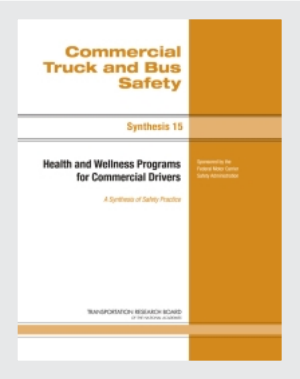

Health and Wellness Programs for Commercial Drivers

DETAILS

80 pages | | PAPERBACK
ISBN 978-0-309-42190-4 | DOI 10.17226/23161

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COMMERCIAL TRUCK AND BUS SAFETY SYNTHESIS PROGRAM

CTBSSP SYNTHESIS 15

Health and Wellness Programs for Commercial Drivers

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Research sponsored by the Federal Motor Carrier Safety Administration

TRANSPORTATION RESEARCH BOARD

WASHINGTON, D.C.
2007
www.TRB.org

COMMERCIAL TRUCK AND BUS SAFETY SYNTHESIS PROGRAM

Safety is a principal focus of government agencies and private-sector organizations concerned with transportation. The Federal Motor Carrier Safety Administration (FMCSA) was established within the Department of Transportation on January 1, 2000, pursuant to the Motor Carrier Safety Improvement Act of 1999. Formerly a part of the Federal Highway Administration, the FMCSA's primary mission is to prevent commercial motor vehicle-related fatalities and injuries. Administration activities contribute to ensuring safety in motor carrier operations through strong enforcement of safety regulations, targeting high-risk carriers and commercial motor vehicle drivers; improving safety information systems and commercial motor vehicle technologies; strengthening commercial motor vehicle equipment and operating standards; and increasing safety awareness. To accomplish these activities, the Administration works with federal, state, and local enforcement agencies, the motor carrier industry, labor, safety interest groups, and others. In addition to safety, security-related issues are also receiving significant attention in light of the terrorist events of September 11, 2001.

Administrators, commercial truck and bus carriers, government regulators, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and underevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information available on nearly every subject of concern to commercial truck and bus safety. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the commercial truck and bus industry, the Commercial Truck and Bus Safety Synthesis Program (CTBSSP) was established by the FMCSA to undertake a series of studies to search out and synthesize useful knowledge from all available sources and to prepare documented reports on current practices in the subject areas of concern. Reports from this endeavor constitute the CTBSSP Synthesis series, which collects and assembles the various forms of information into single concise documents pertaining to specific commercial truck and bus safety problems or sets of closely related problems

The CTBSSP, administered by the Transportation Research Board, began in early 2002 in support of the FMCSA's safety research programs. The program initiates three to four synthesis studies annually that address concerns in the area of commercial truck and bus safety. A synthesis report is a document that summarizes existing practice in a specific technical area based typically on a literature search and a survey of relevant organizations (e.g., state DOTs, enforcement agencies, commercial truck and bus companies, or other organizations appropriate for the specific topic). The primary users of the syntheses are practitioners who work on issues or problems using diverse approaches in their individual settings. The program is modeled after the successful synthesis programs currently operated as part of the National Cooperative Highway Research Program (NCHRP) and the Transit Cooperative Research Program (TCRP).

This synthesis series reports on various practices, making recommendations where appropriate. Each document is a compendium of the best knowledge available on measures found to be successful in resolving specific problems. To develop these syntheses in a comprehensive manner and to ensure inclusion of significant knowledge, available information assembled from numerous sources, including a large number of relevant organizations, is analyzed.

For each topic, the project objectives are (1) to locate and assemble documented information (2) to learn what practice has been used for solving or alleviating problems; (3) to identify all ongoing research; (4) to learn what problems remain largely unsolved; and (5) to organize, evaluate, and document the useful information that is acquired. Each synthesis is an immediately useful document that records practices that were acceptable within the limitations of the knowledge available at the time of its preparation.

The CTBSSP is governed by a Program Oversight Panel consisting of individuals knowledgeable in the area of commercial truck and bus safety from a number of perspectives—commercial truck and bus carriers, key industry trade associations, state regulatory agencies, safety organizations, academia, and related federal agencies. Major responsibilities of the panel are to (1) provide general oversight of the CTBSSP and its procedures, (2) annually select synthesis topics, (3) refine synthesis scopes, (4) select researchers to prepare each synthesis, (5) review products, and (6) make publication recommendations.

Each year, potential synthesis topics are solicited through a broad industry-wide process. Based on the topics received, the Program Oversight Panel selects new synthesis topics based on the level of funding provided by the FMCSA. In late 2002, the Program Oversight Panel selected two task-order contractor teams through a competitive process to conduct syntheses for Fiscal Years 2003 through 2005.

CTBSSP SYNTHESIS 15

Project MC-16
ISSN 1544-6808
ISBN: 978-0-309-09887-8
Library of Congress Control Number 2007928897

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COMMERCIAL TRUCK AND BUS SAFETY SYNTHESIS PROGRAM

are available from:

Transportation Research Board
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Washington, DC 20001

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Printed in the United States of America

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AUTHOR ACKNOWLEDGMENTS

The research team expresses appreciation to Dr. Peter Orris, MD, MPH, FACP, FACOEM, of the Division of Occupational Medicine at the John H. Stroger, Jr., Hospital of Cook County, Chicago, Illinois, for his medical technical review of this report.

The team also expresses appreciation for the mentorship, the numerous review comments, and the suggestions for improvements made by Albert Alvarez of the Federal Motor Carrier Safety Administration.

FOREWORD

By Christopher W. Jenks
Director, Cooperative Research Programs
Transportation Research Board

This synthesis will be useful to federal and state agencies, commercial truck and bus operators, and others interested in improving commercial vehicle safety. The synthesis provides a state of the practice of commercial driver health and wellness programs. It provides a review of literature on truck and motorcoach driver health issues, highlighting the chief health risks facing commercial drivers; presents an analytical review of literature associating crash causation with functional impairments affecting abilities of commercial motor vehicle drivers to drive safely; describes elements of employee health and wellness programs that could apply to commercial drivers; provides the results of a survey of trucking and motorcoach companies who have already implemented employee health and wellness programs and documents the components that are presently being offered to their drivers; and offers several case studies of successful employee health and wellness programs in the truck and motorbus industries, focusing on the elements that appear to work effectively.

Administrators, commercial truck and bus carriers, government regulators, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and underevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information available on nearly every subject of concern to commercial truck and bus safety. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day jobs. To provide a systematic means for assembling and evaluating such useful information and to make it available to the commercial truck and bus industry, the Commercial Truck and Bus Safety Synthesis Program (CTBSSP) was established by the Federal Motor Carrier Safety Administration (FMCSA) to undertake a series of studies to search out and synthesize useful knowledge from all available sources and to prepare documented reports on current practices in the subject areas of concern. Reports from this endeavor constitute the CTBSSP Synthesis series, which collects and assembles information into single concise documents pertaining to specific commercial truck and bus safety problems.

The CTBSSP, administered by the Transportation Research Board, was authorized in late 2001 and began in 2002 in support of the FMCSA's safety research programs. The program initiates several synthesis studies annually that address issues in the area of commercial truck and bus safety. A synthesis report is a document that summarizes existing practice in a specific technical area based typically on a literature search and a survey of relevant organizations

(e.g., state DOTs, enforcement agencies, commercial truck and bus companies, or other organizations appropriate for the specific topic). The primary users of the syntheses are practitioners who work on issues or problems using diverse approaches in their individual settings.

This synthesis series reports on various practices; each document is a compendium of the best knowledge available on measures found to be successful in resolving specific problems. To develop these syntheses in a comprehensive manner and to ensure inclusion of significant knowledge, available information assembled from numerous sources is analyzed.

For each topic, the project objectives are (1) to locate and assemble documented information; (2) to learn what practices have been used for solving or alleviating problems; (3) to identify relevant, ongoing research; (4) to learn what problems remain largely unsolved; and (5) to organize, evaluate, and document the useful information that is acquired. Each synthesis is an immediately useful document that records practices that were acceptable within the limitations of the knowledge available at the time of its preparation.

CONTENTS

SUMMARY

Health and Wellness Programs for Commercial Drivers

This synthesis describes the development, analysis, and results of CTBSSP Project MC-16, "Health and Wellness Programs for Commercial Vehicle Drivers." The synthesis met four principal objectives: (1) a technical review of the literature, highlighting the chief health risks facing commercial drivers; (2) an analytical review of literature associating crash causation with functional impairments affecting abilities to drive safely; (3) a description of identifiable elements of some industry employee health and wellness (H&W) programs, including several aimed at commercial drivers; and (4) an outline of findings from five case studies of successful employee health and wellness programs in the trucking and commercial bus/motorcoach industries. The synthesis provides information to assist the commercial transportation safety community and the Federal Motor Carrier Safety Administration (FMCSA) in assessing the effectiveness and value of and mechanisms for implementing employee health and wellness programs in the trucking and intercity bus/motorcoach industries.

CHAPTER 1

Introduction

1.1 Background

From 1995 to 2006, the U.S. Department of Transportation's (U.S. DOT's) FMCSA conducted a concentrated program of research and outreach education on commercial motor vehicle (CMV) driver alertness, fatigue, health, wellness, and fitness. Initially, the primary emphasis of those initiatives was on "driver fatigue." More recently, FMCSA shifted emphasis toward commercial driver health, wellness, and fitness. There are at least five reasons for this renewed emphasis on driver health and wellness.

1. In 2002, FMCSA and the American Transportation Research Institute (ATRI) began a trucking industrywide outreach training program called Gettin' in Gear (Roberts and York 2000; Krueger and Brewster 2002; Brewster and Krueger 2005). This Gettin' in Gear wellness program was developed after FMCSA and ATRI trained commercial trucking officials for 5 years on driver fatigue, using a train-the-trainer course titled Mastering Alertness and Managing Driver Fatigue (O'Neill et al. 1996; Brewster and Krueger 2005).

   The Gettin' in Gear wellness course was then offered in combination with the Mastering Alertness course from October 2002 through 2006. The combination of the two courses has been attended by hundreds of representatives from trucking companies across the country and all industry sectors. Attendees are helped to understand that a lifestyle focused on health, wellness, and fitness can be viewed as a precursor to overall driver safety consciousness, with a belief that commercial drivers and their employers adopting a wellness lifestyle will have a greater likelihood of enacting proper fatigue management both at the corporate and at the individual driver level (Krueger and Brewster 2002; Krueger et al. 2002; Brewster and Krueger 2005). The demand for FMCSA and ATRI offering these educational courses (both driver fatigue and wellness) has continued unabated in the trucking industry for the past 5 years, and the demand is increasing now that wellness training of drivers is expected as part of FMCSA rulemaking on new entrant training.
2. The commercial intercity bus and motorcoach communities are also interested and motivated regarding driver wellness programs. This synthesis is meant to assist in their efforts.
3. Driver health and wellness topics are being identified by leading transportation companies as key areas for maintaining continued corporate leadership, for continually improving safety records, decreasing health care and workers' compensation costs, and insurance premiums; for increasing employee morale and job satisfaction; and for improving retention of valued "healthy drivers" (Husting 2005; Husting and Biddle 2005). Proactive companies are adapting various elements of driver wellness programs into corporate operations, thereby making employee wellness part of their overall corporate culture of excellence.
4. The July 2004 federal court case vacated the 2003 hours-of-service (HOS) rules which took effect for the trucking industry in January 2004. In so doing, the court case raised additional questions about the health of commercial drivers, bringing the topic of driver health to the forefront. Amidst the requirements of the modified HOS rules of August 2005, commercial carriers now are expected to include wellness programs and training as part of their safety and operational management regimens. In February 2006, the continuation of the federal court case regarding trucking HOS rekindled the debate regarding driver health and wellness issues.
5. The National Transportation Safety Board (NTSB) urged FMCSA to place more emphasis on health and wellness of commercial drivers, and also to update medical qualification standards for CMV drivers. FMCSA currently has

medical review panels updating CMV medical qualification standards. For details see FMCSA website at www.fmcsa.dot.gov.

As a result of this heightened attention to commercial driver health and wellness, FMCSA and the trucking, bus, and safety communities requested the CTBSSP to provide information on the relationship between employee health and wellness programs and the potential for enhancing highway safety in the commercial truck and bus/motorcoach industries. FMCSA is seeking information about experiences, and wellness program models of proactive organizations working to upgrade their employees' physical and psychological well-being. This report documents some of this information.

1.2 Objectives and Scope

There were five principal objectives for this synthesis: (1) to review the literature on truck and bus driver health issues, highlighting the chief health risks facing commercial drivers; (2) to present an analytical review of literature associating crash causation with functional impairments affecting abilities of CMV drivers to drive safely; (3) to describe elements of employee health and wellness programs that could be made to apply to transportation industry employee health and wellness programs principally aimed at commercial drivers; (4) to conduct a survey of trucking, bus, and motorcoach companies who already have implemented employee health and wellness programs and to document what components of the numerous health and wellness options available are presently being offered to their employees, especially drivers; and (5) to report several case studies of successful employee health and wellness programs in the trucking industry and in the commercial bus and motorcoach communities. Health and wellness case studies are presented to highlight lessons learned, indicating what seems to work well. This synthesis also provides recommendations for implementation of employee health and wellness programs and information and suggestions concerning areas for additional research on this critical issue.

This synthesis was conducted to provide up-to-date information to inform decision making for near-, mid-, and long-range planning of research and educational outreach programs.

1.3 Methodology and Approach of This Synthesis

1.3.1 Driver Health Risks

To provide context for the literature review on health and wellness programs for commercial drivers, the most prominent health risks facing commercial transportation workers, especially truck and bus/motorcoach operators, are summarized first.

1.3.2 Driver Medical Qualifications

The current medical qualification standards for commercial drivers are given, for example, Code of Federal Regulations (CFR), Part 391: Qualifications of Drivers, provides medical standards for attaining and retaining certification as a commercial driver, entitling one to hold a commercial driver's license (CDL) and to work in the industry.

1.3.3 Literature Review

The principal focus of the literature review is to describe corporate experiences with employee health and wellness programs that help ensure employees are healthy and safe at work. Reports pertaining directly to transportation operators, and in particular to truck and bus/motorcoach operators, are included from such sources as (a) scientific journal articles presenting assessments of employee health and wellness programs, especially those in transportation industries; (b) occupational health and health promotion journals; (c) professional truck and bus/motorcoach industry trade literature; and (d) corporate and professional human resources (HR) literature, wellness magazines, and various Internet-based websites of wellness program providers. Included in this report are additional sources describing or assessing employee health and wellness programs in other industries (i.e., not limited to the transportation community) and program outcomes (e.g., documenting success stories, failures, cost-benefit assessments, and so on).

Also provided is a brief analytical review of the emerging body of literature on the influence of health and medical factors on motor vehicle crash involvement associating *crash causation* with *functional impairments.* Summarized in this section of the report are recent epidemiological (case-control) studies using violation and crash records, analyzed both retrospectively and prospectively to determine their relationships with functional status for large, representative driver samples. Applications to heavy vehicle operations are emphasized, pointing toward the potential to develop, validate, and demonstrate the administrative feasibility of screening procedures to reliably measure differences in key safe driving abilities in the near term.

1.3.4 Surveys of Employee Health and Wellness Programs

This synthesis included two surveys to gain insights into industry experiences with employee health and wellness programs.

Truck carriers and intercity/charter bus and motorcoach carriers were surveyed regarding experiences with health and wellness programs by means of

1. A survey of truck and bus **motor carrier company managers** and
2. A survey of **truck and bus drivers** who work for companies that offer some form of formal or informal health and wellness programs for employees.

Two questionnaires were developed (see Appendices A and B); the first for *managers* (safety and risk managers, driver managers, human resources personnel, and company executives) and the second for *drivers.* The surveys were distributed via fax, emailed, and posted on ATRI's Internet website.

The survey development and distribution methodology, as well as survey results, are described in detail in Section 3.1. In both the driver and the driver manager surveys, health and wellness programs were defined as a series of ongoing company planned activities intended to improve health and well-being of truck or bus/motorcoach drivers.

Bus and Motorcoach Manager Survey. The research team elicited participation by the American Bus Association (ABA) and the United Motorcoach Association (UMA) to survey intercity bus and motorcoach carriers in a manner similar to that described for the trucking industry (see Section 3.1).

Commercial Truck and Bus Driver Surveys/Interviews. A convenience sampling of truck and bus **drivers**, whose companies offer health and wellness programs, was also conducted. Drivers surveyed were determined after the companies that have wellness programs were identified and the company's cooperation elicited to permit drivers to be surveyed.

Many of the questions used in the manager and driver surveys were similar to, but modified from, the questions used in the conduct of the survey done for *TCRP Synthesis 52* (Davis 2004). It was acknowledged that replicating portions of some of the questions posed to the transit community would allow for comparison between the two transportation industry segments.

1.3.5 Case Studies

In select sectors of both the **trucking** and **bus/motorcoach** industries, five employee wellness programs are documented as case studies highlighting successful attributes and lessons learned in terms of rationale used for implementing programs, program components, and carrier experience with program results.

The descriptive *case studies* document both successful implementation of innovative employee health and wellness practices and programs. Targets for the case studies were proactive corporations and organizations seeking to upgrade employees' physical and psychological well-being. The health and wellness program elements and features include formal or informal employee wellness programs, employee health risk assessments, fitness-for-duty evaluations, exercise programs, employee assistance programs, mentoring programs, labor-management health and safety committees, nutrition and diet programs, critical incident stress management, smoking cessation programs, disease management programs, health consultant follow-ups with individual employee health coaching, and case management initiatives.

Case studies were identified through interactions with the companies surveyed. The company health and wellness programs are described and presented in the form of programs offered and of lessons learned, identifying successes and information gaps, and making recommendations regarding the efficacy of such programs.

The research team identified and received approval to describe four key programs in the trucking industry: (1) Schneider National, Inc., (2) JB Hunt, (3) Trucks, Inc., and (4) Waste Management, Inc. Members of the research team previously worked with the first three of these trucking firms on a Truckload Carriers Association audio-conference on driver health and wellness programs (ATRI and TCA 2006). For more information on that audio-conference, see Appendix C. In the interstate bus and motorcoach industry several key companies having health and wellness programs were identified, and a case study on Greyhound Lines, Inc., is provided. The case studies are described in Chapter 4 of this report.

CHAPTER 2

Review of the Literature

2.1 Commercial Driving Affects Driver Health

Addressing health and wellness concerns for commercial drivers is challenging, in part, because of the varied work environments in which commercial drivers operate. Some drivers may do daily deliveries of goods, while other drivers do short-haul or long-haul (over-the-road) delivery of freight. Bus and motorcoach drivers may drive passengers between distant cities and states or work in the tourist trade where the driver is more likely to usher passengers to tour stops and await completion of the passengers' tour before making a return trip [for additional differences see *CTBSSP Synthesis 6* (Grenzeback et al. 2005) and *CTBSSP Synthesis 7* (Brock et al. 2005)]. How often, how far, and how long he/she drives, whether or not the driver works a regular schedule, returns home from an on-duty cycle every day, sleeps in his/her own bed, uses a truck sleeper berth while driving over-the-road, or sleeps in motels, eats regular scheduled meals, eats at home or in fast food restaurants, whether he/she has much opportunity to engage in physical exercise, and so on, all impact a driver's state of health and wellness.

From many aspects, the variety of work schedules of commercial truck and bus drivers is a major contributor to driver health and wellness concerns. Work schedules often may be irregular, involving long and unusual hours, and many drivers spend much time (successive days, even weeks at a stretch) on the road. When describing the myriad of factors involved in assessing commercial driver fatigue, McCallum et al. (2003) listed operational risk factors as including extended work and/or commuting periods; split-shift work schedules; changing, rotating, and unpredictable work schedules; lack of rest or nap periods during work; sleep deprivation and sleep disruption; sleep-work periods conflicting with the body's biological and circadian rhythms; inadequate exercise opportunities; poor diet and nutrition; and environmental stressors. All of these factors make commercial drivers particularly prone to health problems.

A driver's chosen profession may predispose him/her to many of these health issues. A sedentary lifestyle, lack of good food choices, almost continuous exposure to whole-body vibration while driving, and numerous specific stressors such as driving in bad weather or heavy traffic are all conditions that can impact the driver's health. In many cases, the driver's chosen profession can lead to physical impairments that ultimately disqualify that driver from that profession.

The National Institute for Occupational Safety and Health (NIOSH) uses Bureau of Labor Statistics (BLS) numbers to illustrate the incidence of deaths and injuries by occupation in the United States. For the 10-year period 1992 to 2001, BLS reported 479 fatal occupational injuries for truck drivers. The yearly rate ranged from 17.0 per 100,000 full-time workers in 1993 to a high of 39.2 in 1999. For truck drivers, BLS reported 57,999 nonfatal occupational injuries and illnesses involving days away from work during this 10-year period, and the rates varied from 533 per 10,000 full-time workers in 1992 to 359 in 1998—an average of 5,800 nonfatal cases per year (NIOSH 2004).

Commercial drivers must adhere to federal regulations concerning fitness and suitability to drive. The relevant regulations are cited in Section 2.2.

2.2 Federal Regulations for Qualification, Fitness, and Suitability to Drive

Physical requirements for commercial drivers are outlined under Title 49 of the CFR 391, the Subpart B, Qualification and Disqualification of Drivers: Paragraph 391.11 General Qualifications of Drivers. The list of requirements includes the following: "A person shall not drive a commercial motor vehicle unless he/she is qualified to drive a commercial motor

vehicle." Under Subpart E, Paragraph 391.41, Physical Qualifications and Examinations, specifies physical qualifications for drivers as follows*:

(a) A person shall not drive a commercial motor vehicle unless he/she is physically qualified to do so. . . ."
(b) A person is physically qualified to drive a commercial motor vehicle if that person:
- Has no loss of a foot, a leg, a hand, or an arm, or has been granted a skill performance evaluation certificate . . ." (follows with additional statements about hand, fingers, arms, feet or legs)
- Has no established medical history or clinical diagnosis of diabetes mellitus currently requiring insulin for control;
- Has no current clinical diagnosis of myocardial infarction, angina pectoris, coronary insufficiency, thrombosis, or any other cardiovascular disease of a variety known to be accompanied by syncope, dyspnea, collapse, or congestive cardiac failure;
- Has no established medical history or clinical diagnosis of a respiratory dysfunction likely to interfere with his/her ability to control and drive a CMV safely;
- Has no current clinical diagnosis of high blood pressure likely to interfere with his/her ability to operate a CMV safely;
- Has no established medical history or clinical diagnosis of rheumatic, arthritic, orthopedic, muscular, neuromuscular, or vascular disease which interferes with his/her ability to control and operate a CMV safely;
- Has no established medical history or clinical diagnosis of epilepsy or any other condition which is likely to cause loss of consciousness or any loss of ability to control a CMV safely;
- Has no mental, nervous, organic, or functional disease or psychiatric disorder likely to interfere with his/her ability to drive a CMV safely;
- Has distant visual acuity of at least 20/40 (Snellen) in each eye without corrective lenses or visual acuity separately corrected to 20/40 (Snellen) or better with corrective lenses, distant binocular acuity of at least 20/40 (Snellen) in both eyes with or without corrective lenses, field of vision of at least 70° in the horizontal meridian in each eye, and the ability to recognize the colors of traffic signals and devices showing standard red, green, and amber;
- First perceives a forced whispered voice in the better ear at not less than 5 feet with or without the use of a hearing aid, or if tested by use of an audiometric device, does not have an average hearing loss in the better ear greater than 40 decibels at 500 Hz, 1,000 Hz, and 2,000 Hz with or without a hearing aid;
- Does not use a controlled substance identified in 21 CFR 1308.11 Schedule I, an amphetamine, a narcotic, or any other habit-forming drug;
- Has no current clinical diagnosis of alcoholism.

*For more details see FMCSA website at http://www.fmcsa.dot.gov.

2.3 FMCSA Initiatives Regarding Physical Qualification Standards

FMCSA identified several health related areas where its standards are either outdated or lack application of the most current scientific and medical knowledge. The agency acknowledges that there are some cases where there is limited data to link the standards to driver performance and safety outcomes. FMCSA is working to address many of these medical and health related issues. Carriers are advised to track these issues when considering implementing a health and wellness program to ensure that the program addresses FMCSA's health and driver qualification standards. FMCSA's initiatives are detailed as follows (current through January 2007).

2.3.1 Medical Review Board Established

In March 2006, the Secretary of Transportation appointed five medical experts to serve on FMCSA's new Medical Review Board (MRB). The MRB will provide science-based guidance for establishing realistic and responsible medical standards during FMCSA's planned updates to the physical qualification regulations for CMV drivers. Public meetings are planned to report and permit tracking of progress of the MRB. For details consult the FMCSA MRB website at http://www.mrb.fmcsa.dot.gov.

2.3.2 Research Panels Planned

To support the work of standards revision and of the MRB's review, research panels are being planned by FMCSA.

2.3.3 Chief Medical Examiner

FMCSA has a plan to appoint a permanent Chief Medical Examiner as a full-time member of the FMCSA staff.

2.3.4 Certified Medical Examiners

As part of the SAFETEA-LU Rulemakings under development, FMCSA issued a Notice of Proposed Rulemaking (NPRM) to establish a National Registry of Certified Medical Examiners (NRCME). The primary mission of the NRCME will be to improve highway safety by producing trained, certified medical examiners who can effectively determine if a CMV driver's health meets FMCSA standards.

2.3.5 CDL and Medical Certification

FMCSA's proposed merger of Medical Certification and CDL Issuance and Renewal Processes (NPRM) was published

in the Federal Register (November 16, 2006, issue, Volume 71, No. 221 pages 66723–66748). The proposal would merge information from a driver's medical certificate into the CDL process as required by section 215 of the Motor Carrier Safety Improvement Act of 1999.

Section 215 of the Act would require interstate CDL holders subject to the physical qualification requirements of the FMCSA to provide a current original or copy of their medical examiner's certificate to their State Driver Licensing Authority (SDLA). This information would be recorded on each individual's motor vehicle record (MVR) and subsequently be entered into the Commercial Driver License Information System (CDLIS), the electronic system that contains driver information for use by licensing and enforcement officials.

2.3.6 Hypertension Standard and Blood Pressure Criteria

In 2004, FMCSA revised its standards for monitoring and diagnosing commercial drivers for signs of high blood pressure and hypertension to be more in line with the standards adhered to by the American Medical Association and the World Health Organization. The change in blood pressure (BP) criteria for CMV drivers was from BP < 160/90 to BP < 140/90.

2.3.7 Medical Standards Review

On March 7, 2006, FMCSA announced the five medical experts who will serve on the new MRB. FMCSA is planning updates to physical qualification regulations of CMV drivers, and the board will provide the necessary science-based guidance to establish realistic and responsible medical standards.

FMCSA and its MRB will work through the medical standards update process sequentially. The plans presently include examinations and possible changes to standards regarding diabetes, drug and alcohol, cardiovascular, neurology, vision, musculoskeletal considerations, and others.

2.3.8 Federal Vision Exemption Program

As of January 2007, more than 1,000 active drivers were participating in vision exemptions as part of the FMCSA Vision Exemption Program. Additional clarification and updating of driver vision standards can be anticipated soon. Readers should check the FMCSA website for updated information on this activity.

2.3.9 Skill Performance Evaluation (SPE)

The former Limb Waiver Program, now called Skill Performance Evaluation (SPE) Certificate Program, has more than 3,400 active driver participants.

2.3.10 Diabetes Standard

In March 2006, FMCSA issued an Advance Notice of Public Rulemaking (ANPRM) regarding the Diabetes Standard. FMCSA announced that it is considering whether to amend its medical qualifications standards to allow the operation of CMVs in interstate commerce by drivers with insulin-treated diabetes mellitus (ITDM) whose physical conditions are adequate to allow them to operate safely and without deleterious effects on their health. Additional clarification of this standard is forthcoming.

There has been a significant increase in applications since SAFETEA-LU was enacted. As of September 2006, more than 60 drivers have been approved for the Federal Diabetes Exemption Program.

2.3.11 HOS

In response to the federal court ruling of July 2004, FMCSA provided supporting documents to the Final Rule on CMV Driver HOS, and also has forthcoming a set of Omnibus HOS Exemptions. There continue to be issues over the latest HOS regarding the definition of off-duty time, sleeper berth rules, interruptions of sleeper berth periods, and the use of a 34-hour restart counting the HOS rules.

2.4 Most Common Health and Fitness Risks for Commercial Drivers

At an occupational health and safety conference held at Wayne State University, Saltzman and Belzer (2007) pointed out that occupational illnesses diminish the quality of life for truck drivers and may lead to premature death. They stated that substantial amounts of additional research are still needed on commercial driver health issues (Saltzman and Belzer 2002, 2007). Conference participants' concerns about commercial driver health and wellness included

- *Poor health habits:* It is estimated that more than 50% of commercial drivers are regular smokers. Many are obese, lack proper physical exercise, tend to develop chronic diseases such as diabetes at relatively early ages, and may have slightly elevated suicide rates. These points also are documented in studies of truck driver illnesses reviewed and cited by Roberts and York.
- *Driver injuries:* About half of driver injuries involving lost workdays are attributable to sprains, often caused by overexertion such as lifting heavy objects (from Department of Labor job injury statistics). Most workers' compensation injuries experienced in the moving, storage, and van lines sector of trucking today are attributable to

lifting and awkward posture movements while handling furniture and other items handled in moving and storage work. Studies of drivers loading and unloading cargo (Krueger and Van Hemel 2001) seem to corroborate those at-risk features of many truck driving jobs.

- *Driver fatigue:* Sleep disorders, sleep loss, sleepiness, and driver fatigue from long and irregular work hours increase risks of operational errors, unsafe driving, injuries, and deaths. The NTSB, FMCSA, the American Trucking Associations, numerous safety advocates and the fatigue research community have documented extensively the issues and research surrounding commercial driver fatigue [see for example the review of many of these issues in *CTBSSP Synthesis 9* by Orris et al. (2005); and extensive amounts of research on commercial driver cited on FMCSA's website].
- *Driver illnesses:* Work-related environmental exposures (e.g., to diesel exhaust, other toxic fumes, continuous noise, and whole-body vibration) may be associated with chronic respiratory diseases, reductions in pulmonary function, lung cancer, allergic inflammation, hearing loss, musculoskeletal injuries, lower back pain, and other conditions which can have driving safety implications (Saltzman and Belzer 2007). These same health risks were raised by Public Citizen in two successive federal court law suits (2004, 2005) as part of the continuing appeals of the newer HOS rules for truck drivers.

A chapter in *Transportation Research Circular E-C117* (Knipling 2007) produced by the Truck and Bus Safety Committee (ANB70) outlines numerous health and wellness issues related to commercial driver safety (Krueger et al. 2007). Taken together, the chapter in the TRB circular, along with the *CTBSSP Synthesis 9* (Orris et al.) and the FMCSA-ATRI Gettin' in Gear wellness program for commercial drivers (Roberts and York; Krueger and Brewster 2002) identify the most important and common risks to commercial driver health and fitness.

- *Regular tobacco use.* It is generally believed that more than 50% of commercial truck drivers are regular tobacco users (Korelitz et al. 1993)—about double the national average of smoking adults in the United States (Substance Abuse and Mental Health Services Administration-Office of Applied Studies [SAMHSA-OAS] 2007). It is estimated that an employee who smokes costs an employer at least $1,000 extra per year in total excess direct and indirect health care costs (American Lung Association 2003). In the Stoohs et al. (1993) study of sleep apnea and hypertension with 125 truck drivers working for one company, 49% were smokers. The percentage of bus and motorcoach drivers who regularly use tobacco is generally believed to be slightly lower than that of truckers because of smoking restrictions inside passenger buses. Anecdotal reports from bus drivers indicate many bus and motorcoach drivers, as a result of such restrictions, have quit smoking altogether.
- *Being overweight and experiencing obesity*. A survey of 3,000 commercial truck drivers in 1993 indicated more than 40% were overweight and 33% were obese. Both figures are considerably higher than national averages (Korelitz et al.). No current accurate figures were obtained on the incidence of obesity in commercial drivers.
- *Hypertension or high blood pressure*. FMCSA recently revised CFR Part 391 standards for hypertension to conform to those of the American Medical Association (AMA) and the World Health Organization (WHO). Now a driver with BP > 140/90 mmHg is deemed to have *hypertension*. If not treated, hypertension can lead to heart disease, renal failure, and stroke. No current incidence of hypertension figures was found for CMV drivers. However, the Korelitz et al. survey found 33% of drivers had BP > 140/90 and 11% had BP > 160/95. Such percentages indicate there is considerable room for improvement and add to the rationale that commercial driver health programs must focus on monitoring and preventing hypertension.
- *Poor eating and drinking habits, inadequate diet and nutrition.* Many truck drivers admit to eating only one or two meals per day instead of the recommended three. Favorite main courses for meals on the road are still steaks and burgers, and many drivers eat numerous "junk food" snacks each day (Korelitz et al.). Few commercial drivers eat five or more servings of fruits and vegetables per day as recommended by the National Cancer Institute. Truck stop food choices tend not to be conducive to good nutrition.
- *Lack of physical activity and proper exercise, degrading states of physical fitness.* Low physical activity is a major public health issue despite the considerable health benefits that can be gained from regular activity (Kelly 1999). Most long-haul drivers do not exercise regularly. Roberts and York reported that only about 10% of commercial drivers regularly participate in aerobic exercise; however, most attendees at the FMCSA-ATRI Gettin' in Gear course offerings expressed much doubt that figures of regular aerobic exercisers are even that high.
- *Use and abuse of alcohol and other chemical substances, including misuse of prescription and non-prescription medications and drugs, diet pills, antihistamines, sleeping pills, energy drinks, and alleged nutritional food supplements.* As a result of the implementation of randomized drug testing in the CMV work force and the threat of loss of employment if illicit drug use is detected, currently there does not appear to be a large problem with use and abuse of illicit drugs in the U.S. commercial driver population; however, no accurate figures on this problem were identified in this survey.

Figures on the use of alcohol and alcohol abuse also are not well-known in either the trucking or bus/motorcoach industries. Many drivers do not understand the impact a variety of other chemical substances have on health and driving performance. More research and education are needed on the performance and interactive effects (especially interactive effects) of prescription drugs, self-medications, and over-the-counter remedies such as antihistamines, diet pills, and nutrition supplements.

2.5 Health Issues That May Affect Commercial Driver Safety

While these driver health risks can impact highway safety, many of the readily identifiable effects are more apparent on drivers' quality of life and life expectancy (Husting 2006). Husting and Biddle outlined how commercial driving fits the Public Health Model, stating that motor vehicle safety is an important public health problem particularly involving commercial drivers. Solomon et al. (2004) point out that the workplace of commercial drivers is the community, and thus the health of commercial drivers is of special interest. Several studies suggest an association between illnesses among commercial drivers and the increased likelihood of fatal motor vehicle crashes with other drivers among the general public (NTSB 1990; Solomon et al.; Stoohs et al. 1994; Dionne et al. 1995; McCartt et al. 2000; Hehakkanen 2001). In a September 2006 review, a Joint Medical Association Task Force provided recommendations on sleep apnea screening for commercial drivers indicating the medical research they reviewed suggests obstructive sleep apnea is a significant cause of motor vehicle crashes (resulting in a twofold to sevenfold increase in risk) and increases the possibility of an individual having significant other health problems (Hartenbaum et al. 2006).

2.5.1 Cardiovascular and Heart Disease

Cardiovascular disease, a leading cause of heart-related illness and sudden death in the general population also impacts the health and safety of a growing number of commercial drivers in the United States (Rafnsson and Gunnarsdottir 1991; Bigert et al. 2003; Blumenthal et al. 2002). Only a few published studies directly address cardiovascular disease (CVD) as it affects truck and motorcoach drivers, and they provide mixed statements of its incidence and risks (Rafnsson and Gunnarsdottir; Bigert et al.; Blumenthal et al.; Robinson and Burnett 2005; Luepker and Smith 1978; Murphy 1991). Ruan Transportation Management Systems in Des Moines, Iowa, determined that during the 3 years of 1990 to 1992, heart problems appeared in the top two most expensive health care cost categories each year, and that more than 10% of the company's total health care costs were related to heart disease. Truck drivers had most of the company's heart claims and had a tremendous impact on Ruan's employee benefit costs (Cleaves 1998; Holmes et al. 1996).

Commercial drivers experience a unique constellation of risk factors for CVD involving lifestyle factors (i.e., poor diet, sedentary jobs, and smoking) combined with worksite factors such as long hours, vigorous exertion, strict road rules, stress, fatigue, and potential exposure to high noise levels, diesel fuel combustion exhaust, carbon monoxide, lead, freon, and the vast array of substances carried as cargo (Robinson and Burnett).

Many factors common among truck drivers (elevated blood cholesterol, high blood pressure and hypertension, diabetes, being overweight, lack of aerobic exercise, and tobacco use) contribute to chronic and acute cardiovascular illness that could lead to myocardial events while driving (Cox 1998; Roberts and York). As an example of this, an NTSB study of crashes involving truck driver fatalities reported 19 of 185 fatally injured truck drivers (10%) had such severe health problems that NTSB pinpointed *health* as a major factor in or the probable cause of the crashes (NTSB). Seventeen of those 19 crashes (89%) involved a form of cardiac incident at the time of the accident (e.g., sudden incapacitation of the driver due to an acute heart problem).

2.5.2 Diabetes

During the past two decades, diabetes has become one of the most important public health problems—a consequence of increasing awareness and a dramatic increase in the number of people who receive a diagnosis of type 2 diabetes (Mantzoros 2006). Diabetes mellitus is a disease in which the body does not produce sufficient insulin, or does not metabolize glucose in the normal way, leading to metabolic changes that can have adverse effects. Diabetics have increased occurrence of eye disorders, kidney disease, arteriosclerosis, and heart disease. Poor circulation in the feet and legs attributable to diabetes leads to problems with peripheral nerves and vasculature of the extremities. One safety concern is that hypoglycemic episodes caused by diabetes may affect a person's ability to drive. These episodes manifest through either loss of consciousness or disorientation, or from end-organ effects on vision, the heart, and particularly the feet. The main safety concern for insulin-dependent drivers is the possibility for unexpected occurrence of hypoglycemic reactions that cause drowsiness, impairment of perception or motor skills, abnormal behavior, impaired judgment (which may develop rapidly and result in loss of control of the vehicle), semi-consciousness, unconsciousness (diabetic coma), or insulin shock.

Laberge-Nadeau et al. (1996) found CDL holders for single-unit trucks, who were diabetic, but without complications and

not using insulin, had an increased crash risk of 1.68 (i.e., 68% increased risk) compared with healthy CDL holders. As a result of irregular work schedules, rotating shifts, and night work that many commercial drivers experience, these drivers frequently experience circadian desynchronosis, a form of *work shift lag* (Comperatore and Krueger 1990) whereby normal circadian physiological functioning also shifts, sometimes affecting other biological functions. Irregular work hours and resultant chronobiological considerations are important for diabetics and are especially critical for shift workers. Lack of sleep, fatigue, poor diet, emotional conditions, stress, and concomitant illness compound the problem by affecting the self-regulatory hormones that keep the blood glucose levels within normal limits.

Commercial drivers who are diabetic need competent medical treatment and prescribed protocols for use of medications. These drivers must follow precautionary steps to avoid hypoglycemic episodes. Diabetic drivers must comply with specified periodic diabetes reviews by medical specialists; eat regularly timed carbohydrate-balanced meals to keep glucose levels within normal or desired limits; monitor blood glucose levels; carry supplemental glucose in the vehicle; and should stop driving immediately if a hypoglycemic episode occurs.

As mentioned in Section 2.3, FMCSA currently has an active program in place to grant certain exceptions to diabetic drivers and also to perform in-depth medical review of current research and insulin treatment practices for diabetics.

2.5.3 Hearing and Hearing Impairments

An important safety consideration for drivers of commercial vehicles is the degree of responsiveness to critical events, particularly in crash-likely circumstances which call for employing defensive and evasive driving maneuvers. CMV drivers require a reasonable level of hearing to ensure their awareness of changes in engine or road noises that may signal developing problems. Drivers need good hearing awareness to respond to oncoming and overtaking traffic, to horns, to railroad crossings, and the signals and sirens of emergency vehicles.

There is no medical requirement for commercial drivers to be able to *communicate well* through spoken word. Communication requirements of a specific job may preclude such a driver from working for a particular employer, but medical criteria do not preclude certification for a CDL. As noted in Section 2.2, FMCSA currently requires all persons seeking a CDL to possess a certain minimal level of hearing. Hearing criteria in 49 CFR 391.41 (b) (11) state that a CMV driver cannot have an average hearing loss in the better ear greater than 40 decibels at 500 Hz, 1,000 Hz, and 2,000 Hz with or without a hearing aid or must be able to perceive a forced whisper from no less than 5 feet away. This actually means drivers with substantial amounts of hearing loss may be permitted to drive commercial vehicles.

Most people with a significant hearing loss are aware of their disability. Hearing loss is gradual and insidious, and so people with mild hearing loss mostly are not aware of it. A driver with mild hearing loss often is able to compensate for his/her impaired hearing, even without wearing hearing aids, by being more cautious and relying more on visual cues. A moderate to substantial hearing loss does not appear to adversely affect a driver's ability to drive safely when that driver compensates for his/her hearing loss by wearing professionally fitted hearing aids.

After extensive literature review on topics related to hearing and driving, Robinson, Casali, and Lee (1997) estimated appropriate hearing levels required in driving commercial vehicles and evaluated methods to test drivers' hearing. Results indicated some truck driving tasks require continual use of good hearing; that truck drivers could potentially suffer hearing loss from noise exposure; and that truck-cab noise in the 1990s model trucks studied compromised the intelligibility of live and CB speech, as well as the audibility of internal and external warning signals. Robinson, Casali, and Lee recommended several truck cab and warning signal design changes.

In a field study to relate driver exposure to continuous acoustical noise to hearing loss, Seshagiri (1998) assessed the noise exposure in truck cabs by taking more than 400 measurements to determine the ambient noise levels to which truck operators are exposed while taking lengthy drives. Seshagiri took noise measurements at the driver's head position in a variety of trucks (in long-haul, pickup and delivery, and sleeper berth truck samples) while drivers operated in a variety of driving conditions. Seshagiri found the noise exposures of 10% of the long-haul drivers tested exceeded 90 dB(A) while 53% of the average noise levels exceeded 85 dB(A). Seshagiri's measurements indicate that some truck drivers, at least some of the time, incur a significant noise exposure risk to their hearing depending on the operating conditions, in particular when they routinely drive with the driver's side window open and have the radio turned to a relatively high volume.

The risk of hearing loss among drivers of repeated long-duration trips is therefore a health concern. While many newer truck cabs on the road today claim to have been designed to be quieter, there are no reports of recent acoustical noise measurements taken at the driver's head position in Class 8 trucks. Because OSHA now promulgates workplace noise exposure limits approximating 85 dB(A) at the operator's head position, perhaps the 49 CFR 393.94 should be re-evaluated for sustained periods of truck driving and additional measurements of ambient noise in current truck

models should be collected and evaluated. There is also a need to develop an audiometric database for truck drivers, and presumably for bus and motorcoach drivers, and to continue assessment of the validity and in-practice application of the forced-whisper test, as well as to continue evaluation of active noise control systems (Maguire 2003, 2005) which can be used to reduce acoustical noise threats to the hearing of commercial drivers.

2.5.4 Vision Considerations

Safe and proper operation of motor vehicles requires excellent vision, in terms of *visual acuity, breath of visual field,* and *color vision.* Good visual acuity is required for many driving tasks. A significant loss of visual acuity or loss of visual fields diminishes a person's ability to drive safely. However, the level of vision necessary for safe driving has been a contentious issue because of the unavailability of definitive empirical evidence on which to base a clearly defensible visual performance standard (Decina and Breton 1993). It is generally accepted that a driver with uncorrected visual defects (i.e., without prescription lenses) may fail to detect other vehicles, pedestrians, or roadside barriers, may take appreciably longer to read road signs at a distance or at night, and therefore may be slow to perceive and react to hazardous situations. Fortunately, prescription lenses can compensate for most forms of degraded visual acuity to permit most drivers to have adequate visual acuity for driving.

Since the federal government began regulating vision standards for motor carriers in interstate commerce during the late 1930s, the purpose of setting vision standards for drivers of commercial vehicles has been to identify individuals who represent an unreasonable and avoidable safety risk if allowed to drive CMVs. Federal regulations, specifically those covered by 49 CFR 391.41 (b) (10), require a driver to have distant visual acuity of at least 20/40 (measured via Snellen eye chart test) in each eye with or without corrective lenses, or visual acuity separately corrected to 20/40 (Snellen) or better with corrective lenses; and distant binocular acuity of at least 20/40 (Snellen) in both eyes with or without corrective lenses.

Recently, laser eye surgery techniques have proliferated for vision corrections; however, laser surgery can be associated with several effects that bear on driver safety, including that of commercial drivers who have recently had laser eye surgery. According to the U.S. Food and Drug Administration (FDA) Center for Devices and Radiological Health (2006) some patients who have had laser eye surgery have instability of visual acuity, which may decline during the waking hours. After undergoing this procedure some drivers may have different visual acuity at different times of the day, worsening by as much as two lines of the Snellen chart (which could result in visual acuity not meeting medical guidelines). Additionally, some people who undergo the vision correcting eye surgery procedure known as Lasik (laser-assisted in-situ keratomileusis) may experience glare, halos, and starbursts around lights at night, which could be troublesome while driving. The effects may take a few months to disappear. The vision medical guideline does not address these issues. It is not known how many commercial drivers undergo increasingly popular laser eye surgery for vision corrections. More research is needed on this set of visual issues relating to laser surgery outcomes.

An aging driver population experiences vision changes associated with age, most particularly cataracts. Cataracts are opacities of the lens attributable to a biochemical change in structure in the eye. People with cataracts experience more glare, particularly at night when the headlights of oncoming traffic reflect off the cataract before hitting the retina. This results in loss of visual acuity and could result in difficulty perceiving the driving environment. Testing for this condition is available, but not required in the Commercial Driver Examination (U.S. DOT vision medical standard). More research on the effect of cataracts and driving performance is warranted.

An adequate visual field is important for driving, and peripheral vision is particularly important in tasks such as changing lanes, merging into a traffic stream, or detecting pedestrians about to cross into traffic. Severely restricted visual fields impair driving performance and can increase crash risk (Johnson and Keltner 1983; Wood and Troutbeck 1992, 1994; Coeckelbergh et al. 2004). U.S. DOT standards 49 CFR 391.41 (b) (10) require commercial drivers to have fields of vision of at least 70 degrees in the horizontal meridian in each eye. Decina and Breton suggest that this aspect of the standards should be revisited because the field-of-view of a normal healthy adult is closer to 140 degrees for each eye.

Visual field losses can result from eye diseases such as retinitis pigmentosa (inherited degeneration of the retina causing significant visual field loss, often by age 30), or conditions such as glaucoma, optic atrophy, retinal detachment, or localized retinal or choroidal infection. Visual fields can also be reduced by head trauma, brain tumor, stroke, or cerebral infection. Good rotation of the head and neck is also necessary to ensure an adequate field of vision.

Drivers generally need *good color vision* for some driving tasks. CFR 49 391.41 (b) (10) requires a driver to recognize the colors of traffic signals and devices showing standard red, green, and amber. A driver with red-deficient vision would have some difficulty detecting and relating to red traffic lights at road intersections and in seeing rear braking lights on other vehicles. In effect, he/she would have to rely on seeing the brightness of the lights rather than the red color. However, there is no solid evidence that color-blind drivers are less safe drivers. Recent improvements in traffic sign

engineering to modify the hue and intensity of traffic lights help persons with red deficiency. Decina and Breton point out that the color requirement does not exclude red-green color defective drivers because the standard does not provide adequate instruction on requirements for color vision testing. They also stated that it is doubtful that the standard intended to exclude typical red-green color defective drivers because these drivers are currently on the road and there is a lack of evidence that their safety record is worse than the records of those without such color vision defects. One of the problems with the standard is the lack of an adequate description of the specificity of testing stimuli, lighting conditions, equipment, or uniformity of testing procedures (Decina and Breton). This area too might warrant some additional research.

Dark adaptation is important for night driving. "Night blind drivers" do not adapt well to darkness, can become involved in night driving crashes, and may need to be restricted to daytime driving activities. Driver testing does not check for night blindness conditions.

Persons with progressive eye conditions such as cataracts, glaucoma, diabetic retinopathy, optic neuropathy and retinitis pigmentosa require counseling by appropriate medical authorities and periodic checkups to determine if their eye conditions have worsened and progressed to the stage where they should no longer drive for safety reasons (Coeckelbergh et al.). Commercial drivers with such conditions may require encouragement to select another form of employment. Their vision should be monitored regularly, and when their loss of acuity or loss of visual fields is such that they are no longer safe to drive, they should surrender their CDLs and other driving licenses as well.

If visual criteria are used to determine fitness to drive, sensitivity and specificity of the vision tests should be high. However, as Coeckelbergh et al. point out, numerous studies cited in the literature suggest that although the relationships between vision requirements and driving safety are significant, they are not conclusive with regard to the identification of individual at-risk drivers (Ball et al. 1993).

For more information, see Visual Disorders and Commercial Drivers at http://www.fmcsa.dot.gov/rulesregs/medreports.htm.

2.5.5 Sleep Disorders and Resultant Driver Fatigue

Sleep disorders can deprive drivers of restful and restorative sleep in the necessary quality and quantity. Sleep disorders, all of which have independent health consequences, often lead to driver fatigue and loss of alertness while driving, thereby negatively affecting driving safety. Some sleep disorders particularly relevant to commercial drivers include insomnia, sleep apnea, drug-dependency insomnia, restless leg syndrome, delayed or advanced sleep phase syndrome, and narcolepsy. Krueger et al. (2007) provide a short explanation of each of these important sleep maladies.

Sleep disorders individually are of concern because of the medical and health conditions associated with them. Obstructive sleep apnea, for example, interacts with independent related health risks involving respiratory, cardiovascular, and circulatory problems and increases the possibility of an individual having significant health problems such as hypertension, stroke, ischemic heart disease, and mood disorders (Hartenbaum et al.). For commercial driving safety, however, the resultant driver fatigue and adverse affects on commercial driver alertness on the road present the greatest concerns. Sleep disorders such as sleep apnea are diagnosable, treatable, and generally partially manageable for commercial drivers.

There is an extensive literature on sleep apnea and its relationship to commercial driving (see Pack et al. 2000, Pack et al. 2002, and the FMCSA and National Sleep Foundation websites for some of this coverage). Through the efforts of the National Sleep Foundation, the FMCSA, and various safety-oriented groups, as well as sleep research groups, motor carriers have become increasingly more aware of sleep disorder issues. Perspectives on sleep disorders, especially sleep apnea, have changed in the past decade. Some carriers have begun to develop sleep disorder countermeasures as a part of employee wellness programs. They provide medical screening for sleep maladies and provide for diagnosis and treatment (see the Schneider National case study in Section 4.1). The goal is to retain valuable, experienced drivers even as the driver receives treatment for sleep maladies.

On September 12, 2006, a joint task force of the American College of Chest Physicians (ACCP), the American College of Occupational and Environmental Medicine (ACOEM), and the National Sleep Foundation released a set of new recommendations they claim offers an updated and consistent approach to the screening and management of obstructive apnea (OSA) among CMV operators (Joint Task Force press release, September 12, 2006; Hartenbaum et al.). This important Joint Task Force statement provides an updated description of sleep apnea, and bases its recommendations on an extensive review of the latest sleep apnea research and existing medical guidelines related to OSA from the U.S. DOT agencies.

Readers will note that the research team chose not to cover the overall topic of commercial driver fatigue in this synthesis because this important topic is adequately covered in numerous other printed reports (for example, *CTBSSP Synthesis 9* [Orris et al.]) and because many driver fatigue issues are more related to driving performance than they are

to "health concerns" per se. However, readers interested in worker fatigue as it relates to health issues might want to review a recent occupational medicine article by Ricci et al. (2007). They reported worker fatigue in the United States carried overall estimated costs of more than $136 billion per year in health-related lost productivity—$101 million more than for workers without fatigue (84% of the costs were related to reduced performance while at work, rather than absences).

2.6 Additional Driver Health Conditions That May Affect Driving Safety

2.6.1 Obesity

Obesity refers to maintaining an excessive amount of body fat or excess storage of energy in adipose tissue. It is generally defined as a body weight greater than 5% more than the "ideal body weight" (average) for specific height and gender categories (McArdle et al. 1991). Medical personnel can readily identify health-related concerns for obesity in commercial drivers. They include a well-established risk factor for cardiovascular disease, hypertension, diabetes, or stroke (Roberts and York), and for obstructive sleep apnea (Pack et al. 2000; Pack, Dinges, and Maislin 2002).

Obesity, or even being slightly overweight, exacerbates conditions of arthritis, back pain (particularly lower back pain), and other MSDs such as carpal tunnel syndrome (Miyamoto et al. 2000). Obesity also increases the risk of cancer when it accompanies other health-related conditions such as low activity levels, diabetes, or recent menopause. The AMA published "Assessment and Management of Adult Obesity: A Primer for Physicians" (Kushner 2003) in an attempt to encourage physicians to accentuate health promotion and disease reduction issues involving obesity.

Research literature specifically relating obesity to driver safety and performance is scant and difficult to locate. Being substantially overweight and unable to maintain a healthy body weight and body fat levels interacts with a driver's ability to maintain overall physical fitness and at least indirectly impacts on a driver's ability to continuously maintain a safe driving posture and practices. In surveying 3,000 truck drivers, Korelitz et al. noted 73% were either overweight—body mass index (BMI) between 25 and 30—or obese—BMI greater than 30. Stoohs et al. (1994, 1995) reported a direct dose-dependent relationship between BMI and driver crash-likelihood. Obesity is often accompanied by obstructive sleep apnea, thereby contributing to driver fatigue. Stoohs et al. (1993) reported the prevalence of sleep apnea in 125 drivers working for one company they surveyed. Of those drivers with sleep apnea, 71% were borderline obese (i.e., defined as BMI > 28 in their study). The relationship between obesity and sleep apnea is a cause of health and safety concern among truck drivers because of the prevalence of obesity in this population.

Obesity in the workforce is also of concern to employers who are interested in cutting down on workplace injuries and workers' compensation claims that might be in part attributable to a worker's overweight condition—seemingly a particular problem in the truck driver population of the United States. Since the 1960s, major changes in employment protection in the form of antidiscrimination laws, such as the Americans with Disabilities Act (ADA), make it tougher for employers to enforce employee physical and weight standards, unless a person simply is unable to perform his or her job (Carpenter 2006).

2.6.2 Hypertension

Hypertension or high blood pressure is a chronic disease affecting more than 50 million people in the United States. High blood pressure increases an individual's risk of heart disease, renal failure, and stroke (David et al. 1996). Hypertension is called the "silent disease" or "silent killer" because there is no clear warning sign to an individual that he or she might have high blood pressure. It is very important for people to have their blood pressure measured and monitored from time to time, because they might have hypertension and not know it for months or years.

Excess body weight correlates closely with increased blood pressure, and the survey work by Roberts and York found that almost every prospective study of factors that influence blood pressure regulation identified weight as the strongest predictor of blood pressure. David et al. estimated that in almost 50% of adults whose hypertension is managed through pharmaceuticals, the need for drug therapy could be alleviated with only modest reductions in body weight.

In addition to the Korelitz et al. data cited in this report, there are other indicators that hypertension is a problem of considerable magnitude in the truck and bus driver communities. An insurance industry study (Harrington 1995) indicated that 20% of the drivers in one of the test groups had high blood pressure. Evans (1994) reported that a large cross-sectional study of black and white male bus drivers in San Francisco revealed elevated rates of hypertension compared with a national sample of similar individuals. This study also noted the prevalence of hypertension increased with length of employment.

Evans also reported a Norwegian study comparing male bus and truck drivers to industrial workers and noted a stronger correlation between length of employment and elevated blood pressure among commercial vehicle drivers

(Evans). The Stoohs et al. (1993) sleep apnea study reported 17% of the truck drivers in that 1993 study had blood pressures measuring greater than 160/95 mmHg.

Contributing factors to hypertension include high cholesterol, obesity, and lack of exercise (West 2001). Uncontrolled hypertension is the primary diagnosis for up to 25% of individuals with chronic kidney failure and can also be a major cause of strokes. Hypertension is very prevalent in African Americans and, according to the American Heart Association, up to 30% of all deaths in African American men can be attributed to hypertension. Fouad et al. (1997) describe the city of Birmingham, Alabama, as having almost 50% African American employees in their workforce, and therefore tailor their educational programs to target reductions of hypertension as a significant part of health promotion. The program produced marked drops in blood pressure measures and demonstrated that a culturally appropriate, educational program, focused on employees known to be at high risk, may increase control of hypertension.

Hypertension, obviously one of the principal health risks to commercial drivers, is discussed at length in the FMCSA-ATRI Gettin' in Gear train-the-trainer course (Krueger and Brewster). Course information for drivers stresses that: unlike vehicle diagnostic systems on trucks and buses, the body has no ready made gauge to tell a person he or she has high blood pressure. One of the easiest health and wellness suggestions to implement which is offered in that course is a suggestion for employers to acquire automated blood pressure monitoring cuffs/kits for their employees, especially so for their drivers. These can be purchased at almost any local drug store for approximately $50. The employer is then told to place the blood pressure monitors into the drivers' day room or gathering place. They are also told to provide a basic amount of information about blood pressure and hypertension (a supply of trifold brochures on blood pressure helps); and then suggest that from time-to-time their drivers measure their own blood pressure and keep track of it in a personal diary for several consecutive weeks. If the drivers sense that they have suspiciously high blood pressure they should be encouraged to seek medical attention and advice.

2.6.3 Poor Nutrition, Eating Habits, and Diet

It is a widely held belief that commercial drivers, both truck and bus/motorcoach drivers, do not usually adhere to healthy eating habits, and therefore their daily diet and nutritional needs are identified as a health and wellness concern (Roberts and York; Krueger and Brewster; Holmes et al.). The reasons for this concern include the fact that many commercial drivers are "continually on the go" driving from place to place. They consume much of the food they eat at "fast food restaurants" or out of coin-operated vending machines and do not maintain a regularly scheduled nutritional diet program for themselves.

For example, Holmes et al. studied 30 drivers in what they described as a prototypical wellness program. They pointed out that the drivers' favorite meal items while on the road were steak and burgers. The typical snacks the drivers ate included chips, fruit, candy, donuts, and cookies, and only 15% of the drivers ate five or more servings of fruits and vegetables per day as the National Cancer Institute recommends for preventive health purposes. In the Korelitz et al. survey of almost 3,000 truck drivers attending a trade show, more than 80% of these drivers ate only one or two meals per day, and 36% had three or more snacks per day.

Roberts and York cited Dr. C. Everett Koop, who noted that 8 of the 10 the leading causes of death are related to what people eat. From heart disease to cancer, the food people eat has an influence on whether many chronic diseases develop. A healthy nutritious diet is among the most important influences on an individual's health. However, "bad habits" (eating junk food, etc.) are among the hardest habits to change.

Gettin' in Gear points out that tracking one's progress toward smoking cessation may simply be a somewhat easy matter of counting the decreasing number of cigarettes one smokes each day/week to gauge the degree of success one is having in smoking cessation. However, in terms of improving nutrition, determining how much one consumes by counting calories, proteins, carbohydrates, vitamins, minerals, and numerous other nutritional measures is considerably more difficult, because it requires a basic understanding of nutrition, the contents of food items consumed, and paying constant attention to the numbers—at least until healthy eating becomes a good habit.

Today, there is no shortage of nutritional information for the American consumer. This information includes books on the topic, newspaper, magazine, and website generated helpful hints, improved labeling of the content and nutritional value of many consumable foods, the Department of Agriculture's latest food pyramid (which is difficult to understand and use and seemingly requires access to computer descriptions of the details), the American Heart Association's Healthy Heart symbols displayed on various restaurant menu items, and extensive lists of the contents of foods at many restaurants (including those provided in popular fast food restaurants). The Gettin' in Gear training program begins the educational process for commercial drivers with plenty of insights on how to proceed (Roberts and York; Krueger and Brewster).

2.6.4 Sedentary Lifestyle: Lack of Physical Fitness

There is plenty of medical and epidemiological research evidence to illustrate the value of physical activity, especially

in the form of physical exercise, to reduce the risk of many diseases, including cardiovascular and heart disease, hypertension, osteoporosis, diabetes, and breast and colon cancer, as well as reducing the risk of psychological illness such as depression, anxiety, and stress (Harig et al. 1995; Barko and Vaitkus 2000; McArdle et al. 1991; U.S. Department of Health and Human Services, Healthy People 2000; Lakka et al. 1994).

A sedentary lifestyle, generally defined as one in which a person exercises less than once per week, is at least partially responsible for one-third of the deaths in the United States due to coronary heart disease, colon cancer, and diabetes (Lakka et al.; U.S. Department of Health and Human Services, Healthy People). It is estimated that about 30% of total deaths and 30% of total loss of disability-adjusted life years in the WHO European Region are related to environmental and lifestyle factors which might be controlled or at least influenced through health protection and promotion activities undertaken at the workplace (Kelly). It is further estimated that physical inactivity is responsible for about 7 to 11% of deaths and 3 to 5% of total loss of disability-life years (Murray and Lopez 1996). Western European health and physical fitness figures are paralleled by many statistics in U.S. health industries.

With a preponderance of irregular driving schedules, many commercial drivers, both truck and bus/motorcoach drivers, find it difficult to schedule time to do regular physical exercise. Fifty percent of the truck drivers in the Korelitz et al. survey of almost 3,000 drivers at a tradeshow said they never participated in "aerobic" exercises and only 8% of these drivers "regularly" participated in aerobic exercise. On the other hand, Halvorson (2002) found that regular exercisers at a company's onsite fitness center achieved higher job performance ratings, stayed longer with the company, had lower medical and prescription claim expenses, and had lower absenteeism rates than those who did not exercise. Exercisers lost an average of 20.9 hours of work (per quarter) compared with 36.6 hours for non-exercisers.

As with the difficulties in getting commercial drivers to eat nutritious meals, encouraging them to take opportunities to do regular scheduled physical exercises is tough. Having or making the time to do regular exercise is a chronic problem for many commercial drivers. A favorite line from one long-haul truck driver often quoted in the Gettin' in Gear course is: "let me understand doc, I get off work about 3 a.m. and you expect me to go to the local gym and do what?" In the Gettin' in Gear program, long-haul drivers are encouraged to capitalize on the opportunity to do 20 to 30 minutes of physical exercise during their now mandatory 10 hours off-duty time since most people do not sleep for 10 hours straight. Numerous hints on how to prepare for and obtain necessary amounts of physical exercise both at home and while on the road, including identification of simple exercise equipment that can be carried in one's truck or bus, are provided in the Gettin' in Gear course materials (Krueger and Brewster; and see also Kelly; Cox 2003).

2.6.5 Musculoskeletal Disorders (MSDs), Low Back Pain, Neck Pain, Other MSDs, and Cumulative Trauma Disorders (CTDs)

The U.S. Department of Labor's Bureau of Labor Statistics (BLS) states that in the year 2004 there were a total of 1.3 million injuries and illnesses in private industry requiring recuperation away from work beyond the day of the incident. Four of 10 injuries and illnesses were sprains or strains, with most of these stemming from overexertion or falls on the same level. BLS also points out that in 2004, heavy-truck and tractor-trailer drivers suffered 17,770 MSDs, which was third highest among U.S. workers. Of the occupations with 0.75% or more of the total days away from work cases, drivers of both heavy trucks and tractor-trailer trucks, as well as light or delivery truck drivers, had the highest median number of days away from work (12) because of illness and injury of all the occupations tracked. (See BLS: "Lost Work Time Injuries and Illnesses, 2004" www.bls.gov/news.release/pdf/osh2.pdf.)

Insurance industry figures on workers' compensation perennially reflect numerous injuries for truck drivers as being involved with not only musculoskeletal injuries (such as low back pain), but neck, arm, shoulder, leg, and knee injuries (personal communication with Martin Lesko, Loss Prevention Manager at Vanliner Insurance Co., September, 26, 2006, at Dallas, TX). Obesity, or even being slightly overweight, is a large contributor to those injury statistics, as obesity can exacerbate conditions of arthritis, back pain, especially low back pain (Miyamoto et al.) and other MSDs such as carpel tunnel syndrome. Magnusson et al. studied the prevalence of back pain among 40 bus and 40 truck drivers, noting that 55% of the truck drivers were overweight.

Truck drivers notoriously lead a sedentary life style (exercise less than one time per week) and their overall level of physical fitness is known not to be good, with large numbers of commercial truck drivers at least, bordering on being unfit. The picture for commercial bus and motorcoach drivers is less clear, because not much analytical data on their fitness levels was located.

A Danish study in 1996 found almost all men in occupations involving professional driving had statistically significant elevated risks of being hospitalized with prolapsed cervical intervertebral disc (Jensen et al. 1996). In comparing occupational risk factors, in 2003, the WHO listed the risks of experiencing low back pain by drivers of buses, trucks and tractors at a risk score ranging from 1.83 to 5.49 relative to a baseline risk of 1.0 for office clerical workers (Concha-Barrientos et al. 2003, pp. 1750 and 1784). The data source for

low back pain in this WHO report seems to have been data quoted from Bovenzi and Betta (1994). A literature review by Teschke et al. (1999) cited such factors as working postures, repeated lifting, heavy labor, previous back pain, and stress-related factors including job satisfaction and control, body condition, and weight (all associated with lengthy driving, at least some of these risks affect many truckers) as contributing to the incidence of back pain and back disorders in a workforce. Simple biomechanics explains why the human body's natural curvature of the spinal column (lordosis) means that humans are not meant to remain in a seated posture for hours at a stretch, as the spinal fluid in the spinal column itself compresses over time while seated (Bhattacharya and McGlothin 1996).

Teschke et al.'s data support a causal link between back disorders and driving occupations and whole-body vibration. Cann, Salmoni, and Eger (2004) highlight some of the contributions to back discomfort which can be attributed to whole-body vibration. At least, each of the major manufacturers of truck seats offers air-cushion-ride seat features. Air-cushion-ride seats are known to absorb only about 20% of the whole-body vibration, so although those seats might feel more comfortable, they do not decrease whole-body vibration influences all together.

Thus, wellness programs such as Gettin' in Gear need to stress to commercial drivers that they need to maintain a high level of physical fitness, manage and control their overall weight, select and adjust proper driver seating, and most of all take periodic breaks away from driving, during which they do some modest amount of exercises to break up the risk of MSDs attributable to back pain, or other CTDs such as carpal tunnel syndrome. A successful workplace ergonomics program can significantly reduce the number and types of musculoskeletal injuries (Grossman 2000; Tyler 2002, 2003). See also the *TCRP Report 25* (You et al. 1997).

2.6.6 Psychological Stress and Mental Health Disorders

Psychological stress. A dictionary definition of *stress* might include such things as "a mentally or emotionally disruptive or disquieting influence causing distress." According to Orris et al. (1997) this influence or stressor stimulates the sympathetic nervous system's fight or flight response, neuroendocrine secretion of corticosteroids, and consequent cardiovascular, hypertensive, gastrointestinal, and immune system impairments (see also Hancock and Desmond 2001). Stress-mediated immune system dysfunction may predispose individuals to arthritis, cancer, and autoimmune diseases. Many times a day, a person can experience stress-causing events that signal the body to produce numerous biochemical changes, mainly the hormones adrenaline and cortisol. A 1997 study examining psychological stress among 303 parcel delivery drivers revealed these drivers scored significantly higher than the U.S. population on four common measures of job stress. This study (Orris et al. 1997) also noted these drivers had higher stress levels than 91% of the U.S. population on the best single scale of psychological stress (catecholamines). In another study among a paucity of such reports on commercial drivers, Evans and Carrere (1991) found a high degree of association between exposure to peak traffic conditions and abnormal on-the-job levels of adrenal compounds in the urine of urban bus drivers.

A NIOSH report, Stress at Work (1999), suggested that job stress can be defined as the harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, or needs of the employee. The report says job stress poses a threat to employees' health and in turn to the health of organizations. M. Mayer, a stress management expert states that stress levels in the workplace are getting worse as a result of poor management training and practices, feelings of a lack of control over the work environment, and corporate cultures that value equipment over people (Mayer 2001).

NIOSH indicates there is ample evidence some workplace stressors associated with overtime and extended work shifts may be correlated with various illnesses, injuries, and health behaviors. Overtime was associated with poorer perceived general health, increased injury rates, more illnesses, or increased mortality in 16 of 22 studies examined in a NIOSH review of work settings that included from health care workers, nuclear power plant operations, and electronics manufacturing plants (Caruso et al. 2004). Four studies of extended work schedules reported the 9th to the 12th hours of work were associated with decreased alertness and increased fatigue, lower cognitive function, declines in vigilance, or increased injuries (Caruso et al.).

Davis (2004) suggested that stress research shows that common tensions, whether the result of 50-hour work weeks, demanding supervisors, or personal concerns, can create a sense of unease or stress. Continuous high levels of stress can and do cause illness, poor judgment, nonproductive relationships, and substandard performance. Experts in the stress management field point out that a given circumstance may be stressful to some people and not to others. That is, it is not the event that causes stress; rather it is the person's reaction to the event that causes stress. Stress reactions vary, but they often include headaches, muscle tension, fatigue, insomnia, fuzzy thinking, and emotional, and other problems. Stress can increase the severity of already existing illnesses (Davis 2004; Tyler 2003; Goetzel 2005).

Goetzel reviewed literature on the effects of stress in the workplace, both from an individual and an organizational

perspective. Goetzel indicated that when one couples individual health concerns with organizational stressors such as downsizing, lackluster senior management, poorly communicated policies, and an environment without clear purpose, the potential for productivity losses can be pronounced. Personal stresses, along with job pressures and stresses may manifest as symptoms reflecting increased health, safety and productivity risks for the individual and the organization. Such symptoms may present themselves as medical conditions (e.g., chest and back pain, heart disease, gastrointestinal disorders, headaches, dizziness, weakness, repetitive motion injuries); psychological disorders (e.g., anxiety, aggression, irritability, apathy, boredom, depression, loneliness, fatigue, moodiness, insomnia); behavioral problems (e.g., accidents, drug and alcohol abuse, eating disorders, smoking); and organizational malaise (e.g., absence and tardiness, poor work relations, high turnover, low morale, job dissatisfaction, low productivity).

In reporting on the costs of stress to the economy, Tyler (2003) and Davis (2004) quote figures from the American Institute of Stress (AIS), indicating that increasing costs of stress can be witnessed in the rapidly increasing cost of health care. In 2003, AIS estimated up to 90% of physician visits in the United States are probably stress related. The AIS quoted BLS statistics stating the median work absence attributable to stress was 23 days in 1997—more than four times the median absence for all occupational injuries and absences (Tyler 2003; Davis 2004). The AIS reported that stress costs U.S. businesses between $200 and $300 billion annually in lost productivity, increased workers' compensation claims, turnover, and health care costs.

Good Mental Health and Depression. The relationship between poor mental health and employers' costs has been examined more recently (Goetzel). For example, a study by Goetzel et al. (1998) showed that employees who are depressed and highly stressed cost employers significantly more in health care costs compared with those without these psychosocial risk factors. Other studies documented the relationship between poor health and productivity losses (Simon et al., 2001). Claxton et al. (1999) demonstrated that when workers are appropriately treated for depression, their absenteeism drops.

The four most common mental health disorders are depression, bipolar disorder, generalized anxiety, and post-traumatic stress. Perhaps one of the least understood mental health disorders with its affects on job performance and health care costs is that of *depression* (Conti and Burton 1994). Davis reported the Society for Human Resource Management (SHRM) estimated costs associated with depressive disorders are on the rise, and SHRM estimated depression costs employers from $30 to $40 billion each year (SHRM 1999). Although the costs of depression are high, the costs of untreated depression are much higher. When depression is not managed, employees may complain about a variety of physical problems. The SHRM report estimated up to 50% of all visits to primary care physicians are made because of conditions caused by or exacerbated by mental problems. The National Mental Health Association reported people with depression are four times more likely to suffer heart attacks than are those with no history of depression (Tyler 2002).

Atkinson (2000) reported that employees who participated in a stress management program took fewer sick days than non-participating co-workers. Those who received stress management assistance saw doctors 34% less often than their fellow employees who did not get assistance. Atkinson concluded that a worksite program focusing on stress management, along with education for small groups can reduce illness and the use of health care benefits. Teaching employees how to recognize stress reactions and the dangers and damaging effects of stress can be a powerful incentive for them to change their responses to the stress triggers in their lives. Techniques taught include deep-breathing exercises, guided imagery, and music therapy.

Tyler (2003) reports that stress management programs have to be marketed so they show a link to the bottom line. Positioning stress management as a performance enhancement strategy and tracking results such as changes in productivity, absenteeism, turnover, and adverse incidents strengthens the credibility of stress management programs (Tyler 2003; Davis 2004).

FMCSA 49 CFR 391.41 (b) (9) states that a person is qualified to drive a CMV if that person has no mental, nervous, organic, or functional disease or psychiatric disorder likely to interfere with his or her ability to drive a CMV safely. The regulations go on to state that emotional or adjustment problems contribute directly to an individual's level of memory, reasoning, attention, and judgment. These problems often underlie physical disorders. A variety of functional disorders can cause drowsiness, dizziness, confusion, weakness, or paralysis that may lead to a lack of coordination, inattention, loss of functional control and susceptibility to crashes while driving. Physical fatigue, headache, impaired coordination, recurring physical ailments, and chronic nagging pain may be present to such a degree that certification for commercial driving is inadvisable. FMCSA further states that somatic and psychosomatic complaints should be thoroughly examined when determining an individual's overall fitness to drive. Disorders of a periodically incapacitating nature, even in the early stages of development, may warrant disqualification. (See the report on the Conference on Neurological Disorders and Commercial Drivers and the Conference on Psychiatric Disorders and Commercial Drivers http://www.fmcsa.dot.gov/rulesregs/medreports.htm.)

In *CTBSSP Synthesis 1*, Knipling, Hickman and Bergoffen (2003) cited National Institute of Mental Health (NIMH) figures indicating about 22% of adult Americans suffer from a diagnosable mental disorder. Major disorders include depression, other mood disorders, and anxiety disorders such as panic disorder and obsessive-compulsive neurosis. In Knipling et al.'s survey work with the commercial truck and bus industry, these mental health problems were not perceived by carrier safety managers and other survey respondents to be as important as other topics in their safety management arena with commercial drivers.

In research work related to the concerns over commercial drivers, Greiner et al. (1997) conducted 81 observational work analyses to measure stressors experienced by operators at the San Francisco Municipal Railway transit system. Greiner et al. defined stress factors as hindrances to task performance attributable to poor work organization or technological design. Stressors included work barriers, defined as obstacles that cause extra work or unsafe behavior; time pressure; monotonous conditions; and time binding or control over timing.

No other mental health related studies nor citable data specifically concerning the mental health of commercial drivers were located for inclusion in this section. Nevertheless, depression and other mental health adjustment disorders can be serious health threats and can have implications for highway safety.

The FMCSA-ATRI Gettin' in Gear wellness program devotes a considerable amount of course material and classroom time to the topic of commercial driver stress and provides numerous recommendations for stress avoidance and stress alleviation techniques and countermeasures, including provision of relaxation tapes, as part of the Gettin' in Gear Four-R challenge geared toward Relaxing and Relating to others (Krueger and Brewster; Roberts and York).

2.6.7 Alcohol, Prescription Drugs, Over-the-Counter Medications, Other Chemicals

Substance abuse is estimated to be the actual cause of approximately 120,000 deaths per year in the United States, with more 80% of them attributed to alcohol and around 20% attributed to other drug use. Alcohol and other drugs contribute to unintentional injury, suicide, and other violent deaths, and they are factors in a high percentage of chronic diseases (Healthy People 2000). According to the 2005 U.S. National Survey on Drug Use and Health's National Findings, 19.7 million (8.1%) of the U.S. population used an illicit drug in the year 2005; 71.5 million (29.4%) used a tobacco product, and 126 million (51.8%) of Americans aged 22 and older used alcohol during the month prior to being surveyed (SAMHSA-OAS 2007).

Safe-driving and the use of alcohol do not mix. For drivers who suffer from alcoholism, safe driving has become a huge public safety issue. For decades, annual U.S. DOT crash statistics reported alcohol was a factor in more than 40% of all traffic fatalities nationwide. The issues are of special concern to the commercial driver community. This is why the blood alcohol concentration (BAC) restrictions for commercial drivers are so much more strict for CMV operators (BAC 0.04) than for passenger car drivers (BAC < 0.08). So much has been written elsewhere about alcohol and driving, about driving performance under the influence of alcohol, and about the relationship of alcohol and the incidence of highway crashes, that it is not focused on here. Alcohol use and commercial driving is an obvious safety issue and should also be viewed as a health and wellness issue.

As for the incidence of alcohol and drug use by commercial drivers, Roberts and York summarized available reports as follows:

- Crouch et al. (1993) studied the prevalence of drugs and alcohol in 168 fatally injured truck drivers and noted alcohol was present in 12.5% of these drivers. Alcohol measures exceeded the legal limit of BAC 0.04% in 1% of these drivers. Marijuana was detected in 13%, cocaine was detected in 8%, and stimulants were detected in 11.3% of these cases.
- In a Finnish study of 168 fatal-to-the-truck driver accidents from 1984–1989, Summal and Mikkola (1994) reported less than 1% of these drivers were found to be driving while intoxicated.
- A 1986 study of 317 truck drivers randomly screened for drugs and alcohol in Tennessee revealed alcohol was present in less than 1% of these drivers; but 15% had evidence of marijuana, 2% had evidence of cocaine, and 15% had evidence of stimulants in their blood systems (Lund et al. 1988).
- Korelitz et al. inquired almost 3,000 drivers attending a trucking trade show and determined 23% of all the drivers may have a drinking problem as indicated by their responses to questions regarding personal drinking perceptions.
- An Australian study of 268 cited truck drivers revealed 15 to 18% of them had been convicted for driving while under the influence of drugs or alcohol (Hartley and Hassani 1994).
- Crouch et al. reported a 1989 survey revealed 26% of drivers were perceived by their peers to be driving under the influence of drugs.

Roberts and York expressed concerns over commercial drivers' use of "heavy stimulants" because stimulants produce strong central nervous system stimulation and increasing physical and mental alertness. Citing the *Physician's Desk*

Reference (1987), Roberts and York characterized amphetamines as bringing about an elevation in blood pressure; however, the warnings include onset of increasing restlessness, dizziness, euphoria, and headaches as side effects, and statements that amphetamine use may impair the ability of a person to engage in potentially hazardous activities such as operating machinery or vehicles. Repeated use of amphetamines can lead to drug dependence and can begin to cause irrational behavior, restlessness, anorexia, insomnia, agitation, tremors, increased motor activity, hallucinations, hostility, and aggressive behavior (Pidetcha et al. 1995).

FMCSA's report to Congress on the Large Truck Crash Causation Study is an in-depth assessment of a nationally representative sample of large-truck fatal and injury crashes during 2001 to 2003 (FMCSA 2006). The report stated that among truck drivers, prescription drug use was an "associated factor" in 28.7% of all crashes sampled, and over-the-counter drugs were an associated factor 19.4% of the time. FMCSA indicated an associated factor may not have contributed to a crash, but what was known is that the factors were present at the time of the crashes.

Krueger et al. (2007) stated that at present, the commercial driving industry appears to have considerable control over illicit drug use in the employed work force. This is likely in part due to randomized urine testing of drivers for recreational and drugs of abuse and imposing harsh penalties such as loss of one's job for positive test results; albeit some commercial drivers are still testing positive for such illicit drug use. Thus far, the only consensus agreement for allowable use of a stimulant by commercial drivers is that for consumption of *caffeine* and the many other stimulating substances similar to caffeine (e.g. *guarana, taurine*, etc.) found in energy booster products (drinks, food bars, chewing gum, etc.) commonly sold over-the-counter in health food stores, truck stops, and even grocery stores.

Krueger et al. (2007) also reported that drivers sometimes take prescription or non-prescription medications, other chemical substances, and drugs (e.g. dietary pills, antihistamines, etc.): (1) as treatment for illnesses, or for relief from symptomatic ailments; (2) as self-administered countermeasures to fatigue (e.g. stimulants or hypnotics); or (3) for recreational purposes (e.g. alcohol, psychotropic substances). Some medications, or drugs, not only bring the driver relief from the discomfort and symptoms of various illnesses, or ailments, but such chemical substances also can have an impact on levels of driver alertness and therefore can affect driving performance and safety.

Prescribed medications taken under a physician's orders may treat some medical condition or ailment (e.g., drugs prescribed for hypertension, cholesterol control, heart conditions, depression, and other illnesses and conditions). Drivers may take a variety of prescriptions or over-the-counter non-prescription medications (e.g., sedating or non-sedating antihistamines, pain relievers) for treatment or relief from respiratory ailments like asthma, chronic bronchitis, emphysema, and seasonal allergies (e.g., hay fever, rhinitis; see Cockburn et al. 1999). Some drivers self-administer dietary supplements (weight loss or appetite suppressant pills); performance and mood enhancers, energy boosting drinks, pills, food bars, and other substances; stimulants (including caffeine from various sources, and numerous other compounds that act in caffeine-like ways, e.g., guarana and taurine found in energy drinks); hypnotics (sleeping pills, melatonin); alcohol, and other chemical substances (Krueger et al. 2007).

There is not enough scientific evidence on the performance effects of many such medications and the myriad of other chemical substances, either when administered singly, or in combination with others. The interactive and synergistic effects of many chemicals, medications, and drugs that drivers ingest are largely unknown.

Some medications have side effects, and manufacturers are required to place caution warnings on the containers or on printed instructions inside drug packaging. Side effects for commercially available drugs are published in the *Physicians' Desk Reference*; however, if the compound is not classified as a drug, but rather as a nutritional supplement (e.g., melatonin used as a sleep enhancer), then it is not governed by FDA good manufacturing practices and may not be written about in the *Physician's Desk Reference* either. Any performance data and study results from pharmaceutical company research on such topics are not readily available because they are considered to be proprietary. Thus, the performance effects of many substances, drugs, nutrients, and self-remedies, which drivers ingest are not so easily known (Krueger et al. 2007). This leads to concerns that not only does the driving community not have a good handle on the effects of mixing such chemicals in the body, but the physicians and health care providers who examine, treat, or counsel commercial drivers also do not have command of such information.

2.7 Medical Conditions, Functional Impairment, and Fitness to Drive

While specific conditions such as diabetes, hypertension, and cardiovascular disease justifiably focus attention on medical fitness to drive, it is the impairment of key safe driving abilities that may result from these conditions that is of greatest concern. The aging of society, coupled with an increasing shortage of commercial vehicle drivers, defines an emerging priority: to develop a practical method of identifying impairments in the sensory, cognitive, and physical abilities that most strongly affect driving safety. Recent research indicates a relatively narrow array of specific visual, physical, and mental abilities that may provide the best crash

prediction. Such functional impairments are not specific to a medical condition (i.e., visual deficits can result from more than one disease). The research in this area has implications for opportunities to improve driver functional screening.

A driver's functional status is a more accurate measure of fitness to drive than medical diagnosis alone. A medical diagnosis is an important marker, but a disease may produce varying levels of impairment due to its particular manifestation or stage of progression (i.e., diabetes and Alzheimer's disease). Also, different diseases may result in comparable levels of functional impairment. This is reflected in reports from both the TRB and the Organisation for Economic Cooperation and Development (OECD) describing model licensing procedures that are based on functional assessment, rather than medical diagnosis, for the general driver population (TRB 2004; Aging and Transport 2001). Ensuring that requirements for commercial vehicle drivers reflect the latest evidence in this area is no less urgent.

2.7.1 Challenges Associated with Functional Requirements for CVOs

Functional requirements for commercial operators are stated in 49 CFR Part 391, Subpart E-Physical Qualifications and Examinations. These pertain to vision [§391.41(b)(10)], hearing [§391.41(b)(11)], and certain aspects of limb and digit function [§391.41(b)(2)]. Supplementary "Medical Advisory Criteria" in this CFR provide physicians with additional functional criteria for selected medical conditions. With this limited guidance, physicians are asked to certify that they have not detected "*the presence of physical, mental, or organic conditions of such a character and extent as to affect the driver's ability to operate a commercial motor vehicle safely,*" nor any specific impairing conditions identified in the CFR (e.g., "*has no current clinical diagnosis of alcoholism*"). Only in selected areas are there well-defined requirements for a particular level of function for qualification to operate a commercial vehicle. Otherwise, the physician's judgment determines when an impairment is severe enough to merit disqualification, when more extensive tests are needed, or when driver certification is restricted to a shorter period with a requirement to monitor and re-check.

The AMA's Council on Ethical and Judicial Affairs published recommendations addressing "*physicians' legal and ethical obligations with respect to reporting physical and mental conditions which may impair a patient's ability to drive*" (AMA 1999). The AMA underscored physicians' traditional respect for the individual and desire to promote patient autonomy, while concurrently articulating the responsibility to recognize impairments in driving ability that pose a threat to public safety. Two criteria are paramount: (1) the physician must be able to identify and document physical or mental impairments clearly related to driving ability and (2) the driver must pose a clear risk to public safety.

2.7.2 New Research Relative to Functional Abilities and Public Safety

New research findings link indicators of public safety (crash risk) to objective levels of impairment in functional abilities. These findings can provide physicians with tools to satisfy legal and ethical responsibilities under the AMA, while meeting the intent of the federal regulations to certify a person is qualified to operate a commercial vehicle. The FMCSA establishment of an NRCME increases the importance of disseminating this information. These examiners will apply a revised and standardized set of procedures in driver qualifications assessments.

Recent research which focused on the cognitive abilities needed to drive safely appears to hold great promise. Decades of research on attention, perception, and cognition as related to crash occurrence led to a pilot test of an enhanced functional screening battery. This battery is aimed at enduring characteristics (sometimes referred to as "traits") that is, the necessary focus of a screening instrument for driver licensure rather than transient performance-impairing factors, like fatigue, that may easily be remediated. The study was sponsored by the National Highway Traffic Safety Administration (NHTSA 2005) and the National Institutes of Health/National Institute on Aging (NIH/NIA) with cooperation of the Maryland Motor Vehicle Administration (Staplin et al. 2003). Full documentation of the pilot test is posted in the *Model Driver Screening and Evaluation Program* on the NHTSA website.

This study demonstrated significant increases in the risk of *at-fault crashes,* based on police reports, with measured declines in four cognitive abilities. The study included a representative sample of nearly 2,000 drivers age 55 and older who were tracked over a *prospective* interval averaging 20 months per driver. Because cognitive decline is more likely among seniors, older drivers were of special interest in this study, but age was *not* an analysis variable (crash predictor). The loss of function, *not age per se*, was tied to increased risk of causing a crash.

In this research, the strength of the relationships between functional status and crash causation was measured via odds ratio (OR) analyses. This method contrasts the odds of at-fault crash involvement *with* a measured decline in cognitive ability against the odds of crash involvement *without* such a decline. An OR value of 1.0 indicates a functional measure has no predictive value in screening at-risk drivers, while increasingly higher OR values denote more potent predictors. The cognitive abilities identified as significant predictors of at-fault crashes in the NHTSA study and associated OR values

Table 1. Peak valid odds ratios for significant at-fault crash predictors.

Functional (cognitive) ability: Measurement tool	Odds Ratio
Visualizing missing information (visual closure): Motor free visual perception test, visual closure subtest	4.96
Visual search (with divided attention): Trail-making test, Part B	3.50
Working memory: Cued and delayed recall (auditory)	2.92
Visual information processing speed (with divided attention): UFOV® subtest 2	2.48

are shown in Table 1. Measurement tools used to assess each cognitive ability are also indicated in this table.

As is depicted in Table 1, four functional abilities have a significant impact on the odds of a future at-fault crash. *Visualizing missing information* enables drivers to perceive a whole object when only part can be discerned. This facilitates early recognition of emerging safety threats and anticipation of hazards. Drivers with this functional impairment were at nearly five times greater risk of causing a crash than drivers without it (see Table 1).

Visual search is an important ability for rapidly scanning the roadway environment for traffic control information, navigational information, and potential conflicts with other vehicles, particularly in the vicinity of intersections. A visual search impairment resulted in a 3.5 times greater risk of causing a crash (see Table 1).

Working memory is a cognitive ability that enables drivers to remember and apply traffic regulations, route-following directions, delivery instructions, and other task-dependent information while simultaneously attending to current traffic and roadway conditions. Drivers with this functional impairment were at nearly three times greater risk of causing a crash than drivers without it (Table 1).

The contribution of *visual information processing speed* to safe operations is demonstrated by an ability to detect threats at the edge of the "useful field of view" while maintaining concentration on what is happening directly ahead. Drivers with visual information processing speed impairments were at roughly 2.5 times greater risk of causing a crash than other drivers (Table 1).

This study focused on passenger vehicle drivers; however, the reported relationships between functional status and crash causation are not vehicle or situation specific. The cognitive abilities cited define performance domains with near-universal applicability in driving experience (including commercial). The same impairments should be cause for greater concern among commercial vehicle drivers. The larger sizes, heavier weights, and longer braking distances that define commercial vehicles increase task demands on commercial vehicle drivers relative to passenger vehicle drivers, while room for driver error is reduced because of the greater consequences of a crash. Also, at this time, there are no proven options for cognitive retraining or remediation of the deficits highlighted in the NHTSA/NIH/NIA research.

The measurement tools employed in the pilot study included a combination of manual and computer-based techniques. To improve the reliability and standardization of the functional measures, while reducing cost and improving the efficiency of administration, currently computer-based tests are used for all of these cognitive screens. Clearly, this would also facilitate continuing this research or pilot implementations of cognitive screening programs with motor carriers.

2.7.3 Additional Functional Criteria for CVO Qualifications

The status of research findings related to other functional criteria for commercial driver qualification deserves re-examination. In the area of vision, prior research has pointed to the need for clarification and expansion of the visual field requirement. A FHWA study concluded the vision standard should be amended to require at least 120 degrees of visual field in each eye, measured separately in the horizontal meridian (Decina et al. 1991). This recommendation was strongly supported in a subsequent review conducted by Berson et al. 1998.

Other research on vision—specifically, contrast sensitivity (CS)—and crash involvement also deserves mention. Whereas, acuity measures an individual's ability to resolve fine detail (high spatial frequency information) that contrasts sharply with its background, CS measures the ability to discriminate objects with edges that may be poorly defined and that have low contrast with their background. Roadway debris encountered at twilight or a curb or median barrier without painted delineation, a pedestrian in dark clothing, are all examples of important low contrast targets. The potential for safety gains from screening for contrast sensitivity in addition to standard acuity measurement has been demonstrated in analyses dating to at least the early 1990s (Decina et al.), and state DMVs (e.g., California) have begun to introduce CS in their passenger vehicle licensing operations on a pilot basis. However, research has not yet established a standard of performance for CS for CVO qualifications.

Hearing requirements for commercial operators were addressed in a case-control study of commercial drivers with hearing disorders (Songer et al. 1993) and in a human factors study to evaluate the FHWA hearing requirement (Robinson et al.). As summarized in an FHWA Technical Brief (FHWA-OMC 1999), hearing is required to detect both intentional signals and incidental sounds to safely operate

a commercial vehicle. In efforts to update current standards it is likely that the "forced-whisper" test methodology should be phased out of use, testing of commercial drivers should probably be done at a wider range of frequencies than are currently prescribed (up to 4,000 Hz), and the use of pure-tone audiometry to objectively assess hearing ability should be expanded.

Where research has provided clear evidence to establish standards of vision and hearing performance for CVO qualifications and associated measurement techniques, there is still a requirement to bring practice in line with these research findings. Initiating practical methods for driver screening for impairments in cognitive abilities that have been validated as predictors of *at-fault crashes* should yield further benefits for industry and for highway safety. Research should continue to provide the best possible information to those charged with updating the physical, medical, and fitness standards for commercial driving qualifications, so as to be able to address not only transient states, diseases, and medical conditions, but also the specific functional abilities research has linked to crash causation.

2.8 Corporate Employee Health and Wellness Programs

2.8.1 Why Corporate Health and Wellness Programs?

Corporate America has experimented with employee health and wellness programs for more than a quarter of a century. The motivations for such programs include management's humanitarian concern for the general well-being of employees and maintaining an aura of corporate excellence. More practical goals include stemming rising insurance premiums, health care costs, and workers' compensation; decreasing incidents of injuries, deaths, costly accidents, and absenteeism; finding replacement employees while some workers are out; and ultimately improving bottom line profits for the company. In both the for-profit and non-profit (e.g., government employers) businesses, now more than ever before, corporate America seems to be embracing company-sponsored employee health and wellness programs, primarily to slow down the ever-escalating medical care costs provided by employers. Improved recruitment, increased productivity, and improved morale are among other wellness program benefits.

Over the past several decades, literally thousands of companies in the United States and western Europe initiated health and wellness programs, with varied degrees of success. However, many companies that implemented health and wellness programs also demonstrated vacillating levels of sustainment of such programs. Many of the programs dissipated back to "doing business as usual." In preparing this synthesis, the research team identified a limited number of commercial trucking and bus/motorcoach companies with company sponsored health and wellness programs. It is one of the intentions of this synthesis to provide useful information and recommendations to assist the commercial shipping and passenger transportation industries with information for practical decision making regarding whether to proceed with their own health and wellness programs in hopes of improving the lives of employees (commercial drivers) and impacting highway safety in a positive way.

2.8.2 What Constitutes a Corporate Health and Wellness Program?

Several different "models" of corporate health and wellness programs might be described. The essential differences among them are largely more a matter of degree of emphasis rather than differences in actual inclusiveness of the various elements of any good employee wellness program. This synthesis first reports some experiences gleaned from the literature on corporate experiences with different types of programs and highlights various elements of company wellness programs. It outlines a few select models of what a prospective wellness program might look like for the trucking and bus/motorcoach industries. For an extensive treatise of the cost-benefit analysis and organizational strategies of health management programs, consult the University of Michigan Health Management Research Center's Cost Benefit Analysis and Report–2006 (Edington 2006) and the work of Ron Goetzel for several decades of corporate wellness research that led to the current focus on Integrated Occupational Health, Safety and Health Promotion Programs in the Workplace (Goetzel 2005). Many pertinent peer-reviewed journal articles done by the staff at the University of Michigan's Health Management Research Center describing work related to the topics of this synthesis are listed in the supplemental bibliography.

There are numerous publications available in the health and wellness "industry or trade" on what to include and how to conduct *workplace wellness programs.* They are far too numerous to describe or even quote from them in this synthesis. For readers motivated to pursue this topic further, one publication which may be particularly pertinent and helpful is "Building Blocks for a Successful Workplace Wellness Program" (Huber et al. 2005). This volume serves as a primer for either wellness managers who are new to the field or for experienced managers who want a guidebook. It identifies numerous practical steps to take in beginning a program and explores elements, strategies, characteristics, and objectives employed in successful wellness programs. The compilation of sound advice, great ideas, proven methods, practical goals,

and "how-to" tips was produced by the editorial team from Wellness Program Management Advisor, a popular monthly news briefing for workplace wellness professionals.

2.8.3 Transportation Industry Employee Wellness Programs

Roberts and York compiled a list of wellness programs in the trucking industry. A number of them are briefly described as follows:

Ruan Transportation Management Systems. Holmes et al. and Roberts and York described the program of Ruan Transportation Management Systems, located in Des Moines, Iowa. In 1995, Ruan had more than 3,000 employees to provide commercial vehicle and employee leasing services for private and for-hire trucking operations in 38 states. Ruan designed a wellness program for their commercial truck drivers as part of a management initiative to control rising health care costs. The company's health care claims experience showed heart problems were the largest cost category for 2 of 3 observed years, and costs associated with heart disease represented more than 10% of total health care costs.

In consultation with wellness specialists, Ruan first identified the principal factors contributing to their employees' heart problems: elevated blood cholesterol, elevated blood pressure, overweight employees, lack of exercise, and smoking. Since the first three of those risk factors are affected by nutrition, they sampled 300 drivers to determine their health and nutrition habits, by asking questions regarding meal and snack frequency and food selection choices while on the road. This survey revealed dinner as the most frequent meal eaten, and burgers and steaks as the most common meal of choice. Additionally, 48% of the drivers indicated snacking while on-the-road with potato chips as the most frequent snack choice.

With the assistance of a nutritionist, the company's management team designed a nutrition intervention program and compared effectiveness of this program using a test and a control group of drivers to determine if a wellness program emphasizing driver nutrition could significantly affect the risk factors attributable to heart problems (Holmes et al.; Roberts and York). The program consisted of nutrition and wellness counseling, printed information designed to educate drivers about healthy meal choices, and "healthy snack bags" containing such items as fresh fruit, juices, raisins, pretzels, and fig cookies. The nutrition intervention program achieved significant differences among the test and the control group of drivers in areas of weight reduction, improved fitness level, and smoking cessation. The team also witnessed improvements in blood cholesterol levels, body fat, and blood glucose levels. Follow-up interviews with the drivers also noted improved feelings about the company (Holmes et al.).

Roberts and York used telephone interviews of 23 trucking companies to elicit health and wellness program information (circa 1998–99). Only six trucking firms had or were willing to highlight their wellness programs. Roberts and York identified these companies only by number in their report for FMCSA. The difficulties of establishing a wellness program in the commercial driver community are portrayed in the report and summarized here.

Motor Carrier #1 was a truckload carrier in the United States with more than 14,000 drivers and 2,500 corporate staff members based in 15 operations centers around the United States. The company has a wellness program because of upper management interest and support. The corporate wellness coordinator indicated that cardiovascular claims were the number one medical cost for truck drivers, and that the company was implementing a disease management program, although specifics had yet to be determined. Other elements of the health and wellness program included a $30 reimbursement for smoking cessation, an employee health assessment program, and stress management and aerobics classes. The wellness coordinator noted the program weakness was not reaching drivers or having wellness program representatives at local operations centers.

The most extensive employee program participation was found at the corporate office where the wellness program was administered. Seventy-five percent of the operations centers were equipped with fitness rooms and employee cafeterias. Roberts (a dietician) reported that during her visit to one of these operations centers, there was no evidence of usage of the fitness room even though about 800 drivers passed through the facility each day. The majority of cafeteria food choices were typical high-fat menu choices such as bacon and eggs and hamburgers and cheeseburgers. Deli sandwiches and prepackaged salads were also available. At the time of Roberts' visit (1999), the facility did not have a local wellness coordinator.

Motor Carrier #2 was a for-hire flatbed operation with approximately 800 trucks. The company began a wellness program to keep health care costs down. However, Roberts and York observed the wellness coordinator had little understanding of the company's health care costs and had not analyzed any data other than to know that costs were increasing. The wellness program reached primarily the office staff and not the drivers. It was estimated that more than $100 was spent on wellness per office staff employee, while almost nothing was spent on drivers. The company had a large fitness facility, cafeteria, and a motel at the corporate headquarters. Lunch seminars, health assessments, and a newsletter were provided. It appeared there was little participation by drivers in the company wellness program. Weaknesses were inability to reach drivers, newness of the wellness program, and lack of personnel to administer the program.

Motor Carrier #3 was a refrigerated carrier, with a large national operation and with 2,100 drivers and a staff of 300 operations and support staff personnel. Driver turnover rates reportedly exceeded 200%. The company was interested in wellness programs because the recently appointed president believed that health affects every part of the business. The company provided a $200 wellness benefit for all employees and distributed a health-oriented newsletter. However, at the time of the interviews, the company had not figured out how to effectively reach drivers with the wellness program.

Motor Carrier #4 was a refrigerated carrier operating in all 50 states with an irregular route truckload operation. The company had 2,000 independent owner-operators and 400 in-house corporate staff support personnel. They too were in the beginning stages of developing a wellness program and at the time provided limited amounts of health information through a company newsletter. Flu shots, health screening, and fitness membership reimbursements were available to all employees and operators. The company was building a fitness center at the corporate headquarters. As with other trucking companies, reaching the drivers was its biggest concern. This was reflected in participation rates—nearly 20% of corporate staff and only 1% of drivers participated in the company wellness program.

Motor Carrier #5 was a private fleet operation consisting of 500 over-the-road refrigerated trucks. Four years previously, the company implemented a fatigue/health education program designed for its truck drivers. The program included classroom instruction on fatigue and other health issues and provided a manual containing information on exercise, diet, stress, and fatigue. The program demonstrated very positive results with a 40% reduction in accidents and large program acceptance by the drivers (Harrington 1995). As often happens, the individual who developed, implemented, and championed the program left the company for a position elsewhere and, since the departure, the corporation reorganized the fleet safety function, placing it under control of risk management, where the level of support by the company was far less. All program activities at the time of the interview were placed on hold.

Motor Carrier #6 was a Western-based trucking company with approximately 3,000 truck drivers and 300 to 500 corporate employees. It attributed the more than 90% turnover rate primarily to the length of time truckers are away from their families. The company was building a new facility for their drivers to include sleeping quarters, a cafeteria, a theater, and a fitness center. In a desire to keep health care costs down, the company was giving high priority to employee health. The wellness program was initiated as a benefit for the employees. The program offered health fairs, weight management programs, exercise incentive programs, and lunch and learn sessions which brought in outside professionals to speak on subjects such as diabetes, healthy food choices, and starting a fitness program. Other activities offered were golf, basketball, volleyball, and aerobics. A bulletin board with tips and facts on improving health was maintained. Truck drivers were told of the wellness programs during their orientation and were given a manual with information about stress management, healthy eating, and exercise tips. Nutrition packets were made available for drivers and included facts on healthy snacking and calories. The program's participation rate averaged 20 to 25% of office employees and 10% of drivers. The coordinator did not think they had enough resources to reach more of the drivers.

Roberts and York also described elements of an additional non-trucking company wellness program as follows:

Grocery Retail Company is an employee-owned Midwestern grocery retail company with 35,000 employees, including 175 truck drivers. The company is decentralized with 250 locations in 7 states. The company placed much emphasis on employee health and started its own wellness program as a benefit for employees. It made the program available to all employees, their spouses, and retirees. Program activities which varied from location to location, often included seminars, recreational activities, and yearly health risk assessments-which were quite popular because they included medical testing of blood cholesterol, blood sugar, blood pressure, body fat, and fitness levels. After testing, a counselor explained the results and gave the employees or family members information and recommendations on how to improve their overall health. Follow-up contacts were made with high-risk employees to help in the behavior change process. The corporate office had "lunch and learns" covering topics from osteoporosis and arthritis to healthy eating and safety issues. Every employee was provided a monthly health newsletter published by the company. The wellness program was staffed with a wellness coordinator, a consultant as needed, and five consultants for the health assessments and follow-ups. More than 75% of their full-time and regular-time employees participated in the health risk assessments, and participation in the overall wellness program was quite high. The company, which is self-insured, experienced a reduction in health care costs; employees also realized health care savings. Seven years passed with no increase in premiums and in 2 of the previous 10 years employees received a health insurance premium rebate.

2.8.4 Overall Benefits of Employee Health and Wellness Programs

Davis said that the rising costs of health care today mirror those of the late 1980s and early 1990s, before managed care clamped down on health costs for a short time. In 2002, an HR consultancy firm estimated large employer (>100 employees)

costs at $4,026 per employee per year—three-fourths of the cost of premiums. Employees were estimated to pay an average of $1,401 more in costs in 2002 than in 2001 (SHRM 2002). Gale (2002), a workplace health promotion specialist cited by Davis, estimated that, at most companies, 10% of all employees consume 80% of the health care costs. These are individuals at highest risk for conditions such as diabetes, high cholesterol, and heart disease, and they are the least likely employees to change unhealthful behaviors. Gale suggested the primary goal of any employee wellness program should be to return the highest risk people to low-risk status while helping the other 90% maintain a low health-risk lifestyle. However, Gale noted that getting the 10% of high-risk employees to participate in managing their health and well-being can be a particularly challenging task.

With these principles in mind, the staff at the University of Michigan Health Management Research Center points out that while high-risk individuals are often the targets of most health intervention programs, low-risk individuals often are allowed to live their lives with little or no apparent attention; and eventually they become susceptible to increasing risks without the proper attention to help them maintain their low-risk status. The premise of the Health Management Research Center therefore is to reduce the flow of low- or medium-risk individuals to high-risk which will result in reduction of the total of high-risk individuals within a few years. The important metric and the gold standard for success is the percentage of the population at low-risk (Edington).

The Wellness Council of America (WELCOA), a nonprofit health promotion organization, is a leading provider of what it claims is a unique workplace wellness model—improving employee health and safety through deployment of its wellness coaches directly to the workplace. One of the goals is to empower employees and to get them to participate at significant levels in their company's wellness programs and thereby achieve outstanding improvements in employee health. Some of WELCOA's programs are outlined on its wellness coaches website at http://www.wellnesscoachesusa.com.

WELCOA suggests that although an employer cannot force employees to participate in a health and wellness program, the employer can tie such participation to an employee's being able to participate in the employee benefits package. WELCOA estimated the typical benefits package costs a company expends is about $4,000 per employee, per year. Considering that outlay of expenditures, WELCOA believes a company has the right to ask individuals to, at a minimum, participate in a series of commonly provided health screenings or health risk appraisals. In addition, the company can implement targeted wellness programs, which are more likely to be used because people are more aware of their medical and health conditions following these screenings or appraisals (University of Michigan Health Management Research Center 1997 and 2006).

Goetzel et al. (1998) followed approximately 46,000 employees from more than six large health care purchasers for 3 years after the employees had completed a health risk appraisal. Employees at high risk for poor health outcomes had significantly higher expenditures than did employees at lower risk in seven of ten risk categories: those who reported themselves as depressed (70% higher expenditures), at high stress (46%), with high blood glucose levels (35%), at extremely high or low body weight (21%), former (20%) and current (14%) tobacco users, with high blood pressure (12%), and with sedentary lifestyle (10%). These same risk factors were found to be associated with a higher likelihood of having extremely high (outlier) expenditures. Employees with multiple risk profiles for specific disease outcomes had higher expenditures than did those without these profiles for the following diseases: heart disease (228% higher expenditures), psychosocial problems (147%), and stroke (85%). The authors concluded common modifiable health risks are associated with short-term increases in the likelihood of incurring health expenditures and in the magnitude of those expenditures.

A University of Michigan Health Management Research Center survey (1997 and 2006) of 1,035 major employers found that 85% of responding employers offer some form of health promotion, and 75% use health risk assessments. Incentives for employees making healthful lifestyle changes and the penalties for those engaging in high-risk behaviors, such as smoking, are becoming more prevalent. Health Management Research Center pointed out that a variety of factors associated with unhealthy employees can contribute to corporate costs including: absenteeism, medical expenses, distress to other employees during absences, and cost of replacement personnel.

Davis concluded health promotion is typically approached in two ways: (1) decreasing external risks, such as by eliminating carcinogens and providing adequate on-the-job safety measures and (2) reversing risk behaviors, such as smoking and physical inactivity. The University of Michigan Health Management Research Center (1997) reported that DuPont found absenteeism 10% to 32% higher among its employees who had any of seven health risks: smoking, obesity, high cholesterol, high blood pressure, excessive alcohol use, lack of exercise, and not using seat belts. After implementing a wellness program at 41 of its sites, DuPont had a 14% decrease in absenteeism. Davis also reported that the Health Management Research Center looked at the Union Pacific Railroad's health promotion program, which was instituted when the company determined its medical costs per employee were almost twice the national average. After implementing a medical self-care program, Union Pacific experienced a savings of $1.26 million annually.

Davis reported the Daimler Chrysler/UAW wellness program realized a savings of $4.2 million among bargaining union employees who participated from 1999 to 2001. The program, piloted in 1985, had approximately 44,000 employees participate from 1985 to 2004. Daimler Chrysler had more than 32,000 active participants in 2001. Daimler Chrysler contracts with health and fitness businesses to administer their wellness program, which is voluntary and confidential (Daimler Chrysler/UAW 2001). Their program activities are aimed at four goals:

- Empower employees to be wise health care consumers and improve their health
- Keep low-risk employees in the low-risk category
- Target high-risk employees with focused interventions
- Provide cost-effective wellness activities designed to contain health costs

The Daimler Chrysler program employs the following incentives and techniques to increase and maintain employees' participation in the program:

- Gifts distributed at health screenings
- Well-bucks "money" earned for participating in activities that can be redeemed for prizes such as gym bags, sweatpants, first aid kits, and polo shirts
- Targeted marketing based on prior participation
- Incentives for participating employees who bring in new participants
- Convenient access to health screenings in the worksite
- Interactive, fun, and non-threatening activities

A study done of Johnson & Johnson's large-scale wellness programs demonstrated positive long-term financial and health effects (Breslow et al. 1994; Davis 2004). The Johnson & Johnson study reviewed medical claims for more than 18,000 domestic wellness program participants from 1995 to 1999. Medical expenditures were evaluated for up to 5 years before and 4 years after the wellness program began. As a result of linking the program to health care benefits and financial incentives, the company saw participation rise from 26% in 1995 to 90% during the study period. Financial incentives included a $500 medical plan discount for employees who completed a health risk assessment and, if recommended, enrolled in a high-risk intervention program. Employees participating in wellness activities had significantly lower medical costs and achieved improvements in several health risk factor reductions in 6 of 13 risk categories in the first year of the program: sedentary lifestyle, hypertension, high cholesterol, low dietary fiber intake, poor motor vehicle safety practices, and tobacco use/smoking. In the first 4 years of the program, Johnson & Johnson averaged $8.5 million savings annually. Savings came primarily from lower administrative and health care use costs (Johnson & Johnson 2002).

In a brief examination of health and wellness programs in other segments of the transportation industry, *TCRP Report 77* (McGlothin Davis, Inc., 2002) reported four health and wellness programs in the transit industry.

- The Utah Transit Authority (UTA) in Salt Lake City, Utah. Since 1990, UTA has had a quality-of-life program called the *Healthy UTA*. Activities included sports programs, health evaluations for all employees and their spouses, a fitness facility at each worksite, health education, and discount tickets to recreational events in the community. In 2000, more than 1,000 employees participated in one or more of the wellness activities.
- Metropolitan Area Rapid Transit Authority in Atlanta, Georgia. The program includes a twice per year health fair, monthly massages, brown-bag health education classes, monthly health promotion newsletters, and fitness facilities at each location.
- Regional Transportation District in Denver, Colorado. The program, *Champions of Transit*, integrates community involvement, employee wellness and employee recognition activities, communicating its commitment to being a positive force in the community and to its employee health, well-being, and development.
- Pierce Transit in Tacoma, Washington. *Health Express* is an employee-committee program which sponsors health education and support to help employees make healthful lifestyle choices.

2.8.5 Other Findings of Interest

Morris et al. (1999) pointed out that blue-collar workers are less likely to participate in worksite health promotion programs than are white-collar workers. Workers in a manufacturing setting, who engaged in welding, assembly, machine operation, maintenance, and painting, viewed the worksite health climate less positively than did white-collar workers. White-collar workers perceived more flexibility to exercise, a more healthful norm for nutrition, and more support from supervisors and co-workers for healthful behavior. Blue-collar workers had a higher norm on only one health behavior, that of an antismoking sentiment which was higher than that of the white-collar workers.

Davis reported employers are increasingly implementing disease management (DM) programs as part of a health and wellness strategy to address the rising costs of treatment associated with chronic health conditions. Employers embrace DM as a way to improve the health of their employees, boost productivity, and reduce medical insurance premiums. According to the Pharmacy Benefit Management

Institute, in 2001, 44% of employers offered DM for chronic medical conditions, up from 14% in 1995 (Atkinson 2001, 2002).

Asthma, diabetes, and cardiovascular disease are the three major illnesses most commonly addressed by DM programs. The goal of DM is to ensure employees receive the best care possible and avoid complications. DM involves employees in their care, ensures proper treatment by physicians, and helps make sense of medical information. Often a contracted service, many DM programs focus not only on cutting health care costs, but also on improving employee attendance and ability to contribute at work. DM programs encourage employees to sign up with a health care provider who educates them about their diseases—how to manage them and the importance of proper medical care. DM programs hold down costs by providing employees and their caregivers with information on how to monitor and treat conditions and coordinate communication among the various stakeholders in the employee's health care coverage (Atkinson 2001, 2002).

Self-care and education efforts that focus on helping employees understand their illnesses and treatment are important aspects of DM programs. DM programs are sometimes separated into three categories of service: (a) high-risk individuals who receive frequent telephone calls, as well as home visits or medical monitoring, (b) medium-risk individuals who require frequent telephone contact, and (c) low-risk individuals who can get by with frequent mailings and occasional telephone contact (Atkinson 2002).

Alan Pierce, a workers' compensation attorney, prepared a top 10 list of reasons injured workers retain attorneys (Pierce 2002). The list is instructive in that it points the direction for employers to design portions of their employee wellness programs in such a way that employers attend properly to the perceptions/expectations of their employees. They include

1. Workers' compensation claim was denied.
2. There was no contact by the employer or the insurer with the injured employee.
3. There was overbearing or intrusive contact by the employer.
4. Bills went unpaid, prescriptions were un-reimbursed, or the check was late.
5. Lawyer advertising and solicitation caught the injured worker's attention.
6. The advice of friends, family, or medical provider swayed the worker.
7. There was a lack of a modified-duty plan or harassment upon return to work.
8. Employee was dissatisfied.
9. Employee had loss of health insurance or other benefits.
10. The accident or injury should never have happened.

2.8.6 Does Workplace Drug Testing Reduce Employee Drug Use? Weed out Undesirables?

In September 2006, the Substance Abuse and Mental Health Services Administration released its National Survey on Drug Use and Health (SAMHSA-OAS). Employers screen their workers and job applicants for drug use with the expectation that such testing will deter worker drug use. It is a cause-and-effect relationship that many employers rely on, and a belief that fuels a multibillion-dollar drug testing industry. When researchers at the University of California, Irvine (UCI), examined alternative explanations to test the link between employee drug testing and lower rates of employee substance abuse, the results did not definitively prove drug testing directly reduced drug use, but those results were the strongest evidence to date (Chris Carpenter of UCI, quoted in *Occupational Health and Safety*, September 27, 2006; Carpenter 2007). According to the UCI study, other workplace drug policies, like a written "zero tolerance" standard or employee assistance programs, do not explain away the association between testing and less worker drug use.

The UCI study also considered the health profile of employees at worksites with lower drug-use rates to determine if healthier workers self-select workplaces that are more likely to screen their employees. Because other policies and workforce characteristics likely dampen drug use to some degree, and because previous research did not account for those effects, Chris Carpenter said that past studies may have overstated the testing-drug use link. Carpenter said that failing to account for other workplace characteristics and drug policies may bloat the testing-drug use association by as much as 25%. The researchers said that could be valuable information to budget-conscious personnel managers who are weighing the costs and benefits of establishing a drug-testing program. When the UCI study compiled data on marijuana screening at private, for-profit companies across the country, results mirrored previous studies, again indicating marijuana is the drug appearing most often in employee failed drug tests.

The implications of such research and commentary by the UCI researchers to the commercial transportation industry are not clear; however, the trucking and bus/motorcoach segments of industry impose no-tolerance and randomized testing for drugs in employees.

2.8.7 Criteria for Successful Employee Health and Wellness Programs

For the FMCSA, Roberts and York surveyed numerous tenets of successful wellness programs (e.g., O'Donnel 1997;

Association for Fitness in Business 1992) and from them, extracted, adapted, and outlined the following fundamental elements for a successful company-sponsored employee health and wellness program:

Fundamental Health and Wellness Program Elements

- Commitment from senior management is important (highest level, CEO if possible)
  - Monetary and personnel support
  - Philosophical support
  - Participation in the programs
- Clear statement of philosophy, purpose, and goals
- Needs Assessment: survey the employee base, check health care costs
- Strong program leadership
- Use of effective and qualified professionals (e.g., wellness consultants)
- Accurate, up-to-date, research-based information made available to participants
- Effective communication
  - High visibility
  - Successful marketing
  - Motivating to employees
- Accessible and convenient for employees (how to attract drivers)
- Realistic budget
- Fun, motivating, and challenging program philosophy
- Supportive work/cultural environment
  - Company policies
  - Company attitude toward employee
- Supportive physical environment
  - Cafeteria and vending provide healthy food choice options
  - Available fitness facilities
  - Windows, lighting, truck cab
- Individualized to meet the needs of each employee
- Defined evaluation system, establish criteria for success, changes
- Shows results for the individual employees and the company

Roberts and York provide extensive elaboration and explanation of most of these program elements, and readers are referred to those descriptions in the overall report by Roberts and York. That report can be found on the FMCSA website at www.fmcsa.dot.gov (publications). Many of the principles of the Roberts and York program development are embedded in the Gettin' in Gear wellness program, and they appear in detail in the instructors' manual and in the other train-the-trainer course materials distributed to course attendees (see Krueger and Brewster).

2.8.8 The New Paradigm: Integrated Occupational Health and Safety and Health Promotion Programs in the Workplace

Goetzel (2005) describes a relatively new and emerging business strategy called Health and Productivity Management (HPM) aimed at improving the total value of human resource investments. Goetzel says HPM has been in the forefront of advocating for integrated employee health, safety, and productivity management programs. These programs rely on the joint management of human resources benefits and programs that employees may access when they are sick, injured, or balancing work/life issues. They include health insurance, disability and workers' compensation, employee assistance, paid sick leave, and occupational safety programs. Also included are activities meant to enhance morale, reduce turnover, and increase on-the-job productivity.

Over the past 10 years, an *integrated health, safety, and productivity model* evolved. In part, businesses pursue an integrated approach as a business imperative because health benefits to employees have become increasingly worrisome. During 2000 to 2004, annual health insurance costs increased an average of 10 to 12% per year, and generally, additional increases are anticipated (Goetzel 2005). In 2003, the annual cost of providing health insurance benefits averaged $3,391 for employee-only coverage and $9,075 for family coverage. On average, employers paid 84% of the premium for employee-only coverage and 73% for family coverage (Gable 2003). However, Goetzel says when factoring in productivity related expenses, the costs to employers are significantly greater. Parry et al. (2004) estimated the overall health and productivity cost burden to employers averaged $16,091 in 2002. This included direct payments for health benefits and indirect payments attributable to lost productivity. Some expenses associated with lost productivity included hiring replacement workers when an employee is absent (absenteeism) and reduction in services, loss of output and missed sales opportunities when employees are distracted or less attentive (e.g., an employee is at work but concerned about illness, etc.), especially when affected by poor health (*presenteeism*). Workers in poor health, and those with behavioral risk factors, may cost the organization more than can be measured by adding up medical expenses; the spillover effects on other areas such as safety, morale, and productivity may be significant (Goetzel 2005).

Goetzel et al. (2002) say that in many businesses, health, safety, and productivity issues are addressed separately, and discreetly, by different functions and departments in an organization: employee benefits, employee assistance, risk management, occupational medicine, safety, organizational development, operations, human resources, employee

relations, and labor relations. Fragmented, department-specific strategies attempt to manage individual and organizational risks although oftentimes these risks are common to several functions simultaneously within the organization and might be better managed through cooperative or integrated activities. Thus, HPM programs advocate an integrated health, safety, and productivity management model which establishes a new paradigm for working *across departments* to form a coordinated, synergistic, and unidirectional set of solution packages for both the employee and the company. This new paradigm forces managers to concentrate their efforts on improving the health and well-being of employees as a whole, not as individual cases, regardless of where the organizational benefit programs reside (Goetzel et al. 2003). This new and forward-looking approach to health and wellness integrated across the organization is not easy and necessitates much organizational change, and hard work. (Consult Goetzel 2003 for details, especially his outline of the top 10 lessons learned in Health and Productivity Management (HPM) and Best Practices, pp. 34-39 and see Chapters 1, 5, and 10 in American College of Sports Medicine's Designing Health Promotion Programs [Cox 2003]).

2.8.9 Commercial Driver Health, Wellness, and Fitness Training Programs

A number of training programs have recently become available for encouraging and assisting commercial drivers to make health and wellness lifestyle changes, with a view toward maintaining and retaining a healthy workforce and fostering safe driving practices on the nation's highways. Two such programs are highlighted here: the FMCSA-ATRI co-sponsored Gettin' in Gear program and the Occupational Athletics program of driver athletes designed for commercial truck and bus drivers.

Gettin' in Gear Wellness Program. This program for commercial drivers focuses on principles of general wellness, health, and fitness for CMV drivers, for their employers, and for their families. The formulation of the Gettin' in Gear wellness program was sponsored by the FMCSA, and it was initially developed by Susan Roberts (a dietician) and Jim York (a trucking safety officer) at the NPTC (Roberts and York). The Gettin' in Gear program was further developed by ATRI. From the Gettin' in Gear program, the ATRI developed a 3-hour train-the-trainer course intended for commercial carrier staff personnel (e.g., human resources, occupational health, safety and risk managers, driver managers, and other company officials). Gettin' in Gear is also designed for presentation to truck and motor coach drivers themselves (Krueger and Brewster 2002; Brewster and Krueger 2005; Krueger, Brewster, and Alvarez 2002). The intent of the Gettin' in Gear train-the-trainer course is to explain the most common health threats facing commercial drivers and to entice employers and drivers to take proactive action to participate in a personal wellness, health, and fitness program. The Gettin' in Gear train-the-trainer course provides preliminary guidance on how to get started on such a program. An executive level Gettin' in Gear course, normally offered to company officials, includes additional discussion of direct and the indirect health care costs associated with not having a corporate wellness program and addresses cost implications of implementing such a program.

The Gettin' in Gear program addresses lifestyle health risks associated with commercial driving careers. Important threats to commercial drivers' health and fitness discussed in the course are as follows:

- Smoking and tobacco use
- Obesity/being overweight
- Hypertension (high blood pressure)
- Poor eating habits, poor diet and nutrition
- Alcohol, drugs, other chemical substances
- Lack of physical activity/physical fitness
- Psychological stress and mental fitness

Gettin' in Gear provides preventive medicine guidance on what to do about these health risks and points the way to developing a personal wellness plan. Basic Gettin' in Gear premises are as follows:

- Drivers' health behavior patterns are precursors to safe driving practices.
- CMV driver health is important to ensure alert, attentive driving for overall safety on the nation's highways.
- Preventing health problems preserves the nation's valuable CMV workers.
- Driver wellness programs foster healthy employees, improve lifestyles, help contain health care consequences and costs for workers, their families, and employers, and they foster a positive corporate climate of concern and excellence.

The Gettin' in Gear wellness program is a personalized driver wellness program built around four health principles, called the four Rs of driver wellness. The 4-R Road Challenge is designed to help drivers attend to health and fitness matters while at home and while traveling on the road. The four Rs in Gettin' in Gear are

- *Refueling:* learning better eating practices so the body performs at its best, giving extra energy and better alertness, especially while driving. Offers nutrition information on lists of food and provides recommendations for healthy diets.

- *Rejuvenating:* improving one's physical self through exercise, maintaining regular exercise and movement activities to preserve one's health, and to remain physically fit. Sample exercises drivers can do are described.
- *Relating:* understanding the importance of relationships; and how to enhance relationships with others, both personal and professional, as they impact our personal stress levels, our health, and our performance on the job.
- *Relaxing:* becoming calmer in a fast paced world, at home and at work, by learning to recognize, control and manage our responses to the many stresses we face. Describes stress alleviation techniques, and hints to avoid road rage.

For drivers, the Gettin' in Gear wellness program is about the following:

- Discovering an improved way of life
- Finding one's own optimal health
- Experiencing one's own personal journey
- Having more energy, most of the time
- Dealing with stress, anticipating it, managing responses to it
- Feeling better about oneself, and just feeling good
- Enjoying retirement, anticipating it rather than dreading it

Drivers as Road Athletes. The Road Athlete System™ and the Bus Athlete System™ are two interactive driver health and safety training programs that specifically address the unique "roadblocks" facing truck and bus drivers that may prevent drivers from living a healthy lifestyle. This interactive training approach treats truck and bus operators as "road athletes" or "bus athletes," encouraging participants to become involved in improving their own health and safety. Participants are to imagine themselves as athletes, their playing field is the road, and they are to envision themselves as being the quarterback of their bus or truck. Each work day the drivers are to participate in a new game (outlined in a workbook) with a new opportunity to achieve personal health and safety goals.

Participant drivers who become involved are given two audio CDs containing a motivational talk and a roundtable discussion among bus/truck drivers and safety experts focusing on the lifestyle and safety of professional drivers. Drivers are then given an Athlete System Game Book with 12 months of games (lessons) designed for the truck driver or bus operator to encourage them to make simple lifestyle changes in his/her own health and safety. Every workday, for 1 year, the book presents the bus or truck driver with another *lifestyle* and a *safety factor* along with short goals to accomplish.

The 12 *lifestyle factors* covered in the driver athlete systems include nutrition, physical exercise, mental fitness, stress reduction, attitude and happiness, sleep, substance abuse, time management, motivation, disease prevention, weight/obesity, and relaxation. The s*afety factors* include weather conditions, driving regulations, passenger safety, compliance, pre- and post-trip inspections, injury prevention, and employee-employer relations.

Each factor is accompanied by a "motor-vator" (a catch phrase) to increase driver interest in each topic. Daily tips and motor-vators are concise, easy to understand, and entertaining to read, and they express a day-by-day, step-by-step, and goal-by-goal approach to altering the driver's lifestyle so as to be more healthy, and they encourage safe driving. Games include physical exercises, counting nutritional intake indicators, and stress reduction activities. As the drivers score their daily game goals, they become winners in the Game of Life. The intent of the road and bus athlete systems is to encourage commercial drivers to exercise control over their physical and mental well-being (lifestyle factors) and, at the same time, gain greater safety awareness and know-how (safety factors). These driver athlete health training systems were developed by Susan and Ron Shapiro and Mark and Lori Everest at Occupational Athletics, LLC, in Harrisburg, Pennsylvania (Shapiro 2005; Everest et al. 2005 www.occupationalathletics.com). The research team found that numerous trucking, bus, and transit companies are involving their drivers in these road athlete programs and beginning to report positive results. This approach warrants further scrutiny and monitoring to determine success rates.

2.8.10 OSHA Web-Based Assistance on Safety and Health Topics

Recently, the Occupational, Safety and Health Administration (OSHA) posted on its website a Safety and Health Topics Page intended to provide information to help safety managers and others demonstrate the value—or "the bottom line"—of safety and health to management. More details about this OSHA initiative can be found in Appendix D.

CHAPTER 3

Health and Wellness Surveys

3.1 Truck and Bus Industry Survey Results: Experiences with Employee Health and Wellness Programs

3.1.1 Survey Development

In spring 2006, the research team initiated a survey process to develop and refine two surveys. The first survey was designed for motor carrier company managers (at truck and bus companies). The second survey focused on truck and bus drivers who currently drive for companies with a formal or informal health and wellness program. The instruments were based on similar surveys conducted with transit drivers in a previous TCRP synthesis.

As a first step in the survey development process, the transit surveys were reviewed and the questions revised to allow for comparability between the two research efforts. The initial draft survey instruments were then reviewed by the research team and a panel of advisors, consisting of stakeholders experienced in health and wellness programs, including representatives from trucking trade associations, safety organizations, health consultants, and universities.

Based on panel input, revisions to the surveys were made and the revised instruments were disseminated to the panel for final review and comment. At that point, a beta test of the survey instruments was conducted with a sample of motor carriers. Cognitive interviews with the carriers were conducted to ensure that the questions were interpreted as intended and to explore challenges in completing the surveys. This feedback was analyzed and incorporated into the final surveys. The instruments were finalized in May 2006.

After the instruments were finalized, online surveys were created to allow for easier completion by respondents. The online surveys were pilot tested and reviewed by the research team to ensure that the formatting and questions were consistent with the paper surveys. A brief introduction and submission instructions were included on both the online and the paper surveys.

3.1.2 Survey Instruments

The survey instruments were designed to distinguish between truck and bus companies to allow for comparisons between the two groups and to provide the ability to analyze the data by industry segment. The manager and driver surveys are provided in Appendices A and B, respectively.

3.1.3 Survey Distribution

The surveys were distributed through a number of means. Due to the focus on commercial driver health and wellness program structure, components, and effectiveness, efforts concentrated on distributing the surveys to motor carriers who currently had a driver health and wellness program. The surveys were distributed to trucking companies through the following means:

- A fax notice to all American Trucking Associations (ATA) members (sent three times over a month);
- A fax notice to carriers in five states through the respective State Trucking Association;
- A fax notice to the NPTC Safety Committee;
- Direct email notice to carriers on the ATRI distribution list for news releases and related ATRI information (500+); and
- Direct email notice to carriers who attended one of ATRI's Gettin' in Gear train-the-trainer courses within the previous 2 years.

In addition, ABA and UMA distributed surveys to their respective memberships.

The number of returns of surveys for both managers and drivers was relatively small. Discussions held with officials at each of the four commercial transportation trade associations (i.e., ATA, NPTC, ABA, and UMA) surmised that the reason was that very few companies, large or small, sponsor what the companies themselves consider to be identifiable employee health and wellness programs, particularly ones that involve commercial drivers.

3.2 Trucking Industry Manager Survey Results

The questions on the *manager survey* were designed to determine the rationale for establishing company health and wellness programs, the structure and organizational support for the program, and program components. The questions also determined how program success is measured.

The respondents to the *manager survey* (N = 24) represent both private and for-hire carriers in the truckload (TL), LTL, and specialized segments of the industry.

Trucking Company Description

	N	%
Truck	24	100%
Private	8	33%
For-Hire	12	50%
TL	9	38%
LTL	5	21%
Specialized	2	8%
Other	1	4%

*Respondents were instructed to check all that apply; therefore totals may exceed 100%.

Number of Drivers per Trucking Company

Driver Type	Mean	Total Represented by Respondents' Companies
Fleet (company) Drivers	1,377	33,048
Independent Contractors	268	5,095

3.2.1 Why Start a Health and Wellness Program?

Commercial drivers face a number of health and wellness challenges. Understanding those challenges is the first step in determining what a company health and wellness program should address and how it should be structured. The trucking managers were asked to rank (on a 7-point scale) driver health risks for the drivers at their respective companies. Unhealthy diet (mean = 2.2) and obesity (mean = 2.3) were the two greatest concerns.

Trucking Managers (N=24) Rated Driver Health Risks

Unhealthy diet	2.2
Obesity	2.3
Stress	3.1
Uncontrolled hypertension	3.3
Sleep disorders	3.9
Drug/Alcohol use	4.9

1 = Greatest Health Risk; 7 = Least Health Risk

The impact of the various driver health risks on driver health, safety, and productivity are all reasons for implementing a company health and wellness program. Respondents were asked to provide the rationale used to implement a program at the company and the results are detailed in rank order.

Reasons for Starting a Health and Wellness Program

To reduce health care costs	84%
To reduce occupational injury	84%
To enhance productivity	84%
To reduce accidents	74%
To reduce absenteeism	68%
To improve driver retention	63%
To improve morale	58%
To improve driver recruitment	21%
To respond to or meet drivers' requests	10%
To comply with statutory requirements	10%

*Managers were instructed to check all that apply; therefore, totals may exceed 100%.

Company health and wellness programs range from simple, low-cost approaches (having drivers complete a health risk appraisal, distributing company newsletters with health and wellness information in them, etc.) to more involved and expensive programs with numerous program components and infrastructure (onsite staff and fitness facilities, health coaches, etc.). When asked the approximate annual budget for the company health and wellness program, the responses ranged from $150 to $500,000, with a mean of $96,340. Respondents were asked to describe the allocation of resources within the company to health and wellness awareness, education, and behavior change. Health and wellness awareness had the greatest percentage with a mean of 45%, followed by health and wellness education (27%), and health and wellness behavior change (24%).

As with any institutional change, the long-term success of that change rests on widespread support across the institution. If the health and wellness program is sustained by the campaign efforts and focus of just one committed employee (e.g., a wellness program manager), then the likelihood for long-term success beyond that employee's tenure is limited. Respondents were asked to detail the breadth of support for the company's health and wellness program and a majority (60%) indicated that support was communicated to all employees by company leadership.

The survey also asked a series of questions about organized labor support for the health and wellness program. However, none of the respondents indicated any organized labor representation at their respective companies.

Even with top level support, without a clear focus or plan, health and wellness programs are subject to attrition. Managers were asked to identify the ways in which the company focuses the plans for the health and wellness program, selecting all that apply. The results are listed in order of priority for the respondents. Sufficient financial support for the plan was indicated as the leading choice for ensuring the continued focus of the health and wellness program.

Support for the Health and Wellness Program

Statement	Percent Responding
Our President communicates the importance of employee health and wellness to all employees (e.g., formal written memos; info. in employee orientation).	60%
Managers actively promote participation in health and wellness activities.	35%
The company has formally appointed an individual or individuals to lead the health and wellness program.	30%
Management allocates adequate resources for the program (budget, space, information, or equipment).	30%
A statement concerning employee health and wellness is in the company's mission/vision statement(s).	25%
The company has formally appointed a committee to lead or support the health and wellness program.	25%
The company has employed an individual to lead the health and wellness program.	20%

Ensuring That the Health and Wellness Program Plan Succeeds

Allocated an itemized budget sufficient to carry out the plan.	67%
Developed a plan for evaluating the stated goals and objectives.	50%
Specified time lines in the plan for when activities/tasks are to be completed.	50%
Prepared an operating plan that addresses health and wellness needs and interests of drivers.	47%
Linked our health and wellness goals and objectives to the organization's strategic priorities.	42%
Established clear, measurable program goals and objectives.	33%
Assigned specific responsibilities to an individual or group for the completion of tasks.	33%
Incorporated appropriate marketing strategies to promote and communicate programs to drivers.	25%

Organizational Environment

Ensure all vehicles are maintained in ergonomically sound condition.	86%
Promote responsible disability prevention and management (e.g., early return to work, restricted duty, etc).	76%
Monitor facility heating, lighting, ventilation, and overall safety.	76%
Provide drivers health benefit options (e.g. health insurance, disability, sick leave, etc).	76%
Provide drivers with other benefits (e.g. vacation, child care, flex-time, tuition reimbursement, etc).	67%
Offer assistance to help drivers address issues of work/life balance.	52%
Recognize and reward driver successes.	43%
Provide incentives to encourage drivers to participate in health and wellness activities.	38%
Make healthy food options available in vending machines, snack shops, and cafeterias.	38%
Provide drivers with release time to participate in health and wellness activities.	29%
Reimburse drivers for health club memberships and/or other wellness activities.	19%
Maintain an easily accessible health and wellness library.	14%
Offer drivers peer support groups and mentoring opportunities.	5%

An employee health and wellness program is not intended to be a stand-alone initiative within an organization. To succeed, a health and wellness program must be developed in and complement an organizational environment which takes a holistic approach to employee health, wellness, and lifestyle issues. There are a number of ways to promote health and wellness within an organization. The following are the most frequently used methods in respondents' companies.

As part of the organizational environment in which a health and wellness program is introduced, company policies related to health, wellness, and safety are important ways to communicate to employees that safe and healthy behaviors are critical. The following company policies were also identified by respondents as ways to foster an organizational commitment to health and wellness.

Health- and Wellness-Related Company Policies

Seatbelt/safe driving practices	95%
Alcohol/drug use policy	86%
Emergency procedures	68%
Smoke-free workplace	59%
Tobacco restrictions	45%
Healthy food options	23%

Integrating the health and wellness program into overall company operations will ensure long-term success and send a very strong message that the health and wellness program is part of the organization's primary mission and critical to achieving corporate goals.

The survey attempted to determine how company health and wellness programs are integrated into overall company operations. To do so, respondents were asked a series of statements regarding program integration and asked to check all that apply. The results are listed below. The linking of health and safety was cited by 53% of respondents as the most frequent method for program integration, along with training on health and wellness as part of new driver orientation.

3.2.2 The Health and Wellness Program

A health and wellness program can be implemented using the simplest of steps, such as asking drivers initially to complete a health risk appraisal. The survey respondents were asked to provide details on their respective programs to give an overview of what health and wellness components were offered and what format or delivery method was used in their programs.

When asked how long the company health and wellness program had been in place, respondents indicated a range of up to 18 years, with an average age of 3.3 years. The majority of respondents indicated the company's health and wellness program was located in the safety and human resources departments of the organization.

The survey queried whether the company performs fitness-for-duty evaluations for company drivers, to which 55% indicated yes. Most managers responding positively indicated driver evaluations were conducted prior to hiring.

Health and Wellness Program Integration

Health and wellness activities are coordinated with safety programs.	53%
Health and wellness information is integrated into new driver orientation and/or training program(s).	53%
Health and wellness activities are coordinated with the employee benefits program.	47%
Health and wellness activities are coordinated with the employee assistance program.	26%
The health and wellness committee developed a mission/vision statement, established strategic priorities, and defined individual roles and responsibilities.	16%
Health and wellness committee members serve as advocates at worksites.	16%
Health and wellness activities are coordinated with the drug and alcohol testing program.	16%
Health and wellness activities are coordinated with the workers' compensation program.	16%
Proceedings of the health and wellness committee meetings are communicated to drivers and their managers.	10%
Health and wellness activities are coordinated with food services.	10%
A health and wellness committee including drivers, organized labor leaders, managers, and representatives from other key departments meets regularly.	5%
A health and wellness committee with membership other than positions listed in the line above meets regularly.	10%

Health and Wellness Program Activities and Format/Delivery Method Used

Activities	*Health Info*	*Group Education*	*Self-Study*	*Computer Based/ Inter-Intranet*	*Individual Counseling*	*Not Offered*
Exercise/physical activity opportunities	45%	25%	10%	5%	20%	40%
Nutrition training/information	47%	37%	26%	32%	16%	32%
Weight management	42%	37%	16%	32%	26%	32%
Nicotine prescriptions	37%	16%	5%	16%	26%	42%
Smoking cessation	45%	20%	10%	20%	30%	40%
Responsible alcohol use	40%	25%	5%	20%	25%	35%
Cardiovascular disease prevention	42%	37%	11%	26%	21%	26%
Medication management	42%	5%	0%	16%	16%	42%
Medical self-care	37%	21%	11%	21%	5%	37%
Threat assessment and management	28%	33%	6%	17%	6%	39%
Infectious disease exposure precautions	28%	33%	6%	17%	0%	28%
Flu shots	47%	42%	11%	16%	16%	26%
Allergy shots	22%	11%	0%	11%	6%	61%
Disease management *e.g., diabetes, hypertension*	56%	33%	11%	22%	28%	22%
Screening for sleep disorders	33%	17%	11%	11%	17%	50%
Ergonomics *e.g., adjustments & devices*	33%	39%	6%	17%	6%	22%
Work & family education	22%	22%	17%	33%	17%	44%
Personal financial management	11%	11%	22%	17%	28%	39%
Stress management	33%	39%	17%	33%	28%	22%
Mental health	39%	11%	11%	22%	33%	39%
Fatigue awareness	39%	72%	17%	28%	22%	6%

Communicating with Drivers and Their Families

Communicate changes in policy and benefit options.	67%
Distribute reminders to drivers and their families concerning upcoming activities and events.	67%
Provide program activity updates.	50%
Circulate information concerning the availability of community resources (e.g., financial counseling, alcohol/smoking cessation clinics, nutrition training).	50%
Give drivers opportunities to communicate feedback through suggestion boxes, e-mail, surveys, etc.	50%
Encourage ongoing dialogue by providing opportunities for driver input on health and wellness-related activities (e.g., work assignment and schedule design, accident and incident prevention, etc).	39%
Provide timely feedback to drivers on how their input is used.	22%

Respondents were asked to detail program components offered and format or delivery method used.

The respondents were also asked whether these health and wellness activities were provided to drivers' families, and 70% indicated yes. Other program components or resources made available to drivers and their families include health fairs and blood drives. Maintaining interest and involvement of drivers and their families in the various health and wellness program activities requires regular communication, which can also be used to recruit new participants in the activities. Respondents were asked to identify ways in which the company keeps drivers informed. The results are listed in order of use.

3.2.3 Measuring Program Success

There is little doubt that health and wellness programs, whether simple or more complex, will not survive without measurable success. Respondents were asked to provide a subjective view of participation in their programs by drivers and then to provide information on program performance measures.

Driver Participation in Program

Increased modestly	39%
Decreased modestly	11%
Increased substantially	5%
Decreased substantially	5%
Remained about the same	39%

To measure program success, performance metrics must be collected and analyzed. Managers were asked to identify which driver health and wellness performance measures are collected and analyzed at 1-, 2-, and 3-year intervals. The results are detailed below.

Other ways health and wellness programs are evaluated for effectiveness include assessing and monitoring the health status of "at-risk" drivers, regularly tracking participation by all drivers and monitoring driver satisfaction with the program.

3.3 Driver Survey Results

A total of 23 driver surveys were completed; 20 by truck drivers (87%) and 3 by bus drivers (13%). Drivers were asked to choose categories best describing their current employer and the breakdown of responses is shown as follows:

Description of Current Employer

	N	%
Truck	20	87%
Private		
For-Hire		
TL		
LTL	20	87%
Specialized		
Bus	3	13%
Charter	3	13%
Tour	2	9%
Regular route	1	4%
Airport Express	1	4%
Special operations	1	4%
Contract services	1	4%

*Drivers were instructed to check all that apply; therefore totals may exceed 100%.

Performance Measure	12 Months	24 Months	36 Months	Not Collected
Workers' compensation claims/costs	65%	10%	25%	5%
Disability claims/costs	58%	5%	21%	11%
Driver turnover records	53%	11%	21%	11%
Health care claims and utilization	50%	10%	15%	10%
Health screening (*e.g., blood pressure; cholesterol testing*)	42%	11%	0%	37%
Workplace facility assessment	40%	10%	5%	30%
Fitness-for-duty assessments	37%	5%	16%	32%
Absenteeism records	37%	5%	16%	32%
Employee (Driver) Health risk appraisal	32%	10%	0%	47%
Ergonomic analysis of vehicles loading/unloading	30%	15%	10%	35%
Employee assistance program utilization	26%	0%	5%	42%
Employee health & wellness needs/interest surveys	21%	11%	0%	42%
Demographic information of drivers/ dependents	21%	5%	0%	37%
Work schedule/shift assignment assessments	21%	11%	5%	42%
Job satisfaction audit/survey	20%	15%	10%	40%
Work/family needs assessment	11%	5%	0%	53%
Organizational policy assessment	5%	5%	5%	47%

All 23 respondents were male, ranging in age from 22 to 57 years old (mean = 32.8). Years of experience driving a commercial vehicle ranged from 1 to 36 years, with a mean of 8.14 years.

Participants in the Gettin' in Gear train-the-trainer course are provided with a personal health risk appraisal form at the start of the course. The purpose of the appraisal is to get the trainers thinking about personal health issues and the impact those issues have on job performance and lifestyle. Likewise, the trainers are encouraged to start their own driver training sessions by asking drivers to complete a personal health appraisal form. Respondents to the driver survey include those from companies who previously have participated in the Gettin' in Gear training.

Have you ever completed a personal health risk appraisal form?

Yes, at this company	78%
Yes, on my own or elsewhere	13%
No, never have	9%

The drivers were asked to rate the status of their overall health. The majority (78%) report current health status as average for their age. Only 9% of the respondents reported being very healthy.

Current Health Status of Drivers

Very healthy	9%
About average for my age	78%
Not very healthy	13%

Drivers were asked to assign a ranking to a series of health risk factors facing commercial drivers today, with 1 being the highest priority (or greatest health risk) to 7 being the lowest health risk. The responding drivers viewed sleep disorders and drug/alcohol abuse as the two greatest health risk factors for commercial drivers. Interestingly, the two highest ranking health risks as identified by the managers in their survey, obesity and unhealthy diet, were among the lowest concerns in the drivers' rankings. Conversely, the two highest concern risk factors on the driver survey, sleep disorders and drug/alcohol use, ranked last in the manager survey.

Commercial Driver Health Risk Factors

Sleep disorders	2.7
Drug/alcohol use	3.2
Stress	3.6
Obesity	3.8
Unhealthy diet	3.9
Uncontrolled hypertension	5.8

1 = Greatest Health Risk; 7 = Lowest Health Risk

When asked how long the company's health and wellness program had been in place, the drivers responded with an average of 2.2 years, ranging from zero to 3 years. When asked how long the responding driver had participated in the company program, the average was 1.5 years, with a range of zero to 2 years.

The responses to questions concerning the length of time the various company health and wellness programs have been in place and the respective driver's participation in the programs seem to point to the relative newness of company-sponsored health and wellness programs. However, it is believed that this might also be more a reflection of how health and wellness programs are defined rather than by how long the programs have been in existence. When carriers were approached to participate in the surveys for this synthesis, many indicated a lack of a formalized health and wellness program. However, upon further discussion with them, it appears many carriers did indeed have a number of program components and simply had yet to connect the pieces enough to want to refer to them as a coordinated health and wellness program. Overcoming the perception that a health and wellness program must be all-encompassing will likely prompt other carriers to adopt individual program components, eventually working toward a full and integrated health and wellness program.

Obviously the best programs in the world will not benefit drivers if there is not active participation in those programs. Drivers were asked their participation level in the respective programs and the responses are detailed as follows:

How active are you in your company health and wellness program?

Very active	15%
Moderately active	45%
Barely active	25%
Not at all active	15%

Drivers were asked to indicate the level of management support within their company for the health and wellness program by choosing all that apply from a series of statements on management support. The responses are detailed at the top of page 38.

Drivers were asked where responsibility for the company health and wellness program resides in their respective companies. The overwhelming majority (91%) indicated the company safety department as the home for the health and wellness program. Other responses included operations and medical/occupational health.

As indicated, companies can begin a health and wellness program in simple, progressive steps by instituting any number of program components. Drivers were asked whether the company performs fitness-for-duty evaluations on company drivers, to which 25% of the respondents indicated yes. No descriptions of the evaluations were provided by responding drivers.

Other program components were detailed and drivers were asked to indicate whether or not the activity was available at their company and to indicate their level of participation in each.

To help gauge the success of company programs, drivers were asked whether individual participation in the program has changed over the past 2 years. The majority (76%)

Statement	Percent Responding
Our President or CEO communicates the importance of employee health and wellness to all employees (e.g., formal written memos; incorporated into employee orientation).	92%
The company has an individual to lead the health and wellness program.	91%
A statement concerning employee health and wellness is in the company's mission/vision statement(s).	89%
Management allocates adequate resources for the program (budget, space, information, or equipment).	89%
Managers actively promote participation in health and wellness activities.	78%
The company has formally appointed a committee to lead or support the health and wellness program.	67%

Program Component	Available (All that apply)	Participate in the most (All that apply)
Employee health risk appraisal	100%	92%
Nutrition and diet advice/assistance	100%	86%
Weight management program	100%	68%
Physical fitness programs	100%	63%
Blood pressure screening	100%	62%
Stresses safe driving practices/promotion of seat belt use	100%	62%
Makes healthy food options available	100%	50%
Encourages drivers' family members to participate in health and wellness programs	100%	50%
Ensures all vehicles are maintained in ergonomically sound condition	100%	42%
Offer drivers peer support groups and mentoring opportunities	100%	38%
Offers assistance to help drivers address issues of work/life balance	100%	38%
Ergonomics training/screening	100%	25%
Driver fatigue management training	100%	25%
Stress management training	100%	13%
Help to quit smoking or use of tobacco	100%	0%
Drug/alcohol program assistance	100%	0%
Regular distribution of health and wellness informational materials	94%	75%
Company provides other incentives to participate in health and wellness activities	75%	38%
Sleep disorders screening/treatment	75%	25%
Provides drivers with release time to participate in health and wellness activities	63%	38%
Maintain an easily accessible health and wellness library	63%	25%
Reimburses drivers for health club memberships or other activities	63%	13%
Occupational medicine department/nurse	63%	12%
Physical fitness equipment is available	25%	38%

indicated that participation has either remained constant or increased by some degree. Given that the average length of participation in the company's health and wellness programs by respondents is 1.5 years, it logically follows that in the past 2 years participation would be on the rise. The real gauge of success of such programs is how long drivers stay engaged over the long-term and are able to see measurable improvements in individual health.

Respondents were asked several questions regarding the effectiveness of the health and wellness messages promulgated by the company. Indicators are that the health and wellness messages are effectively being delivered (79% yes) and

Individual Driver Participation in Program

Remained the same	23%
Decreased modestly	6%
Increased modestly	18%
Decreased substantially	12%
Increased substantially	35%
Does not apply	6%

understood by most drivers at the company (68% yes). When asked what percentage of drivers in the company actively participates in the health and wellness program, respondents gave an average of 61.2%. To improve participation by other drivers, respondents were asked an open-ended question about program improvements designed to get participation from a larger group of drivers. Responses included offering a weight room, company sports team and, interestingly, a government mandate regarding driver health and wellness program participation.

In the question on available program components, 25% of the respondents indicated the availability of physical fitness equipment, but they specifically mention such program features as a way to increase driver participation. Given that the majority of drivers responding to the survey are LTL truck drivers, the availability of a weight room makes sense because those drivers return to the terminal or company facility on a regular (perhaps daily) basis. It is not clear how much use a weight room would provide in the long-haul truckload segment where drivers do not return to the company facility with any regularity or frequency.

3.4 Key Survey Findings

- Health and wellness programs do not need to be all encompassing to begin to address driver health issues. Programs can be started simply by administering a health risk appraisal to drivers to determine the most pressing needs.
- Although this limited sample of managers and drivers seems to have a disconnect in their ranking of priority for driver health risks, it appears that the health and wellness program components being offered by companies and used by drivers do address the concerns identified by both groups.
- Both managers and drivers believe that support for the health and wellness program from the highest levels of the organization exists and is evident in the messages communicated to drivers.
- Integrating the employee health and wellness program throughout the organization's operations is critical for long-term success.
- The value of involving drivers' families in the health and wellness program is understood and being accomplished by making program components available to family members.
- To support the adage that "what gets measured gets accomplished," it appears that companies are tracking various performance metrics to identify where the health and wellness program is having the most effect and where additional resources are needed.

CHAPTER 4

Health and Wellness Program Case Studies

In addition to the surveys and literature review presented, this synthesis includes four trucking case studies and one bus company case study describing implementation of innovative company-sponsored employee health and wellness practices and programs.

The four trucking industry case studies presented here include both large and small carriers from TL, LTL, short-haul carriers, and one very large nationwide (short-haul) waste management company. Case study data were obtained from a single intercity, interstate bus company: Greyhound Lines, Inc. Some of the key points identified from the four trucking and one bus company case studies include

- Significant value is placed on drivers as the cornerstone of companies because they are crucial to continued company success.
- Recognition of the challenges to driver health and wellness related to the unique nature of the truck driving lifestyle.
- Recognition of the connection between driver health and driver safety.
- The value of health and wellness initiatives on the companies' bottom lines through the reduction of health claims, early identification of treatable health issues, and improved driver retention.
- The value of an integrated human capital management strategy for controlling overall health care and workers' compensation costs.

The case studies identified some key initiatives being conducted by carriers. These initiatives include more extensive pre-employment and annual physical testing, establishment of onsite clinics, health coaches, and training programs such as Gettin' in Gear, additional efforts to address sleep apnea for all drivers by means of early testing and diagnosis, and implementing more ergonomic cab settings (such as seat adjustments). The carriers emphasized the importance of educating drivers about the availability of the health and wellness programs and working together toward reducing any additional health-related costs for drivers.

The carriers described methods for advocating and implementing the programs. Some of the carriers conducted claims studies to examine the cost savings of particular programs. All the carriers discussed the importance of identifying the benefits to the corporate bottom line and overall reduced health care costs, and conveying those to management. The carriers emphasized the importance of educating all levels of the organization about the importance of health and wellness programs. Some of the benefits discussed by carriers included

- Holding rises in claims cost to single digit increases over 1 year compared with an industry norm of expecting double digit annual increases,
- Reduction of claims involving serious musculoskeletal injuries and workers' compensation claims,
- Decreased accident rates,
- Decreased personnel turnover rates, and
- Early identification and the costs savings associated with identifying potential health problems of individual employees (drivers) early.

4.1 Case Study: Schneider National, Inc.

Headquartered in Green Bay, Wisconsin, Schneider National, Inc., is the nation's largest truckload carrier, employing more than 15,000 drivers and independent contractors. Schneider National's approach to driver health and wellness is based on recognition that drivers are the cornerstone of the operation. Without drivers, the company would not be successful. Schneider National believes that focusing on driver health and wellness results in improvements across the safety continuum from individual drivers, to their families, to the motoring public who share the highway with Schneider National drivers.

Acknowledging that the lifestyle of a truck driver makes meeting health and wellness goals challenging, Schneider National has instituted a number of initiatives designed to mitigate the impact of the various wellness challenges (long periods sitting, truck stop diet, shift work, being away from home for extended periods of time, etc). Schneider National reports that its health and wellness initiatives have had a positive impact on the company's bottom line.

Sleep Apnea Initiative. In an effort to reduce the risks associated with sleep apnea, Schneider National initiated a program to identify and treat drivers suffering from sleep apnea. An initial cohort of 339 drivers deemed positive for sleep apnea were tested. The one-night study in a sleep malady clinic, conducted with a third-party vendor and paid for by Schneider National, resulted in the diagnosis of drivers with sleep apnea who were sent home with a Continuous Positive Airway Pressure (CPAP) machine. After treatment with a CPAP for 1 year, Schneider National experienced a $538 per driver per month health care savings among the cohort and a 55% greater retention rate among participating drivers than the fleet as a whole.

Based on the success of this initial test, Schneider National now pays for all sleep malady testing and CPAP costs for drivers at risk for and diagnosed with sleep apnea. The driver is followed for 30 days post-CPAP intervention to troubleshoot any specific issues to assist the driver in getting used to the CPAP treatment. Quarterly follow-up with the driver is done to ensure long-term compliance with the sleep apnea intervention.

Ergonomic Improvements in Seating. Truck drivers spend a significant portion of their time in the cab of the truck, specifically in the seat, while driving. Therefore, seat comfort is an issue for commercial drivers who may experience back, head, or shoulder pain as a result of poor seat design or use, combined with the constant vibration from the road. Schneider National wanted to find a way to promote more in-cab comfort for their drivers, believing that it would promote driver satisfaction as well as safety.

Schneider National's solution to the driver seat comfort issue was to invest in a system that works with existing cab and seat ergonomics to provide drivers with the ability to adjust seats and steering wheel for maximum comfort and safety. With the seat and steering wheel customized to each driver's build and specific needs, Schneider National believes that drivers feel better, perform better, and are less fatigued.

In the first year of its implementation at Schneider National, performance metrics calculated included lost time injuries, driver discomfort, and workers' compensation claims. Schneider National's results with the ergonomic seating showed a significant decrease in lost time injuries, workers' compensation injuries, and improved driver discomfort complaints by 47%.

Schneider National officials comment that while driver satisfaction and comfort were the primary drivers of the seat system, there has been a demonstrated return-on-investment (ROI) as a result of system implementation.

Disease Management and Health Coaches. Under the direction of and in conjunction with a full-time Occupational Health medical team and Benefit Administration, Schneider National has several disease management and health coaches who work with the drivers on a regular basis. Areas of focus include cardiac health, diabetes, asthma, chronic obstructive pulmonary disease and congestive heart failure. Schneider National's focus is on education and prevention, believing that educated drivers will be safer, more productive, and more invested in their overall health and wellness.

Overall Program Effectiveness. In an attempt to measure the impact of its various health and wellness initiatives, Schneider National undertook a study to review health care claims costs pre- and post-wellness program interventions. Through July 2005, Schneider National was able to hold claims costs to a single-digit percentage increase from the previous year, which is relatively low compared with industry norms.

Schneider National cites as a key to the success of its various health and wellness initiatives the education and integration of the programs across the organization from drivers to management. Additionally, with its corporate focus on the health and wellness of drivers as a cornerstone of the company's success, Schneider National believes that its programs must address a reduction in accidents and the risk of injury to the driver.

All these efforts, when used in an integrative model approach, have led to health and safety benefits for the organization.

4.2 Case Study: Trucks, Inc.

Based in Jackson, Georgia, Trucks, Inc., is a regional truckload carrier with hundreds of drivers, operating 300 tractors, primarily in Georgia, Florida, Alabama, and South Carolina.

Personal Approach to Health and Wellness. Trucks, Inc., officials believe their personal approach with their drivers is a key to the company's success and this approach includes a health and wellness program. With a self-funded health insurance program, the safety department has done considerable research to correlate their drivers' physical and emotional well-being to safety performance. Believing firmly in the connection between driver health and wellness and driving safety, the company provides drivers with health and

wellness education and with the tools necessary to change drivers' mindset toward adopting a health and wellness lifestyle.

Company Officials Train in Health and Wellness. Company safety officials have completed the Gettin' in Gear training course and they use materials from the course, along with workers' compensation materials from their insurance provider, to educate drivers on health, wellness, and safety issues. Trucks, Inc., relies on driver testimonials to encourage other drivers to participate in the health and wellness activities. Healthier lifestyle choices are often the focus of the education provided and specific topics covered have included instruction on nutrition, exercise, and smoking cessation.

Annual Physical Examinations. Included in the health and wellness program at Trucks, Inc., is an annual DOT physical exam, for which the company employs a medical doctor and a physician's assistant to conduct the exams onsite. The physical form used by Trucks, Inc., exceeds the minimum DOT physical requirements in a number of areas. Physical results from all Trucks, Inc., drivers are tracked to identify driver training needs based on resulting diagnoses. Any drivers with borderline physical exam results are rechecked on a more frequent basis.

Trucks, Inc., annually checks drivers' blood work to identify risk factors such as high cholesterol and to check prostate-specific antigen (PSA) levels. The company also provides exercise equipment for drivers, available 24 hr/day at company facilities.

Health and Wellness Program Pays Off. Company officials report that the health and wellness program has had a significant ROI. Early diagnosis of health issues has saved Trucks, Inc., more than $250,000 in medical insurance costs. The company reports that thus far the program has led to early identification of two cancer cases, five pre-heart attack conditions, and numerous pre-diabetic conditions.

Trucks, Inc., believes that its personal approach with drivers and the care shown in drivers' health and wellness have paid dividends in terms of driver retention as well. The personnel turnover rate at Trucks, Inc., is under 30%, compared with industry averages in the truckload sector of more than 100%. The company has also been recognized by the Georgia Motor Trucking Association for its safety performance (which Trucks, Inc., believes is closely related to driver health and wellness) for the last 11 years.

4.3 Case Study: JB Hunt, Inc.

JB Hunt, Inc., one of the nation's largest truckload carriers, is headquartered in Lowell, Arkansas.

Driver Medical Examinations. JB Hunt uses a third-party provider for comprehensive DOT medical examinations and early health risk identification of its drivers. The medical exam includes cardiovascular testing, a thorough musculoskeletal evaluation performed by a physical therapist, and job-specific testing to determine abilities to perform job tasks.

Once complete, the DOT medical examination is entered into a web-based application so that all data are maintained electronically. Statistical analyses can be performed on all data fields of the DOT exam and trend analyses are conducted regularly. These analyses allow JB Hunt to focus wellness initiatives on specific health risks and allow for health and wellness programs to be more effective.

Health Coaching. JB Hunt provides health coaches to individual drivers. Drivers who are determined to have health risks such as hypertension and diabetes are given information that will assist them in initiating a relationship with a health coach who can assist in making lifestyle changes and create accountability.

Health Program Results Favorable. JB Hunt has seen many significant results due to the use of health coaches and the electronic tracking of DOT medical examination findings. There has been a reduction in the number of workers' compensation claims and costs, a reduction of claims due to serious musculoskeletal injuries, a reduction in workers' compensation claims within 90 days of hire, a reduction in accident rates, and a decrease in driver turnover.

4.4 Case Study: Waste Management, Inc.

Waste Management, Inc., (WM) is one of the nation's largest short-haul trucking companies, employing more than 30,000 drivers, about half of whom hold CDLs and drive trash and garbage hauler trucks.

Assessing Company Health-Related Costs. In 2002, WM's health-related costs were high and increasing rapidly. After successes with a Mission to Zero (M2Z) safety program, WM embarked on an effort to address excessive health care costs. Guided by management information produced out of an integrated human capital management data warehouse, WM established a human capital management (HCM) approach to addressing its health and disability challenges and achieving cost savings through focused programs and policy changes. WM's approach yielded a management infrastructure that supports more comprehensive efforts to manage human capital in the future. WM admits it takes patience and leadership to follow the road map they identified for itself in controlling health, safety, and job performance risks and

costs. However, WM reports outstanding success in the relatively new program and currently experiences some success in terms of cost control results. WM's decreased cost inflation trend dropped from 22+% to a negative 1.3%, and WM reports having saved well over $100 million in just the few years since implementing new HCM programs (Hoffman and Kasper 2006).

WM's new HCM program has numerous facets to it, but only a few that, in particular, pertain directly to employee health and wellness are described.

Integrated HCM Data and Information System. WM began to examine total human capital data across all aspects of the company. It incorporated those sources of data into an HCM information system that permitted an examination of the integrated nature of human capital cost situations. This permitted management to "see across" benefit programs and to lead WM to make a critical transition from benefit-centric administration, to people-centered management of the company's benefit investments that examines costs more precisely and searchers for person-centric solutions.

WM's HCM analysis pointed out how individual employees use portions of the full range of health and absence-related benefits offered. The analysis showed that just over 10% of all WM employees use 80% of the dollars spent on health care, workers' compensation, absence, and disability benefits. On average, those employees in this high risk group cost WM over $17,000 annually versus an average cost of less than $500 per year for the balance of WM's lower risk employees. For WM drivers, the average cost of this high risk group was even higher at over $212,000 and a very slim minority (about 1.4%) in the high risk group consumed a broad array of benefits and accounted for 40% of the total benefits spent, whereas a significant majority (over 90%) of employees (the low risk group) consumed only 20% of the benefit dollars.

Occupational Health Counselors (OHCs). Among the several HCM initiatives on health, WM partnered with a team of occupational health counselors to establish 19 field-based occupational health specialists as the primary points-of-contact for supervisors to engage immediately on hearing of an injury accident. The OHCs guided employees to the best medical care resources and worked with employees, supervisors, safety, and human resource personnel to coordinate a safe and timely return to work when injuries resulted in lost duty time.

OHCs were equipped with information that enabled them to address employees as people rather than as injury cases. They treated employees on a broad range of issues related to job satisfaction, safety, return to health, and return to productive work.

Specific Employee Health-Related Programs. Based on analyses of employee health care data, priority health conditions for WM employees include musculoskeletal/back problems, cardiovascular/circulatory problems, obesity, and asthma.

WM conducts health and wellness programs including diagnosing and treating sleep apnea, driver safety, managing obesity and blood pressure, lunch-and-learn educational programs, and first aid training.

WM treats the CDL physical exam as an opportunity to track and link employees needing follow-up assistance to the appropriate resources to obtain medical help.

Overall Strategy. WM actively steps into the breach between what employees need and what the health care system is geared to provide, especially in support of employees for their chronic medical conditions.

WM's strategy is to get employees and their dependents to change their attitudes and behaviors with respect to their health and health care costs and, as needed, to take advantage of the programs and benefits available to help them improve their health, safety, and job performance.

WM is launching a comprehensive communication and education program that will provide all employees and their dependents with a steady stream of reliable information to help them better understand and improve their health. The program will include a wellness newsletter and monthly education program modules, offering flu shots, health fairs, health screenings, health coaching and counseling, and other health-related activities.

4.5 Case Study: Greyhound Lines, Inc. (Amalgamated Transit Union National Local 1700 Health and Welfare Plan)

This plan covers the ATU-represented employees of Greyhound Lines, Inc. The company is based in Dallas, Texas, but the employees and participants are located throughout the United States. Some of the programs available to the drivers, spouses, and dependents enrolled in the medical plan include:

Disease Management. These programs are available for chronic conditions, such as asthma, diabetes, heart disease, low back pain, chronic obstructive pulmonary disease, and weight complications. Each program allows one to design a personalized action plan under the employee's doctor's guidance. Participants are provided with access to a personal, experienced registered nurse to call for guidance and support who provides educational material about an individual's medical condition, self-care information, reminders of important tests and exams, and informational newsletters. The goal is to help the person anticipate his/her own symptoms and manage them better.

Various Wellness Options. Participants are able to obtain discounts on fitness club memberships, weight management programs, massage therapy, chiropractic care, and two different smoking cessation options. In addition, there is a program to show members the benefits of consistent shorter sessions of physical activity throughout the day. This program features a pedometer to measure walking distance and an online tool to log daily steps, track progress, and receive coaching tips.

24-Hour Health Information Line. Helpful health information is available by phone from a trained registered nurse or from an audiotape library of more than 1,000 health-related topics.

Online Tools. Participants can complete a health risk assessment that helps them assess and monitor their health status, obtain a personal analysis of many preventable and common conditions, review details of their contributing risk factors, access recommended steps for improvement, interactive tools, and wellness information. A hospital information tool allows them to compare hospitals for over 50 surgical and medical procedures. A prescription drug tool allows the member to research individual drugs or compare several drugs used to treat a specific condition. An interactive library provides information on health conditions, everyday health and wellness, first aid, and medical exams.

Miscellaneous. If employees have purchased certain voluntary insurance, they could be eligible to receive cash back for obtaining certain preventive testing or routine examinations. All employees and their dependents are eligible for an employee assistance program free of charge that covers counseling for issues that could relate to health and wellness issues.

CHAPTER 5

Failure of Employee Wellness Programs

Why Wellness Programs Often Do Not Work. In the experience of the research team, perhaps more than any other corporate safety initiatives, employee wellness programs, no matter how well-intentioned, are plagued with obstacles. While this experience is not necessarily scientific, there seem to be obvious reasons and not so obvious reasons why these programs fail more often than not, or work for a short time, but are gradually discarded in favor of other initiatives with quicker results. Employee wellness programs are initially put in place with very well-intentioned goals in mind. These may include a genuine concern for the health and well-being of employees, lowering escalating medical and workers' compensation costs, improving recruitment and retention, increasing productivity, and improving employee morale—all potential benefits that have already been described throughout this report.

With all of these gains, making the decision to implement a successful employee wellness program should be an easy one. However, the operative word here is "successful." A significant number of American companies implemented wellness programs in the past 2 decades, but a check on the progress after a few years generally shows that many are either no longer involved at all or have reduced their health and wellness program to some periodic communication from which very few employees benefit.

Perhaps the overriding reason is that "wellness" is a very personal issue, and making improvements can require making extremely difficult lifestyle changes (i.e., physical exercise, nutrition, smoking cessation, etc.). Coupled with the fact that a person is being asked to change habits that took decades to develop is the fact that any lifestyle change is going to be gradual, will take a substantial length of time, and demands personal commitment to be sustainable. Most organizations are looking for more immediate results. Conservatively, most industrial health professionals say the ROI for a good wellness/disease management program is somewhere in the neighborhood of 3:1 or 4:1. However, it can take a while for the savings to show up, it is difficult to isolate the savings as direct results of wellness programs, and the savings are difficult to track. Most companies do not have a long-term view and lack a committed coordinator or adequate resources to attend to such matters.

Due to the personal nature of wellness, the program cannot be a "one size fits all" type of effort. One employee may like walking on a treadmill while another may like to walk outside. Still others may enjoy organized sports. While the measurements of improvement can be consistent, how a person gets there should contain a number of options. The measures have previously been covered but the following is a quick review:

- Weight
- BMI (fat vs. muscle)
- Blood pressure
- Fitness level
- Blood glucose
- Degree of cessation of tobacco use/smoking
- Blood total and HDL cholesterol

The Health Enhancement Research Organization (HERO) is an organization dedicated to making employee health management a widely accepted strategy for controlling health care costs. According to HERO, most of the solutions being tried are economic, but they fail to address the root cause of high insurance premiums—health issues leading to costly treatment. To a large extent, higher health care costs stem from unhealthy living. HERO indicates that from 50 to 70% of all illnesses and medical problems are associated with a relative handful of lifestyle choices: obesity, smoking, inadequate exercise, poor nutrition, and inability to manage stress (Goetzel et al. 1998). Research shows that people who are prone to these problems generally have much higher health care costs than those who are not. In fact, the numbers are even higher for the professional driver population. Companies often begin by providing healthier menu items in

company cafeterias and setting up exercise facilities in company locations, but these are often not available to drivers who spend most of their time on the road.

To better understand the difficulty of implementing a sustained employee wellness program, it may be useful to look at some of the obstacles and mixed messages that can undermine the effort. Many of these have already been described in detail; they are included here in summary form.

- Missing a clear statement of philosophy, purpose, and goals of wellness program.
- Wellness is a "priority" when it needs to be a "value" just as safety is a value. Priorities change, while values are forever. Must integrate wellness into the safety value.
- Championing the program often doesn't start at the top.
- Failure to involve front-line management in the program.
- Lack of management support. (Management personnel are not healthy either.)
- No effective and qualified professionals to guide program and measure results.
- No specific people have been assigned to manage the wellness program.
- Champion or sparkplug program leader gets program going and then gets promoted or leaves the organization. No depth in management to carry on.
- Ineffective communication.
- Unrealistic budget.
- Not convenient/not accessible, particularly for over-the-road drivers.
- Failure to involve employee's spouse/family. Drivers need support on home front to reinforce the message, change diet, reduce stress, etc.
- Actions don't support the message (e.g., serving donuts or pizza as a snack or meal during wellness training).
- Work culture/environment is unsupportive—vending machines, smoking areas, etc.
- Takes too long to see the results.
- Medical insurance premiums go up anyway (probably not as much as they would have but any increase is considered a failure in the short term).

In contrast, the best practices of some of the safest facilities can be applied to successfully implementing a wellness program. When companies study their best performing locations, the following are some of the underlying principles of achieving that exceptional performance:

- Adherence to company programs
  - Manager holds himself/herself to a high standard of program management quality
  - Corporate programs are used as a starting point for facility programs. (This is an important point for any safety program. It should be more of a template rather than a full program and should be easy to fit to the facility design and culture.)
  - Strong documentation and recordkeeping
  - Structured, well-planned training
- Constant, active drive to improve
  - Further enhancement of corporate programs for maximum effectiveness at the facility
  - Management review and feedback on work performed
  - Monthly meetings, open discussions to develop improvement ideas
- Strong employee empowerment
  - Accountability assigned to employees for specific management duties
  - Employees feel responsible for each other
  - Employees take ownership of programs
  - Teamwork is prevalent and supported
  - Employees understand corporate programs
- Excellent management planning
  - Liberal use of computer software to manage programs and track results.
  - Daily, monthly, and long-term planning
  - Use of face-to-face meetings
  - Planning by management and employees
- Strong focus on at-risk behavior identification and correction
  - Regular inspections and observations
  - Action plans, action item assignment (For wellness, employees would have personal action plans but might also have a coach.)

In general, wellness programs implemented in well-managed locations with strong leadership and empowered employees have a better chance of success. Programs themselves should be guided by professionals, offer an abundance of employee options, and be easily adaptable.

CHAPTER 6

Conclusions and Discussion

Continued personal health and wellness are critically important for truck drivers and bus/motorcoach operators—for themselves and for their families. What has not been so apparent until recently is just how important employee health and wellness is to commercial truck carriers and bus and motorcoach companies that want to retain quality employees and to control escalating costs associated with driver safety and health issues. The work done in this synthesis leads the research team to believe that employing healthier drivers can possibly increase highway safety by decreasing accident risk. Employers who implement health and wellness programs for their drivers may find that such programs lead to improved employee morale, lower driver turnover, reduced medical and workers' compensation costs, and improved profits. Such forward thinking human capital strategies can help a company to maintain a position of excellence in the transportation industry.

This synthesis provides important information to aid in the understanding of

1. Research findings on workplace health consequences;
2. Corporate health and wellness programs and what they mean to a company's productivity, safety, and bottom line costs/profits; and
3. Numerous health and wellness resources that can be used by truck and bus/motorcoach industries to enact viable HPM programs.

The literature review presented, accompanied by survey and case study work, provides important information about (a) key health and wellness issues facing commercial drivers, (b) effective mechanisms for addressing these issues at the company level, and (c) areas for future research.

Although the survey sample returns in this synthesis were small, the survey of driver managers and commercial drivers themselves elicited findings worthy of attention.

- To begin to address commercial driver health issues, corporate health and wellness programs do not need to be all encompassing. Programs can be started simply by administering a health risk appraisal to drivers to determine the most pressing needs and then establishing a plan to address those issues.
- This sample of *managers* and *drivers* points to somewhat of a disconnect in how the two groups rank the priority of driver health risks. Surveyed drivers viewed sleep disorders and drug/alcohol abuse as two of the greatest health risks, whereas the surveyed managers viewed obesity and an unhealthy diet as high risks for their drivers.
- It appears that health and wellness program components offered by some companies and used by drivers do address many of the concerns identified by both groups.
- For those companies conducting health and wellness programs, both managers and drivers believe program support is given from the highest levels of the organization and is evident in messages communicated to drivers.
- Integrating a health and wellness program throughout an organization's operations is critical for long-term success.
- The value of involving drivers' families in the health and wellness program is understood and being accomplished by making program components available to family members.
- To support the adage that "what gets measured gets accomplished," it appears companies are tracking various performance metrics to identify where their health and wellness program is having the most effect and where additional resources are needed.

There are several "models" of employee health and wellness programs which commercial carriers can emulate or adopt for their purposes. Each company may need to tailor health and wellness programs to their particular needs. The findings gleaned from this synthesis include the following:

- Many trucking and bus/motorcoach companies seemingly demonstrate too little appreciation for the possible

benefits of employee health and wellness programs for their companies (e.g. improved driver morale, cost-benefits to affect productivity, and bottom line profits, etc.).

- What is needed long-term is a cultural change, a paradigm shift in the transportation industry toward embracing integrated models of health, safety, and productivity management as being the joint and shared responsibility of individual drivers, their managers, and senior leadership of their organizations.
- Numerous corporate experiences with formal employee health and wellness programs are available to be learned from and shared. Currently, there is a gap between what is known from health and wellness research and best practice in other industries and what is being applied in the transportation communities that employ commercial drivers.
- In the short term, companies employing commercial drivers should take a closer look at the many corporate wellness programs that already demonstrate substantial cost savings in terms of employee health, workers' compensation claims, insurance costs, worker absenteeism, worker productivity, etc. Then they can make the decision to implement program components building toward a corporate health and wellness program.
- FMCSA-ATRI's conduct of the Gettin' in Gear train-the-trainer program for the past 5 years has acted as a catalyst for some portion of the trucking industry to get started with formal health and wellness programs. However, it is clear that many companies still need to make the decision to enact the findings and principles contained in training like the Gettin' in Gear program into a companywide health and wellness program tailored to their specific circumstances. The commercial bus and motorcoach industry sector could also likely benefit from such wellness training.
- Transportation companies interested in developing their own employee health and wellness programs are still very much in need of guidance and resources on "how to do it." Better tools and off-the-shelf practices for translating knowledge into action are needed.
- More case study examples of successful health and wellness and safety programs are needed to describe what works to point the way for other companies to make the decision to act and to gain insights about how to do it. Of special interest is learning how such health and wellness programs relate to economic outcomes—a key concern of business.
- Prominent in the practical experiences of carriers is the difficulty of making employee health and wellness program elements available to the drivers themselves—that is, how does one effectively reach and obtain driver involvement, especially when drivers are so mobile because of their day-to-day working environment and their quick turnover rates in employment?
- Commercial driver advocate groups (e.g., FMCSA, ATA, NPTC, ATRI, the ABA, UMA, and others) each have important roles to play in helping bring about the needed culture change toward employee (driver) health and wellness programs.
- Screening for deficits in specific visual, mental, and physical abilities that significantly predict at-fault crashes can be practically carried out in an office environment. With the aging of the work force, such practices will have increasing value for industry and highway safety.

CHAPTER 7

Suggestions for Future Research

Several suggestions for additional research flow from the work done on this synthesis. These are summarized as follows:

- Research should continue to provide the best possible information to those charged with updating the Physical, Medical, and Fitness Standards for Commercial Driving Qualifications, so as to be able to address not only transient states, diseases, and medical conditions, but also the specific functional abilities research has linked to crash causation.
- More applied worksite health and wellness research should be done, particularly to elucidate how it pertains to employee health and safety in the surface transportation industries (commercial truck and bus/motorcoach drivers).
- Academic and research institutions that examine workplace health and wellness issues must communicate more clearly the current findings about what works in health, safety, and productivity management and report how successful programs involving commercial drivers can be integrated to meet corporate organizational goals (see Goetzel 2005).
- Researchers should conduct additional examinations of successful commercial driver health and wellness programs, that is, conduct more in-depth onsite surveys and structured interviews during visits to truck carriers and bus/motorcoach companies that have demonstrated success in driver health and wellness programs.

  For example, studies should (a) explore what types of data are necessary to convince senior managers to invest in improved driver health, safety, and productivity programs and (b) determine how employers can involve health plan providers as partners in health, safety, and productivity management efforts. If possible the research should determine what the ROI is for such efforts.
- More research should be done to identify where commercial driver health, wellness, and fitness programs fall in the safety continuum, focusing specifically on the impact of such programs on improving highway safety.
- A commercial Driver Health and Wellness Program Template should be developed that contains all the elements of a well-designed program, but that can be easily adapted to each company's circumstances and driver operations. The program should also include training and communication templates and provide a myriad of ideas for successful implementation.
- Transportation employers and policy makers are experiencing "informational gaps" regarding the value of health, safety, and productivity management programs. Much of the solid and usable information already produced by employee health and wellness advocates should be "packaged" and be made readily available for public use in the commercial driving community. Such information would have to be screened, selected, and produced with a consensus "seal of approval" of what is generally acceptable, and then be disseminated industrywide. Public relations and media experts might assist in crafting the communication of such information so that it is presented in a straightforward and credible fashion.
- The program materials in both the Gettin' in Gear wellness program and those used in the Mastering Driver Alertness and Fatigue course should be updated and upgraded periodically. The current printed materials distributed in the fatigue and alertness course are mostly dated before 1996 and do not include the findings of the last decade of FMCSA-sponsored research on commercial driver fatigue. The materials distributed in the Gettin' in Gear wellness course are from 1999 to 2002. Infusing more current research results and practical applications into both programs would be exceedingly helpful to the commercial driving community. The communication media used in both programs could be upgraded to meet current Internet web-based and computer electronics advances.
- The conduct of train-the-trainer program classes on Driver Wellness and on Driver Alertness and Fatigue should be

renewed. Carriers and trucking associations want and request such training. Additional implementation should provide more course offerings countrywide. A renewed effort should be made to involve and include bus and motorcoach companies in such training.

- Researchers need to reach out more to the bus/motorcoach community, to enlist participation and cooperation in examining the benefits of driver health and wellness programs.
- Research on truck and bus driver health and wellness should be linked more closely to and participate in a cooperative way with programs sponsored by OSHA and NIOSH. This coordination effort would ensure that the best features of other occupational and workplace health and wellness programs are applied to commercial driving issues, that they meet statutory safety program requirements, and that they enhance the links to health and safety initiatives in the commercial driver workplace—the nation's highways.

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APPENDIX A

Manager Survey

Company Manager Survey on Health and Wellness Programs

The objective of this survey is to gather information from truck and bus companies on current experiences with driver health and wellness programs. This survey is part of a larger synthesis commissioned by the Transportation Research Board (TRB). It is designed to examine prevention and intervention strategies and resources that can be used by truck and bus companies to proactively address driver health and wellness.

Please take a few moments to respond to the following survey regarding company health and wellness programs. For this study, health and wellness programs are defined as a series of ongoing planned activities designed to improve the health and well-being of truck or bus drivers.

Survey Completion and Submission Instructions

Please complete this survey by (5/31/06) and **fax it to (770)-432-0638** or **mail it to**:

Virginia Dick, Ph.D.
American Transportation Research Institute
1850 Lake Park Dr., Suite 123
Smyrna, GA 30518

Computer Online Survey: If you would prefer to complete the survey online, please go to the Web at: **http://atri-online.org/driversurvey/** and click on **Manager Survey.**

Company Name:_____

Address:_____

Person Completing Survey:_____

Title/Department:_____

Phone:_____Fax:_____E-mail:_____

All survey responses will be kept confidential and will be presented only in an aggregate

format. If you have any questions, please call Dr. Virginia Dick at 770-432-0628 or Dr. Jerry Krueger at 703-850-6397. The final results will be summarized in a report that will be available from the Transportation Research Board.

As a **thank you** for your participation in this survey, we will provide a copy of the final report, mailed to the address above.

GENERAL INFORMATION

1. Which categories best describe your company? *(Check all that apply)*

☐ Truck company	☐ Bus company
☐ Private	☐ Charter
☐ For-Hire	☐ Tour
☐ Truckload	☐ Regular route
☐ Less-than-Truckload	☐ Airport express
☐ Specialized	☐ Special operations
☐ Other (please specify): _____	☐ Contract services
	☐ Other (please specify): _____

2. How many drivers does your company employ, by type?

Fleet drivers _____ Independent contractors _____

3. How long has your health and wellness program been in place? _____ Years

4. In what department(s) is your health and wellness program located? *(Check all that apply)*

☐ Operations ☐ Human resources ☐ Medical/occupational health

☐ Health promotion ☐ Safety ☐ Other (please specify):_____

5. Rank the following health risk factors for drivers at your company, in order of priority from 1 (highest priority) to 7 (lowest priority), using each rank only **once:**

____ Obesity ____ Drug/alcohol use _____ Sleep disorders

____ Unhealthy diet ____ Stress _____ Uncontrolled hypertension

____ Other (Please specify) _____

6. Please estimate the percent of total resources allocated to each category: *(Should total 100%)*

_____%	**Awareness:** Encourage drivers to consider healthy lifestyle changes.
_____%	**Education:** Teach drivers to make changes to reduce risk factors or address specific conditions.
_____%	**Behavior change:** Give drivers tools and support needed to improve health and wellness long-term.
= 100%	

7. Check all the statement(s) that describe why your company started a health & wellness program:

☐ To reduce health care costs ☐ To reduce occupational injury ☐ To improve morale

☐ To respond to or meet drivers' requests ☐ To improve driver retention ☐ To enhance productivity

☐ To improve driver recruitment ☐ To reduce absenteeism ☐ To reduce accidents

☐ To comply with statutory requirements ☐ Other (please explain):_____

8. Does your company perform fitness for duty evaluations for the company drivers? ☐ Yes ☐ No

8a. If **yes**, please describe how and when they are conducted?_____

8b. If **yes,**how and where are the records kept regarding the outcomes?_____

9. What is the approximate annual budget for your health & wellness program? $ _____

10. Overall, how have participation rates in your H & W program changed over the past two years? (*Check one)*

☐ Increased modestly ☐ Decreased modestly

☐ Increased substantially ☐ Decreased substantially

☐ Remained about the same ☐ Does not apply, we are just getting started

SUPPORT FOR HEALTH AND WELLNESS PROGRAM

11. Check all the following statements that reflect your company's support for the health & wellness program:

☐ Our CEO has communicated the importance of employee health & wellness to all employees

(e.g., formal written memo/bulletin, incorporated into employee orientation).

☐ A statement on employee health & wellness is included in our company mission/vision statement(s).

☐ The company has employed an individual to lead the H & W program.

☐ The company has formally appointed an individual or individuals to lead the H & W program.

☐ The company has formally appointed a committee(s) to lead or support the program.

☐ Management allocates adequate resources for the program (budget, space, information, equipment).

☐ Managers actively promote participation in health and wellness activities.

☐ Other (please specify): _____

12. Check all the statements below that reflect how union support for the program is demonstrated:

☐ Union leaders communicate the importance of employee health and wellness to their membership (e.g., formal written memo/bulletin, incorporated into newsletters, public addresses).

☐ Union leaders are members of the committee that leads or supports the health & wellness program.

☐ Union leaders signed off on joint labor–management documents encouraging members to participate in health & wellness activities.

☐ Union leaders proposed specific health & wellness provisions during collective bargaining.

☐ Union leaders regularly participate in health & wellness activities.

☐ Union leaders identified or contributed resources for enhancing health & wellness activities.

☐ Not applicable (not unionized)

HEALTH AND WELLNESS TEAM

13. Check all of the statements that indicate how integration of the program is demonstrated at your company:

☐ A health & wellness committee including drivers, union leaders, managers, and representatives from other key departments meets regularly.

☐ A health & wellness committee with membership other than positions listed in the line above meets regularly.

☐ The health & wellness committee developed a mission/vision statement, established strategic priorities, and defined individual roles and responsibilities.

☐ Proceedings of the health & wellness committee meetings are communicated to drivers and their managers.

☐ Health & wellness committee members serve as health & wellness advocates at their worksites.

☐ Health & wellness activities are coordinated with safety programs.

☐ Health & wellness activities are coordinated with the employee assistance program.

☐ Health & wellness activities are coordinated with the drug and alcohol testing program.

☐ Health & wellness activities are coordinated with the workers' compensation program.

☐ Health & wellness activities are coordinated with food services.

☐ Health & wellness activities are coordinated with the employee benefits program.

☐ Health & wellness information is integrated into new driver orientation and/or training program(s).

☐ Other (please specify): _____

14. Which of the following data measures have you collected and analyzed over the last 12, 24, or 36 months.

DATA SOURCE	12 Months	24 Months	36 Months	Not collected
Employee (Driver) Health risk appraisal	☐	☐	☐	☐
Health screening (*e.g., blood pressure; cholesterol testing)*	☐	☐	☐	☐
Employee health & wellness needs/interest surveys	☐	☐	☐	☐
Demographic information of drivers / dependents	☐	☐	☐	☐
Fitness-for-duty assessments	☐	☐	☐	☐
Work/family needs assessment	☐	☐	☐	☐
Ergonomic analysis of vehicles loading/unloading	☐	☐	☐	☐
Workplace facility assessment	☐	☐	☐	☐
Work schedule/shift assignment assessments	☐	☐	☐	☐
Health care claims and utilization	☐	☐	☐	☐
Employee assistance program utilization	☐	☐	☐	☐
Absenteeism records	☐	☐	☐	☐
Disability claims/costs	☐	☐	☐	☐
Workers' compensation claims/costs	☐	☐	☐	☐
Passenger-related incident reports	☐	☐	☐	☐
Passenger satisfaction survey reports	☐	☐	☐	☐
Driver turnover records	☐	☐	☐	☐
Job satisfaction audit/survey	☐	☐	☐	☐
Union support	☐	☐	☐	☐
Organizational policy assessment	☐	☐	☐	☐
Other (please specify): _____	☐	☐	☐	☐
Other (please specify): _____	☐	☐	☐	☐

15. Which of the following options does your company use to focus your H&W program? (*Check all that apply*)

☐ Prepared an operating plan that addresses health & wellness needs and interests of drivers.

☐ Established clear, measurable program goals and objectives.

☐ Linked our health & wellness goals and objectives to the organization's strategic priorities.

☐ Specified time lines in the plan for when activities/tasks are to be completed.

☐ Assigned specific responsibilities to an individual or group for the completion of tasks.

☐ Allocated an itemized budget sufficient to carry out the plan.

☐ Incorporated appropriate marketing strategies to promote and communicate programs to drivers.

☐ Developed a plan for evaluating the stated goals and objectives.

16. Which of the following does your company use to inform drivers about the program? (*Check all that apply)*

☐ Provide program activity updates.

☐ Circulate information concerning the availability of community resources (e.g., financial counseling, alcohol/smoking cessation clinics, nutrition training).

☐ Communicate changes in policy and benefit options.

☐ Distribute reminders to drivers and their families concerning upcoming activities and events.

☐ Encourage ongoing dialogue by providing opportunities for driver input into line activities (e.g., work assignment/schedule design, accident & incident prevention).

☐ Provide timely feedback to drivers on how their input is used.

☐ Give drivers opportunities to communicate feedback through suggestion boxes, e-mail, surveys, etc.

ORGANIZATIONAL ENVIRONMENT

17. Check all the ways your company fosters a supportive organizational environment:

☐ Provide drivers with release time to participate in health & wellness activities.

☐ Promote responsible disability prevention and management (e.g., early return to work, restricted duty, etc.).

☐ Reimburse drivers for health club memberships and/or other wellness activities.

☐ Provide incentives to encourage drivers to participate in health & wellness activities.

☐ Offer drivers peer support groups and mentoring opportunities.

☐ Make healthy food options available in our vending machines, snack shops, and cafeterias.

☐ Ensure all vehicles are maintained in ergonomically sound condition.

☐ Monitor our facilities' heating, lighting, ventilation, and overall safety.

☐ Maintain an easily accessible health and wellness library.

☐ Offer assistance to help drivers address issues of work/life balance.

☐ Recognize and reward driver successes.

☐ Provide drivers the health benefit options (e.g. health insurance, disability, sick leave, etc.).

☐ Provide drivers with other benefits (e.g. vacation, child care, flex time, tuition reimbursement, etc.).

18. Which of the following policies does your company currently have? (*Check all that apply)*

☐ Smoke-free workplace	☐ Tobacco restrictions	☐ Healthy food options
☐ Seatbelt/safe driving practices	☐ Alcohol/drug use	☐ Emergency procedures

☐ Others (please specify): _____

19. Which of the following activities has your company offered in the last two years to address the health and wellness needs and interests of drivers? (*Check all that apply)*

Activities	**Activity Format**					
	Not Offered	*Health Info*	*Group Educ*	*Self-Study*	*Computer Based/Inter/ Intranet*	*Individual Counseling*
Exercise/physical activity opportunities	☐	☐	☐	☐	☐	☐
Nutrition training/information	☐	☐	☐	☐	☐	☐
Weight management	☐	☐	☐	☐	☐	☐
Nicotine prescriptions	☐	☐	☐	☐	☐	☐
Smoking cessation	☐	☐	☐	☐	☐	☐
Responsible alcohol use	☐	☐	☐	☐	☐	☐
Cardiovascular disease prevention	☐	☐	☐	☐	☐	☐
Medication management	☐	☐	☐	☐	☐	☐
Medical self-care	☐	☐	☐	☐	☐	☐
Threat assessment & management	☐	☐	☐	☐	☐	☐
Infectious disease exposure precautions	☐	☐	☐	☐	☐	☐
Flu shots	☐	☐	☐	☐	☐	☐
Allergy shots	☐	☐	☐	☐	☐	☐
Disease management *e.g., Diabetes; Hypertension*	☐	☐	☐	☐	☐	☐
Screening for sleep disorders	☐	☐	☐	☐	☐	☐
Ergonomics *e.g., adjustments & devices*	☐	☐	☐	☐	☐	☐
Work & family education	☐	☐	☐	☐	☐	☐
Personal financial management	☐	☐	☐	☐	☐	☐
Stress management	☐	☐	☐	☐	☐	☐
Mental health	☐	☐	☐	☐	☐	☐
Fatigue awareness	☐	☐	☐	☐	☐	☐
Other	☐	☐	☐	☐	☐	☐

20. Does your company provide any of the above activities for **families** of drivers? ☐ Yes ☐ No

20a. If **yes**, please specify which programs? _____

21. Does your company provide any other information to **families** as part of the health and wellness program?

☐ Yes ☐ No

21a. If **yes**, please describe: _____

22. Which of the following activities/resources for drivers and family members does your company include in the health and wellness program? (*Check all that apply*)

	Drivers	Family Members
Health fairs	☐	☐
Blood drives	☐	☐
Walking/running paths	☐	☐
Walking/running clubs	☐	☐
Community runs/bike and walk-a-thons	☐	☐
Onsite fitness facilities	☐	☐
Volunteer activities	☐	☐
Wellness brochures/poster displays	☐	☐
Health and wellness challenges/competition	☐	☐
Exercise classes	☐	☐
Nutrition training/information	☐	☐
Alternative/complementary health classes/demonstrations	☐	☐
Spiritual counseling	☐	☐

Meditation/nap rooms	☐	☐
Bike storage facilities	☐	☐
Lockers/showers	☐	☐
Linkages with community resources *e.g., heart, diabetes, cancer associations, fire departments, health departments, fitness clubs, health food stores*	☐	☐

PROGRAM EVALUATION

23. How does your company evaluate the health and wellness program? (*Check all that apply)*

- ☐ Regularly track participation
- ☐ Monitor participant satisfaction
- ☐ Document improvements in driver knowledge, attitudes, skills, and behaviors
- ☐ Assess changes in biometric measures (e.g., body weight, cholesterol levels, blood pressure, etc.)
- ☐ Assess and monitor the health status of "at-risk" drivers
- ☐ Measure changes in both the physical and cultural environment (e.g., benefits, working conditions, etc.)
- ☐ Monitor the impact of wellness on key productivity indicators (e.g., absenteeism, turnover, morale, etc.)
- ☐ Analyze effectiveness, cost savings, and return on investment
- ☐ Other (please specify):

  _____

Any additional comments:

_____

_____

_____

_____

_____

Thank you very much for your participation!

APPENDIX B

Driver Survey

CMV Driver Survey: Health and Wellness Program Experiences

This survey is part of a Transportation Research Board (TRB) study to gain information from commercial motor vehicle drivers (truck, bus, or motor coach) on your experiences with company-sponsored driver health and wellness programs. The survey asks about company programs, strategies, and resources used by truck and bus companies to proactively improve driver health and wellness.

Please take a few moments to respond to the following survey regarding your experiences with company-sponsored health and wellness programs. **For this study, health and wellness programs are defined as a series of ongoing company planned activities intended to improve the health and well-being of truck or bus and motor coach drivers.**

Survey Completion and Submission Instructions

Please complete this survey by (5/31/06) and **fax it to (770)-432-0638** or **mail it to**:
Virginia Dick, Ph.D.
American Transportation Research Institute
1850 Lake Park Dr., Suite 123
Smyrna, GA 30518

Computer Online Survey: If you would prefer to complete the survey online, please go to the Web at:

http://atri-online.org/driversurvey/ and click on **Driver Survey.**

Company Name:_____

Address:_____

Your Name: _____

Title/Department:_____

Phone:_____Fax:_____E-mail:_____

Completion of this survey by Telephone: If you would prefer to answer this survey over the telephone, please contact us by phone at (770) 432-0628 extension 2; or via email (vdick@trucking.org) to set up an appointment.

All survey responses will be kept confidential and will be presented only in an aggregate format. If you have any questions, please call Virginia Dick at 770-432-0628 or Jerry Krueger at (703) 850-6397. The final results will be summarized in a report that will be available from the Transportation Research Board. Your safety manager will have a copy of this report for your review.

GENERAL INFORMATION

1. Which categories best describe your current company (employer)? *(Check all that apply)*

☐ Truck company	☐ Bus company
☐ Private	☐ Charter
☐ For-Hire	☐ Tour
☐ Truckload	☐ Regular route
☐ Less-than-Truckload	☐ Airport express
☐ Specialized	☐ Special operations
☐ Other (please specify): _____	☐ Contract services
	☐ Other (please specify): _____

2. How old are you? ____ years old

3. Are you? ☐ Male ☐ Female

4. How many years have you been driving a commercial vehicle? _____years

5. How would you rate the status of your health overall right now?

☐ Very healthy ☐ About average health for my age ☐ Not very healthy

6. Rank the following health risk factors for commercial drivers today, in order of priority from 1 (highest priority) to 7 (lowest priority), using each rank only **once**:

____ Obesity ____ Drug/alcohol use _____ Sleep disorders

____ Unhealthy diet ____ Stress _____ Uncontrolled hypertension

_____ Other (Please specify) _____

7. Have you ever completed a personal health risk appraisal form?

☐ Yes, at this company ☐ Yes, on my own, or elsewhere ☐ No, never have

8. How long has your company's health & wellness program been in place? _____Years (Not sure)

9. About how long have you participated in your company program? _____Years

10. How actively do you participate in your company health & wellness program?

☐ Very active ☐ Moderately active ☐ Barely active ☐ Not at all

11. In what department(s) is your company's health & wellness program located? *(Check all that apply)*

☐ Operations ☐ Human resources ☐ Medical/occupational health

☐ Health promotion ☐ Safety ☐ Other (please specify):_____

12. Does your company perform fitness-for-duty evaluations for the company drivers? ☐ Yes

☐ No

12a. If **yes**, please describe what they consist of, how and when they are conducted:_____

13. Which of the following statements reflect the level of support for the program? (*Check all that apply)*

☐ Our President or CEO communicates importance of employee health & wellness to all employees (e.g., formal written memos; incorporated into employee orientation).

☐ A statement concerning employee health and wellness is in the company's mission/vision statement(s).

☐ The company has an individual to lead the H & W program.

☐ The company has formally appointed a committee to lead or support the H & W program.

☐ Management allocates adequate resources for the program (budget, space, information, or equipment).

☐ Managers actively promote participation in health and wellness activities.

☐ Other (please specify): _____

14. Indicate which features are available at your company, the ones you participate in the most, and which you like most and least.

	Available (All that apply)	**Participate in the most** (All that apply)	**Best** (Only one)	**Least** (Only one)
Occupational med. dept/nurse	☐	☐	O	O
Employee health risk appraisal	☐	☐	O	O
Nutrition & diet advice/assistance	☐	☐	O	O
Physical fitness programs	☐	☐	O	O
Weight management program	☐	☐	O	O
Help to quit smoking or use of tobacco	☐	☐	O	O
Physical fitness equipment is available	☐	☐	O	O
Blood pressure screening	☐	☐	O	O
Sleep disorders screening/treatment	☐	☐	O	O
Ergonomics training/screening	☐	☐	O	O
Stress management training	☐	☐	O	O
Driver fatigue management training	☐	☐	O	O
Drug/alcohol program assistance	☐	☐	O	O
Stresses safe driving practices /promotion of seat belt use	☐	☐	O	O
Makes healthy food options available	☐	☐	O	O
Regular distribution of H&W informational materials	☐	☐	O	O
Maintain an easily accessible health and wellness library	☐	☐	O	O
Provides drivers with release time to participate in H&W activities	☐	☐	O	O
Reimburses drivers for health club memberships or other activities	☐	☐	O	O
Company provides other incentives to participate in H&W activities	☐	☐	O	O
Offer drivers peer support groups and mentoring opportunities	☐	☐	O	O
Ensures all vehicles are maintained in ergonomically sound condition	☐	☐	O	O
Offers assistance to help drivers address issues of work/life balance	☐	☐	O	O
Encourages drivers' family members to participate in H&W programs	☐	☐	O	O
Other: _____	☐	☐	O	O

15. Overall, has your participation in the program changed over the past two years? (*Check only one)*

☐ Remained about the same ☐ Decreased modestly

☐ Increased modestly ☐ Decreased substantially

☐ Increased substantially

☐ Does not apply, have not been with company that long

16. Do you think the important health & wellness messages are effectively delivered to drivers at your company?

☐ Yes ☐ No

16a. If no, how can they be improved?_____

17. Do you think most drivers in your company understand those H&W messages? ☐ Yes ☐ No

17a. If not, why not?_____

18. What percentage of drivers in your company would you estimate actively participate in the health & wellness program? _____%

19. What program improvements would prompt more participation by drivers? _____

20. Do you think your company provides opportunities for drivers to improve their health and wellness?

☐ Yes ☐ No

20a. What could your company do to improve quality of life for drivers?_____

21. Would you be willing to discuss your company's H&W program with us further? ☐ Yes ☐ No

21a. If yes, please provide us a phone number to call you: _____

Thank you very much for your participation!

APPENDIX C

Truckload Carriers Association Audio Teleconference on Driver Health

Improving Driver Health – Why Does it Matter and What Can You Do?
Truckload Carriers Conference Audio Conference
Thursday, June 1, 2006 12:00 pm–1:30 pm

Driver fatigue and wellness are serious safety issues for today's commercial drivers. Too many drivers are unaware of the correlation between mental and physical health and job performance. Healthier drivers who are well rested mean increased highway safety, improved morale, lower driver turnover and reduced medical costs, benefiting both the individual and the company.

Want to do more about your drivers' health and wellness but not sure how to get started? Join us June 1st and get the answers to these questions and more:

- ❑ What are the health concerns facing drivers?
- ❑ Why should we have a wellness program?
- ❑ What constitutes a health and wellness program?
- ❑ How do I get started?
- ❑ What materials are available?
- ❑ Can I improve my drivers' health and wellness without breaking the bank?
- ❑ What will the impact be to my bottom line?
- ❑ What are examples of successful driver health and wellness programs?

The American Transportation Research Institute (ATRI), the trucking industry's research organization, has been conducting training on driver wellness based on the latest research for over 10 years. Hear from ATRI experts how you can work with your drivers to improve their health and wellness and listen as carriers, large and small, discuss how they have successfully integrated wellness into their driver management and what it has meant for their business.

Hear from the experts:

Dr. Gerald P. Krueger, Ph.D., CPE, ATRI's Instructor for *Gettin' in Gear Driver Wellness and Mastering Alertness and Managing Driver Fatigue* courses, Alexandria, VA
Wendy Sullivan, R.N., Occupational Health Manager, Schneider National, Inc., Green Bay, WI
Joel Whiteman, Director of Driver Health and Wellness, JB Hunt, Inc., Lowell, AR
Suzanne Jarman, Vice President of Safety, Operations, and Human Resources, Trucks, Inc., Jackson, GA

Moderated by:

Avery Vise, Editorial Director, CCJ, Randall-Reilly Publishing Co. LLC, Tuscaloosa, AL
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Virginia DeRoze at Truckload Carriers Association at telephone: 703/838-1950.

APPENDIX D

OSHA's Web-Based Assistance on Safety and Health Topics

Recently, the Occupational, Safety and Health Administration (OSHA) posted on its Web site a Safety and Health Topics Page, intended to provide information to help safety managers and others demonstrate the value – or "the bottom line" – of safety and health to management.

OSHA states that employers who invest in workplace safety and health can expect to reduce fatalities, injuries, and illnesses. This should result in cost savings in a variety of areas, such as lowering workers' compensation costs and medical expenses, avoiding OSHA penalties, and reducing costs to train replacement employees and conduct accident investigations. In addition, employers will often find that changes made to improve workplace safety and health can result in significant improvements to their organization's productivity and financial performance.

The *OSHA Safety and Health Topics Web Page* is: http://www.osha.gov/dcsp/products/topics/businesscase/index.html

The Web page is a product of several OSHA alliances. Found on the Web site are case studies and e-Tools that can help demonstrate the business case for safety and health. OSHA offers resources that help answer the following questions:

- What are the costs of workplace injuries and illnesses?
- How can I show the economic benefits of workplace safety and health?
- What information is available by industry or safety and health topic?
- How can designing for safety improve workplace safety and health and improve my bottom line?
- What additional information is available on making the business case for safety and health?
- How do I get started improving workplace safety and health?

**Source for above write-up: Stevens Publishing Occupational Health & Safety Online news (see www.stevenspublishing.com).

Abbreviations and acronyms used without definitions in TRB publications:

AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI–NA	Airports Council International–North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	Air Transport Association
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation