

Bus Driver Fatigue and Stress Issues Study

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I INTRODUCTION

Arrowhead Space and Telecommunications, Inc. conducted a research project to identify unique aspects of operations within the motorcoach industry which may produce bus driver fatigue and stress. Funding for and oversight of the study was provided by the Federal Highway Administration (FHWA), Office of Motor Carriers (OMC).

The purpose of this study is to (1) identify from direct interaction with motorcoach owners, safety directors, operations managers, and drivers those fatigue-inducing stresses which they believe are unique to the motorcoach industry; (2) evaluate the relative influence of these stresses on bus driver fatigue; (3) provide relevant feedback to the FHWA/OMC for its use in future decisions which will affect the motorcoach industry; and (4) develop an outreach video to help motorcoach drivers understand the effects of fatigue, the stresses that induce it, and means to reduce it.

This study was conducted with a “regulation neutral” approach. While the information derived from the study may be useful for decision making by FHWA/OMC, the study does not provide recommendations concerning changes to existing regulations or the creation of new regulations for the motorcoach industry.

Human error is a causative factor in 85% or more of all crashes. The National Transportation Safety Board (NTSB) has documented numerous motorcoach accidents that have resulted in fatalities where driver fatigue has been determined to be a principal cause. Since December of 1998, there have been an unfortunate number of motorcoach accidents resulting in fatalities or serious injuries where driver error is clearly a principal cause. Fatigue may be an important factor in most, if not all, of these accidents.

There has always been some sense of concern regarding driver fatigue, especially for drivers of commercial vehicles. Hours of service regulations have been in existence in the United States since 1935. They are currently undergoing scrutiny for change based upon current scientific knowledge and data.

Currently, hours of service regulations are prescriptive. They directly influence carrier operations, including motorcoach companies. Complete conformance to these rules, however, does not eliminate driving fatigue as a concern for commercial vehicle safety. Many other factors influence driver fatigue such as eating habits, quantity and quality of sleep, and stresses associated with the other responsibilities of drivers such as loading and unloading, customer interaction, alternate route selection, traffic conditions, time and schedule sensitivities, etc.

There has been much focus on commercial driver fatigue within the past five years. Virtually all of this focus has been directed to the trucking industry. However, issues of fatigue associated with truck drivers and their job may be decidedly different than fatigue issues for bus drivers. Hours behind the wheel and on the road may be different. Cargo hauled is different. Method of pay is different. Influences on the job are different. The amount of loading and unloading of heavy objects is different. Therefore, it is appropriate that bus drivers be considered as a separate entity from other commercial drivers.

II APPROACH

We believe that to identify unique operating characteristics which influence bus driver fatigue and stress, the collective input and wisdom of the motorcoach industry is needed. In addition, a firm understanding of research and knowledge from past studies and projects is also important.

Therefore, a first and fundamental effort was to conduct a comprehensive review of literature and videos to identify known aspects of bus driver fatigue. This review included literature from past research projects; symposiums on fatigue; results of National Transportation Safety Board investigations; other known research projects in progress; and literature and information obtained through Internet/web search techniques.

The results of the literature search will serve as a foundation for the remainder of this project. Identified relevant issues will be used for further study and discussion with the motorcoach industry. Focus Group discussions will be facilitated around relevant issues identified in the literature.

In conjunction with the literature/video search, we will identify and assess unique operating characteristics within the motorcoach industry which influence bus driver fatigue and stress through the broad based participation of representatives within the motorcoach industry. To accomplish this, as one basis of data gathering, we conducted a series of Focus Groups and focused discussions with representatives of the motorcoach industry.

Concurrently with Focus Group discussions and data collection, we assembled an Industry Advisory Panel (IAP) composed of motorcoach owners, safety directors, operation managers, and drivers; a representative

of the insurance industry; representatives from the major motorcoach associations; a sleep research scientist; and two representatives from the trucking industry who have knowledge of trucking operations and who have been involved in fatigue related research.

To supplement live Focus Group input, we will contact individual motorcoach owners, safety directors, and operation managers by phone and thus gain additional input from individuals who are not available to participate in the scheduled Focus Groups. We will broaden participation and information exchange through this supplemental effort to Focus Group sessions.

Our approach began by identifying, through the literature search, operation specific issues which relate to driver fatigue and driver stress. Most of these issues have been developed through the studies of the trucking industry; however, if such issues are present within the motorcoach industry, they will be included for further study and discussion. The literature search was also used to define scientifically valid information related to fatigue and stress which transcends specific operational issues but which is important towards understanding driver fatigue and stress and in developing an effective fatigue video for the motorcoach industry.

Using the information gained from the literature review as a foundation, Focus Groups were organized and facilitated to invite input concerning operational and experiential issues within the motorcoach industry that can result in driver fatigue and stress. All identified issues were discussed and any unique aspects relative to the motorcoach industry defined. Any new operational issues also were defined and discussed during these Focus Group sessions.

The Industry Advisory Panel was invited to assist in the review of all issues identified through the literature review and Focus Group discussions. The panel helped define distinct and unique operational issues associated with the motorcoach industry that can produce driver fatigue and stress. The Industry Advisory

Panel was asked to assist in determining the priorities of importance of these issues and in developing recommendations for the OMC.

After this information was developed and prioritized, we prepared this report on activities and findings which includes the results from Focus Groups sessions, telephone interviews, and industry advisory panel assessment.

The findings developed through these efforts will be used to develop a bus driver fatigue video that will incorporate known scientific data about fatigue; physiological issues concerning fatigue; and operational issues which affect the bus driver's activities and fatigue and stress. Suggested countermeasures for fatigue issues will also be part of this video to provide all bus drivers with the knowledge of what causes fatigue and how to combat it.

III LITERATURE SEARCH

An extensive review of the commercial driver fatigue literature was undertaken. A bibliography of research articles, government reports, trade articles, and company publications that were reviewed has been submitted. The bibliography includes publications that address a variety of driver fatigue and general safety issues in both the United States and other countries. However, the majority of this research addresses driver fatigue within the trucking industry and not within the bus industry.

One of the first research studies which addressed bus driver fatigue was the October 1978 report prepared for the National Highway Traffic Safety Administration entitled "*Effects of Hours of Service Regularity of Schedules, and Cargo Loading on Truck and Bus Driver Fatigue*" by Mackie and Miller. The most significant finding of this report was that bus drivers operating on irregular schedules suffer greater subjective fatigue and physiological stress than drivers operating on a regular schedule. This subjective fatigue and physiological stress was most significant on trips with irregular operating schedules that involved late night and early morning driving. While cumulative fatigue affects appear to be minor between regular and irregular bus driving operations, such affects would become more significant if the final driving hours of the trip occurred in the late night/early morning hours.

This study defined the major problem presented to drivers on irregular schedules as the necessity that they drive during hours of the night when circadian depressions and psycho-physiological arousal are substantial. Furthermore, the ability to get adequate sleep just prior to these driving hours appears to be reduced by circadian influences.

It should be noted that the results of this study were measured from drivers who had the opportunity to

obtain eight hours of sleep each night. This may not be the case for drivers on irregular schedules under many operating conditions.

We found no other research specifically addressing bus drivers in our bibliographical review.

There are numerous references which tend to historically define the importance of fatigue in bus industry. Of course, the 1978 research report cited above provides scientific evidence of bus driver fatigue. In August, 1995, a bus conference sponsored by the Federal Highway Administration/Office of Motor Carriers was held in Tyson's Corner, VA. This conference brought together leaders throughout the interstate bus industry to define and prioritize issues of importance to the industries future vitality and safety. Hours of service/fatigue was rated as one of the highest priority issues by the industry.

In November 1995, a symposium on managing human fatigue in transportation was held in Tyson's Corner, VA. Irregular duty/sleep patterns and inverted duty/sleep patterns were identified as major contributors to driver fatigue which resulted in commercial motor vehicle accidents.

On February 11, 1999 the National Transportation Safety Board published a highway special investigation report on selective motorcoach issues (NTSB/SIR-99/01) this study concluded that driver fatigue played a significant role in the two crashes investigated. They recommend that bus drivers be made aware of the dangers of inverted duty/sleep periods as part of a video on driver fatigue.

The net result of the literature search is that there is very little specific fatigue research on intercity bus drivers.

What is very clear as a result of the literature review is the scientific knowledge related to fatigue and its relationship to the driving task. "Fatigue" is a generic term used to encompass a range of

experiences. These experiences range from sleepiness and tiredness to mood and temperament changes and inattentiveness. There are two major physiological phenomena that have been demonstrated to create fatigue: sleep loss and circadian rhythm disruption:

Sleep loss. Sleep is a vital physiological function. The average individual normally needs about eight (8) hours of sleep daily. If a person does not get his required sleep, he accumulates a sleep debt which can only be eliminated through sufficient amounts of sleep.

Circadian rhythm disruption. Circadian rhythms are physiological and behavioral processes that oscillate on a 24 hour basis. While the quantity of sleep needed is known, the quality of sleep is related to when sleep is obtained within the circadian rhythms.

Circadian disruption and sleep loss combine to produce adverse fatigue effects.

Proper nutrition and physical conditioning are important influences on the effects of fatigue for commercial motor vehicle drivers. Proper eating during the day and before sleep significantly influence alertness and rest quality. Reasonable physical conditioning and weight control not only increase stamina which reduces or delays the onset of fatigue but also may reduce the possibility of sleep apnea.

We are also aware of a study currently underway which is being conducted by the Trucking Research Institute, the Private Fleet Management Institute, and Iowa State University to evaluate the role of motor carrier scheduling practices in interstate commercial driver fatigue. This study has a bus component as a part of the project. Currently, the researchers are planning to survey the motor carrier community to learn of their scheduling practices and compare them to a commercial motor vehicle driver fatigue model that identifies various scheduling-related factors that influence driver fatigue, non-scheduling factors that may also have an affect on driver fatigue, and measures of driver fatigue. This model was developed through

the knowledge and experience of a number of individuals and organizations within the commercial driver community. The results of this study will not be known until the end of 1999 or the beginning of the year 2000.

IV VIDEO SEARCH

No videos directly related to bus driver fatigue were found during our search. Only three (3) fatigue videos for commercial drivers were found and reviewed. Those three videos are:

- *Fatigue* by Centurion Video, 1988
- *Dealing with Truck Driver Fatigue* by Owner-Operator Independent Drivers Association Foundation, Inc., 1997
- *The Alert Driver, a Trucker's Guide to Sleep, Fatigue, and Rest in our 24-Hour Society* by the American Trucking Association, 1997.

All three of these videos address fatigue issues for commercial drivers; but specifically truck drivers. The video developed by the American Trucking Association is an excellent one detailing the need for proper sleep, nutrition, and physical exercise. It also describes operational issues that drivers face that can result in fatigue, and discusses the effects of caffeine and nicotine on alertness.

None of these videos provide the setting and the operational situations that bus drivers face. Thus, while they have scientific educational value, they are not specifically relevant to the motorcoach driver. Bus drivers share similar problems, but it is unlikely that most bus drivers would relate personally to the trucker's situations portrayed in the videos.

V WORLD WIDE WEB SEARCH

The Internet is an excellent source of information on a wide variety of topics. The Department of Transportation maintains an informative web site with many reports, articles, program data, statistics and resources. We used this as a starting point to ensure that we would not be duplicating work already known to the Federal Highway Administration, Office of Motor Carriers on the topic under consideration. We attempted to research, on the web, items that may not have been included in the body of known literature. This would include current events, periodicals, international items and other points of interest. We found a wealth of data addressing the topics of sleep, driver fatigue and stress, and commercial vehicle accidents. We found a considerable number of items on bus safety and motor vehicle accident prevention. We will not attempt to summarize every item found, but have listed those of some relevance and that we found of interest. In order for the reader to access these items himself, we have provided a listing with the web address of each item at the end of this chapter.

Arrowhead analysts queried the world wide web for data related to fatigue and stress issues. We did this in order to discover information that is more current or more diverse than that contained in the basic literature. This avenue for information gathering is relatively new, and we wanted to explore it as a source of knowledge perhaps not previously accessed by authors of similar studies. It is also interesting to see what other investigators will find on the web in conducting such a search.

We used standard search engines with key words and followed links to other sites. We then formulated a matrix chart to categorize the sites visited as to area of interest and numbered each entry for ease of future reference. The numbers in brackets in the text refer the findings discussed.

We employed several Internet search engines to seek related data. The search engines queried included Netscape, HotBot, Yahoo, Excite, Google, MSN and aol's NetFind. The key words on which the search

was conducted included:

- Sleep
- Fatigue
- Stress
- Bus drivers
- Transportation
- Motor Coach

Various combinations of these words were used and often links were pursued that led from one source to another. Some search engines identified over 1,000,000 “hits” for these key words. Often the suggested source documents dealt with computer equipment data buses and disc drives or drivers, rather than vehicles. Another large body of information addressed school buses, an area outside the scope of this study. When these extraneous items were removed, there was considerably less relevant material.

Over 80 documents were found which bore some relation to the topic under study. These findings were downloaded, printed and numbered for reference. Copies of the documents deemed of some interest were previously submitted in the “Report on Results from Literature and Video Search.” The references were catalogued in a simple matrix form to identify the area of interest they addressed: sleep research, driver fatigue or stress, fatigue countermeasures, truck or bus drivers specifically. Then some remarks indicate the general information of interest contained in the article. The numbers in brackets in the following discussions refer to this reference listing.

The following points were gleaned from the web search. Each point is discussed in the some detail in the next section.

- The problem of fatigue in commercial drivers is widely recognized.
- The problem of fatigued drivers is national and international in scope.
- Busing is a safe mode of transportation, but accidents involving buses are occurring with more frequency in recent years.
- Among the Causative Factors of Driver Stress and Fatigue are:
 - Tight Schedules
 - Insufficient Sleep/sleep disorders
 - Driving at night when body wants to be asleep
 - Driving on shifts with varied schedules
 - Making extra “off-the-book” runs
 - Insufficient rest stops scheduled
 - Lack of control; feelings of helplessness
- Countermeasures to combat fatigue include:
 - Education about the physiological need for sleep and its deprivation effects
 - Enforcement of duty cycle limitations
 - Heavy fines for Companies that disregard rules and regulations
 - Decreased driving from midnight to 6:00 am
 - Recognizing fatigue symptoms
 - Devices/Alarms that indicate drowsiness
 - Environmental Improvements to highways
 - Stimulants—coffee, cola, tea
 - Good health—physical fitness
 - Napping

Relaxation/meditation techniques

Each of these findings from the web review is discussed in some detail below with references to the item that supports the finding.

The problem of fatigue in commercial drivers is widely recognized.

Numerous organizations and research studies were found that address fatigue as a cause of road accidents in addition to the DOT/FHWA. Among the organizations with web sites that addressed some aspect of the driver fatigue issue are:

AAA	American Automobile Association [40]
AAMVA	American Association of Motor Vehicle Administrators [39]
ASIRT	Association for Safe International Road Travel [78]
ITSA	International Traffic Safety Association [20]
ITF	International Transport Workers Federation [62]
NIOSH	National Institute of Safety and Health [29]
NTSB	National Transportation Safety Board [48]
NSF	National Sleep Foundation [42]
NASA	National Air and Space Agency [14]
SC&RA	Specialized Carriers & Rigging Association [15]
TRB	Transportation Research Board [86]

Among the research studies specific to driver fatigue identified on the web are:

Impact of Sleeper Berth Usage on Driver Fatigue; Virginia Tech Center for
Transportation Research [16]

Traffic Safety, Information Village; AAMVA [39]
Driver Fatigue and Alertness Study (Executive Summary); DOT/FHWA [11]
Driver Fatigue; ITSA
Fatigue in Transportation: Multimodal Issues and Solutions; TDC [52]
Understanding Truck Driver Fatigue; TDC [55]
Facts About Drowsy Driving; NSF [25]
Driving in the Awake Lane, Safety and Fatigue Consultants Intl. [72]
Aircrew Fatigue Resources on the Web, Eglin AFB NOTAMS [41]
What Makes Bus Driving Stressful? TGWU [79]

Only one, the last, of these reports is specific to bus drivers, and it presents the results of a survey conducted by the Transport and General Workers Union in Sheffield, England. The bus drivers surveyed were **not** intercity drivers, so their conclusions, while interesting, are not necessarily transferable to the tour bus, charter bus, and commercial cross country bus drivers of this study. (The Study Team had already obtained a copy of this report from Ms. Debbie Freund of DOT/OMC.)

The problem of fatigued drivers is both national and international in scope.

In the United States, many states have issued brochures and Public Service Announcements [12] on the topic. State level DOTs have conducted forums and released information on the subject; Minnesota [6], Illinois [17], New York [8, 12, 22, 64].

On the international scene, articles and reports were found that address problems of driver fatigue leading to accidents in Canada [7,52], Australia [23, 49], Belgium [60], Denmark [65], Malaysia [61], Africa [63], Israel [57], Brazil [66], and Great Britain [20]. International conferences have been held on the subject [34]. The European Union Transport Commission has addressed the issue [60, 62].

Bus safety is decreasing -- more accidents are occurring involving buses in recent years.

A number of articles were discovered that indicated that while bus transport has been generally viewed as one of the safest modes of transportation, that view is changing. One of the most recent was a lead article in USA TODAY, May 26, 1999 issue, entitled “*Gambling with Riders’ Safety.*” This article dealt particularly with accidents that occurred on Charter Buses going to and from gambling casinos. It indicated that the number of bus accidents has been rising over the past three years and has risen significantly in the past six months [50]. Buses were involved in 69 fatal crashes last year (1998), which was double the number of the previous year [50]. Details of another recent (February ‘99) accident on casino bus was found [21].

Other articles with a similar theme are *Charter Bus Drivers Working Illegal Hours*, an article in the Tri State Transportation Campaign (TSTC) organization bulletin [64] of February 1999, and an NTSB news release of February 1999 that warns of increasing incidents of bus driver fatigue [47].

Fatigue Causative factors that were identified are:

Tight Schedules. One in five drivers said that “tight running times or running late are the most stressful part of the job. In fact, 66% said running times at peak hours are too fast or unachievable.”[79] Drivers are often forced to exceed the legal speed limits to meet their schedules [62]. This pressure leads to stress and to accidents. Drivers who fail to speed are fired says one report from Zimbabwe [63].

Good scheduling can reduce fatigue is evidenced by a statement from the Runcutter News Web Page [46] which says, “...some of the runcutting techniques I’ve devised go to counter fatigue. It is easier to avoid collision and injuries if we schedule our drivers appropriately.”

Insufficient Sleep. The problem of workers' schedules affecting their fatigue, sleepiness and stress was documented in Walter Reed's studies on "Sleep Deprivation and Simple Psychomotor Performance, Physical Strength, and Endurance [1];" and "On-line Real-time Alertness and Performance Monitoring [2]." The NTSB news release on Driver Fatigue [5] of March 1999, which called for DOT motorcoach safety rating, says that "inverted duty-sleep schedules created the fatiguing conditions that caused the bus driver to fall asleep" resulting in a fatal accident. The BC Research study on Shift and Fatigue Management [30] also recommends fatigue management training for commercial drivers and their families. The *Cross Modal Study of Fatigue and Hours of Service* resulted in their recommending a performance-based approach [33].

Sleep disorders. Several sources mentioned the possibility of sleep apnea causing fatigue and drowsiness at the wheel [55]. They point out that many bus drivers are over-weight middle-aged men who are most at risk for sleep apnea problems [38]. In fact, one study indicated that the incidence of sleep apnea in commercial drivers was higher than the general population average. A Hospital study on 100 drivers who had accidents concluded that there is a strong association between patients with sleep apnea and the risk of traffic accidents [71].

Driving at Night when body wants to be asleep. Night time driving was mentioned in several documents as being the time of highest risk for driving accidents [5]. The article, "*How Good Are Our Drivers?*" [57] indicates that night driving represents a risk factor 36 times greater than day driving. Time of day and circadian cycles are identified as the biggest contributors to road accidents at the International Conference in Fremantle, Australia in 1997 [53]. Most accidents occur between midnight and 0600. A full, informative report on the findings of the conference is available on the web [55].

Driving on shifts with varied schedules. It was pointed out that inverted sleep cycles resulting from shift work changes add to fatigue as the body tries to adjust to irregular times to sleep [30]. Also workers on changing shifts have a more difficult time getting sufficient sleep when they are off duty [33]. This problem is addressed in the NSF *Sleep in America Poll* [42] which found that 53% of shift workers do not have regular schedules, a situation which disrupts their natural sleep cycles. One study mentioned a tendency for new commercial drivers, who are the least experienced, to get the worse shifts [51].

Making extra-off-the-book runs. Long hours of service were mentioned in several reports notably the NSF [26] and the NIOSH [29]. A report on options for changes to Hours of Service regulations in Canada reports that after 24 hours of duty, workers experience a 25% decrease in performance [56]. Working illegal hours is reported as a regular practice by bus drivers, particularly on the New York City to Atlantic City route [64].

Lack of control; feelings of helplessness. A connection between lack of control and stress leading to fatigue is documented in a study of Danish bus drivers [65] that found when self-governance was introduced cardiovascular diseases decreased. Bus drivers are at a higher than normal risk for these diseases [80]. An ITF bulletin claimed that workers can reduce stress by getting the voice of the workers heard and improving relations at work [80].

Recommended Countermeasures to Fatigue Include:

Education about the physiological need for sleep and its deprivation effects. Several articles mentioned the importance of drivers understanding the affect of lack of sleep on performance. They stressed the need to educate drivers on the amount of sleep required by the human body and the danger of not getting sufficient rest [4]. Some training materials were offered

that addressed understanding sleep requirements for truck drivers. The NSF provides sleep stats and points out the need for public education on these facts [42]. They sponsor the Pickwick Club, which is devoted to promote public awareness for the Drive Alert-Arrive Alive Program [42]. The *Drive Safely at Work Week* [45] is another effort to promote awareness of the dangers of insufficient sleep on drivers.

Two courses on Fatigue awareness were mentioned on the web. One that appeared in *Runcutter News* [46] is a Transportation Safety Institute *Fatigue Awareness* course recommended for fleet managers, supervisors and drivers. The other is a commercial course entitled “*Driving in the Awake Lane*” available for truck drivers [72].

Enforcement of duty cycle limitations. There are federal rules and regulations governing the number of hours a commercial driver can drive at one time and the number of hours that must be allowed as time off between jobs (Hours of Service). The current rules may need revision in order to ensure that drivers are able to get sufficient sleep. However, even the existing limitations are often ignored or subverted by drivers who are trying to increase their salaries and by companies trying to increase revenue and make tight schedules [33]. An Associated Press news release addressed the need for tighter rules [36]. A plea for heavier fines on Corporations is made by city and local officials [37]. In an article entitled “Safety and Working Conditions in Europe,”[62] bus safety is addressed with an admonition to enforce regulations on Hours of Service (HOS).

Heavier fines for Companies that disregard rules and regulations. Closely related to the hours of service regulations is the fact that fines for breaking the rules are not very stiff. In many cases, the maximum fine for an infraction is \$500.00 [37]. The companies are willing to accept the fine rather than abide by the regulations for hours of service. Increasing fines and imposing severe

penalties on Companies that fail to comply would help drivers abide by the limitations that are designed to ensure that they get sufficient rest to avoid driving while fatigued. The NTSB is calling for tougher fines and regulations [5]

In one case a woman is suing the bus company for the death of her driver husband saying that the company forced him to drive long hours although they were aware that it was dangerous [79]. In another example, the claim is that transit companies insist that their drivers exceed the speed limit and if they get a speeding ticket, the company pays the fines.

Decrease driving during midnight to 6:00 am. Numerous examples are cited that indicate that the hours between midnight and daybreak (around 6:00 am) are the times of most severe fatigue [68]. A second low period is between 2:00 and 4:00 in the afternoon, but this time period is not as severe [17]. These sleepy periods are due to natural body circadian cycles and cannot be resisted. A case may be made that truck drivers cannot escape the necessity to drive during those times, but bus drivers can be scheduled more flexibly and should be. Also, when drivers must drive during the low energy hours, the HOS allowed should be reduced to compensate for the added risk of fatigue.

Recognize fatigue symptoms. A device warning the driver that he is in danger of falling asleep at the wheel is described [13] . Several sources mentioned that people are not always able to assess accurately how sleepy or fatigued they really are [25, 38].

Devices/Alarms that indicate drowsiness. Among the devices designed to alleviate the stress and fatigue of driving long trips are a backsaver [9], improved steering bellcrank [10], and sleeper berths [16]. Warning systems of fatigue symptoms to alert drivers [13] are proposed to enhance

truck drivers' safety [35 (SAM)].

The Department of Behavioral Biology at Walter Reed AIR is evaluating a variety of alertness and performance measuring devices including eye tracking, pupilometry, computer-based facial expression analysis, and other embedded performance measures [2].

Environmental Improvements to highways. Environmental aids to keep drivers alert are mentioned in several cases. One such device is the installation of rumble strips to alert a driver when he is drifting out of his lane [68]. Bright lights are a physiological countermeasure to drowsiness and may provide aids to night drivers [84]. For truck drivers, the addition of suitable rest stop areas was felt to be an aid.

Stimulants—coffee, cola, tea. Caffeine can be an effective stimulant [17]. Two cups of coffee consumed 20 minutes prior to times of anticipated sleepiness may help combat fatigue [4]. However, caffeine provides a quick, but short-lived improvement in alertness, and the body becomes adapted to regular use of caffeine; so, to capitalize on its benefits, one should use it only when a boost is needed [17].

Melatonin is a hormone that may be useful to combat fatigue by resetting the body's circadian rhythm, and allowing a person to sleep at atypical times. This would be extremely useful for people on shift work if they had regular cycles [81].

Good health—physical fitness. Physical fitness is important to general good health. One report recommended improving personal safety and fitness as a means to reducing stress for bus drivers [80]. They suggested instruction by medical professionals on improving posture whilst sitting in

the driver seat, learning how to stretch muscles and reduce muscular tension stress management instruction and physical fitness programs [80].

Napping. Pulling over to nap for 15-20 minutes is cited as a means to moderate a driver's level of sleepiness for a brief period of time [4]. The New York Transit authority is considering napping as a possible way to reduce fatigue among train and bus operators [12]. A study by the Australian TDC addressed the short-term value of brief naps to combat fatigue on long trips [54]. The value of short naps is also discussed in several medical studies; one, sponsored by the FAA, found that a brief in-flight nap improved performance and physiological alertness[84]. Based on these results, the FAA has developed regulatory materials for implementing planned cockpit rest periods [84].

Relaxation/meditation techniques. In one study of 235 bus drivers in Rio de Janeiro [66] meditation exercises and correct breathing exercises were reported to help reduce stress significantly. A similar, independently conducted study was purported to have produced good results in Sweden as well [66].

In conclusion, while we discovered a significant amount of material on the Internet that addresses topics relating to the area under study, there were no studies or reports that specifically addressed intercity bus driver's fatigue and stress issues.

WEB SEARCH RESULTS
DRIVER STRESS AND FATIGUE REFERENCES

1. DEPARTMENT OF BEHAVIORAL BIOLOGY

Sleep Deprivation and Simple Psychomotor Performance, Physical Strength, and Endurance: <http://wrair-www.army.mil/depts/behavbio/sdsep.htm>

2. DEPARTMENT OF BEHAVIORAL BIOLOGY

On-line real-time Alertness and Performance Monitoring:
<http://wrair-www.army.mil/depts/behavbio/rtma.htm>

3. DEPARTMENT OF BEHAVIORAL BIOLOGY

Publication List
<http://wrair-www.army.mil/depts/behavbio/pubs/bbpib.htm>

4. DRIVING ON THE EDGE – A MOBILE SOCIETY ON TOO LITTLE SLEEP:
<http://www.rxforsleep.com/html/sleepinfo/driving.html>

5. NTSB CALLS FOR DOT MOTORCOACH SAFETY RATING:

[Driver Fatigue Awysiwyg://6/http://news.propertyan...risk-management/19990309-8879.html](http://news.propertyan...risk-management/19990309-8879.html)

6. 4th ANNUAL PARTNERS FOR ROADWAY SAFETY CONFERENCE AGENDA:

<http://www.dot.state.mn.us/conferences/partners4/agenda.shtml>

7. A SAFETY INITIATIVE OF THE CANADIAN AND ONTARIO TRUCKING ASSOCIATIONS

Project Alert
http://www.ontruck.org.news/releases/1995_1997/alert.htm

8. NYS DEPARTMENT OF MOTOR VEHICLES, GOVERNORS TRAFFIC SAFETY COMMITTEE

Don't hang out in the "No Zone"
<http://nysgtsc.state.ny.us/nozone.htm>

9. THE BAKER BACKSAVER

<http://www.bakerprecision.com/backsave.htm>

10. ERIC'S RV PERFORMANCE CENTER

Super Steer Bellcrank

<http://www.ericrv.com/bellcrank.htm>

11. U.S. DEPARTMENT OF TRANSPORTATION

Driver Fatigue and Alertness Study

<http://www.fhwa.dot.gov/omc/fatrept.htm>

12. NAPPING

<http://www.calslb.com/news/0129news/newpage7.htm>

13. HIGH TECH FATIGUE WARNING SYSTEM ENHANCES TRUCKER SAFETY

<http://www.preiersystems.com/market/index.html>

14. NASA

Fatigue Resource Directory

<http://olias.arc.nasa.gov/zleam/fredi/home-page.html>

15. SC&RA PRESS ROOM

Transport Safety and Management Forum Covers key issues:

<http://www.scranet.org/press/pressr21.htm>

16. VIRGINIA TECH CENTER FOR TRANSPORTATION RESEARCH

Impact of Sleeper Berth Usage on Driver Fatigue:

http://www.ctr.vt.edu/current_projects/sleeper_berth.shtml

17. DRIVER SAFETY INFO

<http://www.safetyinfo.com/dot/driver.htm>

18. LITIGATION SUPPORT

<http://www.trucks-bus-consultant.com/>

19. VIRGINIA TECH CENTER OF TRANSPORTATION RESEARCH

The Human Factors Safety research Group

http://www.ctr.vt.edu/research_areas/hfs.shtml

20. DRIVER FATIGUE A KILLER ON THE ROADS

http://www.itsafety.org/ITSA/driver_fatigue_a_killer_on_the_r.htm

21. BUS HIT A TREE KILLING DRIVER

<http://www.phillynews.com/news/99/Feb/11/jersey/JFIL11.htm>

22. NEW YORK TEACHER

Senate Proposes bus safety bills

<http://www.Nysut.org/dept/nyt/98-99/990224safety.html>

23. INTERNATIONAL ACTION DAY ON DRIVER'S HOURS

Facts about Fatigue and Driving

<http://www.itf.org.uk/SECTIONS/It/8sept98/facts.html>

24. DRIVER FATIGUE CITED IN CRASH OF HAZARDOUS MATERIALS TRUCK IN NY:

http://www.itsafety.org/ITSA/driver_fatigue_cited_in_crash_of.htm

25. WAKE UP

Sleeping and driving don't mix:

<http://www.sleepfoundation.org/publications/wakeup.html>

26. NSF: FATIGUE MANAGEMENT INITIATIVE

Educational programs to prevent Transportation injuries and death:

<http://www.sleepfoundation.org/advocacy/dotpress.html>

27. TRUCKS AND COMMERCIAL VEHICLES

http://www.albany.edu/sph.injr_12z.html

28. THE TOP TRUCK AND BUS SAFETY ISSUES

<http://www.thfrc.gov/pubrds/summer95/p95su20.htm>

29. NIOSH REPORT HIGHLIGHTS MOTOR VEHICLE.... PROTECTIVE MEASURES

<http://www.cdc.gov.niosh/motorveh.html>

30. BC RESEARCH INC.

Shift and Fatigue Management:

<http://www.ber.bc.ca/ergonomics/fatigue.htm>

31. SUSQUEHANNA TRAILWAYS BUS

<http://www.susquehannabus.com/>

32. BEHIND THE WHEEL ON ROUTE 66

<http://www.drive66.com/index.html>

33. CROSS MODAL HUMAN FATIGUE/HOURS-OF- WORK POLICY

<http://www.nts.gov/recs/fatigue.htm>

34. JIM HILLS SPEECH ON 4/30/97

National Transportation Safety Board:

<http://www.nts.gov/speeches/jh970430.htm>

35. REBMAN DRIVER ALERT SYSTEMS LTD.

Fatigue Systems:

<http://www.sleepdriver.com.more.htm>

36. TOUGHER RULES SOUGHT AFTER CRASHES

<http://www.lineofduty.com/blotter/messages/4785.html>

37. CITY & LOCAL

Feds taking aim at truck safety:

[wysiwyg://157/http://www.phillynew...ly news/99/May/27/local/TUCK27.htm](http://www.phillynews.com/news/99/May/27/local/TUCK27.htm)

38. COMMERCIAL MOTOR VEHICLE DRIVER FATIGUE AND ALERTNESS STUDY

<http://www.fhwa.dot.gov/omc/es-5g.html>

39. TRAFFIC SAFETY INFORMATION VILLAGE

Associations & Organizations

<http://www.drivers.com/org.html/>

40. AAA FOUNDATION RESEARCH PAPERS

<http://phoneix.webfirst.com/aaa/Text/research/rsrcheat.htm>

41. NOTAMS

Aircrew Fatigue Resources on the Web

<http://www.-afsc.saia.af.mil/magazine/htdocs/maytag98/notams.htm>

42. 1999 OMNIBUS SLEEP IN AMERICA POLL:

<http://www.sleepfoundation.org/publications/1999poll.html>

43. PICKWICK CLUB

National Sleep Foundation

<http://www.sleepfoundation.org/activities/pickwick.html>

44. NSF: RESEARCH FUNDING AT CDC

<http://www.sleepfoundation.org/advocacy/cdcprss.html>

45. DRIVE SAFELY AT WORK WEEK

Driver Fatigue Quiz

[wysiwyg://188/http://www.fhwa.dot.gov/omc/fatigue.htm](http://www.fhwa.dot.gov/omc/fatigue.htm)

46. RUNCUTTER NEWS PAGE

TSI Fatigue Awareness

<http://www.runcutter.com>

47. NTSB

Press release:

<http://www.nts.gov/pressrel/980129.htm>

48. NTSB

Warns About bus Driver Fatigue

<http://www.800laiwinfo.com/articels/article11.cfm>

49. SAFETYLINE 27

Coach Drivers Checked for Fatigue

http://www.wt.com.au/safetyline/magazine/sline_27/article16.htm

50. CHARTER BUSES

Gambling with Riders Safety

<http://www.usatoday.com/life/travel/leisure/1999/t0526bu.htm>

51. BUS DRIVERS AND SCHOOL DRIVERS

<http://www.calmis.cahwnet.gov/file/occcgudie/BUSSDRIV.TXT>

52. TDC

Fatigue in Transportation: Multimodal Issues and Solutions

<http://www.tc.gc.ca/TDC/news/mmwork.htm>

53. TDC

Proceedings of Fatigue in Transportation Workshop

<http://www.tc.gc.ca/TDC/sumerry/13375.htm>

54. TDC

Driver Drowsiness, Length of Prior Principal Sleep Periods. And Naps

<http://www.tc.gc.ca/TDC/summery/13237e.htm>

55. TDC

Understanding Truck Driver Fatigue

<http://www.tc.gc.ca/TDC/news/fatigue.htm>

56. TDC

Options for Changes to Hours of Service for Commercial Vehicle Drivers:

<http://www.tc.gc.ca/TDC/summery/13309e.htm>

57. HOW GOOD ARE OUR BUS DRIVERS

<http://www.israelwire.com/New/990101/9901013.html>

58. GREEN TORTOISE

Adventure Travel

<http://www.greentortoise.com/home.html>

59. GREEN TORTOISE

Online Driver Application

<http://www.google.com/search?q=cac....com/adventure.bus.drivers.on.html>

60. EUROMYTHS

Driven Crazy by Barmy Bus Driver Brussels Ruling

<http://www.cec.org.uk/myths/newmyths/myths31.htm>

61. MY AGENT: TOUR BUS DRIVERS DON'T GET ENOUGH REST

<http://www.cs.uiuc.edu/users/chai/berita/967011-960801/0184.html>

62. SAFETY AND WORKING CONDITIONS IN EUROPEAN BUS AND COACH TRANSPORT

<http://www.iff.org.uk/SECTIONS/it/road/busleaflet1.htm>

63. TABLOID:BAD PLANET

Bus Drivers Wanted:

<http://www.tabloid.net/1998/04/21/D1.html>

64. MTR 209, AROUND THE REGION

Charter Bus Drivers Working Illegal Hours

<http://www.tstc.org./bulletin/199990226/mtr20914.htm>

65. DANISH BUS DRIVERS

<http://www.google.com/search?q=cac...serve.net/cse/projects/pdanbus.htm>

66. OSHO MEDITATIONS HELP RIO BUS DRIVERS

<http://www.osho.com/news/world/bus-dr.htm>

67. TDC PUBLICATIONS

<http://www.tc.gc.ca./TDC/publicat/listing.htm>

68. NSF: DAAA FACTS

Facts about Drowsy Driving

<http://www.sleepfoundation.org./activities/daaafacts.html>

69. HSPMC

Transportation Safety Bibliography

http://www.hskids-tmse.org/resources/guides/tb_state.htm

70. THE VIRGINIA TECH CENTER FOR TRANSPORTATION RESEARCH

http://www.ctr.vt.eud/current_projects/local_short_haul.shtml

71. CHRONOGIOLOGY INTERNATIONAL

Output signals of the SCN; Impact of Melatonin on Driving Performance

Rethinking the assessment of sleepiness

An examination of next day hang-over effects

Accidents related to sleepiness

The association between Sleep Apnea and Traffic Accidents

72. DRIVER FATIGUE IS EVERYBODY'S PROBLEM

<http://www.sfcintl.com/right.htm>

73. COMMERCIAL VEHICLE CONSULTANTS, INC.

Bus Maintenance Management

<http://www.comvehicle.com/pages/buses.htm>

74. AMONG INTERSTATE TRUCK AND BUS DRIVERS

<http://www.dot.gov/affaors/1998/fhwa0298.htm>

75. TOTAL REPORTED INCIDENTS BY MODE (1993-1997)

<http://apta.com/stats/modesumm/bussum.htm>

76. NATIONAL SAFETY COUNCIL

School /Bus Safety Fact Sheet

<http://www.nsc.org/mem/motor.htm>

77. UMA SAFETY AND FACT SHEET

<http://www.uma.org/umfacts>

78. ASIRT

Road Travel Report:Turkey

79. PROPOSALS TO IMPROVE BUS AND COACH SAFETY

www.itf.org.uk

80. BUS DRIVER'S ALERT

www.itf.org

81. BUS DRIVERS Examined by ITF Health Group

Lack of job satisfaction can make you sick

www.itf.org

82. ITF: Safety

Safety and Working Conditions in European bus and coach transport

www.itf.org

83. INSTITUTE OF ADVANCED MOTORISTS (IAM)

Road Safety Training and Database of Links

<http://www.iam.org.uk/Links/links93.htm>

84. NASA

Fatigue Countermeasures

<http://www-afo.arc.nasa.gov/zteam/fredi/home-page.html>

85. ABA

Industry Profile and Safety

<http://www.buses.org/rightblank.html>

86. TRANSPORTATION RESEARCH BOARD

TRB Information Service

<http://nas.edu.trb/about/trisf2.html>

VI INDUSTRY ADVISORY PANEL

The Industry Advisory Panel was comprised of leaders in the motorcoach industry, as well as scientific experts and, insurance industry experts, and others knowledgeable about fatigue related issues for

commercial motor vehicle drivers. More specifically, motorcoach owners, safety directors, operation managers, and drivers were represented on the committee to provide the broadest representation and range of experience necessary to provide guidance for the study and review results. Moreover, these people represented a number of groups that are stakeholders in the area of bus driver safety. Therefore, their involvement was deemed crucial to the success of the results of the study.

The following are members of this panel:

- Mr. David Bolen, Owner, New World Coaches
- Mr. Godfrey LeBron, Owner, Paradise Travel and Tours
- Mr. Pete Van Beek, Corporate Safety Director, Coach USA
- Mr. Alex Guariento, Director of Safety, Greyhound Lines
- Mr. Tom Carrigan, Director of Safety, Martz Lines
- Mr. Jeff Barnett, Operations Manager, Eyre Bus
- Mr. Mike Horak, Operations Manager, Academy Bus Lines
- Mr. Vaughn Ammons, Operations Manager, Capitol Trailways
- Mr. Jack Burkert, Senior Vice-President, Lancer Insurance Co.

- Mr. Steve Sprague, Chief Operating Officer, United Motorcoach Association

- Mr. William Mahorney, Director of Government and Regulatory Affairs, American Bus Association

- Mr. John McQuaid, President, National Private Truck Council

- Dr. William Rogers, Director, Trucking Research Institute, a part of the American Trucking Association

- Mr. William Campbell, Driver, Martz-Franklin Lines

- Mr. Moses Lennon, Driver/Driver Instructor, Greyhound Lines

- Pat McKeon, Commercial Fleet Service Specialist, Marsh Inc.

- Mr. Wes Barber, Special Agent, FHWA/OMCS

- Mr. Ron Knipling, Chief of Research Division, FHWA/OMCS

This panel convened for a one-day session in Falls Church, Virginia, on September 10, 1999.

All relevant subject matter resulting from the two completed Focus Groups held previous to September 10 and the literature and video search was discussed with the Industry Advisory Panel. When all subsequent Focus Group sessions were completed, a set of preliminary recommendations was prepared and presented to the Industry Advisory Panel for their review and comments. This was accomplished via e-mail and fax.

The panel provided substantial and significant guidance and perspective to consideration of the issues that were identified and helped refine the final recommendations contained in this report.

VII FEDERAL AND STATE OFFICIALS

To obtain as complete a perspective as possible on motorcoach driver fatigue and issues associated with it. We have interviewed several Federal officials in the US Department of Transportation. Among the DOT managers whom we have contacted are Ms. Debbie Freund, Ms. Elaine Riccio, and Ms. Cynthia McMickens. Each of these managers was very helpful in providing training materials, other potential resources and their input.

The objectives and conduct of this Study were presented to the Passenger Carrier Committee of the Commercial Vehicle Safety Alliance (CVSA) at their Annual Meeting in September 1999 in Portland, Oregon. Input received from Committee attendees was incorporated into the Study recommendations.

VIII FOCUS GROUP SESSIONS

The Focus Group sessions were designed to develop the issues and operating situations that are unique within the motorcoach industry and which contribute to driver fatigue. This direct interaction with the people currently involved in the industry was crucial to produce a study that is relevant to today's drivers. Our strategy in scheduling Focus Groups was to gain as wide a geographical representation as possible and to obtain input from the four relevant operational areas within motorcoach organizations: namely, owners, operation managers, safety directors, and drivers.

An additional Focus Group was recommended by the Industry Advisory Panel and authorized by the DOT Program Manager. This Focus Group was comprised of tour and travel industry professionals. The results of this Focus Group are included separately as Appendix C to this report.

To accomplish this, a series of five Focus Group sessions were convened by Arrowhead; and an additional Focus Group session was conducted by an operator for its drivers. One hundred and twenty-five (125) people participated in the Focus Groups. Group sessions, locations, and targeted organizational areas were as follows:

- Motorcoach Drivers - June 17, 1999; Biloxi, MS (28 participants)
- Motorcoach Operation Managers - August 30, 1999; Chicago, IL (14 participants)
- Motorcoach Company Owners - September 16, 1999; Ontario, CA (27 participants)
- Motorcoach Safety Directors - October 5, 1999; Sweetwater, NJ (20 participants)

- Motorcoach Drivers - October 5, 1999; Sweetwater, NJ (16 participants)
- Motorcoach Drivers - September 20, 1999; Sundance Stage Lines - San Diego, CA (20 participants)

Appendix A contains the list of the attendees at these Focus Group Sessions.

Our objective was to facilitate a lively candid discussion around the relevant topics to produce meaningful input within a 2-hour time interval. This objective was fully achieved.

Based upon the literature review, the major areas around which Focus Group discussions were facilitated are as follows:

- Does the motorcoach driver in your company have the opportunity to get at least 8 hours of sleep on a daily basis during his/her work week?
- What operational situations/issues can lead to motorcoach driver stress and fatigue?
- What operational situations/issues which can lead to motorcoach driver stress and fatigue are unique to the motorcoach industry?
- What situations can be applied to minimize/eliminate these driver stress and fatigue producing situations/issues?

In addition to the Focus Groups, telephone surveys were conducted with individuals who could not attend a Focus Group session, but wanted to participate. The base discussion topics were used during phone

discussions to obtain relevant input for the study. Appendix A contains a list of these survey participants.

One motorcoach driver, Walt Williamson, Jr. of the Free Enterprise System, provided written input which was incorporated into the study.

IX IDENTIFICATION OF ISSUES FROM FOCUS GROUP SESSIONS AND PHONE SURVEYS

Participants in the Focus Group sessions and phone surveys provided substantial and relevant contributions toward defining the relevant issues associated with bus driver stress and fatigue, the unique aspects associated with the motorcoach industry, and possible solutions as well as additional concerns related to these issues. These contributions came from a geographical and operational cross section of the industry. The locations of the Focus Group sessions were detailed previously. Generally, attendees at these Focus Groups were from those regional areas. Also, as previously described, contributions were received from drivers, operation managers, safety directors, and owners.

Bus driver's stress and fatigue issues, the unique aspects related to the motorcoach industry, and solutions that were identified at each of these Focus Group sessions and through the phone surveys are consistent and similar. This consistency provides a strong foundation upon which to identify these issues and to recommend solutions. Appendix B contains a complete listing of issues identified at the five bus industry Focus Group sessions. Appendix C contains the results of the special Travel Industry Focus Group, conducted November 10, 1999.

Many of the issues and solutions centered around key operational areas (e.g. passenger management, driver scheduling, regulatory compliance). We have attempted to combine input from the Focus Groups and phone surveys under such key operational areas.

Based upon input from all participants in the Focus Groups, the following issues are relevant to bus driver fatigue and stress:

1. Driver Issues

- C Wellness and lifestyle - a driver's physical fitness, diet, and personal living habits influence and contribute to fatigue on the job. Family matters, state of health, and sense of self-worth also contribute to a mental state of mind or attitude which in turn influences stress and fatigue while operating a motorcoach.

- C Personal accountability - a driver's level of personal accountability for his or her actions can significantly influence the effect of fatigue while operating a motorcoach. Holding one's self to a personal and professional standard will directly influence the levels of stress and fatigue associated with being a motorcoach operator.

- C Exceeding one's limits - usually related to economic opportunities, many drivers may accept motorcoach operations which take them beyond their physical limits. Regardless of whether economic need, company demand, or both, cause a driver to accept work, delaying or ignoring the physiological need for rest usually occurs.

2. Vehicle Issues

- C Driver comfort - the driving environment on a modern motorcoach offers comfort and ergonomic efficiency for the coach operator. As such, the operation and control of the motorcoach can be accomplished with little physical exertion. This is a positive aspect towards combating or reducing fatigue for the driver.

On the other hand, the comfort of the driver within the driving environment in combination with the monotony of the driving task can result in a loss of attention and alertness. If the

driver is fatigued, this comfort can invite sleep or rest episodes.

While motorcoach seats are comfortable for extended periods of travel, they do not accommodate comfortable positions for quality rest or sleep. And, motorcoaches do not easily accommodate acceptable “sleeper berth” areas for drivers. Currently, there is a debate as to the effectiveness and the appropriateness of the use of a sleeper berth on a motorcoach while passengers are present. Without the presence of passengers, such accommodations may provide the means for quality rest, but “sleeper berth” design is critical; and better options (hotel rooms) are available during nighttime off-duty periods.

However, one fully-reclining seat would accommodate a driver and allow for quality rest when the driver must remain on the coach while waiting for passengers at many destinations (e.g. State Fairs, festivals, race tracks, bingo halls, etc.). Such accommodations could reduce driver stress and fatigue during the remaining on-duty hours.

- C Driver / passenger interface - the driving area is not physically isolated from the passenger area on any motorcoach. While there are many good reasons for this, it can result in passenger conversation with drivers, and driver distraction because of passenger activities. These situations can produce stress and can produce fatigue.

3. Operations

- C Driver shortage / lack of quality drivers - with fewer drivers available, currently employed drivers must drive more to meet operating schedules and customer demands. This increased demand for driving time results in less cumulative off duty rest time and can result

in producing fatigue.

The driver shortage is felt mostly within the tour/charter segment of the industry. It is important to note that many regular route operators, and especially Greyhound Lines, Inc., are not experiencing driver shortages to any significant extent.

The relatively small compensation packages for charter/tour operators force them to work more hours and to earn significant tips from groups for adequate compensation. Hourly compensation for regular scheduled drivers is higher and has a positive affect on hours worked as well as availability of drivers.

- C Dispatch protocol - this can increase driver stress because of communication issues between dispatchers and drivers (authoritative and confrontational communication styles), the dispatcher's motivation simply to move buses without sensitivity to driver needs, and the influence of seniority/extra boards and some dispatchers "playing favorites". Operations with "first in/first out" protocols do not experience as many stress-producing situations as compared to operators who use other dispatch protocols.

- C Customers and passengers - tour organizers demand itineraries and schedules which significantly influence driver fatigue. Inverted duty/sleep cycles can occur because of group itineraries.

Also, groups sometimes wish to "spontaneously" do things during trips that are not part of the original itinerary. This puts pressure on the driver to either refuse such a request because of unavailable hours or inappropriate timing or accept it, knowing it can impact his

or her level of fatigue during the trip.

A driver must also tend to passenger's needs during the trip when not driving. Ensuring that hotel accommodations are acceptable; that baggage is loaded and unloaded; and other requests are met add to the work time for drivers and associated stress and fatigue which can result from them.

There is a positive situation associated with most charter and tour trips. It is a fact that drivers do sleep in hotel beds almost always. Thus, the environment for quality rest is enhanced while on the road. However, if two drivers are used on a trip, many times they share a room to lower overall costs for the motorcoach company. This can result in reduced quality of rest for both drivers in many cases.

For regular schedule drivers, the situation is much different. Small groups or individual passengers board and exit buses throughout the day. Thus, large groups who communicate and socialize among each other are not common place.

While some passengers may engage in conversation with the driver, this is not as frequent as it is in charter and tour operations. And, the regular schedule driver does not have to be concerned with hotel accommodations; although he must attend to passenger luggage.

The regular schedule driver must also collect tickets/fares and answer questions concerning connections and other such activities for passengers which is different than for the charter and tour driver.

Frequent stops made by the regular schedule driver provides breaks from the potential monotony of driving, thus allowing for refreshed alertness and vigilance while driving.

In both cases, the fact that there are numerous people behind the driver causes a stress and fatigue inducing situation. To know that these people are watching driving behavior can be stressful.

On the other hand, passengers on board produce an incentive for more diligence and professionalism on the part of a driver. Thus, passengers have both negative and positive effects because of their presence.

- C Regulations - current hours of service regulations allow for “extended days” and specify a minimum of eight (8) hours off duty. Both of these situations are believed to influence or cause fatigue for a motorcoach driver.

A driver can fully comply with the 10/15 hour rule even though he or she may have a much longer day from punch-in to punch-out. Off duty periods while charter and tour groups are attending activities allow for such occurrences.

This type of situation is not frequent for regular schedule drivers who have more specific work schedules and less time from punch-in to punch-out on a daily basis.

A minimum of 8 consecutive hours off duty until one can drive again is considered to be too little. Drivers need time to move from the terminal to home. If they are away from home, they need time to relax before they can fall asleep. These examples only serve to define the obvious point that no one can get 8 hours of sleep with only 8 hours off.

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- C Regulatory enforcement - inconsistent and insufficient enforcement of regulations causes operators to compete on an uneven playing field and can produce stress and fatigue situations for drivers. Those operators who are willing to break the rules and are not caught create a disadvantage in the marketplace for those operators who attempt to abide by the rules. The pressure to accept trips at reduced prices because of these illegal operations causes stress and pressure throughout the operation, and it is clearly most felt by the driver.

 - C Lack of organizational coordination - many times sales people, who accept group itineraries, may not be aware of driver needs and requirements. Nor are they aware of competing trips and demands. This in turn places pressure upon dispatch for scheduling of drivers. And, ultimately can result in fatigue situations for drivers.

 - C Seasonality - demand for motorcoach services has seasonal variations. During the peak seasons, the need for driver services increases. Because of this, there are fewer extended rest periods for drivers.

Unique Aspects of the Motorcoach Industry

Overwhelmingly, the unique aspect of motorcoach operations which can lead to driver stress and fatigue that was identified and discussed at length at all Focus Groups is the presence of passengers on the vehicle. This uniqueness presents itself in many ways:

- C The “customer” is on board, watching the driver’s activities. This puts pressure on the driver at all

times.

- C Passengers have questions, requests, even demands. These occur spontaneously and frequently throughout a driver's day. These interactions cause stress.

- C With passengers on board, schedules and itineraries must be kept. If a driver feels fatigued, he or she cannot simply pull over and take a nap. When trips are running late, the driver must deal with the pressure of dissatisfied passengers.

- C Drivers must ensure that passengers know where to meet and when to board. He must attend to their accommodations in hotels, at attractions, etc. He must handle luggage. All of these situations extend the driver's day and cause stress and possible fatigue.

- C Passengers will make requests for unscheduled activities to the driver during trips. When this occurs, the driver must find a way to politely refuse passenger requests or agree to them, many times knowing that it will infringe upon his off duty and rest time.

Overall, drivers must attend to passenger requests, needs, and safety throughout their workday. These passengers are also the customer. And in the case of tour groups, itineraries are in place that will cause the driver to have extended days, and work at various hours during successive days. This is truly unique to the motorcoach industry.

This unique issue does not only have negative impacts. As mentioned before, drivers are more aware of their behavior behind the wheel because of passengers on board. In addition, companies must train and manage drivers in customer relations in addition to defensive driving. Their policies and procedures revolve

around transport of passengers. Thus, good driver management is a byproduct of transporting passengers within the motorcoach industry.

Throughout the Focus Group discussions, this unique aspect of the motorcoach industry also led to another unique assertion. Hours of service rules, which have been formulated largely for the trucking industry, are not necessarily appropriate for the motorcoach industry. Conversely, the motorcoach industry and its needs are different than the trucking industry and its needs. Thus, a “one size fits all” approach to hours of service does not work. The unique operational issues of the motorcoach industry should be taken into account for any changes to regulations according to participants in the Focus Groups. Participants also pointed to the outstanding safety record¹ of the motorcoach industry as a reason for exclusive consideration for any changes to hours-of-service rules.

A study performed by Greyhound Lines, Inc. completed within the last two (2) months strengthens the safety indicators found in the National Safety Council publications. The results of the Greyhound analysis not only shows a very low accident frequency for their coaches, but also provides insight into accident exposure during nighttime hours as compared to daytime hours. The results of this study suggest that nighttime operations are relatively safer than daytime operations. Data from this study is displayed in Appendix D to this report.

The “one size fits all” approach is inappropriate as well for “SafeStat” information. By being part of this database which includes all trucking operations, motorcoach companies become relatively insignificant because of the industry’s small population as compared to the trucking industry population, and the relatively small numbers of vehicle/driver inspections and compliance reviews. By separating the motorcoach industry

¹ The 1999 edition of the National Safety Council “Injury Facts” shows that commercial buses account for 0.2% of all vehicles involved in 1998 collisions, and are responsible for only 0.01 deaths per 100 million passenger miles for the period 1995 to 1997.

from the trucking industry, industry performance resulting from inspections and reviews can be defined, those operators who should be reviewed will be more easily identified, and the overall levels of motorcoach enforcement and compliance activities will be known.

Participants also identified one other unique issue regarding the motorcoach industry. There is no qualitative empirical data specifically about the motorcoach industry from which measurements of its safety performance and regulatory decisions can be made. The need for motorcoach census data, accident data, and accident/exposure data, vehicle performance/crash data, etc. is essential. Without such data, unnecessary regulations and requirements may be forced upon the motorcoach industry without foundation. Equally important, the relationship of motorcoach operational aspects to accidents will never be known.

X Countermeasures

Based upon input from all participants and the results of literature and video review, major recommendations as countermeasures to driver stress and fatigue are listed below.

1. Increase minimum off-duty time for drivers to at least 10 hours between trips and improve opportunities for drivers to get better rest during long and overnight trips.

The need for longer rest cycles between trip assignments was expressed as a solution to fatigue during many of the Focus Group sessions. However, no consensus was evident as to the feasibility of a single rigid regulation. There are other considerations during long or overnight trips that would improve driver's rest, such as not having to share a hotel room with other drivers, and having a fully reclining seat onboard for the driver to use during his non-driving periods. We found that having to share a room was a particular annoyance to the bus drivers, while a tour operator admitted that he would choose a company that offered double-bunking if it saved him money.

2. Minimize inverted duty sleep cycles for drivers during extended tours and trips.

Advance consultation and coordination between bus companies and tour groups is required to minimize inverted sleep cycles. A better awareness by tour sales people of the impact of inverted sleep cycles on driver alertness and safety is needed. If inverted duty sleep cycles are not minimized during the itinerary preparation, it is practically impossible to eliminate

them during trips.

3. Establish “first in/first out” dispatch protocols to minimize stress and fatigue-producing situations associated with dispatch.

The establishment of a set of guidelines for scheduling drivers would improve scheduling, assist in ensuring fair assignments and help eliminate charges of dispatcher’s arbitrarily “punishing” or “rewarding” some drivers.

4. Enhance total compensation packages for drivers to attract more quality drivers to the motorcoach industry and to retain them.

A shortage of good drivers was mentioned in all focus groups, even though some individual companies reported no problems in finding and retaining drivers. Quality of life is viewed by many drivers to be as important as higher salaries in attracting new applicants to the field. By attracting more drivers, scheduling for operations can be improved and sufficient qualitative off duty time can be provided.

5. Provide training on fatigue causes and countermeasures for bus drivers on a regular basis.

Driver training should include the need for proper diet and nutrition; maintaining adequate physical fitness; understanding the body’s physical need for quality rest, considerations and

methods to obtain quality rest; and an explanation of the numerous situations which drivers will face due to passengers, schedules, etc. and how they may be handled to reduce fatigue. A standard driver training model for use by licenced bus operators was recommended by the tour industry members.

6. Provide bus drivers with skill training in areas such as passenger management and conflict resolution.to reduce daily stress factors.

Providing bus drivers training in required career skills—not just on-road driving—could also decrease fatigue-related illnesses and burn-out among drivers. The training could include passenger management and conflict resolution to handle talkative passengers, unruly passengers, etc. Such training should prepare drivers to handle these situations positively and thus reduce their stress and fatigue.

7. Provide effective outreach and education for tour group organizations and the general bus riding public regarding regulatory and operational limitations and bus driver fatigue.

The DOT could create and distribute materials to educate tour groups and organizations about situations that can produce driver stress and fatigue, including the impact of itineraries and customer demands. This would serve to educate passengers on the federal hours of service requirements and the necessity to comply with them. These materials should emphasize the dangers to the passengers and the safety consequences resulting from situations that produce driver stress and fatigue.

-
8. The motorcoach industry should be considered as a separate entity for federal regulations which affect operations and which will impact situations related to driver fatigue.

The discussions with the focus groups and the Industry Advisory Panel clearly indicated multiple ways in which the motorcoach operations are considerably different and unique from trucking operations. The motorcoach operators are subject to quite different pressures as a result of having precious cargo onboard. They have an outstanding safety record. The industry should be monitored and addressed separately from other carriers.

9. Compile relevant data specific to the motorcoach industry determining number of units in operation, miles driven, accidents, etc.

There is a need to collect and analyze reliable data on the motorcoach industry. Separate safestat data for motor coach operators is recommended. Relevant data should be readily available to the bus industry, tour operators and the general public. It should include dates of last inspection, number of infractions, accident records, etc.. It is recommended that a web site be established and maintained for the motor coach industry. The means for reporting infractions and requesting that inspections be performed should be better publicized to tour operators and the general public.

10. Increase and enhance motorcoach federal regulation enforcement.

Expand the enforcement of existing regulation, increase the number of inspections and compliance reviews, and identify and curtail the illegal operator. We found that the

responsible bus operators felt that the fines and penalties for non-compliance are completely inadequate and should be increased to serve as greater deterrents to those who disregard public safety. It was pointed out that full strict compliance with all rules and regulations costs more, so better enforcement will enable compliant operators to compete fairly for business while reducing fatigue-inducing situations for their drivers as much as possible.

11. Include tour group operators as responsible parties for compliance with regulations by motorcoach operators and drivers.

Tour operators are the customers of the bus companies and must work with them in every situation. By holding the tour operators responsible in cases of non-compliance with federal regulations, inappropriate demands by tour groups and passengers would be minimized. This might be difficult to do, but the ability to charge tour operators with aiding and abetting the disregard of public safety would be a powerful deterrent to their making demands on bus companies to engage in unsafe practices.

APPENDIX A

Focus Group and Phone Survey Participants

**DRIVER FATIGUE FOCUS GROUP
JUNE 17, 1999
Biloxi, MS**

Drivers Attendees

Name	Title	Phone	Company	Address
Walt Williamson	Driver		The Free Enterprise System	One Sodrel Dr. Jefersonville, IN
Dennis Shank	Driver		O. D. Anderson Coach & Tour	1 Anderson Plaza Greenville, PA
Harold Thomas	Driver		National Coach Works/ Martz Trailways	10411 Hall Industrial Drive Fredericksburg, VA
Anthony Griffith	Driver		New York Airport Service	4725 27 th Street Long Island City, NY
Greg Gross	Driver		All West Coachlines	7701 Wilbur Way Sacramento, CA
Thomas Butler	Driver		Frank Martz Coach Company	239 Old River Road Wilkes-Barre, PA
Larry Wolfarth	Driver		Hotard Coaches	2838 Touro St. New Orleans, LA
David Soares	Driver		Peter Pan Bus Lines	Springfield, MA
Rodney Johnson	Driver		Wheatland Express	300 SE Fairmont Pullman, WA
Derek Hughes	Driver		The Free Enterprise System	One Sodrel Dr. Jefersonville, IN
Karl Besancon	Driver		Frank Martz Coach Company	239 Old River Road Wilkes-Barre, PA
Don Upton	Driver		The Free Enterprise System	One Sodrel Dr. Jefersonville, IN
Norman Riggs	Driver		Kerrville Bus Co./Coach USA	958 Birdsong Lafayette, LA
Glenn Cormier	Driver		Tanstario Bus Lines & Tours	Bradford, Ontario Canada
Eric Young	Driver		Puget Sound Coach Lines	8721 S. 218 th Street Kent, WA
David Kuchinski	Driver		Trans-Bridge Lines	2012 Industrial Drive Bethlehem, PA

**DRIVER FATIGUE FOCUS GROUP
JUNE 17, 1999
Biloxi, MS**

Drivers Attendees

Name	Title	Phone	Company	Address
Edward Koerner	Driver		New York Trailways	411 Washington Ave. Kingston, NY
Roger Copko	Driver		Carolina Coach Company	Raleigh, NC
Lee Bryant	Driver		Grayline SF/Coach USA	350 8 th Street San Francisco, CA
Earl Reid	Driver		Royal Coach Tours	630 Stockton Ave. San Jose, CA
Duane Lynton	Driver		The Free Enterprise System	One Sodrel Dr. Jefersonville, IN
Jose de Jesus Sanchez	Driver		EI Expresso/Coach USA	950 McCarty Drive Houston, TX 77029
Ron Flick	Driver		Franklin Motorcoach / Martz Trailways	Manassas, VA
David Decarlo	Driver		Arrow Line/Coach USA	East Hartford, CT
Melviin Zimmerman	Driver		O D Anderson Coach & Tour	1 Anderson Plaza Greenville, PA
Jim Tunney	Driver		Penetang-Midland Coach Lines	85 Brock Street Barrie, Ontario Canada
Booth Fowler	Driver		Airport Shuttle - Bellaire Charters	Bellingham, WA
John Price	Driver		Woodlawn Motor Coach, Inc.	3109 Rolling Road Baltimore, MD

**DRIVER FATIGUE FOCUS GROUP
AUGUST 30, 1999
Chicago, IL**

Dispatchers/Operation Managers Attendees

Name	Title	Phone	Company	Address
Rex G. Kemp	General Manager/ Scheduling	972-789-7056 972-789-7158 rkemp@greyhound.com	Greyhound	15110 N. Dallas Parkway Dallas, TX
Michael Ake	Operations Manager	972-419-7419 972-419-7474	Greyhound	15110 N. Dallas Parkway Dallas, TX
Mickey Shenkle	District Manager Driver OPS	614-225-1069 614-221-0579	Greyhound	111 E. Town St. Colombus, OH
Dennis Douberteen	Dispatcher	219-824-9405 800-348-7487	Cardinal Buses, Inc.	Box 271 Middleburg, IN
Patrick McKeon	Region Manager	414-290-4777 414-290-4959 Patrick.J.McKeon@marshmc.com	Marsh Inc.	411 E. Wisconsin Ave. Milwaukee, WI 53202
Steve Randall	General Manager	773-890-2065 773-254-1231	Coach USA	615 W. 41 st St. Chicago, IL
Mark Tadder	Dispatcher	800-747-0914	Van Golden Coach	715 S. Pearl St. Jonesville, WI 53545
Jack Burkert	Sr. VP	410-987-1803	Lancer Insurance	P O Box 1382 Millersville, MD
Perry Famularu	Director of Operations	812-282-7941	The Free Enterprise System	1 Soone Dr. Jeffersonville, IN
John H Thurman	Ex. VP	608-752-5407 vangolden@jvlnet.com	Van Golden Coach	715 S. Pearl St. Jamesville, WI 53545
Tom Clark	Safety Director	800-833-5555	Shoup Bus Travelways	Middlebury, IN
Mark Winter	Regional Safety Director	314-422-5351	Global Passenger - Travelways	St. Louis, MO
Russ Ferrill	Driver	317-974-0700	Global Passenger - Travelways	Indianapolis, IN
Bill Rose	Driver	800-844-3701	Global Passenger - Travelways	Columbia, MO
Leonard R. Jobe	Driver	800-833-5555	United Limo, Inc. - Shoup Bus	Mishawaka, IN

**DRIVER FATIGUE FOCUS GROUP
OCTOBER 5, 1999
Atlantic City (Sweetwater), NJ**

Safety Directors Attendees

Name	Title	Phone	Company	Address
Mart Bowman	Operation Manager/Safety Director	703-643-9800 703-643-9527 F	New World Tours	9406 B Gunston Cove Road Lorton, VA 22079
Albert C. Flemming	Administrative Assistant Safety Compliance	609-698-9512 609-698-9638	Trolley Tours	217 Lacey Road Forked River, NJ 08731
K C Kotyk	Field Safety Manager	312-408-2078 kkotyk@greyhound.com	Greyhound	905 Halsted Chicago, IL 60504
Bill Rohrbaugh	Treasurer-CEO	410-239-8000 410-239-3551	Bill Rohrbaugh's Charter Service, Inc.	3395 Main Street P O Box 690 Manchester, MD 21102
Kirby Parnell	Sr. Vice President	610-868-6001 610-868-9057	Trans-Bridge Lines	2012 Industrial Dr. Bethlehem, PA 18017
James E. Johnson, Jr.	Safety Director	610-683-7333	Carl E. Beiber Tourways	320 Fair Street P O Box 180 Kutztown, PA 19530
Jim Fitzpatrick	Safety Director	610-691-0310	Trans-Bridge Lines	2012 Industrial Dr. Bethlehem, PA 18017
Linda Hettich	Amin.	215-742-9898 215-742-9979 F	David Tours	7820 Castor Avenue Philadelphia, PA 19149
Peter DeFoto	Safety Director	732-942-2250	Travelways	4559 Toute 9 Howell, NJ
Harry Landis	Director of Operations	732-942-3155	Travelways-NJ	501 Prospect Street Lakewood, NJ
Darrell Prinsell	General Manager	718-886-5204 718-368-0878 F	Travelways-NY	31-70 College Point Blvd. Flushing, NY 11354
Clyde Dunbar	Safety Director/District Director - Coach USA	800-222-0492 ext. 272	Coach USA Suburban	750 Somerset Street New Brunswick, NJ 08901
Jeff Carty	Operations Manager/ Safety Director	800-257-7510 609-272-8000	Coach USA Adventure Trails	711 New Road Pleasantville, NJ 08232
Don Shukri	Operations Manager/ Safety Director	800-666-4949	Classic Coach	1600 Locust Avenue Bohemia, NY
Ron Fraillace	CSO/President	609-971-6341 F 609-971-6699	Trolley Tours	217 Lacey Road Forked River, NJ

**DRIVER FATIGUE FOCUS GROUP
OCTOBER 5, 1999
Atlantic City (Sweetwater), NJ**

Safety Directors Attendees

Name	Title	Phone	Company	Address
Thomas J. Carrigan	Director, Corporate Safety	570-821-3872 570-821-3811 bcar436@aol.com	The Martz Group	239 Old River Road Wilkes-Barre, PA 18702
Chuck Miller	Safety Director	201-420-7000 ext. 2269 cmuller@AcademyBus.com	Academy	1515 Jefferson Street Hoboken, NJ 07030
Ron Fuller	Regional Manager	814-238-1247	Lancer Ins.	108 Nisle Street State College, PA 16801
Vaughn Ammons	Director of Operations	717-233-7674	Capitol Bus Co.	1061 South Cameron Street Harrisburg, PA 17105
Mike O'Brien	Regional Manager	800-720-6434 770-487-2339	Lancer Management Co.	102 Oxford Court Peachtree City, GA 30269
Carl E. Werkheiser	Safety Director	516-491-9100	Harran Trans.	30 Mahan Street West Babylon, NY 11704

**DRIVER FATIGUE FOCUS GROUP
OCTOBER 5, 1999
Atlantic City (Sweetwater), NJ**

Driver Attendees

Name	Title	Phone	Company	Address
Warren Laughman	Driver/Driver Trainer	410-239-8000	Bill Rohrbaugh's Charter Service	P O Box 690 Manchester, MD 21102
Ronald Shaffer	Fleet Operations	410-239-8000	Bill Rohrbaugh's Charter Service	P O Box 690 Manchester, MD 21102
Bill Gatewood	Driver/Instructor	804-550-2957	Greyhound	2910 North Blvd. Richmond, VA 23230
Bill Habave	Driver	516-354-5827	Personal Trans Travelways	31-70 College Point Blvd. Flushing, NYC
Socrates Salom	Driver	718-727-3279	Travelways	31-70 College Point Blvd. Flushing, NYC
Don Krack	Driver/Instructor	609-804-0117	Academy	P O Box 264 Coldene, NJ 08213
Richard Williams	Driver/Dispatcher	800-257-7510	Leisure Lines-Coach USA	711 N. New Road Pleasantville, NJ 08232
Paul Hessler	Driver	800-222-1370	Adventure Trails-Coach USA	711 N. New Road Pleasantville, NJ 08232
Evan A. Bevan	Driver	610-868-6001	Trans-Bridge Lines	2012 Industrial Dr. Bethlehem, PA 18018
Larry Wyche	Dispatcher	973-374-3085	T & S Tours	46 S. Ozoth St. Irvington, NJ
Gary Padgett	Driver	908-689-3882	Trans-Bridge Lines	40 Cornish St. Washington, NJ 07882
Robert Kleintor	Driver	610-759-0708	Trans-Bridge Lines	2012 Industrial Dr. Bethlehem, PA 18018
Diane Daubert	Driver	610-262-2772	Trans-Bridge Lines	2012 Industrial Dr. Bethlehem, PA 18018
Wayne Lawrence	Driver	570-384-7379	Trans-Bridge Lines	2012 Industrial Dr. Bethlehem, PA 18018
Robert Helwig	Driver	717-233-7674	Capitol Bus	1061 S. Cameron Street Harrisburg, PA 17105

DRIVER FATIGUE FOCUS GROUP
SEPTEMBER 20, 1999
Sundance Stage Lines

Driver Attendees

Name	Title	Phone	Company	Address
Roger Martin	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Scott Blake	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Rick Walden	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
S. Robinson	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Joe Huvar	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Theresa Bitonds	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Jane Gray	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Bill Davis	Safety Director	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Lenny Papp	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Floyd Phillip	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Francisco E. Rodriguez	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Thomas Dick	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Bill Glaser	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Thomas Doty	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Terri Honson	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Greg Honson	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Paul Heazlit	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Bill Wedlake	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, Ca 92113

Name	Title	Phone	Company	Address
Michael P. Cochrane	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Jesse A. Gray	Driver	800-872-2100	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Don Young	Driver	800-872-2100	Sundance Stage	San Diego, CA 92113

**DRIVER FATIGUE FOCUS GROUP
SEPTEMBER 16, 1999
Ontario, CA**

Owner/Manager Attendees

Name	Title	Phone	Company	Address
Bill Fickett	President	909-466-3984	H & L Charter	8801 Helms Ave. Rancho Cucamonga, CA 91730
Elaine Fickett	Secretary/Treasurer	909-466-3984	H & L Charter	8801 Helms Ave. Rancho Cucamonga, CA 91730
Jodi Merritt	Vice President of Operations	909-466-3984	H & L Charter	8801 Helms Ave. Rancho Cucamonga, CA 91730
Angela Marbray	Motor Vehicle Program Supervisor II	916-657-7210	DMV - Motor Carrier	2570 24 th Street Sacramento, CA 95818
Gloria Feldery	Motor Vehicle Program Supervisor II	916-657-7210	DMV - Motor Carrier	2570 24 th Street Sacramento, CA 95818
Dean Carsen	President	909-682-2557	Transit Sales International	1863 Service Ct. Riverside, CA 92507
Sandra Allen	President	408-279-4801 sandy@royal-coach.com	Royal Coach Tours	630 Stockton Ave. San Jose, CA 95126
Peggy Robinson	Owner	916-929-8935 Peggy@charterbuss.com	Great American Stage	8800 Nimbus Way Orangeville, CA 95662
John G. Miechowicz		909-888-1321	I S U North American	
Alan Charibian	Principal	800-286-3995	AVOCO	3200 La Crescenta #203 Glendale, CA 91208
Bill Davis	Safety Director	619-525-1575 sslbundy@pacbell.net	Sundance Stage Lines	3762 Main Street San Diego, CA 92113
Mike Waters	President	pcbuss@pacbell.net	Pacific Coast Bus	P O Box 882224 San Francisco, CA 94188

**DRIVER FATIGUE FOCUS GROUP
SEPTEMBER 16, 1999
Ontario, CA**

Owner/Manager Attendees

Name	Title	Phone	Company	Address
Jon Henningsen	Broker	jhenningsen@tibinsurance.com	TIB	425 W. Broadway Glendale, CA
Jim Hepford	Bus Salesman		Prevost Car, Inc.	3384 De Forest Mire Loma, CA
Kevin Creighton	Vice President of Operations	408-371-1230 KevinCRGI@aol.com	West Valley Charter Lines	240 Cristich Lane Campbell, CA 95008
David Gregory	President	714-835-8676	Certified Transportation	1038 N. Custer Street Sant Ann, CA 92701
Mike Bauer	District Manager	213-629-8500	Greyhound Lines, Inc.	1614 E. 7 th Los Angeles, CA 92001
Cecil Heden	Field Safety Manager	214-850-0931	Greyhound Lines, Inc.	1614 E. 7 th Los Angeles, CA 92001
Marcus Clark	District Manager	916-444-0448 maclark@greyhound.com	Greyhound Lines, Inc.	715 L. Street Sacramento, CA 95814
Lance Gentry	Regional Manager	877-252-4392 909-627-2999 Lgentry@aol.com	Lancer Insurance	12905 San Marcos Place Chino, CA 94581
Dennis Easley	Loss Prevention Manager	707-252-4392 easleydl@aol.com	Clarendon National Insurance Co.	P O Box 10009 Napa, CA 94581
J C Ruane	President	619-263-4481	Goodalls Charter Bus	5010 Market Street San Diego, CA 92102
Manuel Mendivil	Vice President	619-428-9517	Mexicoach, Inc.	4570 Camino De La Plaza San Ysidro, CA 92173
Michael Cooper	Manager	909-885-4465	Roesch Lines	844 E. 9 th Street San Bernadino, CA 92410
Roy D. McDaniel	Vice President	661-948-8421	Coach USA	660 Wave L Lancaster, CA 93534
George Marudas	Vice President	562-634-7969	Coach USA	3333 E. 69 th Street Long Beach, CA 90865
Ray Gilligan	President	714-637-4377	Transportation Charter Services	1785 North Batavia Street Orange, CA 92865
Robert Seberry	President	909-360-3645	Try-Me-Charter	5685 Ptulenny Way Mira Loma, CA 91752

**DRIVER FATIGUE FOCUS GROUP
SEPTEMBER 16, 1999
Ontario, CA**

Owner/Manager Attendees

Name	Title	Phone	Company	Address
Philip J. Hanley	Team Leader-Enf. Senior Program Manager	202-366-6811	U S Dept. of Transportation FHWA-Office of Enforcement	400 7 th Street SW Room 4432A Washington, DC 20590
Dave Dwight	General Manager	310-549-6010	Travelways - LA	117 Sierra Street El Segunda, CA 90245
Jason Osborn	General Manager	213-748-2256	Los Angeles Sightseeing Tours	2101 E. Washington Blvd. Los Angeles, CA 90021
Nancy Temill	Marketing Representative	909-445-1155	National Interstate	100 West Foothill Claremont, CA 91711
Roger Vollmer	President	520-774-5000	Nava-Hopi Tours	P O Box 339 Flagstaff, AZ 86002-0339
Kerren Vollmer	Vice President/General Manager	520-774-5003 kavollmer@aol.co	Nava-Hopi Tours	114 W. Route 66 Flagstaff, AZ 86001
Eldon Johnson	Owner	415-776-1550	Pax Unlimited	825 Van Ness Ave. #601 San Francisco, CA 94109

**DRIVER FATIGUE FOCUS GROUP
NOVEMBER 10, 1999
Nashville, TN**

Tour Group Owners/Operators

Name	Title	Phone	Company	Address
Betty Romaine	Owner/ Tour Operator	225-293-9586 225-296-8080 fax	Gulf South Travel	11821 Coursey Blvd Baton Rouge, LA 70816.
Don Romaine	Owner/Tour Operator	225-293-9586 225-296-8080 fax	Gulf Tour Travel	11821 Coursey Blvd. Baton Rouge, LA 70816
Greg Dennis	President	973-467-2113 shtours@interact ive.net	Short Hills Tours	46 Chatham Road Short Hills, NJ 07078
Sue Biggs	Owner	313-388- 0448/7820 customholi@eart hlink.net	Custom Holidays	15250 Euclid Allen Park, MI 48101
Michael Neustadt	President	203-798- 8687/8532 coachtours@aol. com	Coach Tours LTD	16 Crosby St. Danbury CT 06810
Ed Dresel	President	860-621- 9178/9347 destone@megah its.com	Destinations Unlimited	51 North Main St. Southington, CT 06489
Shirley B. LeBlanc	President	503-585-3979	Oregon West Exc.	P.O. Box 12987 Salem, OR 97309
Margery Short	President	914-452- 2130/5840 mshort1557@aol .com	Aristocrat Tours	P.O. Box 3357 Poughkeepiel, NY 12603
Lena Bilbrey	President	915-692-1308 915-692-5565 fax	Bilbrey Tours	P.O. Box 5724 Abilene, TX 79608
Charles R. Silver	Sr. Vice President	775-882- 2100/0208 info@frontiertour s.com	Frontier Tours	1923 N. Carson St. 105 Carson City, NV 89701
Pete Anderson	Product Manager	785-331- 1000/1057	Maupintour, Inc.	P.O. Box 807 Lawrence, KS 66044
Sean M. Brennan	VP/CPO	206-622- 9155/9160	Brennan Tours	1462 3 rd Ave. # 717 Seattle, WA 98101
Dave Snyder	President	810-664- 1777/1913 dsnyder@travela dv.com	Travel Adventures	1175 South Lapeer Rd. Lapeer, MI 48446

DRIVER FATIGUE FOCUS GROUP

Telephone Survey Participants

Name	Title	Phone	Company	Address
Jack Haugslund	Chief Operating Officer	972-789-7532	Greyhound Lines, Inc.	15110 N. Dallas Parkway Dallas, TX 75248
Ian Patton	President	812-876-7851	Star of Indiana	8111 N. State Road Bloomington, IN 47404
Paul Kulls	Vice President/General Manager	518-584-5252	Upstate Tours & Travel	P O Box 325 Saratoga Springs, NY 12866
R. W. Van Dyke	President/Owner	316-263-9141	Prestige Transportation Systems	2100 East Central Wichita, KS 67214

APPENDIX B

Issues Identified at Focus Group Sessions

Bus Driver Stress and Fatigue Issues Study

APPENDIX B

Report on Issues Identified in Focus Groups

Introduction

Five Focus Groups were conducted in accordance with the schedule. An unscheduled Driver Focus Group was conducted voluntarily by a single Motorcoach corporation who learned of the study. The results of this group of drivers, from Sundance Lines in San Diego, California, are included.

Drivers	Biloxi, MS	June 17, 1999
Dispatchers	Chicago, IL	August 30, 1999
Owners/Managers	Ontario, CA	September 16, 1999
Drivers	San Diego, CA	September 20, 1999
Safety Directors	Atlantic City, NJ	October 5, 1999
Drivers	Atlantic City NJ	October 5, 1999

The summary of the discussions of each group is provided. An attendee list is available (See Appendix A), but there is no attribution of particular remarks to particular individuals. The notes reflect the individual nature of the particular focus group, each of which had a very unique profile.

A special Focus Group was conducted at the recommendation of the Industry Advisory Panel. This Focus Group was composed of representatives of the tour and travel industry, rather than the motor coach industry. The results of that focus group appear in Appendix C.

Focus Group Report

Bus Drivers

Biloxi, MS

June 17, 1999

DRIVER FOCUS GROUP

June 17, 1999

Biloxi, MS

FATIGUE - DRIVER'S VIEW/ISSUES

- Not enough in salary - needs to hold 2 jobs to make ends meet
- Charter/trip demand - sense of loyalty
- Lack of quality drivers
- "No respect" from management - Booking jobs whether or not you have drivers
- Babysit/training new drivers on the road (extra stress)
- Unknown or surprise trip itineraries
- Drivers should be responsible for their own fatigue/limits
- Fear of refusing trips
- Extended day - from punch-in to punch-out is what can contribute to driver fatigue

DOES FOOD CONTRIBUTE TO FATIGUE?

- Yes!
- If it is free you will eat more and then get tired driving. (You will eat less if you pay for it)

DISPATCH

- Will aggravate driver before starting on trip.
- Use the rule to move a bus
- Seniority/extraboard (seniority - yes)

Focus Group Report

Bus Company Dispatchers

Chicago, IL

August 30, 1999

DISPATCHER/OPERATIONS MANAGER FOCUS GROUP

August 30, 1999

Chicago, IL

16. Traffic congestion
17. Equipment
18. Incompetent drivers
 - Underpaid
 - Underqualified
19. Weather conditions
20. Expectations
 - Duties and driving
 - What is reasonable
21. Road trips
 - No quality rest time
 - Shared rooming
 - The other guy is noisy
22. Customer produced stress levels
23. Total trip management
 - Schedule
 - Trip
 - Luggage
 - Financial
 - Handle money
24. Quality of the medical review
 - Are the drivers really qualified?
 - Medical evaluation
25. Passenger driven stress
26. Environment - affecting duties
27. Last minute scheduling
 - Last minute call-ins
 - (scheduling error?)

DISPATCHER/OPERATIONS MANAGER FOCUS GROUP

August 30, 1999

Chicago, IL

28. Layovers - boredom ° tiring
29. Dispatch - change times of trips without warning
30. Competition - if we don't do it someone will
Always someone willing
Financial drive

DISPATCHER/OPERATIONS MANAGER FOCUS GROUP

August 30, 1999

Chicago, IL

WHAT MAKES THE BUS INDUSTRY UNIQUE?

1. We can't stop when we are tired
Passenger - Customer - Schedule Demands
2. The cargo talks back
Creates higher degree of stress
More demanding
More responsibility
3. The vehicle -
The driver is the mechanic
4. Different environment for driving
Traffic/tourist destinations
Parking/layover space
5. Handling money
6. Trucking has fewer "options" for refusal or lower productivity
7. Demand for neat, clean, "customer-friendly" appearance
8. Bus operators get a bedroom
Better rest
Better quality of rest
9. Extended (but legal) days
Multiple stops/layovers
With rest periods that aren't restful
This makes for a long day (20+ hours)
"On Duty Not Driving" logged as OFF DUTY
10. Better treatment for bus drivers
Free food
No traffic ticket
11. Quality of life
Home more
When not on the road gives the bus driver much better conditions

DISPATCHER/OPERATIONS MANAGER FOCUS GROUP

August 30, 1999

Chicago, IL

12. Public perception
 Bus vs. truck industry

DISPATCHER/OPERATIONS MANAGER FOCUS GROUP

August 30, 1999

Chicago, IL

SOLUTIONS - Specific

1. Train company sales people
 - What a driver is capable of
 - Limits
 - What should/should not happen

2. Consistent enforcement of rules
 - By commercial vehicle enforcement personnel
 - consistent / equal / all carriers
 - Self policing by companies
 - Electronic monitoring
 - (logging)
 - (there are problems to overcome)

3. Medical - Exams
 - Used qualified, specialized doctors who
 - Understand compliance
 - Comprehend extent of duties

4. Pay needs to go up
 - Better candidates/drivers
 - Wide variations in pay
 - (Raise money doesn't apply to all)
 - Industry segment specific

5. Changes in how business is conducted
 - Less stress
 - Buses have priority
 - HOV parking, etc.

6. Use third party drivers on tours
 - To give driver a rest period

7. Inverted sleep cycles
 - a) Nature of business
 - b) Shortage of drivers
 - c) Drivers want hours - more pay
 - d) Drivers need control of sleep patterns

DISPATCHER/OPERATIONS MANAGER FOCUS GROUP
August 30, 1999
Chicago, IL

DISPATCHER/OPERATIONS MANAGER FOCUS GROUP
August 30, 1999
Chicago, IL

SOLUTIONS - General

- Nighttime driving training
- Driver education - fatigue
- Need industry specific study
- Reduced hours on day after taxing trip/duty
- Restrict night hours
- Public education about rules
- Evaluate those who operate late/long
- Hours-of-Service fix
 - 24 hour cycle/clock critical structure
 - 70 hours - reduce - force more time off,
 - but
 - allow longer days
- Do we force drivers to take second jobs?
 - Pay scale is critical
- “AN 18 hour day isn’t hard until you have to do it.”
- Increase time off
- Impose maximum consecutive hours limit
 - Deal with customer pressures

DISPATCHER/OPERATIONS MANAGER FOCUS GROUP

August 30, 1999

Chicago, IL

ISSUE LIST - From sessions with other Drivers/Dispatchers

Causes of Fatigue

- Extended day - too long but legal
- Salary - need a 2nd job to make it
- Personal responsibility - refuse a trip to get rest instead
- Charter
 - Passenger stress
 - Spontaneous requests
- Line
 - Passenger stress
 - Dealing with difficult people
- Surprise trips
- Lack of quality drivers
- No respect from management
- Training new drivers without authority to fix
- Seniority issues

Focus Group Report

Motorcoach Company Owners/Managers

Ontario, CA

September 16, 1999

MOTORCOACH OWNERS/MANAGERS FOCUS GROUP
September 16, 1999
Ontario, CA

What Aspects of Motorcoach Operations Cause or Lead to Driver Fatigue?

- In the charter business, every day is different. Except on the redundant routes, the start and finish times are different and destinations are different. There is a lot of instability in a driver's life. Traffic conditions are continually changing. Schedules are impractical and sometimes unreasonable.
- The time periods between destinations are sometimes very short which add to the driver's stress because he or she is not tired nor ready for a long break.
- The driver's work environment is constantly changing.
- The public perception of the driver. The driver is not perceived as a professional and the profession is not looked upon as a career.
- There is a constant change in the driver's personal priorities and quality of life. The focus is entirely on work and the demands of the job. There is little consideration for the needs of the employee such as his or her lifestyle, family, and material needs.
- Due to the nature of the charter bus business, the driver does not have the opportunity to rest properly. Because of the demands of the charter group, the carrier cannot manage the driver's time off. There is a need for public education. Oftentimes, the group wants the driver to be shuttling them around a given location when he or she should be resting or sleeping.
- Due to constantly changing and unfamiliar surroundings, it is often difficult for the driver to obtain adequate rest during off-duty periods. Drivers are not required to sleep during the off-duty period.
- There is a lack of understanding by the public. They make demands that interfere with the driver's rest periods. A driver is not always fatigued and ready for rest at a designated time and place such as a turn around point.
- A driver's age and physical health are not considered in scheduling rest periods. A driver is not always aware of his or her next work schedule far enough in advance to plan personal activities. Oftentimes they are advised on the day of the trip of what their itinerary will be. This adds to their level of stress.

- Commuting to and from work locations at different times of the day and night also adds to their stress level.

What Are the Unique Aspects of the Motorcoach Industry that Lead to or Cause Driver Fatigue?

- This was a male dominated industry 20 years ago. Gender is now an issue with more females working in the industry and balancing their home and family responsibilities. Because their work schedule is constantly changing, they are unable to manage their personal and family time. Working a revolving shift is stressful.
- The charter bus business is seasonal. Most of the drivers want to work as many hours as they can and make as much money as they can while the opportunity is there. During the rest of the year, work is sporadic.
- The DOT hours-of-service regulations are a “one size fits all”. Traffic conditions change with the seasons as does a driver’s attitude and level of frustration.
- Charter tours provide for fixed periods of rest for the group. Contrary to freight commodities, tour drivers get a lot of rest. However, there is no flexibility with regard to compliance with the hours-of-service regulations.
- Extreme changes in hours-of-service rules without adequate consideration and evaluation of the particular driving task will negatively impact driver attitude and lead to a further shortage of drivers in the motorcoach industry.
- Unlike freight where the shipper sets the schedule, travel agents and tour guides set the schedule for the charter. Oftentimes, the actual itinerary is not consistent with what was presented. There is no regulation of these “brokers.” In this instance, the lack of any regulation causes stress.
- Tours are oftentimes a series of short shifts followed by 8 hr. periods of off-duty. Shifts do not follow a regular cycle. Charter drivers are continually in an unfamiliar sleep environment. Drivers are averaging 5.25 to 5.75 hours of sleep during an 8 hr. off duty period.
- Too much time off is as bad as too little time off.

What Are the Solutions?

Study shipper demands and hold travel agency and tour guides accountable for making unrealistic demands on the motorcoach industry.

- Adequately forecast a driver's work schedule and allow the driver some time to plan for his or her personal life.
- Look at some alternate hours-of-service rules for charter bus co-drivers such as allowing the co-driver to log off-duty time while riding in the bus.
- Tailor both state and federal regulations to the motorcoach industry needs and do away with the "one size fits all" regulations that currently exist.
- Revisit the minimum age qualifications for interstate commerce. Many industry executives believe there are drivers available to the workforce that are under the age of 21 who are mature enough to handle the demands of the job and could safely operate in interstate commerce. This is another example of a "one size fits all" regulation with no exceptions.

Additional Comments

Industry representatives made a few recommendations that are not necessarily related to the fatigue issue, but that some believe will enhance safety and promote efficiency:

- First, industry should provide anger management training to its drivers.
- Industry needs to "grow" its own work force. One way of accomplishing this is to request federal assistance with recruiting and training of professional motorcoach drivers at the community college level.
- Finally, provide a more generally trained driver for school bus work and assign the most qualified drivers to motorcoach operations.

Focus Group Report

Bus Drivers

San Diego, CA

September 20, 1999

BUS DRIVER FOCUS GROUP
(Sundance Stage Lines)September 20, 1999
San Diego, CA

What Aspect of Motorcoach Operations Cause or Lead to Driver Fatigue?

- C Multiple 17 hour days. Example: Leave the yard at 7:00 am, obtain rest via the interpretation, in the bus, return to the yard at 12:00 am., take 8 hrs. off, work another 17 hour day.
- C Rotational Shift. Example: Varied start times Monday 8:00 am; Tuesday 16:00; Wednesday 6:00 am; Thursday 23:30.
- C Quick Turnaround - 8 hrs. between shift. When asked how much sleep they get with 8 hrs. of the drivers responded: 3, 4, 5, 5.5, and 6 hrs. Most answers were in the 5 hrs. range.
- C Long Stand-by Time - Multiple long hours in parking lots used as off-duty for log purposes, in the hot sun, in a hot bus.
- C Traffic.
- C Weather.
- C Passengers - The drivers stated that they felt constantly watched and that this led to stress/fatigue. They felt stress from constant fear of getting lost and the potential heckling from passengers. The drivers felt a need to constantly concentrate on operating the bus in a smooth manner when the passengers were on board, and felt less stress/fatigue when the passengers got off the bus. Additionally back seat drivers were a cause of stress/fatigue.
- C Poor diet, the inability to control your diet. passengers choose places to eat that offer few healthy meals.
- C Luggage - extended hours loading luggage on shuttles.

What Are the Unique Aspects of the Motorcoach Industry that Lead to or Cause Driver Fatigue?

- C Passengers - If a driver felt fatigued or drowsy the passengers and fear of heckling prevented them from stopping for a rest.
- C The passengers often disturb the driver resting on the bus.
- C There is no place on a bus to sleep comfortably, when the bus is used for rest.
- C Lack of control over the itinerary and pressure from tour guides and passengers to exceed hours-of-service regulations.
- C Dealing with the video, AM/FM radio and passengers requests for volume and picture adjustments.
- C Passengers listening to music that disturbs the driver.
- C Rooming with other drivers on multiple bus moves with different sleep habits (snoring).

What Are the Solutions to These Issues?

- C Individual rooms for drivers.
- C The driver is the captain and has complete authority on bus activities.
- C Ten (10) hours off between runs to return to ten (10) hours available for driving.
- C Maximum of 16 hours without returning to the yard or getting a hotel room.
- C Better driver's compartment - ergonomics
- C Comfortable area on bus to sleep - sleeper berth.
- C Mandatory breaks - drive for awhile, then stop for a break.

Focus Group Report

Safety Directors

Atlantic City, NJ

October 5, 1999

SAFETY DIRECTORS FOCUS GROUP
Atlantic City (Sweetwater), NJ
October 5, 1999

What operational issues cause or lead to driver fatigue?

- C Sales issues / itineraries
- C Scheduling of trip by dispatch - amount of time allotted for trip
- C Driver accountability - not getting enough rest before start of trip by own habits or choice
- C Seasonality
- C Non-coordination between sales/dispatch/drivers. Sales not aware of driver needs, capabilities and/or regulations.
- C Driver shortage
- C Flexibility in hours (extended day) - abuse by companies of hours flexibility
- C Driver diet / fitness
- C Education of sales/dispatch/employees
- C Education - disclose driver limits to tour leaders and organizers
- C *Willingness of non-safe companies to take illegal trips (non-even playing field)
- C Inconsistent enforcement
- C Off duty time is insufficient
- C Coaches too comfortable for drivers
- C Driver accountability - wanting extra hours for more money
- C Pension/Pay for drivers insufficient - leads them to work other jobs or overwork
- C Competition keeps wages low - work product undervalued
- C Enforcement does not occur outside of 8:00 am to 5:00 pm
- C Run/schedule trip without receiving and reviewing customer itinerary
- C Negative consequences for drivers for following orders/regulations.
- C Personal problems

What are the unique aspects of the motorcoach industry that lead to or cause driver fatigue?

- C Passengers
- C Equipment
- C Regular schedules (Greyhound)
- C Client
- C Mental stress/extra care and responsibility for passengers
- C (Positive aspect) Driver gets home more often
- C Cargo: 50 people are counting on maintaining schedule versus 1 or 2.
- C Not possible to take quick nap on side of road; stop for coffee, etc..

What are the solutions to these issues?

- C Tougher discipline for breaking rules
- C Simplify rules
- C Consistent rules
- C Holding driver more accountable
- C Education of those who have influence over itineraries (customer, sales, driver, dispatch)
- C Revenue, wage and compensation package
- C Limit off-duty time during work day
- C Increase required off-duty time from 8 to 10 hours
- C Better enforcement
- C Train drivers on how to deal with/manage fatigue
- C Train drivers on how to deal with groups/tour leaders
- C Make tour groups/organizers accountable/punishable by law
- C On-board computers to track bus - cut out “side” trips made between groups and drivers
- C Conditional certificate/stricter standards for new operator
- Compliance reviews within 6 months for new operators.

Focus Group Report

Bus Drivers

Atlantic City, NJ

October 5, 1999

BUS DRIVER FOCUS GROUP
Atlantic City (Sweetwater), NJ
October 5, 1999

What aspects of motorcoach operations cause or lead to driver fatigue?

- C Not enough sleep
- C Too much sleep
- C No place to rest when you are off duty
- C Stress of the job, construction, traffic conditions, etc.
- C Annoying customers
- C Too much concentration (driving; passengers, weather conditions, etc.)
- C Boredom - "White line fever"
- C Lack of concern / "pushed" by management
- C Lack of exercise; poor diet
- C Sleep disorders - sleep apnea; insomnia
- C Condition of the coach you are driving
- C Tour guides and passengers - being pushed by them to be on schedule
- C Extended day - sightseeing in addition to arriving at destination
- C Itinerary difference - company has a different one than the driver (the driver usually has more "to do")
- C Unscheduled requests
- C Because of low pay, drivers have to work more trips to make ends meet at home - sometimes seven (7) days a week
- C Poor bus design - driver's seat does not recline for comfort or rest while laying over or in between stops
- C Driver shortage - bosses say you will work or hit the road
- C Moonlighting - driver needs a second paycheck to make ends meet
- C Precious cargo vs. truck cargo = less pay and more hassles
- C No place to park bus to rest when arriving at destination (ie: Washington DC & NYC)
- C The commute - home to terminal to destination and back again
- C No sick days - you work when you should be at home
- C No time to schedule doctor's appt. so you take NO time off
- C No consideration for driver's needs
- C No time off policy - too busy, driver shortage, company survival, and company income more important
- C Odd start times (ie: gets a day off but has to report to work at 3:00 am for the next trip - this is not a 24 hr. day off)
- C Victims of the four wheelers
- C Bad attitude on the job
- C No breaks - constant driving

- C minimum rest time - does not always get a full 8 hrs.
- C Last minute schedule changes
- C Time of day allotted for sleeping
- C No appreciation of drivers by owners/bosses - drivers would like to receive positive feedback
- C Personal and family issues and problems
- C Tired of making excuses for company mistakes - sometimes an everyday occurrence -
Customer Relations = Stress=Fatigue
- C Two drivers to a room (personal habits, snoring etc. does not allow for a restful night)
- C Buses not wanted except where designated.

What are the unique aspects of the motorcoach industry that lead to or cause driver fatigue?

- Tour guides and groups
 - *No place to rest once you arrive at destination
 - People are the “cargo” - every mistake is magnified
 - *No time to rest due to itinerary
 - “Cargo” talks back - more stressful, disturbs concentration
 - No idling for a bus - comfort issue (ie: cannot run the heat in winter or the air conditioner in the summer)
 - Vehicles treated differently by law
 - Lay overs - defined and limits your options
 - Get more chance to rest on layovers (trucks)
- * Most Important

What are the solutions to these issues?

- Minimum 10 hrs between jobs
- Person in management should be a driver - will be more sympathetic to driver issues
- Mandatory breaks / stop driving period
- Tour cities could provide rest areas for drivers
- Reclining seats for driver rest.
- Tour guides should be responsible for legal violations
- Minimum break times
- Driver input into their schedules
- Who's in charge here? Bus driver or Tour guide?

APPENDIX C

Travel Industry Focus Group Report

Bus Driver Fatigue and Stress Study

APPENDIX C

Travel Industry Focus Group Report

Nashville, TN

November 10, 1999

Travel Industry Focus Group Report

The Bus Driver Fatigue and Stress Study Industry Advisory Panel (IAP) that met on September 10, 1999, recommended a Focus Group be conducted comprised of tour group organizers. They felt that the study results would be more valid if they included input from the consumers.

Tour organizers and travel agents who arrange for charter bus tours are the largest group of customers of intercity charter and tour bus travel. This bus travel is probably the fastest growing segment of the industry. In other Focus Groups, composed of bus drivers, company owners and safety directors, it was pointed out that in order to stay in business, bus drivers are forced to try to accommodate their customers *even when doing so is contrary to the rules and regulations of the DOT and/or the corporation*. Further, they asserted that any change in rules or regulations affecting the bus industry would affect the tour industry as well. Accordingly, any attempt to improve bus travel safety must take into consideration the impact on the customer.

The OMC Program Manager approved a contractual modification to conduct a Focus Group of customers to explore their understanding of the stress and fatigue placed upon bus drivers by passenger demands. The purpose of the Travel Industry Focus Group is to discover their major concerns and desires in their relationships with the bus companies and with the DOT.

The National Tour Association (NTA) is the major professional association for the bus charter industry. We contacted NTA to solicit assistance in making arrangements and identifying appropriate participants for a travel industry Focus Group. They responded positively and a meeting was scheduled for November 10 at the NTA annual conference at the Opryland Hotel in Nashville, Tennessee. The NTA provided a list of conference attendees from which 30 were invited to participate in the Focus Group.

Although over 20 members accepted our invitation, only 13 actually attended the session. However, these thirteen participants were well-qualified representatives of the industry. They came from all parts of the United States. Most attendees were small tour company operators who contract with various bus companies for their tours. Two of the participants own their own buses and one member of the group had a standing contract with one bus company for all his tours. Meeting notes were compiled and the results have been integrated with the results from the other Focus Groups.

The travel industry Focus Group discussion was somewhat different from that of the other focus groups. Here the focus was on the relationship between the bus industry representatives and the travel/tour industry representatives. From that basic discussion, possible causes of stress and fatigue were explored. The paragraphs below summarize the results of this discussion.

Members of the group pointed out that good planning in advance of the trip can prevent a lot of problems that can occur during a trip. They listed the following areas that should be fully explored by representatives of the bus company and the tour organizers when planning the itinerary:

- Passengers needs
 - The tour must be sellable: a balance of travel and sightseeing.
 - What is the pace of the group (depending on age)?
 - What is the passenger length of day (depending on age)?
- Schedules
 - How many cities will be visited and how many stops scheduled per city?
 - Is time for bus servicing included on the schedule?
- Hotel accommodations
 - Does the driver stay in the same hotel as the passengers? If not, where?
 - When there are multiple drivers will they bunk together?
- Meals
 - Will breakfast be served for passengers at the hotel? Breakfast at the hotel raises costs, but gives the driver an additional 1 – 2 hours of time to rest or to service the bus.

The group emphasized that the bus driver and the onboard tour guide must work together as a team. They mentioned the following conditions that can affect bus driver stress and fatigue onboard the bus during the trip:

- Itineraries that are not correct; better directions are needed.
- Back-seat drivers make comments.
- Mechanical failures are blamed on the bus driver:
 - VCR malfunction
 - Poor quality sound systems
 - Air conditioning/heat

Supplies (i.e., handi-wipes in onboard bathroom)

- Driver's rooming and eating arrangements are not clearly defined or are substandard.
- Parking space for the bus is difficult to find; multiple bus relocations required
- Driver-Dispatcher misunderstandings.

- Communications between drivers and tour escorts are affected by individual's ego.
- Extra activities at the beginning and end of the day—favors, etc.
- Shortage of good drivers.
- Driver must be all things to all people—too talkative, too quiet, too whatever??
- Unscheduled emergency stops.
- Weather and traffic conditions.
- Tension between escort and driver: Too fast, too slow, not making schedules, etc.

The Group discussed their feelings about the way things are in the “real world” compared to the way they think things should be done. The following points were made:

- Everyone wants to stay legal and do the right thing, but sometimes there are circumstances beyond their control. If traffic / construction etc. upset a schedule, alternative accommodations may not be a viable solution. (Some flexibility is needed for special circumstances.)
- NTA / ABA membership are viewed as being a seal of approval, but in reality, a supplier only has to pay the dues to be a member.
- Tour operators require 3 years in business, a number of tour days, references, and adherence to a code of ethics.
- Tougher standards are fine, but a national standard is needed. It is not feasible to try to comply with 48 differing sets of regulations. Some states (California and New York) require more education of drivers for licensing and more stringent bus inspections than others.
- The current federal standard is not too low, but enforcement of the laws is haphazard. There is not enough enforcement of the laws on the books. The typical government reaction to problems is to pass more legislation and regulations, but more enforcement of the existing rules is *not* attempted to see if that will fix the problems. More rules just hamper the ethical “good guy” companies, but do not punish the problem companies that are already ignoring the current rules.

- There is no known mechanism for tour operators or the general public to report slipshod operators and get them inspected by DOT.
- Safety records are available on the Internet through safersys.com (The group was unsure who supports this site, but thought it might be UMA), but most users are unaware of the site. The ones who used it felt the data on the site was reliable. (Note: Arrowhead analysts attempted to access this site, but it displays a message that says, “This site is under construction.”)
- Supplier selection should be based not only on price, but also on reliability and safety. However, some customers, such as school boards, require purchasing from the low bidder. This encourages disregard for driver’s needs when planning the itinerary.
- Double rooming of drivers limits their ability to get quality sleep, but when price is the major issue, it is a saving.
- An escort’s skills can help or hurt the driver. Non-professional escorts may make illegal, or just impractical, demands of the driver, and may request itinerary changes that can’t fit within the hours of service rules, and then they do not understand why this is a problem.
- Driver compatibility with the tour operator is a must. If the driver does not like loud student groups, his stress level is raised by this kind of trip.
- Spot-checking of logbooks doesn’t work. It does not catch the disreputable drivers. Logbooks are faked and not enough spot checks are done.

In the general discussion that followed, these points were made:

- Contingency planning. A dialog between the driver and the tour operator is needed at the beginning of the trip to cover bus servicing times, construction zones, and other unexpected problems.
- Some customers ask for itineraries that would be illegal but will accept alternatives; others demand it and will keep shopping until they find a willing supplier.
- Overnight trips (“red-eyes,” gambling junkets, student groups that travel 24 hours straight from Florida to DC) create inverted sleep cycles for drivers. This is a small percentage of the industry.

- Rules: Some bus operators provide tour organizers a plain English version of the DOT hours of service rules. It would be helpful if all operators did this so people would know when their requests are unreasonable and understand why it is unsafe. Education of Tour Operators is a must to avoid illegal itineraries.
- There was some confusion among the members as to what counts as “hours of service.” One operator asked, “Does a two hour break while the tour is at an event count towards on-duty hours?”
- Hours of Service. Several members of the Group were aware of proposed changes to the current hours of service regulations. They wanted to discuss this question. One person (who is on the NTA government affairs committee) said that Tour Operators are generally opposed to changing the bus drivers’ off-duty cycle from 8 to 10 hours. They feel it will cost more money and will make scheduling more difficult, without actually lessening the driver’s fatigue. They favor increasing the time required between multi-day trip assignments to ensure rested drivers.

The group discussed the things that a tour operator considers when selecting a bus company:

- The physical equipment: age of the bus, condition, bathrooms onboard, etc.
- Distance of trip
- Insurance – does the supplier fax a copy of a certificate or is it coming from the insurance provider?
- Does the company have a network for repairs / maintenance / replacement of bus once outside of corporate headquarters range?

The final questions put to the Group were those mentioned by the Program Manager:

What does the public expect of the bus drivers?

What does the public expect from DOT?

Of bus drivers, the participants said they expect to have drivers that are:

Sober

Safe

Well trained (The need for a standard, government-approved Training Model was mentioned.)

Rested drivers

Good Scheduling

From DOT they said would like to have:

- Better regulations for “Between Trip” rest periods.
- Recognition by DOT for those bus companies with high approval ratings and superior safety records.
- More customer rating scales to discriminate between “Acceptable” and “Good” or “Poor” services. Not just ratings of Acceptable or Not Acceptable.
- A standard Bus Driver Training Model
- Consider Safety Belts: At least on the Front Seats. Test effectiveness of Lap belts or Shoulder straps. Conduct a Study of seat belt effectiveness and acceptance in buses.
- Better Enforcement of current rules
- More thorough and more frequent Bus Inspections
- Driving Records Maintenance (in a centralized database)
- Bus Company records available with up-to-date data on Inspections and Safety Records.
- Available Information for public awareness; a DOT Website accessible by industry and public.
- DOT endorsement of a set of suggestions for improved bus safety (similar to those in a UMA brochure).
- Monitor motorcoach safety records and maintain separate Motorcoach statistics from Truckers statistics
- Require private overnight accommodations for Drivers (do not make them bunk together)
- Increase the penalties for non-compliance with DOT regulations
- Conduct more DOT audits/scheduled (1 week notice)
- Require all bus company operators to be registered/licensed

- Issue stricter entry requirements
- Should you allow several small companies to share a DOT registration number? What does the DOT number really mean?
- Improve national level laws. State laws vs Federal Laws are confusing (CA and NY have tough laws)
 - Employ new Technologies for Monitoring driving times
 - Provide low interest loans to small bus owners for installation of electronic monitors

Several other recommendations that came up in during the session as things the members thought would be helpful:

- Cell phones (or similar communication systems) on all buses to allow driver to contact his home office/dispatcher.
- A means for reporting violations to DOT (hotline) and to request a company inspection be conducted.
- “Plain English” guidelines for good bus/tour guide relations distributed to the Tour Operators. NTA members are a good source.

APPENDIX D

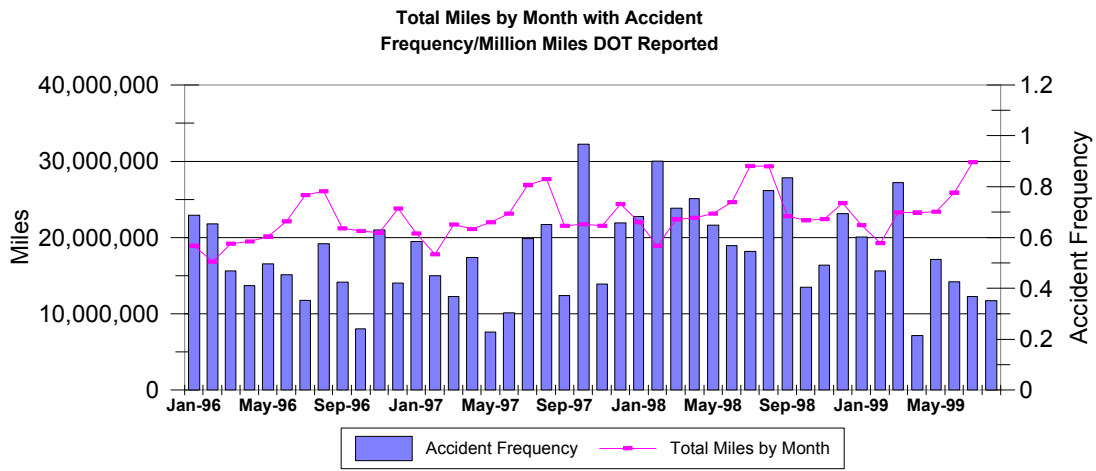
Safety Study Performed by Greyhound Lines, Inc.

Safety Study Performed by Greyhound Lines, Inc.

The following data is provided courtesy of Greyhound Lines, Inc. and is included with permission.

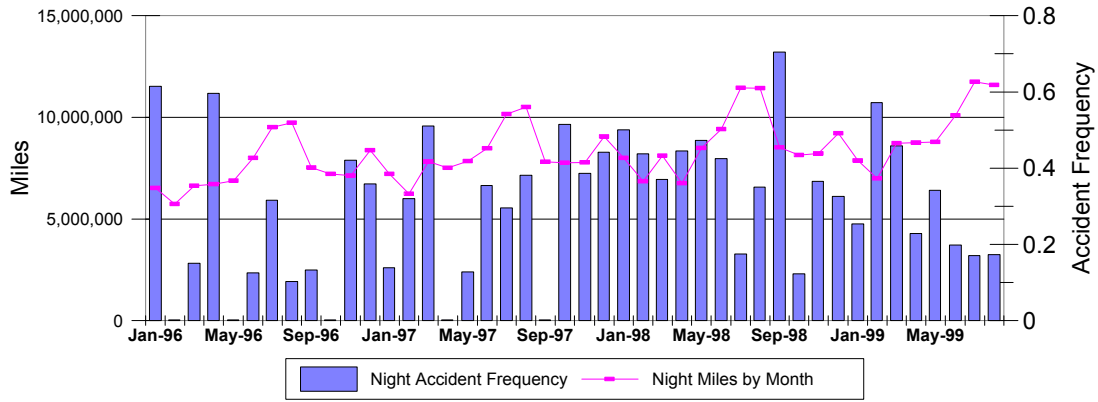
Arrowhead wishes to thank Mr. Alex Guariento for providing this data. Mr. Guariento is a member of the Industry Advisory Panel for the study. The information reflects this company's actual experience from January 1996 to August 1999.

Accidents Jan 96 - Aug 99



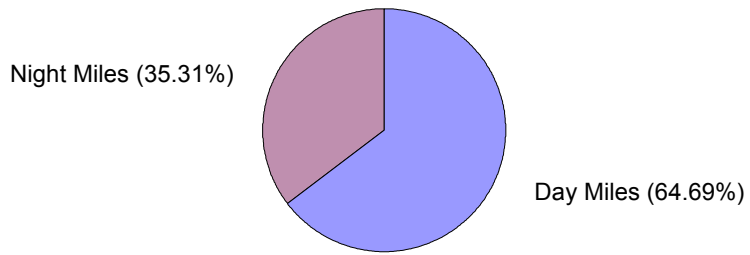
Accidents Jan 96 - Aug 99

Night Miles by Month With Night Accident Frequency/ Million Miles DOT

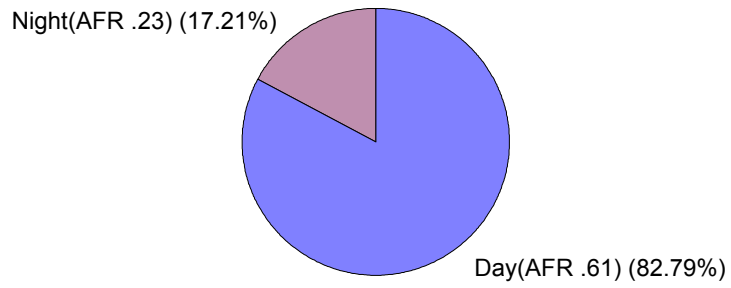


Accidents Jan 96 - Aug 99

**1996 Total Mileage
by Time of Day**

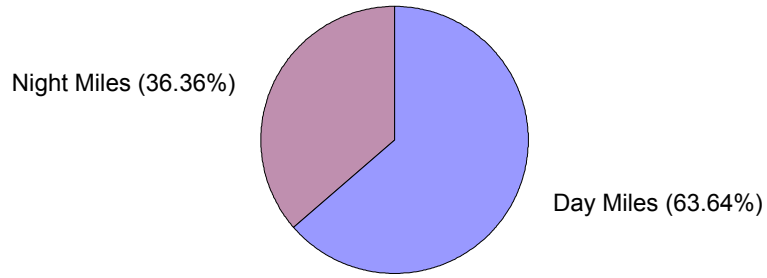


**1996 Total DOT Accidents
by Time of Day**

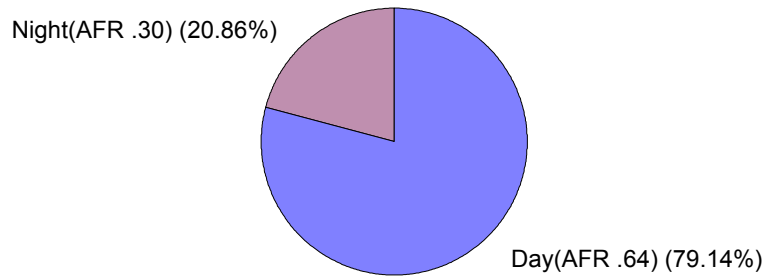


Accidents Jan 96 - Aug 99

**1997 Total Mileage
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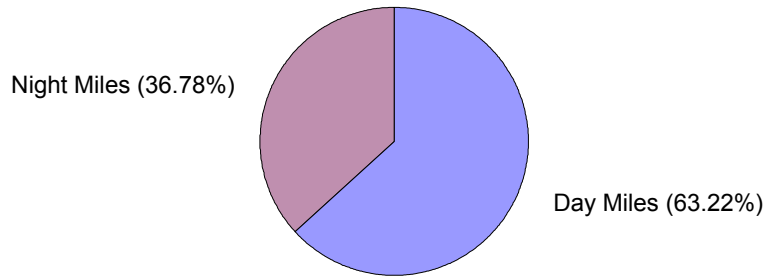


**1997 DOT Accidents
by Time of Day**

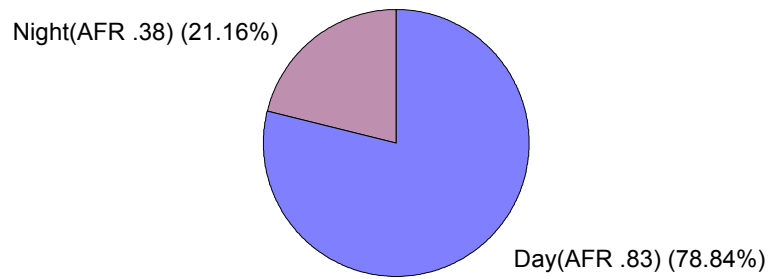


Accidents Jan 96 - Aug 99

**1998 Total Mileage
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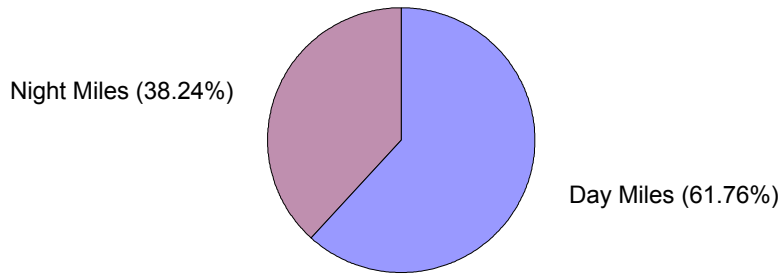


**1998 DOT Accidents
by Time of Day**

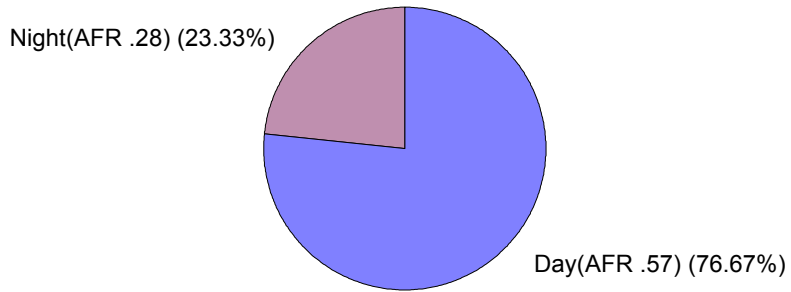


Accidents Jan 96 - Aug 99

**1999 Total Mileage
by Time of Day**

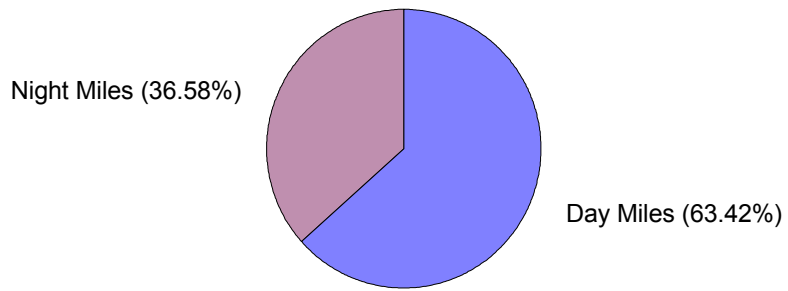


1999 DOT Accidents by Time of Day



Accidents Jan 96 - Aug 99

**Jan'96 - Aug'99 Total Mileage
by Time of Day**



**Jan'96 - Aug'99 Total DOT Accidents
by Time of Day**

