

The goal of the Federal Motor Carrier Safety Administration (FMCSA) is to reduce the number and severity of large truck-involved crashes through more commercial motor vehicle and operator inspections and compliance reviews, stronger enforcement measures against violators, expedited completion of rulemaking proceedings, scientifically sound research, and effective CDL testing, recordkeeping, and sanctions. The Office of Research and Technology manages research and technology development and deployment programs for the FMCSA.

FMCSA R&T activities encompass a range of issues and disciplines relating to motor carrier safety, including problem assessment; policy, safety management, and outreach; drivers; truck and bus vehicle safety performance; and compliance, enforcement and operations.

Driver alertness and fatigue primarily supports current and future hours-of-service rulemaking activities, along with fatigue outreach and fatigue management technology development.



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Bus Driver Fatigue and Stress Issues Study

Introduction

Commercial driver fatigue long has been recognized as a major highway safety problem, but motor carrier researchers traditionally have focused on the trucking industry. Fatigue-related issues associated with motorcoach drivers differ from the issues faced by truck drivers because of the distinct nature of their jobs. For example, truck and motorcoach drivers deal with different vehicular operating characteristics, number of hours spent behind the wheel and on the road, cargo, method of driver compensation, and outside influences.

The Federal Motor Carrier Safety Administration (FMCSA), formerly the Office of Motor Carriers (OMC) of the Federal Highway Administration, conducted a research project to identify unique aspects of operations in the motorcoach industry that produce driver fatigue and stress. This Tech Brief summarizes the study final report.

Purpose

The purpose of this study was to:

- identify fatigue-inducing stresses unique to the motorcoach industry through direct interaction with motorcoach owners, safety directors, operations managers, and drivers;
- evaluate the relative influence of those stresses on motorcoach driver fatigue;
- provide relevant feedback to the OMC for its consideration in future decisions that affect the motorcoach industry; and
- develop an outreach video to help motorcoach drivers understand the effects of fatigue, the stresses that induce it, and the means to reduce it.



photo courtesy of TPI Composites, Inc.

Motorcoach driver-related issues affecting fatigue and stress include wellness and lifestyle, personal accountability, and "exceeding one's limits."

Methodology

In order to identify the unique characteristics that influence motorcoach driver fatigue and stress, researchers needed collective input from the motorcoach industry and a concrete understanding of relevant past studies and projects. They used three primary sources of information:

- a comprehensive review of literature and videos;
- input from a series of five focus group sessions and telephone interviews; and
- information provided by an industry advisory panel.



Literature Search

Researchers conducted a comprehensive review of literature and videos to identify known aspects of motorcoach driver fatigue and gather information to serve as the foundation for the remainder of the project. This review included literature related to other research projects, symposiums on fatigue, results of National Transportation Safety Board investigations, and information obtained through Internet searches. The literature search revealed very little specific research related to fatigue and motorcoach drivers. The three commercial driver fatigue videos found by researchers focused on truck drivers rather than motorcoach drivers. An Internet search yielded almost 90 sites related to fatigue and stress issues, but none directly addressed motorcoach driver fatigue.

Although the search did not reveal specific fatigue research on motorcoach drivers, the relationship between fatigue and driving has been well documented. Two major physiological phenomena that cause fatigue are sleep loss and circadian rhythm disruption. Proper nutrition and physical conditioning also influence the fatigue of commercial vehicle drivers. Physical conditioning and weight control increase stamina and may reduce the incidence of sleep apnea.

Focus Group Sessions

After the literature search was completed, researchers contacted representatives of the motorcoach industry to participate in focus group sessions in several U.S. cities. Individuals who were unable to participate in live group sessions were interviewed by telephone. This direct interaction with current industry employees was crucial in producing a study relevant to today's motorcoach drivers.



Vehicle-related issues affecting motorcoach driver fatigue and stress include driver comfort and interface between the driver and passengers.

Researchers scheduled focus groups to gain a wide geographical representation from the four operational areas within motorcoach organizations—owners, operation managers, safety directors, and drivers. Approximately 150 people participated in either a focus group or telephone interview.

Information gathered during the literature review served as the basis for the focus group discussions. During the sessions, participants discussed the unique causes of fatigue and stress in the motorcoach industry and proposed measures to alleviate the problem.

Industry Advisory Panel

An industry advisory panel reviewed the information gathered during the focus group sessions and provided input and guidance for the study. Members of the panel included motorcoach owners, safety directors, operations managers, and drivers; a representative of the insurance industry; representatives of the major motorcoach associations; a sleep research scientist; and trucking industry representatives involved in fatigue-related research. The panel prioritized motorcoach driver fatigue issues and developed recommendations for the OMC. An additional focus group made up of tour and travel industry professionals was convened upon the recommendation of the industry advisory panel.

Findings

Participants in the different focus group sessions raised many of the same concerns. The focus groups identified the presence of passengers on the vehicle as the single most significant factor that is unique to motorcoach operations and contributes to driver

fatigue and stress. Customers often put pressure on drivers by burdening them with questions, requests, and demands. Based on the overall input of focus group participants, researchers identified three primary issues—driver, vehicle, and operations—that affect motorcoach driver fatigue and stress.

Driver Issues

Motorcoach driver-related issues that affect fatigue and stress include wellness and lifestyle, personal accountability, and “exceeding one’s limits.” Drivers’ physical fitness, diet, and personal living habits influence their levels of fatigue and stress on the job. Focus groups identified a

driver's level of personal accountability for his or her actions (i.e., holding one's self to personal and professional standards) as another influence. In addition, many motorcoach drivers exceed their physical limits in accepting additional work because of economic benefit or company need, thus delaying or ignoring their need for rest.

Vehicle Issues

Significant vehicle-related issues that affect motorcoach driver fatigue and stress include driver comfort and interface between the driver and passengers. The operation and control of a modern motorcoach can be accomplished with little physical exertion—a positive step in reducing fatigue for the driver. However, a driver's comfort combined with the monotony of the driving task could result in a loss of attention and alertness.

Although motorcoach seats are adequate for extended periods of travel, they do not accommodate comfortable positions for quality rest or sleep. Further, motorcoaches do not easily accommodate acceptable sleeper-berth areas for drivers. In the absence of passengers, sleeper-berth design may provide the means for quality rest, but better options, such as individual hotel rooms, are available during off-duty periods. The study report notes that a fully reclining seat would allow a driver to rest while waiting for passengers, thus potentially reducing fatigue and stress even when the driver is on-duty.

Interface between a driver and passengers could affect driver fatigue and stress levels. The driving area is not physically isolated from the passenger area of a motorcoach, which encourages passenger conversation with drivers and driver distraction due to passenger activities. Regular route drivers must collect tickets or fares as well as answer passengers' questions. Drivers on charter and tour trips often deal with large groups of people socializing. In both cases, drivers may experience fatigue or stress because they know passengers are monitoring their driving. Conversely, passengers may provide an incentive for drivers to be more diligent.

Operations Issues

The report cites a wide array of operations-related issues that affect motorcoach driver fatigue and stress. Such issues range from driver compensation to seasonal variations in the demand for motorcoach services.

The current shortage of motorcoach drivers and lack of quality drivers—primarily in the tour and charter segments of the industry—force current drivers to work longer hours to meet operating schedules and customer demands, resulting in less off-duty rest time.

Further, because tour and charter drivers earn relatively small compensation packages, compared to regular route drivers, they are forced to work more to earn tips from tour groups. Some tour and charter drivers may need to work two jobs in order to meet their financial needs, which limits opportunities for rest and increases their chances of feeling drowsy when driving. Many focus group participants mentioned driver salary increases as a potential solution to alleviate the driver shortage problem and increase the pool of qualified drivers.

The itineraries demanded by tour organizers as well as spontaneous "off-the-book" runs that are not part of original plans put pressure on tour bus drivers to accept requests that could adversely impact their level of fatigue. In addition, tour and charter drivers must tend to passengers' needs when not driving—from resolving hotel-related problems to handling luggage. Focus group participants pointed out that tour and charter drivers often are forced to accommodate their customers in order to help their employers retain business even when the requested action is contrary to federal regulations or company policy. For example, if road construction or traffic disrupts a tour itinerary, the group might ask the driver to violate hours-of-service rules to maintain the trip schedule.

Drivers usually sleep in hotel beds on tour and charter trips, which generally enhances quality rest. However, they may be required to share rooms with other drivers who snore or make them feel uncomfortable, reducing the quality and quantity of sleep. Individual rooms for each driver provide a more restful environment, but usually require additional expense.

According to the focus groups, communication between dispatchers and drivers may increase driver stress, particularly when dispatchers have authoritative and confrontational communication styles, emphasize completing trips without sensitivity to driver needs, or "play favorites" among drivers. Operations with "first in/first out" dispatch protocols (i.e., a set of guidelines for scheduling drivers to ensure fair assignments and help eliminate charges that a dispatcher arbitrarily punishes or rewards certain drivers) cause less stress than those with other protocols.

Focus group participants identified several other operations-related issues, including the hours-of-service regulations, as causes of motorcoach driver fatigue and stress. Current hours-of-service rules require 8 consecutive hours off-duty after a maximum of 10 hours driving or 15 hours on-duty. Under these regulations, charter and tour drivers often work "extended days," when they drive both before and after a midday off-duty period when passengers are

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Availability

For more information about the study final report and *Motorcoach Driver Fatigue* video-cassette, contact Phil Hanley, FMCSA's Office of Bus and Truck Standards and Operations, Commercial Passenger Carrier Safety Division, (202) 366-6811.

Key Words

bus, driver, fatigue, motorcoach, stress

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away from the motorcoach. Participants also mentioned the inconsistent and insufficient enforcement of federal, state, and local regulations, lack of organization in coordinating group itineraries, and seasonal variations in the demand for motorcoach services as fatigue- and stress-related operations issues.

Recommendations

Based on input from focus group participants and information gathered in the literature review, researchers outlined countermeasures for motorcoach driver fatigue and stress. These suggestions, however, do not necessarily represent the position or policies of the FMCSA. The study report included the following recommendations:

- increase minimum off-duty time for drivers to at least 10 hours between trip assignments and improve opportunities for drivers to get better rest during long and overnight trips;
- minimize inverted-duty sleep cycles for drivers during extended tours and trips, such as planning tour group itineraries to allow for consistent sleep schedules for drivers;
- establish "first in/first out" dispatch protocols;
- enhance total compensation packages to attract and retain more quality drivers;
- provide regular training to motorcoach drivers on the causes and countermeasures of fatigue;
- provide skill training to drivers in passenger management and conflict resolution;
- provide effective outreach on regulatory limitations and the effects of motorcoach driver fatigue to tour group organizations and the general public;
- consider the motorcoach industry separately from the trucking industry in federal regulations that affect operations and driver fatigue factors;
- compile census, accident, vehicle performance, and other data that is specific to the motorcoach industry;
- increase and enhance federal motorcoach regulation enforcement, including the number of inspections and compliance reviews; and
- hold tour group operators responsible for contributing to non-compliance with federal motorcoach regulations.

Further Developments

The study findings were used to develop the FMCSA video, *Motorcoach Driver Fatigue*, which incorporates known scientific data about fatigue, physiological issues related to fatigue, and operational issues that affect motorcoach drivers' activities and their levels of fatigue and stress. The video provides drivers with valuable information about what causes fatigue and how to minimize its effects.

The FMCSA has acknowledged in its proposed revision of the hours-of-service regulations that little is known specifically about the operation of buses and motorcoaches. Congress has called for further study of the operations, driver practices, and driver fatigue issues specific to buses and motorcoaches before finalization of the hours-of-service rulemaking.

Reference

Bus Driver Fatigue and Stress Issues Study Final Report, Federal Highway Administration, Office of Motor Carriers, Washington, D.C., Dec. 1999.