



U.S. Department of Transportation
Federal Motor Carrier Safety Administration
Office of Analysis, Research, and Technology

2013 TRB 92nd Annual Meeting

Enforcement and Compliance Research Update

TRB

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Passenger Carrier Research

Motorcoach Fatigue Study

Safety Performance Study

Drowsy Driver Mitigation System

Ongoing Research



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Motorcoach Driver Fatigue Study

- Determine motorcoach driver duty hours, sleep time, fatigue, and performance within the limits of the current regulations.
 - Motorcoach drivers different operation types.
 - The study assessed the degree to which drivers expose themselves to abnormal work/rest cycles that would restrict sleep and impair performance.



Motorcoach Driver Fatigue Study

- Methodology:
 - Drivers studied for 30 days.
 - Personal and health data collected at beginning of study.
 - Wore an actigraph continuously.
 - Took a 5-minute PVT to measure performance at the beginning and end of each shift.
 - Subjective fatigue and sleepiness were rated at the beginning and end of each shift.



Motorcoach Driver Fatigue Study

- Results
 - Drivers in study were Middle-aged, Overweight or Obese and predominately Male.
 - No indication drivers are not in sync with normal 24-hour cycle.
 - Slightly more than 40 hours per week.
 - Start in morning/early morning.
 - 9-hour shift.
 - Average 8 hours sleep.



Safety Performance Study: Passenger Carriers and Drivers

- Continuation of a previous study (2001) that analyzed data from more than 6,000 passenger carriers.
- Compared passenger carrier safety data to property carrier safety data.
- Drivers more likely to be involved in a crash:
 - Had a **Higher Body Mass Index (BMI)**.
 - Were **Male**.
 - Have worked for **Many Employers**.
 - Generally **Better Safety Performance** than truck drivers.



Drowsy Driver Mitigation System

- Develop and test a prototype system to unobtrusively detect and alert drowsy, distracted, and aggressive drivers prior to performance degradation.
 - The multi-variable drowsy driver mitigation system (DDMS) combines many indicators of drowsiness and alertness into a composite drowsiness score.
 - Integration of multiple sensors shows promise in monitoring drowsiness.



Ongoing Passenger Carrier Safety Research

- Spreading of violations
 - A research project is examining ways to identify from MCMIS violation data spread across carriers by a driver. (Estimated completion 9/2013)
- Model Motor Coach Driver Curriculum
 - Will update based on equipment changes, technological advances, regulatory changes, changes in training methodologies. (Estimated completion 5/2014)
- Medical Review Board Guidelines
Motorcoach Drivers
 - Assess and characterize the relationship between crash and fatigue in generally healthy motorcoach drivers. (Ongoing)



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CSA Analysis

CSA Effectiveness

Crash Weighting



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CSA Effectiveness

- CSA has not been evaluated since 2011 UMTRI report on test.
- Did not capture the effectiveness of a national rollout of CSA.
- Conducted ad hoc analyses to measure the program's effectiveness since rollout.

CSA Effectiveness

Two major tasks:

- **Task 1:** Update the analysis from the UMTRI study to reflect program performance since national rollout.
- **Task 2:** Develop new metrics to capture the program's effectiveness.

CSA Effectiveness

- Elements to effectiveness:
 - SMS Effectiveness.
 - Intervention Effectiveness.
 - Overall program effectiveness (Crash reduction).
- Initial analysis complete Mid 2013.
 - Results will be refreshed at regular intervals.

Crash Weighting

- SMS currently uses all crashes.
- Crash indicator is a good predictor of future crash risk.
- Goal is to better understand the safety benefits of adjusting crash weights in SMS based on the motor carrier's role in the crash (i.e., preventability).
- Analysis complete summer 2013.

Crash Weighting

Research Questions

1. Do police accident reports (PARs) across the Nation provide sufficient information to support weighting?
2. Will a crash weighting determination process offer an even stronger predictor of crash risk?
3. How would the Agency manage the process for making crash weight determinations including public input to the process?

https://csa.fmcsa.dot.gov/Documents/CrashWeightingResearchPlan_7-2012.pdf

Enforcement and Compliance Research

- New and sustained research on program effectiveness is a priority
- Focus on Passenger Carrier research will continue throughout 2013 and beyond