



# U.S. Department of Transportation Federal Motor Carrier Safety Administration

## Research Study Completions 2010

Federal Motor Carrier Safety Administration  
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- **Evaluating the Safety Benefits of a Low-Cost Driving Behavior Management System in Commercial Vehicle Operations.**

This project provides an independent evaluation of a commercially available low-cost driving behavior management system. Participating drivers from two carriers drove an instrumented vehicle for 17 consecutive weeks while they made their normal, revenue-producing deliveries. During the 4-week baseline phase, the event recorder recorded safety-related events; however, the feedback light on the event recorder was disabled and safety managers did not have access to the recorded safety-related events to provide feedback to drivers. During the 13-week intervention phase, the feedback light on the event recorder was activated and safety managers had access to the recorded safety-related events and followed a recommended coaching protocol with drivers (when necessary). Carrier A significantly reduced the mean rate of recorded safety-related events/10k vehicle miles travelled (VMT) from baseline to intervention by 38% ( $p = 0.046$ ), while Carrier B significantly reduced the mean rate of recorded safety-related events/10k VMT from baseline to intervention by 52% ( $p = 0.03$ ). <http://www.fmcsa.dot.gov/facts-research/research-technology/report/FMCSA-RRR-10-033.pdf>

- **Crash Analysis using Naturalistic Driving Data & Large Truck Crash Causation (LTCCS) data.**

This study compared the Large Truck Crash Causation Study (LTCCS) and naturalistic driving (ND) data sets to identify discrepancies and determine the source(s) of these discrepancies. The project included a generalized comparative analysis of the LTCCS, General Estimates System, and ND data sets and then focused on five specific analyses using only two data sets (LTCCS and ND).

- **Efficacy of Web-Based Instruction for Training CMV Regulations and Best Practices Study.**

This study examined the efficacy of using WBI to disseminate information and train personnel within the motor carrier industry regarding FMCSRs. The project was comprised of a literature review of general WBI literature, FMCSA and U.S. Department of Transportation (USDOT) uses of WBI, other Federal and State Government WBI applications; surveys of fleet safety managers; and interviews of FMCSA staff experienced in WBI. The project also developed a set of measures for FMCSA to evaluate the efficacy of future WBI.

- **Synthesis of Literature & Operating Safety Practices Relating to Cell Phone/PDAs Use in Commercial Truck and Bus Operations.**

This study provides a summary of the research literature on the use of cell phones and other device while driving commercial vehicles.

- Identify Factors That Affect the Service Life of Cargo Tanks.**  
 Study objectives were to identify factors that affect the service life of cargo tanks and to develop a document titled "Guidelines for Testing, Inspection, Assembly and Repair of Cargo Tanks." The study identified The collected data was placed into 8 factor categories: (1) Tank Distortion/Bulkhead Reversal; (2) Tank Rupture; (3) Tank/Trailer Impact Damage; (4) Tank Component Failure; (5) Tank Out-of-Spec Condition; (6) Fatigue Damage to the Tank; (7) Frame/Suspension Stress; and (8) Material Thickness Reduction.
- Assessing Exposure Risks of Trucking Occupational Hazards (Phase I).**  
 This study simultaneously measured air pollution concentrations, noise, and vibration inside truck cabs and sleeping berths while driving at different speeds and idling at a truck stop.  
Noise Level: Noise levels were well below the OSHA standards.  
Whole-body Vibration: Vibration levels were below the EU standards.  
Air Quality: In some instances, Diesel PM 2.5 exceeded EPA ambient air standards.  
<http://www.fmcsa.dot.gov/facts-research/research-technology/report/Ergonomics-report.pdf>
- Distraction in Commercial Trucks and Buses: Assessing Prevalence and Risk in Conjunction with Crashes and Near-Crashes.**  
 This project analyzed naturalistic data on commercial trucks and buses data from over 207 truck and bus fleets comprising 13,431 vehicles included 1,336 crashes, 15,864 near-crashes, and 173,591 crash-relevant conflicts; Study results document the prevalence of cellular telephone distractions and the risk associated with performing related tasks while driving. Findings include the odds of involvement in a safety-critical event differed as a function of performing different cell phone-related sub-tasks while driving. More specifically, talking/listening on a cell phone while driving was generally found not to impact significantly the odds of involvement in a safety-critical event (and was even found to decrease the odds significantly in some cases), while other cell phone sub-tasks (e.g., texting, dialing, reaching) were found to increase significantly the odds of involvement in a safety-critical event. Analyses examine the likelihood of commercial drivers to use their cell phone under a fleet cell phone policy and State cell phone law.  
<http://www.fmcsa.dot.gov/facts-research/research-technology/report/Distractin-in-Commercial-Trucks-and-Buses-report.pdf>
- Investigation into Motor Carrier Practices to Achieve Optimal CMV Driver Performance**  
 This study examined the effectiveness of the current 34-hour restart provision. WSU conducted a two-phase, in-laboratory, experiment. Phase 1, the effectiveness of the current 34-hour restart provision was evaluated using a best/worst case design. In Phase 2, the effectiveness of a two nocturnal sleep periods for night-time driver was evaluated.  
 Phase 1 - Findings: 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.  
<http://www.fmcsa.dot.gov/facts-research/research-technology/report/Restart-Phase-I.pdf>  
 Phase 2 - Findings: For night-time drivers the two night provision works better than one night to mitigate driver fatigue.  
<http://www.fmcsa.dot.gov/facts-research/research-technology/report/Restart-Phase-II.pdf>