As part of a large scale initiative, U.S. Department of Transportation recently announced the University of Michigan Transportation Research Institute in Ann Arbor, MI will conduct the highly visible Safety Pilot Model Deployment Test that will commence in late 2012. The goal of

the safety pilot test is to demonstrate the safety, mobility and environmental benefits of wirelessly connected vehicles and the smart infrastructure in a real-life driving environment. Multiple ongoing truck programs will provide connected commercial vehicles to the deployment area. FMCSA has the lead on the Retrofit Safety Device Development contracts funded by the Research and Innovative Technology Administration's Joint Program Office. A total of 8-16 in-service commercial vehicles from participating fleets will be retrofitted with advanced warning systems in the safety pilot test. Safety benefits assessment results from this test will feed into a regulatory decision by National Highway Traffic Safety Administration by the end of 2013-14 on the use of Dedicated Short-Range Communications for Vehicle-to-Vehicle safety applications purposes.

3. Wireless Roadside Inspection (WRI) Phase II Pilot Test Findings

The objective of the WRI project is to determine the feasibility of the WRI concept and, if feasible, to identify the best suite of technologies to use in a follow-on field operational test. In the Phase II pilot test, WRI systems were installed and tested across three testing platforms in Kentucky, New York, and along the FMCSA Commercial Motor Vehicle Roadside Technology Corridor in Tennessee. The test collected real-world data and lessons learned regarding technologies, intelligent transportation infrastructure requirements to upload electronic inspections to state and FMCSA safety databases, and technology and procedural standards. The presentation will discuss findings from the pilot test.

4. Commercial Vehicle Information Systems and Networks (CVISN) Program Status Report

The CVISN program is a key component of FMCSA's primary mission to improve commercial motor vehicle safety. States collect safety, security, and other commercial vehicle operation-related data electronically and share that information among authorized stakeholders. Expanded CVISN deployment focuses on how information can be integrated to improve the accuracy, integrity, and efficiency of motor carrier, commercial vehicle, driver, and cargo data. The program's objective is to work with eligible States and the motor carrier industry to implement expanded CVISN capabilities that improve the safety and productivity of commercial vehicle operations, and enhance transportation security in four primary areas: driver information sharing, enhanced safety information exchange, smart roadside, and expanded electronic credentialing. This presentation will provide an update on the status of CVISN deployment in the U.S. and the technical guidance and planning support for deployment of expanded CVISN capabilities.

5. CMV Industry Real World Experience with Onboard Safety Systems

Between 2009 and 2011, a study was conducted to determine the effectiveness of onboard safety systems (OBSS) by analyzing crash data from over 14 truck fleets traveling over 13 billion miles and involving 88,112 crashes. OBSS include forward collision warning (FCW) systems, lane departure warning systems, and roll stability control systems. Unlike previous studies, the OBSS study used fleet-collected data from a broad spectrum of commercial motor vehicle crashes, including crashes not officially reported, and it actually measured real-world crash

rates instead of modeling them. Moreover, crashes in this study were filtered to include only OBSS-related crashes. For example, a FCW-related crash is a crash that could have been avoided or mitigated by a FCW system. This presentation will provide a review of the OBSS study results.

6. Onboard Safety Systems Research under the Small Business Innovation Research (SBIR) Program

FMCSA's Technology Division is utilizing USDOT's SBIR Program in a number projects where feasible and cost-effective solutions need further innovation. For example, when new tractors are coupled with older trailers, there is often a substantial technology gap between the on-board safety systems installed on the tractor and the trailer. The effectiveness of on-board safety systems could be substantially improved if there were a mechanism to automatically determine certain trailer characteristics from within the tractor in an efficient manner that does not rely on the operator. FMCSA's Trailer Configuration SBIR project will demonstrate a low-cost vehicle monitoring system for tractor-trailers where wireless and other modular options are being researched as a robust means to bridge this technology gap. Through another SBIR project, FMCSA is exploring cost-effective mechanisms to securely and accurately communicate the trailer(s) vehicle identification number (VIN) to the powered unit in order to address various roadside, border crossing, smart parking, connected vehicle initiatives. The composition of the trailer VIN includes a number of trailer characteristics that can be decoded and used for a variety of reasons.