

**BEST HIGHWAY SAFETY PRACTICES:
A SURVEY ABOUT SAFETY MANAGEMENT PRACTICES
AMONG THE SAFEST MOTOR CARRIERS**

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EXECUTIVE SUMMARY

The Supply Chain Management Center at the R.H. Smith School of Business, University of Maryland, has conducted a series of studies under a cooperative agreement with the Federal Motor Carrier Safety Administration (FMCSA) examining the diversity of this nation's motor carrier industry. In conducting this investigation, the analysis team has produced three reports. The first provided a profile of the structure, operations, and financial performance of the major segments in the industry. The second report focused on the safety performance profile of the individual segments. The third report provided a linkage between safety performance and financial performance. The completion of the three reports provides a wealth of new information about the financial performance and the safety performance of the individual motor carrier segments.

In its continuing efforts to improve the safety performance of the motor carrier industry, FMCSA requested the Supply Chain Management Center continue its examination of the diverse motor carrier industry by focusing on the safety management practices of the industry's safety leaders. The first objective is to identify the commercial motor carrier industry's safety performance leaders based on a series of objective safety measures and indicators. Upon identification of these safety leaders, a second objective is to systematically define their safety management programs and policies. The ultimate goal of the effort is to communicate the safety management policies and programs of the industry's safety performance leaders to companies with safety performance problems or to companies seeking to enhance already strong safety programs and policies, thereby providing guidance and direction for improvements as they emulate some of the best practices of the industry's safety leaders.

The process of identifying the "best safety performers" relied on a combination of safety performance data compiled by FMCSA's Motor Carrier Management Information System (MCMIS) via the SafeStat identification and assessment process*, and the knowledge and expertise of FMCSA Division Administrators. The set of scored and un-scored carriers from the SafeStat run of September 2000 were grouped based on size and commodity transported (as designated by the carrier on its DOT Motor Carrier census form). All carriers were stratified into three equal groups based on the number of power units in their fleets (as indicated by the carrier on its DOT Motor Carrier census form). Thus, the number of carriers in each size group varied by commodity segment.

The study results are based on responses from 148 carriers. Throughout the analysis, results are reported for all 148 carriers as a group as well as for sub-sets of respondents based on carrier size and commodity handled. The analysis team stratified the 148 carriers into three equal groups based on the number of power units in their fleets. The first third (33 percent) of the respondents are designated as the "small" carrier group. Each of the carriers in this group has between one and 24 power units. The second group of respondents is designated as the "medium" carrier group. Each of the medium sized carriers has between 25 and 94 power units. The third group of respondents is designated as the "large" carrier group. Each of the carriers in this group has more than 94 power units.

Section 1: General Information

The initial section of the questionnaire probed management's overall attitude concerning the importance of safety issues as well as their willingness to create an atmosphere in which safety issues are freely discussed among employees and their managers. With respect to their general safety

* For detailed information about SafeStat, visit FMCSA's Analysis and Information (A&I) Online website at ai.volpe.dot.gov.

outlook, the questionnaire considered potential conflicts of interest when a firm's commitment to safety practices were not in line with the company's financial outlook or its commitment to customer service. Results from safety leaders' responses demonstrate a strong verbal commitment toward safety, even when in competition with economic and customer service issues. Companies consider safety regulations to be critical in satisfying their highway safety objectives, but some may feel that complying with safety regulations does not completely satisfy safety objectives. To that end, cost is not a driving factor in making safety decisions. Managers also feel strongly that customer service, employee relations, and highway safety performance go hand-in-hand.

With respect to communications about safety, the questionnaire probed carriers about the depth of their commitment to safety and how well that commitment is communicated to their employees. In essence, did the carrier create an atmosphere in which employees could feel comfortable and were encouraged to share safety concerns? Results illustrate that management feel they communicate safety policies to employees and their employees feel comfortable in raising safety concerns with their supervisors. Ultimately, employees are the source of safety improvement initiatives, management publicizes its safety concerns to the employees, and employees frequently voice their safety concerns to their supervisors. These results demonstrate that safety leaders create an atmosphere in which employees are free to raise safety concerns and there is open and continuous dialogue among employees, supervisors, and managers about safety issues.

Section 2: Driver Hiring Practices

The second section of the questionnaire explores the driver hiring practices of the safety performance leaders. It addresses whether or not the respondent carriers employ the services of owner-operators and, if owner-operators are used, what share of their total drivers are owner-operators. It looks at a series of driver characteristics and asks carriers to evaluate the importance of each characteristic in the hiring decision (both for owner-operators and for company drivers). It probes carriers regarding the importance of a series of personality traits in their selection process. It also evaluates a set of hiring practices to see how effective each practice is in helping the company to assess the safety risk of the applicants. Finally, this section concludes by determining how clearly each of a set of safety-related criteria is stated in the company's written hiring policy.

Frequency and Mix between Company Drivers and Owner-Operators

First, the questionnaire assessed the level of hiring that companies engage in. Over 90 percent of companies hire one hundred drivers or less each year, with 60 percent hiring twenty or fewer drivers annually. Not unexpectedly, 80 percent of the small-sized carriers hire ten or fewer drivers annually, while an additional 11 percent hire between 11 and 20 drivers annually. Clearly, carrier size dictates the magnitude of drivers hired on an annual basis. With this level of driver turnover, hiring new drivers is an important component for maintaining business and safety operations for any carrier.

A fundamental question faced by carriers in their driver hiring policies is the mix between owner-operator and company employee drivers. This is a fundamental decision reflecting basic carrier attitude about managing a workforce. There are significant advantages and disadvantages associated with the decision to hire all owner-operators, all company drivers, or a mix of both types of drivers. The questionnaire addressed whether or not the respondent carriers employ the services of owner-operators and, if owner-operators are used, what share of their total drivers are owner-operators. The safe carriers studied in this report indicated that 54 percent do not have a policy against hiring owner-operator drivers. This percentage ranges from a high of 63 among the general freight carriers and 62

among the large-sized carriers to a low of 48 among the medium-sized carriers. However, approximately one-third of the companies that do not have a policy against hiring owner-operator drivers report that they do not hire any owner-operators. Thus among all respondent carriers, only 36 percent report that they hire owner-operators and only 7 percent hire 50 percent or more of their drivers as owner-operators.

Driver Characteristics

The second section of the questionnaire probed the best practice carriers concerning the importance of selected driver characteristics in their hiring decision. In all, respondents were asked to evaluate the importance of ten driver characteristics ranging from age to past driving experience and driving record. For both owner operators and company drivers, managers were asked to consider what driver qualifications were important when making a hiring decision. The results illustrate that few differences exist between attractive characteristics for employees and owner operators.

The categories of driver qualifications that were considered important in the survey are demographics, experience, training, and driver records. In evaluating a company's decision to hire a driver, the questionnaire asked managers to evaluate what personality traits they considered important for driver applicants. It is very important to note that the three most important characteristics all involve an analysis of the individual's past driving performance with a special emphasis on the avoidance of dismissals for alcohol or drugs and the absence of any chargeable crashes. Specific results indicate that age and training were less important to carriers when considering hiring decisions compared to the applicant's safety record. Of all driver qualifications, carriers rated no chargeable crashes and prior dismissals for alcohol or drug related violations as most important when considering a hiring decision. Other important considerations were driving experience, speeding and traffic violations, as well as recommendations from other carriers.

An applicant's personality is also important to carriers when considering hiring decisions. Carriers are most interested in hiring drivers that are honest, reliable, and self-disciplined. Drivers are on the road and not on a job site. As a result, the employer needs to be able to count on the driver's reliability. The employer needs to feel certain that the driver will be where he or she is supposed to be and at the designated time. Furthermore, the driver has direct contact with the shipper and handles valuable commodities in transit. Hence, honesty becomes a critical factor as well.

Assessing the Safety Risk of Driver Applicants

The questionnaire then attempted to isolate companies that had written hiring policies that contained safety-related criteria when considering driver applicants. The results indicate that 70 percent of all companies (90 percent of large carriers) use safety-related criteria to evaluate driver applicants. The questionnaire presented the managers with a series of hiring practices and asked them to evaluate the effectiveness of each practice in helping their company assess the safety risk of driver applicants. The practices ranged from drug testing to records checks to job interviews. Most common are companies that are required to review an applicant's driving record before they are considered for hire.

Specific results indicate that 90 percent or more of carriers use drug testing, past traffic records, on-road tests for evaluating driver behavior, and license qualification checks as effective means of assessing the safety risk of driver applicants. Among the carriers, a higher percentage of the large-sized carriers than of the medium-sized and small-sized carriers view these practices as effective or

very effective in helping them to assess the safety risk of the applicants. In fact, a higher percentage of the large-sized carriers than of all carriers overall view seven of the eight hiring practices as effective or very effective in the assessment process. A higher percentage of the liquid gas carriers than of all carriers overall view seven of these eight practices as effective or very effective in assessing driver safety risk.

The questionnaire included an item regarding how clearly carriers state a set of safety-related criteria in their written policies regarding hiring. Obviously, if carriers were going to base hiring decisions on applicants meeting specific criteria, it would be helpful if these criteria or thresholds were clearly stated in written guidelines. The most common criteria for establishing driver safety are requiring review of applicant's past driving record, and setting a number of moving violations and crashes that disqualify an applicant. Overall, a higher percentage of the large-size carriers than of carriers overall included these safety-related criteria clearly or very clearly in their written hiring policies.

Section 3: Driver Training Practices

The third section of the questionnaire to motor carriers probed their senior management about pre-service and in-service training programs. Senior management responded to questions about duration of training programs, subjects covered, training venues, evaluation methods, outsourcing policies and general attitudes toward training and how it relates to their safety management goals. The results suggest that pre- and in-service training programs for employees and owner operators are strategic safety investments for companies. Close to 90 percent of all carriers require training programs; the majority of which require 1-2 weeks of training. The results also indicate that employees appreciate the relevance of training programs and their importance in maintaining safe carrier performance. Specific results for training subjects, venues, and outsourcing include:

- Training Subjects. Over 90 percent of carriers incorporate the following training subjects for employees and over 80 percent of carriers incorporate the following training subjects for owner-operators: pre-trip inspections, federal safety regulations, accident notification, hours of service regulations, post-trip inspections, driver disciplinary policies and dispatch procedures. Small carriers are less likely than an average carrier to train drivers on hour-of-service regulations. Topics that are covered during pre-service and in-service training by less than one-third of the carriers are: CPR training, first-aid training, and team driving training. The overall conclusion is that carriers include a broad array of topics in both pre-and in-service training. There seems to be an overwhelming emphasis in both pre-and in-service training on the topics dealing directly with the regulatory environment—i.e., hours-of-service regulations, accident notification, and general safety regulations.
- Venues for Training and Evaluation. The most effective venue for training programs is in-vehicle, on-road training with classroom training as the second most effective venue. The majority of firms require 1-2 weeks of training. During training programs, driver evaluations are issued in the similar venues as the training programs. For example, the most common evaluation exam takes place in-vehicle and on-road. The second and third most common evaluation exams are oral and written exams. A small minority of the carriers uses either computer-assisted or internet-based exams to evaluate their drivers. These patterns are common across the various carrier size groups. Liquid gas, chemical, and large carriers are more likely to issue oral and written classroom exams than other carrier groups.

- Outsourcing. A majority of the respondent group of carriers runs their pre- and in-service training programs entirely with company personnel. Outsourcing is uncommon for both pre-service and in-service training programs. For example, just 12 percent and 24 percent of carriers surveyed outsource a portion of their company's training programs, respectively. Only 3 percent of carriers outsource all of their training to one source. Popular sources for outsourcing include insurance companies and training consultants.

In the final portion of this section of the questionnaire, managers were asked to evaluate the importance of driver training and to make comparisons between pre-service and in-service training. Indeed, it is prudent management practice to closely monitor both pre- and in-service driver training expenses, making sure that every dollar is well spent, regardless of the purpose of the expense. Over 57 percent of all carriers indicate that both pre-service and in-service driver training have an equal impact on the company's highway safety performance. However, more companies consider in-service driver training to be more critical than pre-service training. A larger percent of carriers consider in-service training as a strategic safety investment, and half of all carriers consider their company's investments for in-service training to be more than other carriers. Overall, training is very important to the safety leaders surveyed here, with training directors having a strong influence over safety management decisions and being well respected by employees. An argument can be made that drivers would learn the most by sharing experiences with existing drivers, and results support the notion that peer-to-peer training among drivers exists and is strongly supported.

Section 4: Encouraging and Reinforcing Safe Driving Behavior

The fourth section of the questionnaire to motor carriers probed their senior management about company practices that encourage and reinforce safe driving. Senior management was asked to consider their approaches to rewarding safe drivers and disciplining unsafe drivers. With respect to driver awards, the questionnaire asked managers to identify which personnel/organizational units were rewarded, how frequently they were rewarded, and the specific type of awards used to encourage safe driving. Furthermore, the questionnaire included items on the specific standards/achievements that were used by companies as the basis for the safety awards.

In addition to rewarding drivers for safe behavior, the questionnaire sought management reaction to the use of disciplinary actions in view of unsafe driving behavior. In fact, the questionnaire asked managers to compare rewards and disciplinary actions in terms of their relative effectiveness in improving company safety performance. A majority of carriers also use discipline to reinforce safe driving behavior. The questionnaire attempted to understand how companies discipline drivers for unsafe driving, whether they find the methods for disciplining to be effective, and how disciplinary actions compare to driver awards in impacting highway safety performance.

- Safety Rewards. Over three fourths of all respondent carriers have safety award programs for individual drivers. Safe drivers get promoted over unsafe drivers in over 89 percent of companies. Safety awards are also presented in order to encourage and reinforce safe driving, most commonly to individual drivers, driver teams, terminals, and garages. Awards are issued on monthly, quarterly, and annual bases with annual being the most common. Many awards are used, such as verbal praise, public recognition, congratulatory letters from management, safety decorations, safety banquets, cash and merchandise. Awards are most frequently based on established criteria or driver accomplishments, such as crashes, violations, or traffic

convictions during a specified time period. The awards are much more frequently time-based than mileage based. Small carriers award individual drivers and driver teams less frequently than large carriers.

- **Disciplining Drivers.** Carriers feel that disciplining drivers is more important or equally important as rewards in encouraging and reinforcing safe driving behavior. Carriers discipline drivers for poor safety performance when drivers violate Federal Motor Carrier Safety Regulations, violate company safety policies, or demonstrate generally unsafe driving performance. The type of disciplinary actions varies from verbal warnings to termination of employment. The most effective discipline actions are termination of employment and suspension from service. A greater percentage of small carriers feel more strongly that disciplining drivers does little to impact company's highway safety.

The results suggest that carriers feel that safety training is effective for reinforcing safe behavior with or without an incentive system. Close to forty-four percent of senior managers agree that rewards and disciplinary actions are both important, if not equal, components for promoting safe driving behavior. However, 33 percent of the carriers thought that safety awards had a greater impact on safety performance than did disciplinary actions, but only 22 percent said that disciplinary actions rather than safety awards had a greater impact on safety performance.

Section 5: Managing and Monitoring Driver Activities

The fifth section of the questionnaire to motor carriers probed their senior management about company practices used to manage and monitor driver activities. Initially, the questionnaire sought to divide respondents on the basis of the type of their operations, specifically addressing the issue of the balance between local and long haul operations. Senior managers were asked to indicate the average length-of-haul, percent of the company's drivers active in local operations, and percent of the company's annual vehicle miles that occur through local operations. The results indicate that one-third of carriers are focused on local operations, while another third are active in long-distance operations. However, the average length of haul for drivers depends on commodity group and carrier size. For example, small carrier drivers travel an average of less than 250 miles over each haul; the liquid gas commodity group and medium carriers have two-thirds of their drivers traveling between 250 and 500 miles over each haul; and 40 percent of large carriers travel between 250 and 500 miles, with 30 percent traveling over 500 miles.

Managers were also questioned about whether or not particular technologies were used to monitor driver performance. The results indicate that companies use a variety of technologies to monitor driver performance and promote safe driving. The most common practices are to use speed regulators on vehicles and engine diagnostics. Companies manage driver fatigue by encouraging drivers to refuse dispatches if they do not feel alert enough to handle the drive, equip trucks so they are easier to handle, and provide unrestricted break times for drivers. One practice that is not encouraged is urging drivers to talk on radios while driving. Although one might assume that larger companies have more resources to invest in expensive diagnostic technologies, the results do not show variations across commodity groups or carrier size.

Section 6: Managing Vehicle Maintenance

The sixth section of the questionnaire to motor carriers probed their senior management about practices used to manage the amount of wear and tear that their vehicles are exposed to. Ultimately, vehicles that are not properly maintained are unsafe; therefore, the questionnaire probed into maintenance activities and management's attitude toward maintenance practices and the company's safety performance. The results indicate that approximately 90 percent of carriers consider cost as a non-issue when it comes to keeping their vehicles defect-free. 90 percent also agree that deploying a defect-free fleet is the most important thing they do to ensure highway safety. Since preventative maintenance is critical to deploying a safe fleet, 80 percent of carriers rarely need to conduct unscheduled maintenance.

Computerized Equipment Maintenance

The questionnaire isolated companies that use a computerized equipment maintenance (CEM) management program and identified which maintenance activities it supported. As an entity, 56 percent of carriers surveyed use CEM management programs. Companies' CEM management programs are used to collect data to develop proper equipment specifications, develop equipment maintenance procedures, monitor equipment maintenance activities, and schedule equipment repairs. To a lesser degree, CEM management programs are used to determine mechanic training needs and analyze part failure. The use of computerized equipment within maintenance management programs largely depends on carrier size. Small carriers, most likely with limited funds for investment, are less likely to invest in this capability. Approximately 23 percent of small carriers use computerized equipment, compared to over 70 percent for other-sized carriers.

Outsourcing Fleet Maintenance Activities

Close to 75 percent of carriers outsource one or more of its fleet maintenance activities. The use of outsourcing largely depends on carrier size. Small companies tend to outsource more of their maintenance activities, due to their limited resources and expertise. The level and style for managing vehicle maintenance largely depends on carrier size. For example, 39 percent of small carriers have employees perform 0 percent of power unit service and repairs. This is compared to 13 percent of large carrier companies. Fifty percent of large carriers surveyed have their employees perform over 75 percent of the company's power unit service and repairs internally by employees. The most common activities that are outsourced by all carriers surveyed are out-of-engine chassis repairs, major drive train repairs, in-chassis engine repairs, and tire repairs.

Maintenance Schedules

The number of mechanics that are hired within each firm depends on its size. A majority of those mechanics that are hired by carriers have formal mechanic's training. The amount of training varies, ranging from 1-6 weeks (40 percent) to more than 24 weeks of training (23 percent). Maintenance schedules depend on the activity and the relative importance of preventing operational failure. Small carriers are more likely to conduct in-frame and out-of-chassis overhauls sooner than larger carriers. This might be because maintenance is scheduled over a time period, rather than miles driven. Eight-five percent of larger carriers travel between 10 and 50 million miles per year compared to smaller carriers (100 percent travel less than 10 million miles per year). Specific results indicate that maintenance inspections, overhauls and trailer repairs are scheduled frequently in order to guarantee safety.

- *Preventative Maintenance.* Schedule A, B, C preventative maintenance inspections are scheduled on a routine basis. Half of carriers inspect before every 10,000 miles, while half of carriers inspect every 10-20,000 miles.
- *Overhauls.* In-frame versus out-of-chassis engine/train overhauls are scheduled after 700,000 miles and 800,000 miles respectively. However, this depends on the carrier's size.
- *Trailers.* Routine inspections of trailer conditions and brake systems are common. Approximately 53 percent of carriers inspect these systems after less than 10,000 miles and 75-85 percent inspect these systems between 10 and 20,000 miles.

INTRODUCTION AND STUDY OBJECTIVES

The Supply Chain Management Center at the R.H. Smith School of Business has conducted a series of studies under a cooperative agreement with the Federal Motor Carrier Safety Administration (FMCSA) examining the diversity of this nation's motor carrier industry. In conducting this investigation, the analysis team has produced three reports. The first provided a profile of the structure, operations, and financial performance of the major segments in the industry. These segments included the following specific activities: refrigerated carriers, tank carriers, moving/household goods carriers, heavy equipment haulers, general freight carriers, bulk material, and building material haulers. The second report developed safety performance profiles of the individual segments. The safety profiles were multi-dimensional in their orientation. Profile coverage involved the following major areas of safety performance: driver management, vehicle management, overall safety management, and crash rates. The third report provided a linkage between safety performance and financial performance. Its major objective was to investigate the extent to which a firm's financial performance influenced its safety performance. Intervening variables, such as firm size and use of owner-operators, were also included as potential explanatory variables. These three reports provide a wealth of valuable information about the financial and safety performance of the individual motor carrier industry segments.

In its continuing efforts to improve the safety performance of the motor carrier industry, FMCSA requested the Supply Chain Management Center to continue its examination of the diverse motor carrier industry by focusing on the safety management practices of the industry's safety leaders. By mandate, the FMCSA enforces the nation's safety regulations. It emphasizes detection of safety performance deficiencies in carrying out its legislative mandate. Clearly, one of FMCSA's primary objectives is to identify carriers with safety problems and require them to correct these deficiencies.

The overall goal of the FMCSA is to improve highway safety and reduce crashes involving large trucks and buses. In addition to removing unsafe vehicles and drivers from the highways, an important component of highway safety is to encourage the safe operation of drivers and vehicles on the nation's highways. FMCSA believes that highway safety would be enhanced if more carriers patterned their safety management policies and practices after those of carriers with excellent safety records.

The specific objective of this current effort, then, is to identify the industry's safety performance leaders based on a series of objective safety measures and indicators. Upon identification of these safety leaders, a second objective is to systematically define their safety management programs and policies. The ultimate goal of the effort is to communicate the safety management policies and programs of the industry's safety performance leaders to companies with safety performance problems or to companies seeking to enhance already strong programs and policies, thereby providing guidance and direction for improvements as they emulate some of the best practices of the industry's safety leaders.

The next section provides a detailed discussion of the methodology used to identify the industry safety leaders as well as the survey instrument used to identify the safety management programs and policies of the performance leaders. Subsequent sections provide a discussion of

the study's major results and findings regarding the programs and policies that have been implemented by the safety leaders.

METHODOLOGY

Initial Selection Process

The process of identifying the “best safety performers” relied on a combination of safety performance data compiled by FMCSA’s Motor Carrier Management Information System (MCMIS) via the SafeStat identification and assessment process and the knowledge and expertise of FMCSA Division Administrators (DA). The set of scored and un-scored carriers from the SafeStat run of September 2000 were grouped based on size and commodity transported (as designated by the carrier on its DOT Motor Carrier census form). All carriers were stratified into three equal groups based on the number of power units in their fleets (as indicated by the carrier on its DOT Motor Carrier census form). Thus, the number of carriers in each size group varied by commodity segment.

Within each size category for each segment, carriers were ranked from best safety performance to worst safety performance. The ranking was based on the sum of each carrier’s score on the following three safety performance indicators: accident involvement indicator, vehicle inspection indicator, and driver inspection indicator. The accident involvement indicator is based on state-reported crash data normalized by power unit data from the Motor Carrier census forms and weighted by time and crash severity. The driver inspection indicator is based on driver roadside out-of-service violations and weighted by time (date of inspection). The vehicle inspection indicator is based on vehicle roadside out-of-service violations and weighted by time (date of inspection).

Carriers with the lowest sum on the three measures were at the top of the list, while those with the highest score were at the bottom of the list. For each measure, score increases are directly related to declining safety performance—i.e., the higher the score, the worse the performance. For each segment, the best twenty safety performers in the largest and the medium-sized groups were forwarded to the respective FMCSA DA for consideration as the set of best performers.

Review by DAs

The respective FMCSA DAs reviewed the list of carriers forwarded by the initial selection process. FMCSA DAs were given the opportunity to add their own perspective on what constituted the set of “best safety performers” in their respective states. They were informed of the criteria used by the analysts to select the initial top 20 carriers in each size/commodity group. However, each DA was free to select the final list of motor carriers to participate in the survey from either the list provided by the analysis team or from their own list of “best carriers.” They were also asked to survey at least five ‘best performers’ from their state, with the goal of acquiring a sample size of approximately 250 carriers. The focus was on tapping the expertise of the DAs who had direct experience with the carriers and opinions about which carriers were the safest.

Final Real-Time Review

The analysis team recognized that the process of using a combination of SafeStat indicators as well as expert judgment by FMCSA DAs to identify the “best safety performers” might lead to different performance standards among the selected carriers. As a result, the analysis team screened

all returned questionnaires against a specific set of performance indicators to ensure that carriers included in the analysis met or exceeded defined performance thresholds.

After all the questionnaires were returned, the analysis team used the Analysis and Information (A&I) Online website to evaluate each carrier respondent's safety performance on each of the indicators. This website provides up-to-date safety performance information and provides a near real-time check on carrier safety performance.

For a carrier's results to be included in the analysis of "best safety performers," the carrier had to meet or exceed the following established thresholds. First, the carrier had to have a total crash per power unit rate (ratio of the total number of crashes to the total number of power units) of equal to or less than 0.25. Second, the carrier had to have a vehicle out-of-service rate (ratio of the number of vehicles out-of-service to the total number of vehicles inspected) of equal to or less than 30 percent and a driver out-of-service rate (ratio of the number of drivers out-of-service to the total number of drivers) of equal to or less than 15 percent. Third, if recently given a CR, it had to have a satisfactory rating (based on a weighted set of evaluation criteria). Carriers with no recent review, however, could still be considered as "best safety performers" if they met or exceeded all other criteria. Fourth, the carrier had to have an Inspection Selection System (ISS) value* of between 1 and 49 and could not be in safety group 1-15. Safety groups (1-15) signify carriers with high (75 or greater) SafeStat scores in at least one SEA category. Inspection groups 16 or higher signify carriers with no single SEA score higher than 74. Finally, in order to receive a SafeStat score, a carrier must have deficiencies in multiple SafeStat evaluation categories (driver, vehicle, accident, safety management). These thresholds are summarized below.

- Total crashes per power unit, < or = 0.25
- Vehicle out-of-service rate, < or = 30 percent.
- Driver out-of-service rate, < or = 15 percent.
- Rating, Satisfactory or None From Compliance Review
- ISS Inspection Value, 1-49.
- ISS Safety Group, Not equal to 1-15.
- SafeStat, Unscored

Thus, in the final analysis, all "best performing carriers" included in the results meet or exceed the thresholds established for the set of safety performance indicators. The process thus incorporates objective results from safety performance indicators, but also makes use of the expertise of the FMCSA DA's with knowledge about the safety management practices and procedures of individual carriers.

Development of Survey Instrument

A survey of best highway safety practices was sent out to motor carriers that were designated as the safest motor carriers in order to learn about their safety management practices. The survey is broken down into six sections: 1) General Information, 2) Driver Hiring Practices, 3) Driver Training

* The ISS Inspection Value is based on the motor carrier's safety performance data. In the case when there is sufficient motor carrier safety performance data available, the value is assigned from information derived from SafeStat results. When a motor carrier has little information on file, the ISS Inspection Value is based on an 'Insufficient Data Algorithm', which determines the inspection value by weighting the carrier size and the number of past inspections.

Practices, 4) Encouraging and Reinforcing Safe Driving Behavior, 5) Managing Service Conditions for Drivers, and 6) Managing Vehicle Maintenance. Each section is composed of general questions common among all carriers with additional questions more specific to particular safety practices. Therefore, the number of responses to each question varies depending on the questions relevant to that company.

The analysis team took great care in designing the survey instrument. Initially, the team reviewed past efforts to define the management practices and programs of the safest carriers. These included studies sponsored by the American Trucking Associations Foundation and the Western Highway Institute.¹ Second, the analysis team drew upon experiences from their own analysis efforts about the relationship between safety inputs and safety outputs.² After developing an initial survey design and draft questions, the analysis team submitted the survey to the FMCSA DAs for their review and assessment. After appropriate changes had been incorporated based on these suggestions, the survey team secured the cooperation of several DAs to conduct pilot tests of the survey instrument. The survey team developed the final survey instrument based on input from the DAs as well as results from carriers filling out the instrument on a pilot basis.

Analysis of Survey Responses

Carriers were asked to respond to the survey and return it completed to the Supply Chain Management Center at the University of Maryland. This ensured anonymity for respondent carriers, since the FMCSA only saw compiled results and not individual carrier names. Therefore, all survey responses should be considered unbiased and accurately representative of carrier's practices and perspectives.

The study results are based on responses from 148 carriers. Throughout the analysis, results are reported for all 148 carriers as a group as well as for sub-sets of respondents based on carrier size and commodity handled. The analysis team stratified the 148 carriers into three equal groups based on the number of power units in their fleets. The first third (33 percent) of the respondents are designated as the "small" carrier group. Each of the carriers in this group has between one and 24 power units. The second group of respondents is designated as the "medium size" carrier group. Each of the medium sized carriers has between 25 and 94 power units. The third group of respondents is designated as the "large size" carrier group. Each of the carriers in this group has more than 94 power units.

Among the 148 carriers, there were a number of commodity groups with a sufficient number of respondents to warrant special identification for analysis purposes. The analysis team felt that some of the responses to questionnaires might be different based on the individual operating segment. The five largest commodity groups represented by the respondents are general freight, liquid gas, chemical, paper products, and dry bulk. The number of carriers in each commodity group is shown in Table 1 below. As demonstrated, the commodity groups

¹ **Making the Difference...A Compendium of Safety Management Practices of Award Winning Carriers**, Western Highway Institute with InMotion, Inc., Denver, Colorado, 1996/1997; **Safe Returns: A Compendium of Injury Reduction and Safety Management Practices of Award Winning Carriers**, American Trucking Associations Foundation with Parker Young, Alexandria, Virginia, 1999. and **Managing for Safety: The Practices and Programs of Colorado's Safest Motor Carriers**, American Trucking Associations Foundation, Alexandria, Virginia, 2000.

² Michael C. Mejza and Thomas M. Corsi, "Assessing Motor Carrier Potential for Improving Safety Processes," **Transportation Journal**, Vol. 38, No. 4, Summer 1999, pp. 36-50.

each have approximately 20-30 percent of their members who are small firms, 32-40 percent of their members who are medium size firms, and 29-48 percent of their members who are large firms. Note that a firm could transport multiple commodities, so the total of firms in the commodity groups is larger than the total of firms based on carrier size.

Table 1. Respondent Carriers by Commodity Group and Size

		General Freight		Liquid Gas		Chemical		Paper Products		Dry Bulk	
		Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %
Size	Small	21	27.3%	9	20.0%	9	20.5%	12	27.9%	11	31.4%
	Medium	21	27.3%	17	37.8%	14	31.8%	14	32.6%	14	40.0%
	Large	35	45.5%	19	42.2%	21	47.7%	17	39.5%	10	28.6%
Total		77	100%	45	100%	44	100%	43	100%	35	100%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Tables 2 through 5 provide the empirical evidence that each of the 148 respondents meets or exceed the safety performance thresholds established for carriers to be included in the list of best safety performers. Table 2 below addresses the ISS Inspection Value Indicator. This indicator provides direction to field personnel regarding the targeting of a carrier's vehicles for inspection. Higher scores on this indicator will result in greater targeting of a carrier's vehicles for roadside inspections. Overall, 27 percent of all respondents had an inspection value less than 19 (an excellent rating); 39 percent had a value between 20 and 25 (a very good rating); and 34 percent had a value between 26 and 49 (a good rating). Respondents in the paper products segment had the highest percentage of carriers achieving an excellent Inspection Value with 23.3 percent of these carriers achieving this rating. Considering size of carriers, 44 percent of the small carriers had an excellent Inspection Value, while only 28 percent of the medium-sized carriers and 9 percent of the large-sized carriers achieved this level of performance.

Table 2. Inspection Value Measure: Performance by Carrier Size and Commodity Group.

		Inspection Value		
		Excellent (0-19)	Very Good (20-25)	Good (25-49)
General Freight		19.5%	45.5%	35.1%
Liquid Gas		20.0%	48.9%	31.1%
Chemical		11.4%	54.5%	34.1%
Paper Products		23.3%	51.2%	25.6%
Dry Bulk		20.0%	45.7%	34.3%
Size	Small	43.8%	31.3%	25.0%
	Medium	27.8%	44.4%	27.8%
	Large	8.7%	41.3%	50.0%
Total		27.0%	39.2%	33.8%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Table 3 below addresses the vehicle out-of-service rate. Overall, 43 percent of the carrier respondents had a vehicle out-of-service rate of nine percent or less, 28 percent had a rate between 9.1 percent and 14 percent and 28 percent had a rate of between 14.1 and 30.0 percent. The highest percentage of carriers with the lowest out-of-service rate occurred among the paper products and dry bulk carriers. Over half of the small and medium-sized carriers achieved the lowest level of vehicle out-of-service rate. In contrast, only 15 percent of the largest sized carriers had a vehicle out-of-service rate of nine percent or less.

Table 3. Vehicle Out-of-Service Measure (Percent of Vehicles Placed Out-of-Service): Respondent Performance by Carrier Size and Commodity Group.

Row %		Vehicle Out-of-Service Rate		
		Excellent (0-9)	Very Good (9-14)	Good (14-30)
General Freight		28.6%	36.4%	35.1%
Liquid Gas		35.6%	33.3%	31.1%
Chemical		34.1%	36.4%	29.5%
Paper Products		46.5%	30.2%	23.3%
Dry Bulk		45.7%	28.6%	25.7%
Size	Small	52.1%	25.0%	22.9%
	Medium	59.3%	20.4%	20.4%
	Large	15.2%	41.3%	43.5%
Total		43.2%	28.4%	28.4%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Table 4 below provides information on the driver out-of-service rate for respondents. Overall, 64.9 percent of the respondents had driver out-of-service rates of 2.1 percent or less, 16.2 percent achieved a driver out-of-service rate between 2.1 percent and 4.2 percent and 18.9 percent were between 4.21 percent and 15 percent. Once again, the small carrier group had the highest percentage of their carriers in the excellent performance category, although the percentage of medium sized carriers in the excellent performance category is nearly equal to the percentage of small carriers in the excellent category. Paper products carriers had the highest percentage of their members in the excellent performance category, followed by the liquid gas carriers with 60 percent of their carriers having driver out-of-service rates of 2.1 percent or less.

Table 4. Driver Out-of-Service Measure (Percent of Drivers Placed Out-of-Service): Respondent Performance by Carrier Size and Commodity Group.

Row %		Driver Out-of-Service Rate		
		Excellent (0-2)	Very Good (2-4)	Good (4-15)
General Freight		59.7%	16.9%	23.4%
Liquid Gas		60.0%	24.4%	15.6%
Chemical		56.8%	15.9%	27.3%
Paper Products		65.1%	20.9%	14.0%
Dry Bulk		51.4%	31.4%	17.1%
Size	Small	70.8%	10.4%	18.8%
	Medium	68.5%	14.8%	16.7%
	Large	54.3%	23.9%	21.7%
Total		64.9%	16.2%	18.9%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Finally, Table 5 below addresses the safety performance indicator (crashes per power unit). Overall, 61 percent of the respondent carriers have 0.032 or fewer crashes per power unit on an annual basis. An additional 19 percent have crashes per power unit of between 0.0321 and 0.055, while 20 percent have rates from 0.0551 to 0.025. Once again, the group with the highest percentage of carriers in the excellent performance group is the small sized carriers. Thus, while 83 percent of the smallest carriers had 0.032 or fewer crashes per power unit, only 38 percent of the largest sized carriers achieved this level of excellence. The dry bulk carrier segment had the highest percentage (60) of carriers with 0.032 or fewer crashes per power unit.

Table 5. Crashes Per Power Unit Measure (Annual Crashes per Vehicle): Respondent Performance by Carrier Size and Commodity Group.

Row %		Crashes per Power Units		
		Excellent (0-0.03)	Very Good (0.03-0.06)	Good (0.06-0.25)
General Freight		52.6%	23.7%	23.7%
Liquid Gas		55.6%	24.4%	20.0%
Chemical		54.5%	22.7%	22.7%
Paper Products		55.8%	16.3%	27.9%
Dry Bulk		60.0%	17.1%	22.9%
Size	Small	83.3%	2.1%	14.6%
	Medium	59.3%	14.8%	25.9%
	Large	37.8%	42.2%	20.0%
Total		60.5%	19.0%	20.4%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Overall, the 148 respondent carriers met or exceeded established criteria on a comprehensive set of safety performance measures. The mean VOOS and DOOS rates for each size group were 10 and 2 percent, respectively. These mean scores are a good indication that this study captures the best industry performers in the survey group, since the average VOOS and DOOS rates for U.S. carriers

in fiscal year 2001 were 24 and 8 percent, respectively.³ On most dimensions, a substantially higher percentage of carriers in the small carrier group achieved the best safety performance scores compared with the percentage of medium sized and large carriers with the best scores.

For each survey question, the report analyzed response frequency for the entire set of 148 respondents as well as highlighted response differences on the basis of commodity groups and carrier size groups. Appendix 1 presents the frequency tables that list each question and the frequency of response as a percentage of the total number of responses. The total number of responses and those within each sub-group are noted below each table. The response frequency for each commodity group, carrier size, and total sample can be compared against each other. Some of the analysis tables are intermingled throughout the text for easy reference. However, the complete set of questions and responses are included in Appendix 1.

SECTION 1: PERCEIVED IMPORTANCE OF SAFETY MANAGEMENT AND COMMUNICATION ABOUT SAFETY ISSUES

The initial section of the questionnaire probed management's overall attitude concerning the importance of safety issues as well as their willingness to create an atmosphere in which safety issues are freely discussed among employees and their managers.

Importance of Safety Issues

Clearly, the implementation of safe management policies and programs has direct costs. Managers with a bottom-line orientation recognize the relationship between costs and profits. The initial question in this section of the questionnaire probes managers on how deep of a commitment they have to safety management programs and policies. Is the commitment superficial and not extensive, just meeting legal requirements, or is it broad and have the highest priority? The questionnaire included a four-part question to probe this issue.

The first part of the initial question asked the respondent about how much they agreed or disagreed with the following statement: "Complying with public safety regulations completely satisfies our highway safety objectives." Overall, over sixty-five percent of the respondents slightly agree, agree, or strongly agree with this statement (Table 6 below). However, approximately 30 percent of the respondents slightly disagree, disagree, or strongly disagree with it. It could be argued that those who disagree feel that compliance with safety regulations does not completely satisfy a company's highway safety objectives. They might feel that more actions are needed in order to completely satisfy safety objectives. The highest expression of disagreement occurs among the medium-sized and the general freight carriers.

³ Motor Carrier Management Information System (MCMIS), July 1, 2002.

Table 6: Level of Agreement with Statement that Complying with Regulations Completely Satisfies Highway Safety Objectives (Percent of carriers in each category)

Row %		1a) Complying with public safety regulations completely satisfies our highway safety objectives						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		8.1%	18.9%	8.1%	2.7%	16.2%	20.3%	25.7%
Liquid Gas		6.7%	6.7%	11.1%	4.4%	11.1%	26.7%	33.3%
Chemical		6.8%	11.4%	6.8%	4.5%	13.6%	20.5%	36.4%
Paper Products		7.1%	14.3%	9.5%		7.1%	33.3%	28.6%
Dry Bulk		2.9%	11.8%	11.8%	2.9%	14.7%	26.5%	29.4%
Size	Small	8.7%	8.7%	6.5%	6.5%	19.6%	26.1%	23.9%
	Medium	7.7%	21.2%	7.7%	3.8%	13.5%	26.9%	19.2%
	Large	4.4%	15.6%	8.9%	2.2%	11.1%	24.4%	33.3%
Total		7.0%	15.4%	7.7%	4.2%	14.7%	25.9%	25.2%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002. Responses (#): Gen. Frt,74; Liq. Gas,45; Chem, 44; Paper, 42; Dry Blk,34; Small,46; Med,52; Lrg,45; Tot Size, 143

The strong verbal commitment to the importance of safety objectives even in competition with economic objectives is displayed in the response to the next part of the initial question. Respondents were asked their level of agreement with the following question: “Cost is no issue when it comes to highway safety decisions at our company.” Over 76 percent of all respondents express some level of agreement with this statement (Table 7 below). The level of agreement is strong across all respondent carrier size groups and commodity groups.

Table 7: Level of Agreement with Statement that Cost is No Issue When It Comes To Highway Safety Decisions (Percent of carriers in each category)

Row %		Q(1b) Cost is no issue when it comes to highway safety decisions at our company						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		2.7%	10.8%	6.8%	2.7%	17.6%	31.1%	28.4%
Liquid Gas		2.2%	6.7%	6.7%	6.7%	15.6%	28.9%	33.3%
Chemical		4.5%	6.8%	9.1%		13.6%	34.1%	31.8%
Paper Products		2.4%	2.4%	11.9%		9.5%	45.2%	28.6%
Dry Bulk		2.9%	5.9%	14.7%		11.8%	38.2%	26.5%
Size	Small	2.2%	2.2%	17.4%	6.5%	19.6%	21.7%	30.4%
	Medium		5.9%	9.8%	3.9%	19.6%	31.4%	29.4%
	Large	2.2%	13.0%	6.5%	2.2%	15.2%	34.8%	26.1%
Total		1.4%	7.0%	11.2%	4.2%	18.2%	29.4%	28.7%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002. Responses (#): Gen. Frt,74; Liq. Gas,45; Chem, 44; Paper, 42; Dry Blk,34; Small,46; Med,51; Lrg,46; Tot Size, 143

The third part of the initial question asked respondents about the relationship between customer service and safety performance. The specific question is: “Customer service and highway safety performance go hand-in-hand at our company.” This question received overwhelming agreement among the respondents. In fact, almost 57 percent strongly agree with it and an additional 31 percent agree with it (Table 8 below). The strength of support is nearly equal across all size groups and commodity categories.

Table 8: Level of Agreement with Statement that Customer Service Go Hand-in-Hand With Highway Safety Performance (Percent of carriers in each category)

Row %

		Q(1c) Customer service and highway safety performance go hand-in-hand at our company						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		1.3%		1.3%	1.3%	2.7%	33.3%	60.0%
Liquid Gas			2.2%	2.2%	4.4%	13.3%	20.0%	57.8%
Chemical		2.3%	2.3%	4.5%	4.5%	9.1%	22.7%	54.5%
Paper Products		2.4%		2.4%		7.1%	26.2%	61.9%
Dry Bulk				2.9%		5.9%	23.5%	67.6%
Size	Small		2.2%	2.2%	2.2%	8.7%	37.0%	47.8%
	Medium			1.9%	1.9%	3.8%	25.0%	67.3%
	Large	2.2%		2.2%	2.2%	6.5%	32.6%	54.3%
Total		.7%	.7%	2.1%	2.1%	6.3%	31.3%	56.9%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002. Responses (#): Gen. Frt,75; Liq. Gas,45; Chem, 44; Paper, 42; Dry Blk,34; Small,46; Med,52; Lrg,46; Tot Size, 144

The final part of the question probing a manager’s general commitment to safety in view of other priorities looked at the connection between employee relations and highway safety performance. The specific question asked whether the respondents agree with the statement “employee relations go hand-in-hand with highway safety performance at our company.” Once again, this question received overwhelming agreement among the respondents regardless of size or commodity group (Table 9 below).

Table 9: Level of Agreement with Statement that Employee Relations Go Hand-in-Hand With Highway Safety Performance (Percent of carriers in each category)

Row %

		Q(1d) Employee relations go hand-in-hand with highway safety performance at our company				
		Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		1.3%		6.7%	33.3%	58.7%
Liquid Gas		2.2%	4.4%	11.1%	17.8%	64.4%
Chemical		2.3%	2.3%	6.8%	27.3%	61.4%
Paper Products		2.4%	2.4%	4.8%	28.6%	61.9%
Dry Bulk		2.9%	2.9%	2.9%	20.6%	70.6%
Size	Small		4.3%	8.7%	34.8%	52.2%
	Medium			11.5%	34.6%	53.8%
	Large	2.2%	2.2%	2.2%	23.9%	69.6%
Total		.7%	2.1%	7.6%	31.3%	58.3%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002. Responses (#): Gen. Frt, 75; Liq. Gas, 45; Chem, 44; Paper, 42; Dry Blk, 34; Small, 46; Med, 41; Lrg, 46; Tot Size, 144

Communication of Safety Issues between Employees, Supervisors, and Managers

This fourth part of the initial question provided the transition to the second topic of this section: i.e., communication about safety matters between managers and employees. The specific issue is how free employees are to raise safety issues and how willing management is to listen to employee concerns. The second topic of the section is covered by a question with four parts.

The initial part of the second question asked managers how much they agreed with the following statement: “Our employees feel comfortable discussing highway safety issues with their supervisors.” Overall, 97 percent of the respondent carriers agree with this statement. These results are strong across all carrier size groups and all commodity groups (Table 10 below).

Table 10: Level of Agreement with Statement that Employees Feel Comfortable Discussing Highway Safety Issues (Percent of carriers in each category)

Row %		Q(2a) Our Employees feel comfortable discussing highway safety issues with their supervisors			
		Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		2.7%	5.3%	50.7%	41.3%
Liquid Gas		4.4%	11.1%	40.0%	44.4%
Chemical		4.5%	4.5%	50.0%	40.9%
Paper Products			2.4%	52.4%	45.2%
Dry Bulk		5.9%	5.9%	50.0%	38.2%
Size	Small	2.2%	13.0%	52.2%	32.6%
	Medium		3.8%	44.2%	51.9%
	Large	6.5%	4.3%	47.8%	41.3%
Total		2.8%	6.9%	47.9%	42.4%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland.

Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Responses (#): Gen. Frt, 75; Liq. Gas, 45; Chem, 44; Paper, 42; Dry Blk, 34; Small, 46; Med, 41; Lrg, 46; Tot Size, 144

The second part of this question probed the managers’ response to the following statement: “Many ideas about improving the firm’s highway safety comes from our employees.” Overall, 90 percent of the respondent carriers agreed with the statement (Table 11 below). However, among the small-sized carriers, 15 percent neither agree nor disagree with this statement. This percentage of carriers expressing a neutral point of view is higher for the small-sized carriers than it is for either the large-sized or medium-sized carriers.

Table 11: Level of Agreement with Statement that Many Ideas About Improving Highway Safety Come From Employees (Percent of carriers in each category)

Row %		Q(2b) Many ideas about improving the firm's highway safety come from our employees					
		Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight			1.3%	6.7%	14.7%	52.0%	25.3%
Liquid Gas				6.7%	22.2%	40.0%	31.1%
Chemical				4.5%	20.5%	45.5%	29.5%
Paper Products				2.4%	21.4%	35.7%	40.5%
Dry Bulk		2.9%		5.9%	26.5%	32.4%	32.4%
Size	Small	2.2%	2.2%	15.2%	21.7%	47.8%	10.9%
	Medium			3.8%	19.2%	48.1%	28.8%
	Large		2.2%	2.2%	19.6%	43.5%	32.6%
Total		.7%	1.4%	6.9%	20.1%	46.5%	24.3%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002. Responses (#): Gen. Frt, 75; Liq. Gas, 45; Chem, 44; Paper, 42; Dry Blk, 34; Small, 46; Med, 41; Lrg, 46; Tot Size, 144

The final two parts of this question indicated that an overwhelming portion of the respondents (over 90 percent) agree that management publicizes its safety concerns to the employees (Table 12 below) and that employees frequently voice their safety concerns to their supervisors (Table 13 below).

Table 12: Level of Agreement with Statement that Management's Highway Safety Concerns are Publicized Among Employees (Percent of carriers in each category)

Row %		Q(2c) Management's highway safety concerns are greatly publicized among our employees			
		Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		1.3%		45.3%	53.3%
Liquid Gas		4.4%	2.2%	44.4%	48.9%
Chemical		2.3%	2.3%	38.6%	56.8%
Paper Products		2.4%	2.4%	28.6%	66.7%
Dry Bulk			5.9%	29.4%	64.7%
Size	Small	4.3%	6.5%	47.8%	41.3%
	Medium	7.7%	3.8%	40.4%	48.1%
	Large			41.3%	58.7%
Total		4.2%	3.5%	43.1%	49.3%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002. Responses (#): Gen. Frt,75; Liq. Gas,45; Chem, 44; Paper, 42; Dry Blk,34; Small,46; Med,52; Lrg,46; Tot Size, 144

Table 13: Level of Agreement with Statement that Employees Frequently Voice Highway Safety Concerns to Supervisors (Percent of carriers in each category)

Row %

		(2d) Our employees frequently voice highway safety concerns to the immediate supervisors				
		Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight			4.0%	18.7%	50.7%	26.7%
Liquid Gas			4.4%	13.3%	53.3%	28.9%
Chemical		2.3%	2.3%	11.4%	59.1%	25.0%
Paper Products				11.9%	52.4%	35.7%
Dry Bulk		2.9%	5.9%	14.7%	47.1%	29.4%
Size	Small	4.3%	6.5%	19.6%	43.5%	26.1%
	Medium		3.8%	9.6%	59.6%	26.9%
	Large		6.5%	17.4%	47.8%	28.3%
Total		1.4%	5.6%	15.3%	50.7%	27.1%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Responses (#): Gen. Frt,75; Liq. Gas,45; Chem, 44; Paper, 42; Dry Blk,34; Small,46; Med,52; Lrg,46; Tot Size, 144

Overall, this section reveals that the safety performance leaders have a very strong verbal commitment to safety that prevails even in the face of strong economic pressures to control costs. Furthermore, managers see a strong linkage between customer service and safety performance. Within their companies, the safety leaders overwhelmingly attempt to create an atmosphere in which employees are free to raise safety concerns and there is open and continuous dialogue among employees, supervisors, and managers about safety issues.

SECTION 2: DRIVER HIRING PRACTICES

The second section of the questionnaire explores the driver hiring practices of the safety performance leaders. It addresses whether or not the respondent carriers employ the services of owner-operators and, if owner-operators are used, what share of their total drivers are owner-operators. It looks at a series of driver characteristics and asks carriers to evaluate the importance of each characteristic in the hiring decision (both for owner-operators and for company drivers). It probes carriers regarding the importance of a series of personality traits in their selection process. It also evaluates a set of hiring practices to see how effective each practice is in helping the company to assess the safety risk of the applicants. Finally, this section concludes by determining how clearly each of a set of safety-related criteria is stated in the company's written hiring policy.

Hiring Drivers: Frequency and Mix between Company Drivers and Owner-Operators

Table 14 below provides a distribution of the respondent carriers on the basis of the number of drivers hired on an annual basis. It shows that 47 percent of the respondents hire between one and ten drivers on an annual basis, while an additional 12 percent hire between 11 and 20 drivers. Thus, nearly 60 percent of the respondents hire twenty or fewer drivers annually. At the other extreme, just less than twelve percent of the respondents hire more than 100 drivers annually, with 5 percent hiring 250 or more on an annual basis. Not unexpectedly, 80 percent of

the small-sized carriers hire ten or fewer drivers annually, while an additional 11 percent hire between 11 and 20 drivers annually. On the basis of commodity group, the general freight carriers have the highest percentage hiring 200 or more drivers on an annual basis. Clearly, carrier size dictates the magnitude of drivers hired on an annual basis.

Table 14: Annual Number of Drivers Hired By Respondent Carriers

Row %		Q(3) Approximately how many drivers does your company hire each year									
		1-10	11-20	21-30	31-40	41-50	51-100	101-150	151-200	200-250	250+
General Freight		40.0%	10.7%	8.0%	4.0%	6.7%	10.7%	4.0%	1.3%	6.7%	8.0%
Liquid Gas		37.8%	13.3%	8.9%	4.4%	6.7%	22.2%	4.4%		2.2%	
Chemical		38.6%	6.8%	9.1%	4.5%	9.1%	18.2%	4.5%		6.8%	2.3%
Paper Products		52.4%	9.5%	7.1%	4.8%	4.8%	9.5%	2.4%		4.8%	4.8%
Dry Bulk		44.1%	8.8%	8.8%		8.8%	11.8%	5.9%		8.8%	2.9%
Size	Small	80.0%	11.1%	4.4%	2.2%					2.2%	
	Medium	44.2%	15.4%	13.5%	7.7%	5.8%	9.6%				3.8%
	Large	17.4%	8.7%	10.9%	6.5%	10.9%	15.2%	8.7%	2.2%	8.7%	10.9%
Total		46.9%	11.9%	9.8%	5.6%	5.6%	8.4%	2.8%	.7%	3.5%	4.9%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Responses (#): Gen. Frt,75; Liq. Gas,45; Chem, 44; Paper, 42; Dry Blk,34; Small,45; Med,52; Lrg,46; Tot Size, 143

A fundamental question faced by carriers in their driver hiring policies is the mix between owner-operator and company employee drivers. This is a fundamental decision reflecting basic carrier attitude about managing a workforce. There are significant advantages and disadvantages associated with the decision to hire all owner-operators, all company drivers, or a mix of both types of drivers. One of the fundamental attractions of hiring owner-operators is the flexibility they provide to management. During a period of economic uncertainty or significant variability in demand, owner-operators provide management with some flexibility in being able to expand capacity quickly without having a continuing commitment to pay salaries and benefits. The carrier only pays the owner-operator on the basis of trips handled. However, this flexibility comes at a price. There are issues of owner-operator availability at the time the manager would like to add capacity as well as the general issue that owner-operators like their independence and can move quickly from carrier to carrier as the situation dictates. This uncertainty and greater challenge in control are fundamental reasons that some managers will not hire any owner-operators. These managers prefer employee drivers over whom they have greater control. Obviously, this ability to have more control comes at a price. The employee driver will have benefits and insurance and limits the manager's ability to increase and decrease capacity based on economic upturns or downturns, respectively.

Table 15 below indicates that 54 percent of the respondent carriers do not have a policy against hiring owner-operator drivers. This percentage ranges from a high of 63 among the general freight carriers and 62 among the large-sized carriers to a low of 48 among the medium-sized carriers and 55 percent among Liquid Gas carriers. Table 16 below indicates that among the respondent carriers who do not have a policy against hiring owner operators, 33 percent report that they do not hire owner-operators and 33 percent hire 10 percent or more of their drivers as owner-operators. The dry bulk commodity category and large-sized carriers hire close to 80 percent of their drivers as owner operators.

Table 15: Policy Toward Hiring Owner Operators (Percent of carriers in each category)

Row %

		Q(5) Does your company have a policy that does not allow it to hire owner operators	
		yes	no
General Freight		37.3%	62.7%
Liquid Gas		45.5%	54.5%
Chemical		39.5%	60.5%
Paper Products		43.6%	56.4%
Dry Bulk		42.4%	57.6%
Size	Small	47.7%	52.3%
	Medium	51.9%	48.1%
	Large	37.8%	62.2%
Total		46.1%	53.9%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002. Responses (#): Gen. Frt,75; Liq. Gas,44; Chem, 43; Paper, 39; Dry Blk,33; Small,44; Med,52; Lrg,45; Tot Size, 141

Table 16: Percentage of Drivers Hired Who Are Owner Operators (Percent of carriers in each category)

Row %

		Q(6) Approx what percent of the drivers that your company hires each year are owner-operators					
		zero	1-10	11-20	31-40	41-50	50+
General Freight		30.0%	30.0%	10.0%	2.0%	10.0%	18.0%
Liquid Gas		27.3%	45.5%	9.1%		4.5%	13.6%
Chemical		37.5%	29.2%	12.5%	4.2%	4.2%	12.5%
Paper Products		22.7%	36.4%	9.1%	4.5%	9.1%	18.2%
Dry Bulk		21.1%	42.1%	5.3%	5.3%	5.3%	21.1%
Size	Small	44.0%	28.0%	12.0%			16.0%
	Medium	33.3%	41.7%	4.2%		12.5%	8.3%
	Large	22.6%	35.5%	6.5%	3.2%	16.1%	16.1%
Total		32.5%	35.0%	7.5%	1.3%	10.0%	13.8%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002. Responses (#): Gen. Frt,50; Liq. Gas,22; Chem, 24; Paper, 22; Dry Blk,19; Small,25; Med,24; Lrg,31; Tot Size, 80

Among the carriers that do hire owner-operators, 52 percent hire 10 percent or less of drivers as owner operators and only 20 percent hire 50 percent or more of their drivers on an annual basis as owner-operators. However, among the general freight carriers who do hire owner-operators, 26 percent hire 50 percent or more of their drivers as owner-operators.

Driver Characteristics

The second section of the questionnaire probed the best practice carriers concerning the importance of selected driver characteristics in their hiring decisions. Tables 17 and 18 below combine important and very important responses for each characteristic and summarize the results for all carrier respondents as well as for respondents disaggregated by size and commodity type. In all, respondents were asked to evaluate the importance of ten driver characteristics ranging from age to past driving experience and driving record. Table 17 relates to employee drivers while Table 18 focuses on the owner-operator driver.

**Table 17. Importance of Selected Driver Characteristics in Hiring Decisions – Company Drivers
(Percent of carriers in each category who responded with “Important” or “Very Important”)**

Characteristic	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
Age: 21-25	48.9	41.3	45.1	61.3	56.8	51.1	54.8	51.3	50.0
Age: 25+	58.8	47.9	62.9	65.2	59.8	68.9	63.7	60.5	65.8
Professional Truck Driver School	30.5	25.5	32.1	34.1	38.2	33.3	46.4	41.8	37.2
Driving Experience with other Carriers	85.0	80.8	83.3	91.3	88.3	84.5	86.3	86.1	82.9
No Chargeable Crashes	92.6	87.5	94.5	95.7	94.8	93.4	93.2	97.7	97.1
No Prior Dismissals for Alcohol & Drugs	96.0	91.6	96.3	100.0	97.4	95.5	95.5	97.6	100.0
No Prior Speeding Tickets	74.4	62.5	81.5	78.3	74.1	82.2	79.6	79.0	77.2
No Prior Traffic Violation Convictions	73.0	60.4	79.6	78.3	72.8	80.0	77.3	76.8	71.4
Recommendation From Other Carriers	65.8	63.9	66.7	66.7	67.6	62.8	66.7	62.8	57.1
Solo Driving Experience	71.9	70.2	71.7	73.9	75.4	68.9	70.4	72.1	65.7

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Table 18. Importance of Selected Driver Characteristics in Hiring Decisions – Owner Operators
(Percent of carriers in each category who responded with “Important” or “Very Important”)

Characteristic	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
Age: 21-25	60.9	52.7	52.6	73.1	72.5	56.3	70.0	73.7	50.0
Age: 25+	69.1	55.0	66.7	81.4	69.8	83.4	81.0	80.0	66.7
Professional Truck Driver School	43.1	35.0	40.0	52.0	56.1	37.5	61.1	63.2	41.2
Driving Experience with other Carriers	89.1	75.0	95.2	96.2	88.1	100.0	100.0	90.0	88.9
No Chargeable Carriers	92.6	90.0	90.5	96.3	95.3	100.0	100.0	95.0	94.4
No Prior Dismissals for Alcohol & Drugs	97.0	95.0	100.0	96.3	97.7	100.0	100.0	95.0	100.0
No Prior Speeding Tickets	69.1	55.0	76.2	74.0	67.5	88.8	80.9	60.0	66.6
No Prior Traffic Violation Convictions	69.1	60.0	71.5	74.0	67.4	94.5	85.7	60.0	72.2
Recommendation From Other Carriers	64.2	55.0	57.1	77.0	71.5	76.5	85.0	75.0	50.0
Solo Driving Experience	73.2	65.0	71.4	80.8	73.9	76.5	75.0	70.0	55.5

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Overall, over 90 percent of the respondents said that the following characteristics were either important or very important in the selection process for employee drivers: a driving record with no prior dismissals for both alcohol or drug violations and a driving record without any chargeable crashes. The third most important characteristic for employee driver selection involves an individual’s driving experience with other carriers. Eighty-five percent of the respondents viewed this characteristic as either important or very important in the selection process. It is very important to note that the three most important characteristics all involve an analysis of the individual’s past driving performance with a special emphasis on the avoidance of dismissals for alcohol or drugs and the absence of any chargeable crashes. Among the

respondents, a slightly higher percentage of the large-sized carriers than of the medium-sized or small carriers view these three characteristics as important or very important. Furthermore, dry bulk carriers, paper product carriers, and general freight carriers have a slightly higher percentage of their carriers compared to the percentage of liquid gas or chemical carriers viewing these three characteristics as important or very important.

The second tier of important characteristics in selecting the employee driver also deals with the candidate's past driving record. Specifically, the fourth, fifth, and sixth most important driver characteristics involve: no prior speeding tickets, no prior traffic violation convictions, and evidence of solo driving experience. Specifically, 74 percent of all respondents said that an employee candidate having no prior speeding tickets is an important or very important characteristic in the selection process. The comparable percentage for the importance of having no prior traffic violation is 73 and the percentage for the importance of having some solo driving experience is 72 percent.

The four remaining driver characteristics divide into two groups: those that are considered important or very important by 50 percent or more of the respondents and those that are considered important or very important by less than 50 percent of the respondents. The former group consists of the following characteristics: a recommendation from another carrier and a candidate's age of 25 or more. The latter group consists of the following characteristics: candidate's age between 21 and 25 and completion of a professional truck driver-training program.

Approximately 66 percent of all respondents said that having a recommendation from another carrier about a prospective employee driver is an important or very important consideration in the selection process. Approximately, 59 percent said that having a candidate at least 25 years of age is an important or very important consideration in the selection process. The age criterion seemed to be of particular importance for the largest-sized carriers and for the liquid gas and dry bulk carriers.

The only two characteristics not considered as important or very important by at least half of the respondent carriers are: candidates in the 21 to 25 age bracket and candidates with certificates to show they had completed a certified training program. However, over 60 percent of the largest-sized carriers viewed the 21-25-age bracket criterion as an important or very important one in contrast to the overall perception of the importance of this criterion. Also, 46 percent of the chemical carriers view a candidate's completion of a professional driver training program as important or very important in the selection process.

Overall, the six leading characteristics in the employee driver selection process all involve an analysis of a prospective employee's past driving record. It should be emphasized, however, that these results do not mean carriers will not hire any prospective employees if they have a prior speeding ticket or traffic violation conviction. All that is being presented here is that the best practice carriers regard these driving record components as important or very important in the selection process.

Table 18 above focuses on the driver characteristics for the owner-operator driver. Overall, the results are quite consistent with the identification of important characteristics in the selection of employee drivers. The three characteristics identified as being important or very

important by the highest percentage of carriers in the selection of owner-operators are the same characteristics that are important or very important by the highest percentage of carriers in selecting an employee driver: no prior dismissals for alcohol or drugs, no chargeable crashes, and driving experience with other carriers. The second tier of important characteristics in selecting the owner-operator driver has four components: evidence of solo driving experience, no prior speeding tickets, no prior traffic violation convictions, and being in the 25 and over age bracket. The second tier of important characteristics for the owner-operators versus the employee drivers includes the age 25 or above characteristic which fell into the third tier of importance in selecting the employee driver. The characteristic considered important or very important by the lowest percentage of carriers in selecting owner-operators is the same characteristic considered important or very important by the lowest percentage of carriers in selecting company drivers: i.e., completion of a professional truck driving school.

In selecting owner-operator drivers, a higher percentage of the large-sized carriers than of all carriers overall view the stated characteristics as important or very important in selecting owner-operator drivers. Thus, for nine of the ten characteristics, the percentage of the large-sized carriers viewing a particular characteristic as important or very important exceeds the percentage of all carrier respondents viewing the characteristics as important or very important in the owner-operator selection process. Similarly, a higher percentage of the liquid gas and chemical carriers than of all carrier respondents view these characteristics as important or very important in the owner-operator selection process. Specifically, a higher percentage of liquid gas carriers than of all respondents view eight of the ten characteristics as being important or very important. A higher percentage of chemical carriers than of all respondents view all ten characteristics as being important or very important in the owner-operator selection process.

Driver Personality Traits

Table 19 below focuses on a set of personality traits that employers might use to evaluate candidates for the driver position. The question asked the respondent motor carriers to rate whether each set of personality traits is important in their decision to hire drivers. Table 19 shows the percentage of carriers who said each characteristic was either important or very important in the driver hiring decision. Overall results in Table 19 are disaggregated based on carrier size and commodity type.

**Table 19. Importance of Driver Personality Traits in Decision to Hire
(Percent of carriers in each category who responded with
“Important” or “Very Important”)**

Characteristic	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
Honest	99.3	97.9	100.0	100.0	100.0	97.7	97.7	100.0	100.0
Patient	88.4	85.2	88.8	90.1	88.1	86.3	88.3	90.7	91.1
Reliable	99.3	100.0	98.2	100.0	100.0	97.8	100.0	100.0	100.0
Self-Disciplined	93.9	89.6	94.5	97.8	96.1	91.1	90.9	93.1	94.3
Self-Motivated	90.5	87.5	92.6	91.3	89.6	91.1	90.9	93.0	97.2
Sociable	58.1	50.0	57.4	67.4	58.4	60.0	63.7	65.1	71.4

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Based on the results shown in Table 19 there are two characteristics viewed as important or very important by almost all carriers, regardless of size or commodity type. These characteristics are: honesty and reliability. It seems above all else carriers expect their drivers to be honest and reliable. It is not hard to understand why these particular characteristics are the ones most frequently mentioned as important or very important. Drivers are on the road and not on a job site. As a result, the employer needs to be able to count on the driver’s reliability. The employer needs to feel certain that the driver will be where he or she is supposed to be and at the designated time. Furthermore, the driver has direct contact with the shipper and handles valuable commodities in transit. Hence, honesty becomes a critical factor as well.

Two characteristics that are close in importance to honesty and reliability are: self-discipline and self-motivation. Approximately 94 percent of the carriers indicated that self-discipline is an important or very important personality trait to look for in hiring a driver and about 91 percent indicated that self-motivation is an important or very important personality trait. Drivers often find themselves in difficult situations in which they might be blamed for things that are not their fault, but because they are representing the carrier to the customer, they might have to bear the brunt of customer dissatisfaction. Drivers who are capable of exercising self-discipline have advantages in dealing with difficult situations. Indeed, 88 percent of the carriers

suggested that patience is an important or very important personality trait to look for in hiring drivers.

The only listed personality trait that didn't resonate with an overwhelming majority of the carriers is sociability. Only 58 percent of the respondent carriers said that this trait is important or very important in the driver selection process. It should be noted, however, that 67 percent of the large-sized carriers and 71 percent of the dry bulk carriers viewed this trait as important or very important.

Hiring Practices for Assessing the Safety Risk of Driver Applicants

The questionnaire presented the managers with a series of hiring practices and asked them to evaluate the effectiveness of each practice in helping their company assess the safety risk of driver applicants. The practices ranged from drug testing to records checks to job interviews. Table 20 below presents the results of the answers of the best practice carriers to this question. Specifically, Table 20 presents the percentage of all carriers who viewed each of the hiring practices as effective or very effective in helping them assess the safety risk of potential driver candidates. Table 20 breaks out the results by carrier size and type of commodity as well.

Table 20. Effectiveness of Selected Hiring Practices in Assessing Driver Safety Risk (Percent of carriers in each category who responded with “Effective” or “Very Effective”)

Characteristic	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
DOT/Fit for Work Physical	73.6	64.6	75.9	80.4	70.2	75.5	70.5	72.1	74.3
Drug Testing	92.5	87.5	94.5	95.5	93.4	93.2	88.4	88.4	87.5
Follow-up on Previous Employment	65.5	64.6	57.4	76.1	68.9	60.0	63.6	55.8	42.9
Job Interview	87.7	87.5	90.6	84.5	82.9	88.9	84.1	83.8	91.4
License Qualification Check	88.4	79.2	92.4	93.5	84.5	93.3	86.3	83.7	80.0
Reference Check	62.2	60.4	61.1	65.3	62.4	66.7	61.4	60.5	54.3
Test Drive	90.6	77.1	100.0	93.5	90.9	93.4	90.9	88.4	85.7
Traffic Record Check	94.0	89.6	96.3	95.7	92.2	95.6	90.9	95.3	91.4

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

There are three practices that ninety percent or more of the carriers view as effective or very effective in assessing safety risk of driver applicants. These practices are: drug testing, a test drive to observe applicant's on-the-road behavior, and a traffic records check. A second tier of practices viewed as effective or very effective by 80 percent of the respondent carriers are: a job interview and a license qualification check. The third tier of effective practices, mentioned as effective or very effective by fewer than 74 percent of the carriers are: DOT physical, follow-up on previous employment record, and reference checks.

Among the carriers, a higher percentage of the large-sized carriers than of the medium-sized and small-sized carriers view these practices as effective or very effective in helping them to assess the safety risk of the applicants. In fact, a higher percentage of the large-sized carriers than of all carriers overall view seven of the eight hiring practices as effective in the assessment process. A higher percentage of the liquid gas carriers than of all carriers overall view seven of these eight practices as effective or very effective in assessing driver safety risk.

Statements of Safety Related Criteria in Written Policies

The questionnaire included an item regarding how clearly carriers state a set of safety-related criteria in their written policies regarding hiring. Obviously, if carriers were going to base hiring decisions on applicants meeting specific criteria, it would be helpful if these criteria or thresholds were clearly stated in written guidelines. This question asked carriers how clearly their written guidelines state criteria concerning the following safety matters: the number of crashes that can disqualify applicants, the number of moving violations that can disqualify an applicant, whether the applicant's driving record will be reviewed; and whether an applicant's participation in a training program is a pre-condition for consideration or whether the training program is a requirement after hiring.

Table 21 below presents the results of this question on the basis of the percentage of carriers who clearly or very clearly state each of the safety related criteria in their written hiring policies. The results are presented for all carriers taken together and are broken out by carrier size and major commodity carried. Over 97 percent of the carriers indicate that their hiring policies clearly or very clearly state that an applicant's driving record will be reviewed prior to consideration for employment. The second most clearly stated safety criterion is the number of moving violations that would disqualify a candidate as an applicant. Seventy-seven percent of the respondent carriers indicated that their written hiring policy clearly or very clearly stated the number of moving violations that would disqualify a candidate as an applicant. Furthermore, seventy percent of the carriers said that their written hiring policy also clearly or very clearly stated the number of crashes that would disqualify an applicant from a job consideration. Almost two-thirds of the carriers said that their written policies clearly or very clearly stated that candidates would have to participate in a driver training program after being hired, but only one-third of the carriers said that their written policies required drivers to have completed a training course as a pre-condition for being hired.

**Table 21. Clarity of Safety Criteria in Written Hiring Policies
(Percent of carriers in each category who responded with “Clearly” or “Very Clearly”)**

Characteristic	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
# of Crashes that Disqualify Applicant	70.4	38.1	78.4	80.0	77.8	71.0	66.7	70.4	68.2
# of Violations that Disqualify Applicant	77.0	50.0	81.6	87.5	80.0	80.7	72.8	74.1	81.8
Required Review of Driving Record	97.1	95.6	100.0	100.0	96.4	100.0	97.0	96.4	95.6
Requirement for Safety Course Before Hiring	33.7	31.6	39.4	29.7	35.3	48.1	40.0	34.8	30.0
Requirement for Safety Course After Hiring	66.3	47.6	76.3	66.7	63.6	68.9	68.8	61.6	66.6

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Overall, a higher percentage of the large-size carriers than of carriers overall included these safety-related criteria clearly or very clearly in their written hiring policies. Specifically on all criteria with the exception of the requirement that a candidate complete a training course prior to being considered, a higher percentage of the large-sized carriers than of all the carriers together clearly or very clearly stated the criteria in their written policies.

SECTION 3: DRIVER TRAINING PRACTICES

The third section of the questionnaire queried carrier senior management about pre-service and in-service training programs. Senior management responded to questions about duration of training programs, subjects covered, training venues, evaluation methods, outsourcing policies, and general attitudes toward training and how it relates to their safety management goals. The results suggest that pre and in-service training programs for employees and owner operators are strategic safety investments for companies. Close to 90 percent of all carriers require training programs; the majority of which require 1-2 weeks of training. The results also indicate that employees appreciate the relevance of training programs and their

importance in maintaining safe carrier performance. This section is broken down into the following three subsections: Existence and Amount of Pre- and In-Service Training; Training Content, Venue, Evaluation Methods, and Use of Company Personnel as Trainers; and Value of Training and Its Effectiveness.

Existence and Amount of Pre- and In-Service Training

Table 22 below provides a distribution of respondent carriers broken down by carrier size and commodity type based on their requirements for both pre- and in-service driver training for company drivers. Table 23 below focuses on the length of the pre-service driver training programs initiated by the carriers for company drivers. Finally, Table 24 below looks at the pre- and in-service driver training programs for owner-operators among the set of carriers who hire owner-operators.

Table 22. Requirements for Pre- and In-Service Training for Company Drivers (Percent of carriers in each category)

		Required Pre-Service Training			Required In-Service Training		
		Yes	No	N/A	Yes	No	N/A
Commodity Group	General Freight	84.4	11.7	3.9	88.2	9.2	2.6
	Liquid Gas	88.9	4.4	6.7	93.3	2.2	4.4
	Chemical	88.6	9.1	2.3	95.5	2.3	2.3
	Paper Products	83.7	9.3	7.0	86.0	7.0	7.0
	Dry Bulk	80.0	14.3	5.7	85.7	8.6	5.7
Size	Small	70.8	20.8	8.3	74.5	21.3	4.3
	Medium	90.7	7.4	1.9	94.4	1.9	3.7
	Large	87.0	6.5	6.5	91.3	4.3	4.3
	Total	83.1	11.5	5.4	87.1	8.8	4.1

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

**Table 23. Number of Weeks of Pre-Service Training for Company Drivers
(Percent of carriers in each category)**

Row %		13a) # of weeks of pre-service training required? Drivers who are company employees						
		0	0	1-2	3-4	5-6	7-8	over 8
General Freight			24.2%	50.0%	16.7%	6.1%	1.5%	1.5%
Liquid Gas		2.5%	12.5%	62.5%	20.0%			2.5%
Chemical			18.4%	55.3%	18.4%	5.3%		2.6%
Paper Products			21.6%	48.6%	18.9%	8.1%		2.7%
Dry Bulk			25.0%	60.7%	7.1%	3.6%		3.6%
Size	Small	2.8%	22.2%	55.6%	11.1%	8.3%		
	Medium		24.5%	44.9%	16.3%	10.2%	2.0%	2.0%
	Large		17.9%	61.5%	20.5%			
Total		.8%	21.8%	53.2%	16.1%	6.5%	.8%	.8%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Responses (#): Gen. Frt, 66; Liq. Gas, 40; Chem, 38; Paper, 37; Dry Blk, 28; Small, 36; Med, 49; Lrg, 39; Tot Size, 124

As shown in Table 22, 83 percent of all respondent carriers require pre-service training for drivers who are employees. This is consistent across the top commodity category groups. However, small carriers are somewhat less likely (71 percent) than medium-sized or large-sized carriers to require pre-service training of their employees. Of the carriers that do require pre-service training, results in Table 23 show that 22 percent of the carriers require less than 1 week for pre-service training, 53 percent require 1-2 weeks, 16 percent require 3-4 weeks, and slightly more than 8 percent require a pre-service training program of five or more weeks.

Results displayed in Table 22 also show how extensive in-service training is among the respondent carriers. A slightly higher percentage of the respondents require in-service training compared to the percentage that require pre-service training. In fact, 87 percent of the respondent carriers require in-service training for their employee drivers. The percentage of liquid gas and chemical carrier groups requiring in-service training are higher than the percentage of all carriers combined that require such training. Indeed, 93 percent of the liquid gas and 96 percent of the chemical carriers require in-service training for employee drivers. Furthermore, the portion of medium-sized and large-sized carriers requiring in-service training for employee drivers exceeds 90 percent.

Table 24 focuses on the pre-and in-service training programs for owner-operators among the group of carriers who hire owner-operators (as determined in the previous section). Among the carriers who hire owner-operators, 80 percent require a pre-service training program for the owner-operators, while 89 percent require an in-service program for them. However, small carriers hiring owner-operators are less likely to require pre-service and in-service training than are either medium-sized or large-sized carriers. Liquid gas and chemical carriers are the carrier groups most likely to require both pre-service and in-service training programs for the owner-operator drivers. Of the carriers who hire owner-operators and have pre-service training programs, 51 percent require less than 1 week and an additional 41 percent require between 1-2 weeks of pre-service training.

Table 24: Pre- and In-Service Training Programs for Owner-Operators: Distribution of Carriers Who Hire Owner-Operators by Commodity Type and Carrier Size

Category		# of Carriers	% of Total	Required Pre-Service Training		Required In-Service Training	
				# of Carriers	% of Total	# of Carriers	% of Total
Commodity	General Freight	35	65%	28	80%	30	86%
	Liquid Gas	16	30%	15	94%	16	100%
	Chemical	15	28%	16	100%	19	100%
	Paper	17	31%	12	71%	12	71%
	Dry Bulk	15	28%	11	73%	15	100%
Size	Small	14	26	5	57%	11	79%
	Medium	16	30	14	88%	15	94%
	Large	24	44	21	88%	22	92%
	Total	54	100	43	80%	48	89%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Training: Content, Venue, Evaluation Methods, and Use of Company Personnel as Trainers

Once carriers have initiated training programs, they face a series of decisions about that training. Carriers must develop content for the training as well as venues for the delivery of that content (classroom versus in-vehicle, etc.). Furthermore, the carriers must develop procedures in order to evaluate whether the drivers have retained the course content. Finally, carriers must decide on who will deliver the course content—i.e., do they outsource the education function to professionals or use company personnel. This subsection provides the responses from the set of respondents to these important questions.

Table 25 below presents a series of topics to be covered during both pre- and in-service training and reports on the percentage of carriers overall and by size group who include each of the topics in their training. Over 90 percent of the respondent carriers overall incorporate the following subjects in their pre-service training for employees: accident notification, dispatch procedures, driver disciplinary policies, federal safety regulations, hours-of-service regulations, post-trip inspections, and pre-trip inspections. Over 90 percent of the respondent carriers overall incorporate the following subjects in their in-service training: accident notification, federal safety regulations, hours-of-service regulations, and pre- and post-trip inspections. Topics that are covered during pre-service and in-service training by less than one-third of the carriers are: CPR training, first-aid training, and team driving training.

**Table 25. Coverage of Topics in Pre - and In-Service Training
(Percent of carriers in each category)**

Topic	Pre-Service Percent of Firms Covering Topic				In-Service Percent of Firms Covering Topic			
	Overall	Small	Med.	Large	Overall	Small	Med.	Large
Accident Notification	95.0	93.9	93.6	97.6	91.5	88.2	92.9	92.7
CPR Training	3.4	6.3	0.0	4.9	11.0	14.7	6.7	12.8
Defensive Driving	80.2	77.4	77.8	85.0	87.4	73.5	93.3	92.5
Dispatch Procedures	91.7	84.8	95.7	92.7	81.7	83.9	81.8	80.0
Driver Disciplinary Policies	91.7	84.8	93.6	95.1	84.5	80.6	88.6	82.9
Federal Safety Regulations	95.0	88.2	97.8	97.6	93.1	87.1	93.2	97.6
First-aid training	9.2	14.3	4.5	9.8	21.2	21.9	23.9	17.5
Hazardous Materials Handling	60.8	47.1	64.4	68.3	67.5	48.3	70.5	78.0
Hours-of-Service Regulations	95.1	91.2	95.7	97.6	92.2	83.9	95.5	95.1
Injury Prevention	77.7	69.7	80.9	80.5	83.6	77.4	91.1	80.0
Post-trip Inspections	93.4	87.9	95.7	95.2	92.3	90.6	95.6	90.0
Pre-trip Inspections	95.1	90.9	95.7	97.6	93.1	90.6	93.2	95.0
Team Driving Training	23.5	25.0	25.6	20.0	29.7	34.5	28.6	27.5
Truck Maintenance	68.9	66.7	67.4	72.5	70.2	66.7	71.1	71.8

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

In general, a lower percentage of the small-sized carriers in comparison to the medium-sized and large-sized carriers cover each of the listed topics during both pre- and in-service training. However, the

percentage of medium-sized and large-sized firms including each of the topics in their training is quite similar. The overall conclusion is that carriers include a broad array of topics in both pre- and in-service training. There seems to an overwhelming emphasis in both pre- and in-service training on the topics dealing directly with the regulatory environment—i.e., hours-of-service regulations, accident notification, and general safety regulations.

Tables 26 and 27 below address the issue of training venue for both pre-and in-service training for drivers. As shown, the highest percentage of carriers for both pre- and in-service training rely on in-vehicle, on-road training. Indeed, over 88 percent of all respondents use this venue for their pre-service training, while 86 percent use it for their in-service driver training. The second most popular venue for training is the classroom with 77 percent of all respondents indicating their use of the classroom for pre-service training and 81 percent using it for in-service training as well. The least popular venue for training is in-vehicle, off-road. Approximately, 69 percent of all respondents used an in-vehicle, off-road venue for pre-service training and 67 percent used it for in-service training.

**Table 26. Training Venues for Pre - and In-Service Training
(Percent of carriers in each category)**

Venue	Pre-Service Percent of Firms Using Venue				In-Service Percent of Firms Using Venue			
	Overall	Small	Med.	Large	Overall	Small	Med.	Large
Classroom	77.0	58.8	78.7	90.2	81.2	60.0	85.1	92.5
In-vehicle, off road	68.6	56.3	68.1	79.5	67.0	71.9	57.1	74.3
In-vehicle, on-road	82.8	81.3	89.6	92.7	85.7	91.2	80.0	87.5

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

**Table 27. Length of Pre-Service Training By Venue
(Percent of carriers in each category)**

Venue	Percent of Firms With Two (2) Weeks or Fewer of Training			
	Overall	Small	Med.	Large
Classroom	98.5	97.0	97.8	100.0
In-vehicle, off road	92.5	94.1	89.2	95.0
In-vehicle, on-road	85.6	85.3	69.5	85.7

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

These patterns are common across the various carrier size groups. However, among the small-sized carriers for in-service driver training, a higher percentage of the small-sized carriers used the in-vehicle, off road option versus the classroom option in contrast to the overall pattern and the pattern for both medium-sized and large-sized carriers. Indeed, 72 percent of the small-sized carriers used the in-vehicle, off road venue, while only 60 percent used the classroom venue for in-service driver training.

Table 27 addresses the issue of length of pre-service driver training by venue. It shows that, overwhelmingly, carriers train for two weeks or fewer in each of the three venues: classroom; in-vehicle, off-road; and in-vehicle, on-road. Indeed, 99 percent of the carriers report a classroom training experience for pre-service training of two or fewer weeks. The comparable percentage for the in-vehicle, off-road option is 93 percent, while it is 86 percent for the in-vehicle, on-road options. If carriers do have longer programs, the highest percentage involves the in-vehicle, on-road option. There appears to be no major variations in patterns based on carrier size.

Table 28 below presents information on the training methods used by the respondent carriers to evaluate both their pre-service and in-service driver training. Consistent with training venue preferences, the highest percentage of carriers uses in-vehicle, on the road tests to evaluate both their pre-service and in-service training. Indeed, nearly 83 percent of all respondent carriers use this evaluation method for pre-service training and 74 percent use it for in-service training. It is the most popular training evaluation method regardless of carrier size. The second most frequently mentioned evaluation method, selected by 63 percent of the carriers for pre-service training and 61 percent for in-service training, is the oral classroom exam. Closely following this method in frequency of use is the written classroom exam. Nearly 61 percent of all respondents for pre-service training and almost 59 percent for in-service training select this method.

Table 28. Training Evaluation Methods (Percent of carriers in each category)

Method	Pre-Service Percent of Firms Using Method				In-Service Percent of Firms Using Method			
	Overall	Small	Med.	Large	Overall	Small	Med.	Large
Computer-Assisted Exams	9.9	0.0	11.1	16.7	12.5	3.0	10.6	22.5
Internet-based Exams	3.3	3.0	4.4	2.4	5.1	3.1	8.7	2.5
In-vehicle, off-road	57.9	44.1	58.7	68.3	49.2	50.0	47.9	50.0
In-vehicle, on-road	82.8	79.4	85.1	82.9	74.4	81.8	69.4	73.2
Oral Classroom Exam	62.9	50.0	59.1	77.5	60.7	50.0	57.1	73.2
Questionnaire	53.4	43.8	42.2	73.2	52.5	40.6	50.0	65.0
Written Classroom Exam	60.7	41.9	60.0	75.5	58.5	33.3	58.3	77.5

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Over half of the respondents selected in-vehicle, off-road tests and questionnaires as methods used for training evaluation. Specifically, nearly 58 percent of the carriers use in-vehicle, off-road training, while 53 percent administer questionnaires to evaluate their pre-service training program. The comparable percentages for these methods to evaluate in-service training are 49 and 53 percent. These results are fairly consistent across the various carrier size groups.

The questionnaire asked the frequency with which carriers use either computer-assisted or internet-based exams to evaluate their drivers. Results in Table 28 demonstrate that only a small minority of the carriers uses these methods. Indeed, only 10 percent of the carriers use computer-assisted exams to evaluate pre-service training, while 13 percent use them to evaluate in-service training. The frequency with which computer-assisted exams are used decreases among the small-sized carriers.

As shown in Table 29 below, overwhelmingly, the respondent group of carriers runs their pre- and in-service training programs entirely with company personnel. In fact, 88 percent of all respondents

run their pre-service training entirely with company personnel. The percentage using company personnel entirely ranges from a low of 86 percent among the medium-sized carriers to a high of 91 percent among the small-sized carriers. Focusing on commodity type, the percentages range from a low of 83 percent for chemical haulers to 90 percent among the liquid gas carriers.

Table 29. Outsourcing of the Training Function (Percent of carriers in each category)

Row %		Q(19a) Run entirely by your company's personnel? Pre-service training programs	
		yes	no
General Freight		89.7%	10.3%
Liquid Gas		90.2%	9.8%
Chemical		82.5%	17.5%
Paper Products		89.5%	10.5%
Dry Bulk		82.8%	17.2%
Size	Small	91.4%	8.6%
	Medium	85.7%	14.3%
	Large	88.4%	11.6%
Total		88.2%	11.8%

Row %		Q(19b) Run entirely by your company's personnel? In-service training programs	
		yes	no
General Freight		77.5%	22.5%
Liquid Gas		76.7%	23.3%
Chemical		70.7%	29.3%
Paper Products		72.5%	27.5%
Dry Bulk		75.0%	25.0%
Size	Small	77.8%	22.2%
	Medium	74.5%	25.5%
	Large	77.3%	22.7%
Total		76.3%	23.7%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Responses (#):

Pre-service: Gen. Frt, 68 ; Liq. Gas, 41 ; Chem, 40 ; Paper, 38 ; Dry Blk, 29 ; Small, 35 ; Med, 49 ; Lrg, 43 ; Tot Size, 127

In-service: Gen. Frt, 71 ; Liq. Gas, 43 ; Chem, 41 ; Paper, 40 ; Dry Blk, 32 ; Small, 36 ; Med, 51 ; Lrg, 44 ; Tot Size, 131

Regarding in-service training, there is somewhat more use of non-company personnel in training. In fact, overall 24 percent of the carriers use some instructors outside of company personnel for in-service training. The use of outside personnel ranges from 22 percent among the small-sized carriers to 26 percent among the medium-sized carriers. Based on commodity type, the percentage use of outside personnel for training ranges from a low of 23 for general freight carriers to a high of 29 for the chemical carriers.

Value of Training and Its Effectiveness

In the final portion of this section, the questionnaire asked the managers to evaluate the importance of driver training and to make comparisons between pre-service and in-service training. The general focus of these questions is to determine management's perception of the importance of the driver training function in meeting overall safety goals. Tables 30 through 32 capture the results of these questions.

Managers were asked about their level of agreement with three statements about both pre-service and in-service training programs. Table 30 below summarizes the respondent carriers' answers to these questions. The percentage of respondent carriers overall as well as the percentage of individual sub-groups of respondents based on carrier size and commodity group are shown in Table 30. The managers were initially asked if they considered pre-service and in-service driver training to be a strategic safety investment. Overwhelmingly, the respondent carriers agreed or strongly agreed with this statement. About 88 percent of all carriers agreed that pre-service driver training is a strategic safety investment. This percentage rose to 90 when carriers were asked about their in-service driver training. Over three-

fourth of all carrier sub-groups, based on size or commodity group, agreed or strongly agreed that both pre- and in-service driver training is a strategic safety investment.

Table 30. Evaluation of Importance of Driver Training (Percent of carriers in each category who responded with “Agree” or “Strongly Agree”)

Evaluation Statement	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
Our company considers pre-service driver training a strategic safety investment	87.5	77.8	91.8	90.7	88.6	100.0	95.0	92.4	83.3
Our company considers in-service driver training a strategic safety investment	90.0	80.0	94.1	93.2	93.0	92.8	87.5	85.0	84.4
Our company spends more on pre-service driver training than do most carriers	31.8	17.2	34.7	40.5	31.8	50.0	48.7	23.0	27.6
Our company spends more on in-service driver training than do most carriers	46.1	25.0	51.0	58.1	44.3	57.2	62.5	45.0	45.2
Our company closely monitors pre-service driver training expenses	35.2	22.2	34.7	46.5	35.7	43.9	37.5	30.8	33.3
Our company closely monitors in-service driver training expenses.	35.1	25.0	33.3	45.5	35.2	39.5	36.6	27.5	31.3

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Carriers were next asked whether their individual company spends more on pre- and in-service driver training than do most carriers. About 32 percent of all carriers agreed or strongly agreed that they spend more on pre-service than do most carriers, while 46 percent agreed or strongly agreed that they spend more on in-service training than do other carriers. In general, a lower percentage of the small-sized carriers agreed or strongly agreed with this statement.

Finally, carriers were questioned about how closely they monitor both the pre- and in service driver training expenses. About 35 percent of all carriers agree or strongly agree with the comment that they closely monitor their driver training expenses. Concern for the expenses of training should in no way be correlated with some lack of support for safety matters. Indeed, it is prudent management practice to make sure that every dollar of expense is well spent and monitored, regardless of the purpose of the expense.

This section has focused on both pre-service and in-service driver training. The questionnaire included an item asking the managers to assess the comparative impact of both types of training on the company’s highway safety performance. The results of this question are provided in Table 31 below. As displayed, over 57 percent of all carriers indicate that both pre-service and in-service driver training have an equal impact on the company’s highway safety performance. However, about 31 percent of the respondent carriers said that in-service training has a greater impact on safety performance than pre-service training has. This contrasts with the 12 percent of respondents who indicate that pre-service training has a greater impact. A higher percentage of the small-sized carriers than of the medium- or large-sized carriers indicate that in-service training has a greater impact than does pre-service training. Indeed, about 38 percent of the small-sized carriers believe that in-service training has a greater impact on safety performance than does pre-service training. In contrast, 68 percent of the large-sized carriers argue that both pre-service and in-service training have an equal impact on the company’s highway safety performance.

Table 31. Comparison in Impact on Highway Performance: Pre - versus In-service Training (Percent of carriers in each category)

Row %		Q(23) Impact on highway safety performance		
		pre-service has more impact	in-service has more impact	equal impact
General Freight		12.9%	28.6%	58.6%
Liquid Gas		11.9%	21.4%	66.7%
Chemical		15.0%	22.5%	62.5%
Paper Products		12.5%	30.0%	57.5%
Dry Bulk		12.5%	37.5%	50.0%
Size	Small	18.9%	37.8%	43.2%
	Medium	10.0%	32.0%	58.0%
	Large	9.1%	22.7%	68.2%
Total		12.2%	30.5%	57.3%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002. Responses (#): Gen. Frt,70; Liq. Gas,42; Chem, 40; Paper, 40; Dry Blk,32; Small,37; Med,50; Lrg,44; Tot Size, 131

A final question in this section tapped executive attitudes toward three statements about driver training personnel and their position within the company. Carriers were asked whether training directors have a strong influence over management safety decisions. As shown in Table 32 below, 79 percent of the respondent carriers agree or strongly agree with this statement. Among the medium-sized and large –sized carriers this percentage increases to 82 and 84 percent, respectively.

Table 32. Statements About Driver Training Personnel (Percent of carriers in each category who responded with “Agree” or “Strongly Agree”)

Statement	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
Training Director Strongly Influences our Safety Management Decisions	78.6	66.7	82.4	84.1	78.8	76.8	70.8	80.0	68.8
Our Trainers Enjoy High Prestige Among Company Employees	53.4	41.7	52.9	63.6	59.1	65.1	51.3	55.0	56.3
Peer-to-Peer Training is a Vital Element of our Driver Safety Program	84.1	78.3	40.2	81.8	81.6	88.4	85.4	80.0	78.2

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Managers were then asked whether trainers enjoy high prestige among company employees. Overall, 53 percent of the respondents agreed or strongly agreed with the statement that trainers enjoy high prestige among the company employees. This percentage ranges from a low of 42 for the small-sized carriers to 64 percent for the large sized carriers. The liquid gas carriers provided the highest level of agreement with this question. Over 65 percent of these carriers agreed or strongly agreed with the statement that trainers enjoy high prestige.

A final question of this section deals with the issue of peer-to-peer training. Indeed, an argument can be made that drivers would learn the most by sharing experiences with existing drivers. Results shown in Table 32 support the notion that peer-to-peer training among drivers exists and is strongly supported. Indeed, 84 percent of the respondent carriers said that peer-to-peer training is a critical element of the carrier’s overall driver safety program. Indeed, the agreement with this statement is widespread among the various carrier sized groups as well as the various commodity types.

SECTION 4: ENCOURAGING AND REINFORCING SAFE DRIVING BEHAVIOR

The fourth section of the questionnaire focused on management’s attitudes toward encouraging and reinforcing safe driving behavior through a combination of rewards and disciplinary actions. With respect to awards, the questionnaire asked managers to identify which personnel/organizational units are rewarded, how frequently they are awarded, and the specific type of awards used to encourage safe driving. Furthermore the questionnaire included items on the specific standards used by companies as the basis for the safety awards, i.e., what achievements did drivers have to accomplish in order to receive their awards. In addition to rewarding drivers for safe behavior, the questionnaire sought management reaction to the use of disciplinary actions in view of unsafe driving behavior. In fact, the questionnaire asked managers to compare rewards and disciplinary actions in terms of their relative effectiveness in improving company safety performance.

Safety Award Programs: Type of Rewards and Basis for Selection

Results in Table 33 below reveal that over three-fourths of all respondent carriers have safety award programs for individual drivers. The percent of respondent carriers with such programs varies from a high of 91 percent for the large-sized carriers to a low of 48 percent for the small-sized carriers. Across the various commodity types, at least 81 percent of the carriers in each group have individual driver safety award programs. In contrast, only 18 percent of all respondent carriers have safety award programs for driver teams. This may reflect the fact that many carriers do not use driver teams in their operations. The use of awards for driver teams varies with carrier size. A higher proportion of the large-sized carriers than small-sized carriers have award programs for driver teams. Slightly more than one-fourth of the carriers have safety reward programs that recognize the contribution of terminals and hubs to the overall safety performance of the drivers. This percentage varies, once again, by carrier size. Over 45 percent of the large-sized carriers have safety award programs for their terminals and hubs, while only 7 percent of the small-sized carriers have such programs. The commodity segments with the highest percentage of carriers having the terminal award programs are the general freight and chemical segments.

Table 33. Existence of Safety Award Programs (Percent of carriers in each category)

Personnel or Organizational Unit	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
Individual Drivers	76.6	47.9	90.4	91.1	81.1	81.4	81.0	82.5	81.3
Driver Teams	17.9	4.8	18.9	28.9	24.7	15.9	23.3	29.3	25.0
Terminals/Hubs	26.2	6.8	25.5	45.7	31.5	29.5	32.6	20.0	22.6

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Table 34 below reports on the frequency of awards for individual drivers, with the majority of carriers (52 percent) having annual awards, while an additional 17 percent have quarterly ones. Only 11 percent of the carriers have awards on a monthly basis.

Table 34. Frequencies of Awards for Individual Drivers (Percent of carriers in each category)

Row %		Q(26a) Frequency that your company presents safety awards: individual drivers					
		No awards at all	weekly awards	monthly awards	quarterly awards	semi-annual awards	Annual awards
General Freight		7.5%	3.0%	11.9%	20.9%	6.0%	50.7%
Liquid Gas		12.8%	5.1%	12.8%	17.9%	7.7%	43.6%
Chemical		8.1%	2.7%	16.2%	21.6%	8.1%	43.2%
Paper Products		5.1%		12.8%	25.6%	5.1%	51.3%
Dry Bulk		3.3%	3.3%	13.3%	13.3%	13.3%	53.3%
Size	Small	17.9%	3.6%	7.1%	21.4%	10.7%	39.3%
	Medium	6.0%	2.0%	10.0%	16.0%	8.0%	58.0%
	Large	6.8%	4.5%	15.9%	15.9%	2.3%	54.5%
Total		9.0%	3.3%	11.5%	17.2%	6.6%	52.5%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002. Responses (#): Gen. Frt,67; Liq. Gas,40; Chem, 38; Paper, 39; Dry Blk,31; Small,28; Med,51; Lrg,44; Tot Size, 123

Table 35 below shows the types of rewards used by managers to encourage safe driving behavior. The results are shown for all carriers taken together as well as for the carriers broken out into the various size groupings. Overall, 93 percent of the carriers use verbal praise as a type of reward. The next most popular forms of reward used by carriers in descending order, are: public recognition (72 percent), letters from management (70 percent), safety decorations (69 percent), cash (66 percent), safety banquets (66 percent), merchandise (65 percent), and certificates of merit (64 percent). Cash awards are very popular regardless of carrier size. Indeed, 73 percent of the small-sized carriers, 66 percent of the medium-sized carriers, and 63 percent of the large-sized carriers use cash as a way to reward their drivers for safe behavior.

Table 36 below focuses on the standards used by carriers for determining their safety awards. Specifically, it addresses the accomplishment drivers need to achieve in order to obtain a safety award. Ninety-three percent of the carriers base safety awards, in part, on the total number of crashes in which drivers are involved within a specified time period. In contrast, only 32 percent of the carriers base their awards on the number of crashes by number of miles driven. Thus, the awards are much more frequently time-based rather than mileage based. Drivers earn awards by avoiding crashes during a specified time period---one year, one quarter, one month, etc. A majority of carriers overall also base their driver awards on each of the following standards: traffic convictions (or lack thereof) during a specified time period and violations of federal motor carrier safety regulations (or lack thereof) during a specified time period. Just slightly less than half the carriers base their awards on public complaints (or lack thereof) received in the name of the driver. The highest percentage of small-sized, medium-sized, and large-sized carriers use crash avoidance during a specified time period as a standard for determining driver safety awards.

**Table 35. Types of Rewards Used to Encourage Safe Driving Behavior
(Percent of carriers in each category)**

Type of Reward	Percent of Firms Using Reward			
	Overall	Small	Med.	Large
Cash	66.4	73.1	66.0	62.8
Certificates of Merit	63.6	29.2	68.0	77.3
Letters from Management	69.8	52.0	65.3	85.7
Extra Holidays	7.8	16.7	8.2	2.4
Favorable Consideration for Promotion	35.9	42.3	42.9	23.8
Free CDL Renewal	8.9	14.3	10.4	4.7
Free Meals	40.9	37.5	32.7	52.4
Insurance Rebates	2.7	0.0	0.0	7.3
Lottery Tickets	3.5	4.3	2.0	4.8
Merchandise	64.7	45.8	61.2	79.1
Public Recognition	72.2	50.0	71.4	85.7
Safety Banquets	65.8	41.7	67.3	77.3
Safety Decorations	69.0	39.1	71.4	81.8
Savings Bonds	10.5	4.3	8.2	16.7
Travel Packages	17.4	8.7	16.3	23.3
Upgrade Vehicle Options	19.3	16.7	18.8	21.4
Verbal Praise	93.2	92.0	91.8	95.5

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Table 36. Standards Used for Driver Safety Awards (Percent of carriers in each category)

Standards	Percent of Firms			
	Overall	Small	Med.	Large
Crashes Over Specified Time	93.0	79.2	95.9	97.6
Crashes Over Specified Number of Miles	32.4	17.4	27.7	46.3
Traffic Convictions Over Specified Time	56.8	56.5	68.1	43.9
Traffic Convictions Over Specified Number of Miles	12.0	4.3	13.3	15.0
FMCSR Violations Over Specified Time	62.5	69.6	64.6	56.1
FMCSR Violations Over Specified Number of Miles	14.5	17.4	12.8	15.0
Public Complaints During Specified Time	48.1	43.5	54.5	43.9

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Driver Disciplinary Actions

In addition to rewarding drivers for safe driving, carriers have the option of initiating disciplinary action against their unsafe drivers. The questionnaire sought information from managers about their use of disciplinary actions as well as comparisons of the effectiveness of disciplinary actions versus rewards to encourage safe driving behavior.

Table 37 below shows that almost all carriers, regardless of size, base disciplinary actions on the following driver actions: violations of the federal motor carrier safety regulations (96 percent); violations of company safety policies (98 percent); and unsafe driving performance in general (99 percent).

Table 38 below indicates that the type of disciplinary actions varies from verbal warnings to termination of employment. Among respondents overall, 91 percent use termination of employment as a disciplinary method. Approximately 79 percent of all carriers use suspension from service as a disciplinary method, while 79 percent use a written warning. Only about half the carriers use a verbal warning as a disciplinary method. These results are quite consistent among the various carrier size groups as well as the different commodity categories.

Table 37. Basis for Disciplinary Actions (Percent of carriers in each category)

	Percent of Firms			
	Overall	Small	Med.	Large
Violations of FMCSR	96.5	93.2	96.2	100.0
Violating Company Safety Policies	97.9	95.5	98.1	100.0
Unsafe Driving Performance in General	99.3	100.0	98.1	100.0

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Table 38. Techniques for Disciplinary Drivers (Percent of carriers in each category who responded with “Effective” or “Very Effective”)

Techniques	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
Suspension from Service	79.1	60.5	86.6	88.6	76.4	86.4	81.0	65.8	72.7
Termination of Employment	90.6	87.4	94.3	95.4	90.3	90.9	88.1	90.3	93.9
Verbal Warning	49.6	46.5	48.0	54.5	48.6	50.0	38.1	42.5	37.6
Written Warning	78.9	60.9	82.7	90.9	84.7	83.7	76.2	72.5	68.8

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Carriers were next asked to compare safety awards and disciplinary actions regarding their effectiveness in impacting safety performance (Table 39 below). Taking all respondents together, 44

percent rated disciplinary actions and safety awards as having an equal impact on safety performance. However, 33 percent of the carriers thought that safety awards had a greater impact on safety performance than did disciplinary actions, but only 22 percent said that disciplinary actions rather than safety awards had a greater impact on safety performance. The percentage of carriers believing that safety rewards have a greater impact than do disciplinary actions ranged from a high of 42 percent among the large-sized carriers to 29 percent among the medium-sized carriers and 30 percent among the small-sized carriers. In fact, 34 percent of the small-sized carriers believe that disciplinary actions have more impact on safety performance than do rewards. For all other carrier-sized groups and for all commodity type groups, a higher percentage of carriers believe that rewards have greater impact on safety performance than do disciplinary actions.

**Table 39. Comparative Evaluation of Impact of Safety Awards versus Disciplinary Actions
(Percent of carriers in each category)**

Row %		Q(31) Impact of safety rewards and/or disciplinary actions		
		safety rewards have more impact	disciplinary actions have more impact	equal impact
General Freight		36.0%	17.3%	46.7%
Liquid Gas		41.9%	25.6%	32.6%
Chemical		42.9%	19.0%	38.1%
Paper Products		35.7%	16.7%	47.6%
Dry Bulk		38.2%	14.7%	47.1%
Size	Small	29.8%	34.0%	36.2%
	Medium	28.8%	15.4%	55.8%
	Large	42.2%	17.8%	40.0%
Total		33.3%	22.2%	44.4%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Responses (#): Gen. Frt,75 ; Liq. Gas,43 ; Chem, 42 ; Paper, 42 ; Dry Blk,34 ; Small,47 ; Med,52 ; Lrg,45 ; Tot Size, 144

Section 4 concludes with a series of statements about best practices in reinforcing driver safety and managers’ reaction to them (Table 40 below). The first statement is the following: “disciplining drivers does little to impact company’s highway safety.” Only 13 percent of the all carrier respondents agreed with this statement. The level of agreement with this question was quite low among the small-sized, medium-sized, and large-sized carriers. It was, furthermore, quite low among the different commodity groups of carriers.

**Table 40. Assessment of Best Practices in Reinforcing Driver Safety
(Percent of carriers in each category)**

Best Practices	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
Disciplining drivers does little to impact company's highway safety	13.1	18.8	9.3	11.4	10.5	16.3	9.5	16.3	22.9
Only safe drivers get promoted at out company	52.1	48.8	62.9	41.9	54.1	52.4	47.6	46.5	42.4
Rewards are the best way to get drivers to drive safely	30.1	25.5	27.8	37.7	29.0	44.2	44.2	27.9	37.2
Safety training without incentives is useless	19.8	21.3	16.7	22.3	21.1	27.9	20.9	16.3	22.8

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

The second statement is the following: “only safe drivers get promoted at my company.” The highest percentage of carriers agreed with this statement. In fact, 52 percent of all carrier respondents agreed with it as did 63 percent of the medium-sized carriers, 49 percent of the small-sized carriers, and 42 percent of the large-sized carriers.

The third statement is the following: “rewards are the best way to get drivers to drive safely.” However, only 30 percent of all carrier respondents agreed with this statement. However, 38 percent of the large-sized carriers and 44 percent of the liquid gas and chemical carriers agreed with it.

A final question said, “safety training without incentives is useless.” However, only 20 percent of the carriers agreed with it. The percentage agreement was highest among the liquid gas carriers and the dry bulk carriers.

The overall results seem to show that managers believe that there is a role for both disciplinary and reward actions to improve safety performance. However, while the majority felt there was no difference in the effectiveness of each technique, twice as high a percentage of carriers felt that rewards were more effective than were disciplinary actions.

SECTION 5: MANAGING AND MONITORING DRIVER ACTIVITIES

The fifth section of the questionnaire probes senior carrier managers about company practices used to manage and monitor driver activities. Initially, the questionnaire sought to divide respondents on the basis of the type of their operations, specifically addressing the issue of the balance between local and long haul operations. Senior managers were asked to indicate the average length-of-haul for their company's long haul drivers as well as the percent of the company's drivers who are active in local operations. Managers were also questioned about whether or not particular technologies were used to monitor driver performance. The results indicate that companies use a variety of technologies to monitor driver performance and promote safe driving. Finally, managers were asked their level of agreement with a series of statements about how they address driver fatigue.

Type of Operations

Tables 41 and 42 below address the issue of the balance of respondent carriers between local and long haul operations. As shown in Table 41, 37 percent of all carriers indicate that the average length-of-haul for their company's over-the-road drivers is 250 miles or less, with an additional 34 percent reporting an average length of haul of between 251 and 500 miles. Less than one-third of all carriers report an average length of haul for their company's drivers of more than 500 miles.

Table 41. Average Length-of-Haul for Company's Over-the-Road Drivers

Row %		Q(33) What is the average length-of-haul for your company's over-the-road drivers				
		0-250 miles	251-500 miles	501-750 miles	750-1000 miles	More than 1000 miles
General Freight		28.4%	40.5%	14.9%	8.1%	8.1%
Liquid Gas		36.4%	38.6%	18.2%	2.3%	4.5%
Chemical		28.6%	40.5%	19.0%	7.1%	4.8%
Paper Products		23.8%	42.9%	23.8%	2.4%	7.1%
Dry Bulk		23.5%	50.0%	17.6%	2.9%	5.9%
Size	Small	47.9%	22.9%	6.3%	8.3%	14.6%
	Medium	34.6%	38.5%	17.3%	1.9%	7.7%
	Large	26.7%	40.0%	20.0%	8.9%	4.4%
Total		36.6%	33.8%	14.5%	6.2%	9.0%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland.

Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Responses (#): Gen. Frt,74; Liq. Gas,44; Chem, 42; Paper, 42; Dry Blk,34; Small,48; Med,52; Lrg,45; Tot Size, 145

Table 42. Percent of Company Drivers Who Work in Local Operations

Row %		35) Approx what percent of your company's drivers work in local operations				
		Zero percent	1-25 percent	26-50 percent	51-75 percent	75-100 percent
General Freight		10.5%	38.2%	3.9%	21.1%	26.3%
Liquid Gas		6.8%	18.2%	9.1%	25.0%	40.9%
Chemical		11.6%	30.2%	7.0%	20.9%	30.2%
Paper Products		9.3%	34.9%	2.3%	16.3%	37.2%
Dry Bulk		11.4%	28.6%	8.6%	14.3%	37.1%
Size	Small	8.3%	25.0%		20.8%	45.8%
	Medium	11.3%	34.0%	9.4%	15.1%	30.2%
	Large	8.9%	31.1%	6.7%	22.2%	31.1%
Total		9.6%	30.1%	5.5%	19.2%	35.6%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002. Responses (#): Gen. Frt,76; Liq. Gas,44; Chem, 43; Paper, 43; Dry Blk,35; Small,48; Med,53; Lrg,45; Tot Size, 146

Not surprisingly, small carriers have the highest percentage of their members reporting that their over-the-road drivers average less than 250 miles (48 percent) or between 251 and 500 miles (23 percent). However, the small-sized carriers also have the highest percentage of their members (15 percent) who report that their drivers average more than 1,000 miles per haul. The commodities group with the highest percentage of carriers whose over-the-road drivers average 250 miles or less is the liquid gas group (36 percent). The commodities group with the highest percentage of carriers whose over the road drivers average more than 1,000 miles is the general freight group (8 percent).

Table 42 focuses on the percentage of a company’s drivers who work in local operations. About 36 percent of the carriers report that between 75 and 100 percent of their drivers participate in local operations. This percentage ranges from a low of 30 percent for the medium-sized carriers to a high of 46 percent for the large-sized carriers. Among the different commodities groups, the one with the highest percentage of their members having between 75 and 100 percent of their members in local operations is the liquid gas group (41 percent). Clearly, a substantial group of respondent carriers (slightly more than a third) have very extensive local operations involving an overwhelming portion of their respective driver pool.

Use of Technologies to Monitor Driver Performance

Table 43 below provides information on carrier use of a variety of technologies that monitor driver behavior and performance. The techniques range from speed regulators and two-way radios all the way to satellite tracking and global positioning. The two technologies used by the highest percentage of carriers are speed regulators on vehicles and engine diagnostics. Specifically, 64 percent of all carriers use engine diagnostics to monitor performance. Yet an even higher percentage of all carriers (71 percent) use speed regulators to monitor and check up on performance. Two other popular technologies to monitor behavior are two-way radios and wireless messaging. Finally, two technologies, real-time vehicle routing and satellite global positioning, have an usage rate of less than 30 percent by carriers in the survey.

**Table 43. Use of Various Technologies to Monitor Driver Performance
(Percent of carriers in each category)**

Technology	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
Engine Diagnostics	64.0	54.5	66.7	70.5	72.6	63.6	64.3	67.5	73.5
Real-time Vehicle Routing Software	27.3	13.6	27.5	40.9	27.4	31.8	28.6	35.0	20.6
Satellite Tracking Global Positioning System	29.3	13.6	29.4	44.4	31.1	34.1	38.1	34.1	17.6
Speed Regulators on Vehicles	71.2	53.5	76.9	81.8	78.1	73.3	79.1	73.2	80.0
Two-way Radios	42.5	50.0	40.8	37.2	43.7	53.3	46.3	46.2	54.5
Wireless Messaging	43.3	41.9	37.5	51.2	44.4	37.2	35.0	43.6	45.5

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Engine diagnostics and speed regulators are used by a substantially higher percentage (82 percent) of the larger carriers. This compares to a figure of 54 percent for the small-sized carriers. 71 percent of large-sized carriers and only 55 percent of the small-sized carriers use engine diagnostics.

Company Practices to Manage Fatigue

Table 44 below displays results from five statements presented to managers about practices to manage fatigue. Of the five statements presented to managers, only two seem to draw substantial interest among the managers. About 74 percent of the respondent carriers agree or strongly agree with the following statement: “We equip our trucks so that they are easier to handle.” Furthermore, 70 percent agree or strongly agree with the statement “our drivers refuse dispatches if they don’t feel alert.” This percentage increases from a low of 65 percent for the large-sized carriers to a high of 77 percent for small-sized carriers.

Table 44. Company Practices to Manage Fatigue (Percent of carriers in each category who responded with “Agree” or “Strongly Agree”)

Practice	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
Our drivers refuse dispatches if they don't feel alert.	70.0	76.8	69.2	64.5	70.7	66.7	60.4	66.7	62.9
Our drivers never suffer from sleep deprivation.	27.4	31.8	26.5	24.5	24.0	22.2	21.0	23.8	25.8
We equip our trucks so they are easier to handle.	74.4	65.1	80.7	75.0	78.1	75.6	74.4	73.8	68.6
We strongly restrict drivers break times.	11.9	15.9	13.2	6.6	10.6	11.1	11.6	16.6	20.0
We urge drivers to talk on the radio.	5.6	0.0	7.6	8.8	5.4	6.6	4.8	4.8	8.6

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Two statements in this section generated very little support among the respondents. The first found that only 12 percent agreed with the following statement: “We strongly restrict drivers’ break times.” Furthermore, only 6 percent encourage their drivers to talk on the radio during driving.

SECTION 6: MANAGING VEHICLE MAINTENANCE

The sixth section of the questionnaire asked senior managers about their fleet management policies and procedures. Ultimately, vehicles that are not properly maintained are unsafe and represent a potential crash causation factor. The questionnaire probed into maintenance activities and management’s attitude toward maintenance practices and the company’s safety performance. The following subsections review the extent to which carriers have adopted a computerized equipment maintenance management program and what elements are specifically included in the adopted programs; the use of outsourcing for fleet maintenance requirements and the balance with company mechanics; the company’s vehicle purchase schedule as well as its schedule for major maintenance actions; and some general attitudes about the importance of vehicle maintenance.

Computerized Equipment Maintenance Management

The questionnaire isolated companies that use a computerized equipment maintenance (CEM) management program and identified which maintenance activities it supported. Overall, 56 percent of carriers use a CEM management program. As shown in Table 45 below, the use of CEM management programs largely depends on carrier size. Small carriers, most likely with limited funds for investment, are less likely to invest in this capability. Approximately 23 percent of small-sized carriers use computerized equipment maintenance programs, compared to a high of 78 percent among the large-sized carriers. Based on commodity type, the use of a CEM ranges from a high of 73 percent among the liquid gas carriers to a low of 55 percent among the paper products carriers.

Table 45. Use of Computerized Equipment Maintenance Management Programs

Row %		Q(38) Does your company currently use a computerized equipment maintenance management program	
		no	yes
General Freight		41.30%	58.70%
Liquid Gas		27.30%	72.70%
Chemical		33.30%	66.70%
Paper Products		45.20%	54.80%
Dry Bulk		41.20%	58.80%
Size	Small	77.30%	22.70%
	Medium	32.70%	67.30%
	Large	22.20%	77.80%
Total		43.30%	56.70%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland.

Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002

Responses (#): Gen. Frt,75 ; Liq. Gas,44 ; Chem, 42 ; Paper, 42 ; Dry Blk,34 ; Small,44 ; Med,52 ; Lrg,45 ; Tot Size, 141

The CEM management programs are used to collect data to develop proper equipment specifications, develop equipment maintenance procedures, monitor equipment maintenance activities, and schedule equipment repairs. To a lesser degree, CEM management programs are used to determine mechanic training needs and analyze part failure. Table 46 below shows the percentage of carriers with CEMs whose systems include specific elements in them. Of particular note is that 61 percent of the CEMs do have the capability to perform part failure analysis. This percentage varies from a high of 63 percent for the large-sized carriers to a low of 30 percent for the small-sized carriers with CEMs. Across commodity types, the general freight carriers with CEMs have the highest percentage with a part failure analysis capability.

**Table 46. Computerized Equipment Maintenance Management Programs Support of the Following Activities
(Percent of carriers in each category)**

Activity	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
Develop Proper Equipment Specifications	83.3	70.0	78.8	91.4	84.4	83.3	84.6	81.8	78.9
Develop Equipment Maintenance Procedures	93.6	90.0	90.9	97.1	97.8	93.3	96.2	95.5	84.2
Monitor Equipment Maintenance Activities	97.4	80.0	100.0	100.0	100.0	100.0	96.2	95.5	94.7
Determine Mechanic Training Needs	56.6	44.4	56.3	60.0	57.8	58.6	50.0	59.1	61.1
Perform Part Failure Analysis	61.0	30.0	62.5	69.6	66.7	46.7	53.8	54.5	63.2
Schedule Equipment Repairs	93.5	100.0	87.9	97.1	93.2	100.0	100.0	95.2	89.5

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002.

Maintenance Outsourcing and Use of Company Mechanics

Results in Table 47 below reveal that over three-fourths of respondent carriers outsource one or more of their fleet maintenance activities. This statistic is consistent across commodity categories and carrier size groups. However, when carriers are questioned about the outsourcing of specific maintenance activities, small-sized carriers indicate use of outsourcing at a higher rate than medium-sized and large-sized carriers.

Table 47. Percentage of Companies in Each Category Who Outsource One or More of Its Fleet Maintenance Activities.

Row %		Q(40) Does your company outsource one or more of its fleet maintenance activities	
		no	yes
General Freight		24.3%	75.7%
Liquid Gas		27.3%	72.7%
Chemical		26.2%	73.8%
Paper Products		22.0%	78.0%
Dry Bulk		20.6%	79.4%
Size	Small	23.3%	76.7%
	Medium	23.1%	76.9%
	Large	24.4%	75.6%
Total		23.6%	76.4%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002
 Responses (#): Gen. Frt,74; Liq. Gas,44; Chem, 42; Paper, 41; Dry Blk,34; Small,43; Med,52; Lrg,45; Tot Size, 140

As seen in Table 48 below, for all carriers combined, the maintenance activities where the highest use of outsourcing occurs are the following: out-of-chassis engine repairs (84 percent); major drive train repairs (78 percent); in-chassis engine repairs (72 percent); and tire repairs (71 percent). The maintenance activities least likely to be outsourced by all carriers combined are the following: electrical light system repairs (43 percent); preventive maintenance (44 percent); and brake system repair (46 percent).

Yet, even within these categories, the small-sized carriers have a higher rate of outsourcing than do the medium-sized and large-sized carriers. For example, while 84 percent of all carriers combined outsource the out-of-chassis engine repairs, this figure increases to 97 percent for the small-sized carriers and decreases to 71 percent for the large-sized carriers. Furthermore, even though only 43 percent of all carriers combined outsource electrical light system repairs, this increases to 59 percent for the small-sized carriers and falls to 37 percent for the large-sized carriers. These results might suggest a resource issue. The small-sized carriers have inadequate resources to pay for a permanent maintenance staff.

**Table 48. Outsourced Maintenance Activities Among Respondents Who Outsource
(Percent of carriers in each category)**

Activity	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
Brake system repair	46.3	68.6	31.6	40.0	40.0	40.6	46.9	42.4	55.6
Electrical light system repairs	42.5	58.8	32.4	37.1	29.6	40.6	46.9	45.5	53.8
In-chassis engine repairs	71.7	94.3	61.1	60.0	65.5	71.9	74.2	62.5	84.6
Major drive train repairs	78.2	94.3	72.5	68.6	73.2	81.8	81.8	76.5	81.5
Minor drive train repairs	50.5	71.4	35.1	45.7	43.6	37.5	45.2	50.0	55.6
Out-of-chassis engine repairs	84.4	97.1	85.0	70.6	76.4	90.6	81.3	73.5	88.5
Preventative maintenance	44.4	67.6	27.5	41.2	32.7	42.4	48.5	45.5	55.6
Tire repairs	70.7	85.7	52.5	74.3	67.9	72.7	75.8	73.5	70.4
Tire replacement	62.7	77.1	55.0	57.1	57.1	63.6	63.6	61.8	63.0
Truck washing	65.7	68.6	61.5	67.6	59.3	68.8	68.8	63.6	66.7

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002

Table 49 below focuses on the flip side of the outsourcing issue by looking at the use of company personnel to perform power unit service and repair. As shown, overall 20 percent of the carriers do not use their employees to perform power unit service and repair. However, this percentage ranges from a low of 13 percent among the large-sized carriers to a high of 39 percent among the small-sized carriers. At the other end of the spectrum, 41 percent of the respondent carriers use their company employees to perform at least 76 percent of all power unit service and repair activity. This figure ranges from a high of 50 percent among the large-sized carriers to a low of 25 percent among the small sized carriers.

Table 49. Percentage of Company's Power Unit Service and Repairs that are Performed By Company Employees.

Row %		(42) Approx what percent of your company's power unit service and repair do company employees perform				
		Zero percent	1-25 percent	26-50 percent	51-75 percent	76-100 percent
General Freight		14.7%	10.7%	9.3%	22.7%	42.7%
Liquid Gas		8.9%	8.9%	15.6%	20.0%	46.7%
Chemical		11.4%	9.1%	15.9%	18.2%	45.5%
Paper Products		23.8%	11.9%	9.5%	9.5%	45.2%
Dry Bulk		23.5%	8.8%	11.8%	23.5%	32.4%
Size	Small	38.6%	22.7%	6.8%	6.8%	25.0%
	Medium	11.1%	13.0%	9.3%	20.4%	46.3%
	Large	13.0%	2.2%	13.0%	21.7%	50.0%
Total		20.1%	12.5%	9.7%	16.7%	41.0%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002
 Responses (#): Gen. Frt,75; Liq. Gas,45; Chem, 44; Paper, 42; Dry Blk,34; Small,44; Med,54; Lrg,46; Tot Size, 144

An important question is the extent to which company mechanics have had formal training. Table 50 below addresses the issue of training for mechanics. Results show that 58 percent of the respondent companies who hire company mechanics provide formal training for at least three-fourths of the mechanics. This figure ranges from a high of 68 percent for the large-sized carriers to a low of 42 percent for the small-sized carriers. Again, this reflects a resource constraint among the small-sized carriers regarding their ability to pay for formal training for their mechanics. Chemical carriers have the highest mechanic training rates. Specifically, 72 percent of these carriers provide formal training for at least three-fourths of their mechanics. This training rate is lowest among the dry bulk carriers. Only 54 percent of these carriers provide formal training for at least three-fourths of their company mechanics.

Table 50. Percentage of Company's Mechanics that Have Formal Mechanics Training.

Row %		(44) Approx what percentage of your company's mechanics have had formal mechanic's training, either prior to or during service with the company			
		0-25 percent	26-50 percent	51-75 percent	76-100 percent
General Freight		12.7%	7.0%	14.1%	66.2%
Liquid Gas		12.2%	14.6%	12.2%	61.0%
Chemical		7.7%	10.3%	10.3%	71.8%
Paper Products		17.1%	8.6%	11.4%	62.9%
Dry Bulk		15.4%	11.5%	19.2%	53.8%
Size	Small	48.5%	3.0%	6.1%	42.4%
	Medium	10.4%	18.8%	10.4%	60.4%
	Large	6.8%	6.8%	18.2%	68.2%
Total		19.2%	10.4%	12.0%	58.4%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002
 Responses (#): Gen. Frt,71; Liq. Gas,41; Chem, 39; Paper, 35; Dry Blk,26; Small,33; Med,48; Lrg,44; Tot Size, 125

Table 51 below addresses the issue of training length. It shows that 42 percent of the carriers providing mechanic training have between a one- and six-week training course for their mechanics. There are some longer training programs, however. Approximately 9 percent of the carriers with

training programs have between a 7- and 12-week training program, 15 percent have between a 12- and 24-week program, and 23 percent have a training program greater than 24 weeks.

Table 51. Number of Weeks that the Average Mechanic Has Received.

Row %		Q(45) Approx how many weeks of formal training has the average mechanic at your company received				
		0 weeks	1-6 weeks	7-12 weeks	12-24 weeks	24 or more weeks
General Freight		7.1%	38.6%	7.1%	22.9%	24.3%
Liquid Gas		7.5%	47.5%	7.5%	12.5%	25.0%
Chemical		7.7%	41.0%	7.7%	17.9%	25.6%
Paper Products		5.7%	48.6%	8.6%	14.3%	22.9%
Dry Bulk		8.0%	44.0%	8.0%	20.0%	20.0%
Size	Small	34.4%	34.4%	6.3%		25.0%
	Medium	2.1%	45.8%	14.6%	16.7%	20.8%
	Large	4.7%	44.2%	4.7%	23.3%	23.3%
Total		11.4%	42.3%	8.9%	14.6%	22.8%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002
 Responses (#): Gen. Frt,70; Liq. Gas,40; Chem, 39; Paper, 35; Dry Blk,25; Small,32; Med,48; Lrg,43; Tot Size, 123

Schedules for Vehicle Purchases and Major Maintenance Actions

A key component of a successful vehicle maintenance program is a regular cycle for vehicle purchases. Carriers may extend their equipment purchase cycles if they have a very extensive vehicle maintenance program. Therefore, it is important not to equate longer equipment purchase cycles with unsafe behavior. Table 52 below presents data on the equipment (power unit) purchase cycles among the respondent carriers. As shown, the highest percentage of carriers (28 percent) has a five-year power-unit replacement cycle. However, 26 percent have an eight-year or more equipment purchase cycle. A very small minority of the carriers (7 percent) has a three-year or less equipment purchase cycle.

Table 52. Number of Years a Company Operates a New Power Unit Before Replacing It.

Row %		Q(47) On average, how many years does your company operate a new power unit before replacing it					
		3 years or less	4 years	5 years	6 years	7 years	8 or more years
General Freight		7.8%	22.1%	28.6%	7.8%	9.1%	24.7%
Liquid Gas		6.7%	20.0%	24.4%	8.9%	11.1%	28.9%
Chemical		2.3%	20.5%	31.8%	6.8%	11.4%	27.3%
Paper Products		4.7%	20.9%	30.2%	16.3%	9.3%	18.6%
Dry Bulk		2.9%	20.6%	32.4%	14.7%	8.8%	20.6%
Size	Small	14.9%	19.1%	31.9%	6.4%	4.3%	23.4%
	Medium	3.8%	21.2%	23.1%	15.4%	9.6%	26.9%
	Large	2.2%	19.6%	30.4%	8.7%	13.0%	26.1%
Total		6.9%	20.0%	28.3%	10.3%	9.0%	25.5%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002
 Responses (#): Gen. Frt,77; Liq. Gas,45; Chem, 44; Paper, 43; Dry Blk,34; Small,47; Med,52; Lrg,46; Tot Size, 145

Table 53 below addresses the issue of the frequency with which carriers conduct out-of-chassis engine overhauls. As shown, the overwhelming majority of respondents (64 percent) conduct out-of-

chassis engine overhauls every 800,000 or more miles of operation. This percentage varies from a high of 79 percent among the large-sized carriers to a low of 53 percent among the small-sized carriers. It could be argued that a higher percentage of the large-sized carriers than of the small-sized carriers drive more miles between overhauls because they do a better job of maintenance between overhauls.

Table 53. Number of Miles Company’s New Power Units Travel Before Needing an Out-of-Chassis Engine Overhaul

Row %		Q(51a) Out-of-chassis engine overhaul				
		Less than 500,000 miles	500,001-600,000	600,001-700,000	700,001-800,000	800,001 or more miles
General Freight		5.2%	8.6%	1.7%	13.8%	70.7%
Liquid Gas		8.8%	5.9%	5.9%	20.6%	58.8%
Chemical		3.1%	6.3%	6.3%	15.6%	68.8%
Paper Products		7.4%	11.1%		11.1%	70.4%
Dry Bulk		5.6%	5.6%		11.1%	77.8%
Size	Small	23.3%	6.7%	3.3%	6.7%	60.0%
	Medium	11.1%	8.3%	2.8%	25.0%	52.8%
	Large	2.9%	5.9%	2.9%	8.8%	79.4%
Total		12.0%	7.0%	3.0%	14.0%	64.0%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002
 Responses (#): Gen. Frt,58; Liq. Gas,34; Chem, 32; Paper, 27; Dry Blk,18; Small,30; Med,36; Lrg,34; Tot Size, 100

At the other extreme of frequency is the extent to which carriers conduct routine service of trailer brake systems. The majority of respondents (53 percent) conduct routine trailer brake service every 10,000 miles. An additional 22 percent of the carriers conduct routine service between 10,000 and 20,000 miles (Table 54 below).

Table 54. Number of Miles Company Trailers Travel Between Routine Servicing of its Brake Systems

Row %		Q(52b) Routine service of trailer brake system					
		Less than 10,000 miles	10,001-20,000	20,001-30,000	30,001-40,000	40,001-50,000	50,001 or more
General Freight		47.7%	18.5%	13.8%	7.7%	6.2%	6.2%
Liquid Gas		58.1%	23.3%	9.3%	2.3%	4.7%	2.3%
Chemical		48.7%	25.6%	10.3%	7.7%	5.1%	2.6%
Paper Products		58.8%	14.7%	11.8%	5.9%	5.9%	2.9%
Dry Bulk		41.4%	24.1%	10.3%	13.8%	10.3%	
Size	Small	58.3%	22.2%	5.6%	8.3%	5.6%	
	Medium	60.9%	21.7%	4.3%	4.3%	2.2%	6.5%
	Large	40.0%	22.5%	20.0%	5.0%	5.0%	7.5%
Total		53.3%	22.1%	9.8%	5.7%	4.1%	4.9%

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002
 Responses (#): Gen. Frt,65; Liq. Gas,43; Chem, 39; Paper, 34; Dry Blk,29; Small,36; Med,46; Lrg,40; Tot Size, 122

General Attitudes About Importance of Maintenance

Carriers in our survey spend significant resources toward maintaining their vehicle fleets in order to enhance safety. Table 55 below provides information on how carriers responded to a series of

questions about the importance of vehicle safety. Approximately 90 percent of the carriers consider cost as a non-issue when it comes to keeping their vehicles defect-free. A similar percentage of the respondents agree that deploying a defect-free fleet is the most important thing they do to ensure highway safety. Finally, 90 percent of the carriers say they rarely need to conduct unscheduled maintenance, presumably since their schedule of maintenance is adequate enough to prevent unscheduled breakdowns.

**Table 55. Statements About Company’s Overall Vehicle Maintenance
(Percent of carriers in each category who responded with “Agree” or “Strongly Agree”)**

Practice	Overall	Size				Commodity Category			
		Small	Medium	Large	Gen. Frt.	Liq. Gas.	Chem.	Paper	Dry Blk.
Cost is no issue when it comes to keeping our vehicles defect free	75.7	66.7	84.9	73.4	75.6	73.4	76.7	63.4	78.8
Deploying a defect-free fleet is the most important thing we do to ensure highway safety	79.8	71.5	84.6	82.2	79.7	82.2	81.4	75.7	84.8
Our vehicles rarely need unscheduled repairs	57.9	59.5	52.8	62.2	60.8	51.1	51.1	48.7	57.6

Source: Supply Chain Management Center, Robert H. Smith School of Business, University of Maryland. Survey of Best Safety Management Practices, Federal Motor Carrier Safety Administration, 2002

APPENDIX

BEST HIGHWAY SAFETY PRACTICES

A SURVEY OF THE SAFEST MOTOR CARRIERS ABOUT SAFETY MANAGEMENT PRACTICES

This questionnaire seeks information about the safety management practices that enable your company to consistently rank among the safest of carriers.

The gray areas containing uppercase letters that appear throughout the questionnaire areas are instructions to guide you through the questionnaire. Please be sure to read them carefully.

Please answer all questions. If the answer categories to a question do not accurately represent your response to the question, select the category that best approximates your answer. If you wish to comment on any aspect of the questions or qualify your answers, please feel free to use the space in the margins. Your comments will be read and taken into account.

In case we need further clarification of your responses, would you please provide your company name, your name and title, and a telephone number that we can reach you at below. However, please do not write your name or your company's name anywhere else on the questionnaire.

When you have completed the questionnaire, please return it by mailing it in the self-addressed stamped envelope that came with it.

Your responses to the questions will be strictly confidential. They will not be associated in any way with your name nor your company's name. They will be used along with responses from other participating carriers to provide summaries about the best safety practices in the motor carrier industry.

Thank you for your participation.

SECTION 1

QUESTIONS 1 AND 2 ARE OF A GENERAL NATURE. THEY SEEK INFORMATION ABOUT THE IMPORTANCE OF SAFETY MANAGEMENT AND OF COMMUNICATION ABOUT SAFETY ISSUES AT YOUR COMPANY.

PLEASE BEGIN BY ANSWERING QUESTION 1 BELOW.

Q-1 Would you indicate how much you agree or disagree with each of the following statements about safety management at your company? *(Circle the appropriate number on the scale to the right of each statement.)*

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
A. Complying with public safety regulations completely satisfies our highway safety objectives.....	1	2	3	4	5	6	7
B. Cost is no issue when it comes to highway safety decisions at our company.....	1	2	3	4	5	6	7
C. Customer service and highway safety performance go hand-in-hand at our company.....	1	2	3	4	5	6	7
D. Employee relations go hand-in-hand with highway safety performance at our company.....	1	2	3	4	5	6	7

Q-2 Would you indicate how much you agree or disagree with each of the following statements about the communication of highway safety issues at your company? *(Circle the appropriate number on the scale to the right of each statement.)*

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
A. Our employees feel comfortable discussing highway safety issues with their supervisors.....	1	2	3	4	5	6	7
B. Many ideas about improving the firm's highway safety come from our employees.....	1	2	3	4	5	6	7
C. Management's highway safety concerns are greatly publicized among our employees.....	1	2	3	4	5	6	7
D. Our employees frequently voice highway safety concerns to their immediate supervisors.....	1	2	3	4	5	6	7

SECTION 2

QUESTIONS 3 THROUGH QUESTION 11 SEEK INFORMATION ABOUT YOUR COMPANY'S DRIVER HIRING PRACTICES. WHENEVER THE TERM "COMPANY DRIVER" APPEARS IN A QUESTION IT WILL REFER TO

"A CARRIER EMPLOYEE WHO HOLDS A DRIVER'S POSITION WITH THE CARRIER."

PLEASE CONTINUE BY ANSWERING QUESTION 3 BELOW.

Q-3 Approximately how many drivers (including owner-operators) does your company hire each year?

- 1-10 drivers per year
- 11-20 drivers per year
- 21-30 drivers per year
- 31-40 drivers per year
- 41-50 drivers per year
- 51-100 drivers per year
- 101-150 drivers per year
- 151-200 drivers per year
- 200-250 drivers per year
- 250 or more drivers per year

Q-4 Would you rate how important or unimportant each of the following driver characteristics is to your company’s decision to hire a company driver? (Circle the appropriate number on the scale to the right of each characteristic.)

Qualification	Very		Slightly	Neither	Slightly		Very
	Unimportant	Unimportant	Unimportant	Important nor Unimportant	Important	Important	Important
A. Applicant is 21-25 years of age.....	1	2	3	4	5	6	7
B. Applicant is over 25 years of age.....	1	2	3	4	5	6	7
C. Completed a Professional Truck Driver Institute-certified training program.....	1	2	3	4	5	6	7
D. Driving experience with other carriers.....	1	2	3	4	5	6	7
E. No chargeable crashes.....	1	2	3	4	5	6	7
F. No prior dismissals for alcohol or drug-related violations.....	1	2	3	4	5	6	7
G. No prior speeding tickets.....	1	2	3	4	5	6	7
H. No prior traffic violation convictions.....	1	2	3	4	5	6	7
I. Recommendation from other carrier(s).....	1	2	3	4	5	6	7
J. Solo driving experience.....	1	2	3	4	5	6	7
K. Other qualifications (Specify below)							
_____	1	2	3	4	5	6	7
_____	1	2	3	4	5	6	7

Q-5 Does your company have a policy that does not allow it to hire owner operators?

- Yes
- No

IF “YES”. SKIP TO QUESTION 8.

Q-6 Approximately what percent of the drivers that your company hires each year are owner-operators?

- Zero percent
- 1-10 percent
- 11-20 percent
- 21-30 percent
- 31-40 percent
- 41-50 percent
- More than 50 percent

Q-7 Would you rate how important or unimportant each of the following driver characteristics is to your company's decision to hire an owner-operator? (Circle the appropriate number on the scale to the right of each characteristic.)

<u>Qualification</u>	Very		Slightly	Neither	Slightly		Very
	Unimportant	Unimportant	Unimportant	Important nor Unimportant	Important	Important	Important
A. Applicant is 21-25 years of age.....	1	2	3	4	5	6	7
B. Applicant is over 25 years of age.....	1	2	3	4	5	6	7
C. Completed a Professional Truck Driver Institute-certified training program.....	1	2	3	4	5	6	7
D. Driving experience with other carriers.....	1	2	3	4	5	6	7
E. No chargeable crashes.....	1	2	3	4	5	6	7
F. No prior dismissals for alcohol or drug-related violations.....	1	2	3	4	5	6	7
G. No prior speeding tickets.....	1	2	3	4	5	6	7
H. No prior traffic violation convictions.....	1	2	3	4	5	6	7
I. Recommendation from other carrier(s).....	1	2	3	4	5	6	7
J. Solo driving experience.....	1	2	3	4	5	6	7
K. Other qualifications (Specify below)							
_____	1	2	3	4	5	6	7
_____	1	2	3	4	5	6	7

Q-8 Would you rate how important or unimportant each of the following personality traits is to your company's decision to hire a driver? (Circle the appropriate number on the scale to the right of each trait.)

<u>Applicant's personality trait</u>	Very		Slightly	Neither	Slightly		Very
	Unimportant	Unimportant	Unimportant	Important nor Unimportant	Important	Important	Important
A. Honest.....	1	2	3	4	5	6	7
B. Patient.....	1	2	3	4	5	6	7
C. Reliable.....	1	2	3	4	5	6	7
D. Self-disciplined.....	1	2	3	4	5	6	7
E. Self-motivated.....	1	2	3	4	5	6	7
F. Sociable.....	1	2	3	4	5	6	7

Q-9 Would you rate how effective or ineffective each of the following hiring practices is at helping your company assess the safety risk of applicants seeking driver positions with your company? (Circle the appropriate number on the scale to the right of each practice.)

<u>Hiring practice</u>	Very		Somewhat	Neither	Somewhat		Very
	Ineffective	Ineffective	Ineffective	Effective nor Ineffective	Effective	Effective	Effective
A. DOT/Fit for work physical.....	1	2	3	4	5	6	7
B. Drug testing.....	1	2	3	4	5	6	7
C. Follow up on previous employment.....	1	2	3	4	5	6	7
D. Job interview.....	1	2	3	4	5	6	7
E. License qualification check.....	1	2	3	4	5	6	7
F. Reference check.....							
G. Test drive to observe applicant's on-the-road behavior.....							
H. Traffic record check.....							

Q-10 Does your company have a written hiring policy that contains safety-related criteria for applicants seeking driver positions with the company?

- Yes
 No

IF “NO”, SKIP TO QUESTION 12 IN SECTION III.

Q-11 Would you rate how clearly or unclearly each of following safety-related criteria or ones similar to these are stated in your company’s written hiring policy? (*Circle the appropriate number on the scale to the right of each practice. If a criterion or one similar to it is not stated in your company’s hiring policy, circle NA in the last column to the right.*)

<u>Criterion for driver safety</u>	Very Unclearly	Unclearly	Slightly Unclearly	Neither Clearly nor Unclearly	Slightly Clearly	Clearly	Very Clearly	Not in Hiring Policy
A. Number of crashes that disqualify an applicant as a candidate for employment....	1	2	3	4	5	6	7	NA
B. Number of moving violations that disqualifies applicant as a candidate for employment.....	1	2	3	4	5	6	7	NA
C. Required review of applicant’s driving record before being considered for hire.....	1	2	3	4	5	6	7	NA
D. Requirement that applicant complete an approved safety training program before being considered for hire.....	1	2	3	4	5	6	7	NA
E. Requirement that applicant participate in driver training after being hired.....	1	2	3	4	5	6	7	NA

SECTION 3

QUESTIONS 12 THROUGH QUESTION 24 SEEK INFORMATION ABOUT YOUR COMPANY’S DRIVER TRAINING PRACTICES. WHENEVER THE TERMS “PRE-SERVICE” AND “IN-SERVICE” APPEAR IN A QUESTION THEY WILL REFER TO THE FOLLOWING.

PRE-SERVICE: “THE TIME PERIOD THAT BEGINS AFTER A DRIVER IS HIRED BY YOUR COMPANY BUT BEFORE THEY BEGIN DRIVING FOR YOUR COMPANY.”

IN-SERVICE: “THE TIME PERIOD THAT BEGINS AFTER A HIRED DRIVER BEGINS DRIVING FOR YOUR COMPANY.”

PLEASE CONTINUE BY ANSWERING QUESTION 12 BELOW.

Q-12 Would you indicate whether or not your company requires pre-service training for hired drivers who are company employees and those who are owner-operators? (*Mark an “X” in the appropriate boxes.*)

	Pre-service training required of these individuals?		
	Yes	No	Not Applicable
A. Drivers who are company employees.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Owner-operators who drive for the company.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IF YOU ANSWERED “NO” OR “NOT APPLICABLE” TO PARTS (A.) AND (B.), SKIP TO QUESTION 14.

Q-13 Approximately how weeks of *pre-service* training does your company require of hired drivers who are company employees and those who are owner-operators? (Mark an "X" in the appropriate boxes.)

Number of weeks of pre-service training required?

	0	1-2	3-4	5-6	7-8	Over 8
A. Drivers who are company employees.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Owner-operators who drive for the company.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q-14 Would you indicate whether or not your company requires in-service training for drivers who are company employees and for those who are owner-operators? (Mark an "X" in the appropriate boxes.)

	In-service training required of these individuals?		
	Yes	No	Not Applicable
A. Drivers who are company employees.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Owner-operators who drive for the company.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IF YOU ANSWERED "NO" OR "NOT APPLICABLE" TO PARTS (A.) AND (B.) FOR QUESTION 12 AND QUESTION 14, SKIP TO QUESTION 25 IN SECTION IV.

Q-15 Would you please indicate whether or not the following subjects are covered in your company's (a) pre-service training and (b) in-service training programs? (Mark an "X" in the appropriate boxes.)

Subject	(a) Covered during pre-service training?		(b) Covered during in-service training?	
	Yes	No	Yes	No
A. Accident Notification.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. CPR training.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Defensive driving.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Dispatch procedures.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Driver disciplinary policies.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Federal safety regulations.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. First-aid training.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H. Hazardous materials handling.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I. Hours-of-service regulations.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J. Injury prevention.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K. Post-trip inspections.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L. Pre-trip inspections.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M. Team driving training.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N. Truck maintenance.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
O. Other subjects (Specify below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q-16 Would you indicate whether or not your company's (a) pre-service training and (b) in-service training occurs in each of the following training venues? (Mark an "X" in the appropriate boxes.)

Training venue	(a) Pre-service training?		(b) In-service training?	
	Yes	No	Yes	No
A. Classroom training.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. In-vehicle, off-road training.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. In-vehicle, on-road training.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Other venues (Specify below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q-17 Approximately how many weeks of *pre-service* training in each of the following venues does your company require of its hired drivers? (Mark an "X" in the appropriate boxes.)

Training venue	Number of weeks of pre-service training required?					
	0	1-2	3-4	5-6	7-8	Over 8
A. Classroom training.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. In-vehicle, off-road training.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. In-vehicle, on-road training.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Other venues (Specify below.) _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q-18 Would you indicate whether or not your company uses each of the following methods for evaluating an individual's performance during its (a) pre-service training and (b) in-service training programs? (Mark an "X" in the appropriate boxes.)

Evaluation method	(a) Used during Pre-service training?		(b) Used during In-service training?	
	Yes	No	Yes	No
A. Computer-assisted examination.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Internet-based examination.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. In-vehicle, off-road training examinations.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. In-vehicle, on-road training examinations.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Oral classroom examination.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Questionnaire.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Written classroom examination.....				
H. Other methods (Specify below) _____ _____				

Q-19 Would you please indicate whether or not your company's pre-service and in-service training programs are run entirely by your company's personnel? (Mark an "X" in the appropriate boxes.)

	Run entirely by your company's personnel?	
	Yes	No
A. Pre-service training programs.....	<input type="checkbox"/>	<input type="checkbox"/>
B. In-service training programs.....	<input type="checkbox"/>	<input type="checkbox"/>

IF YOU ANSWERED "YES" TO PARTS (A.) AND (B.), SKIP TO QUESTION 21.

Q-20 Would you indicate whether or not each of the following outside sources *provides all*, *provides some but not all*, or *provides none* of your company's (a) pre-service training and (b) in-service training programs? (Mark an "X" in the appropriate boxes.)

Outside source	(a) Pre-service training?			(b) In-service training?		
	Provides All	Provides Some But Not All	Provides None	Provides All	Provides Some But Not All	Provides None
A. Insurance companies.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Professional training schools.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Training consultants.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Other sources (Specify below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q-21 Would you indicate how much you agree or disagree with the following three statements about pre-service driver training for your company? (Circle the appropriate number on the scale to the right of each statement.)

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
A. Our company considers pre-service driver training a strategic safety investment.....	1	2	3	4	5	6	7
B. Our company spends more on pre-service driving training than do most carriers.....	1	2	3	4	5	6	7
C. Our company closely monitors pre-service driver-training expenses.....	1	2	3	4	5	6	7

Q-22 Would you indicate how much you agree or disagree with the following three statements about in-service driver training for your company? (Circle the appropriate number on the scale to the right of each statement.)

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
A. Our company considers in-service driver training a strategic safety investment.....	1	2	3	4	5	6	7
B. Our company spends more on in-service driving training than do most carriers.....	1	2	3	4	5	6	7
C. Our company closely monitors in-service driver-training expenses.....	1	2	3	4	5	6	7

Q-23 Would you say that pre-service driver training has greater impact than in-service driver training, that in-service driver training has greater impact than pre-service driver training, or that both have equal impact on your company's highway safety performance? (Mark an "X" in the appropriate box.)

- Pre-service training has more impact than in-service training
- In-service training has more impact than pre-service training
- Pre-service and in-service training have equal impact

Q-24 Would you indicate how much you agree or disagree with following three statements about your company's driver training personnel? (Circle the appropriate number on the scale to the right of each statement.)

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
A. Training directors strongly influence our safety management decisions.....	1	2	3	4	5	6	7
B. Our trainers enjoy high prestige among company employees.....	1	2	3	4	5	6	7
C. Peer-to-peer training is a vital element of our driver safety program.....	1	2	3	4	5	6	7

SECTION 4

QUESTIONS 25 THROUGH QUESTION 32 SEEK INFORMATION ABOUT PRACTICES THAT YOUR COMPANY USES TO ENCOURAGE AND REINFORCE SAFE DRIVING BEHAVIOR.

PLEASE CONTINUE BY ANSWERING QUESTION 25.

Q-25 Would you indicate whether or not your company has safety award programs for the following categories of personnel or organizational units? (Mark an "X" in the appropriate boxes.)

<u>Personnel or organizational unit</u>	Does the company have a safety award program for them?		
	Yes	No	Not Applicable
A. Individual drivers.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Driver teams.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Terminals or hubs.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Other personnel or organizational units (Specify below) _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IF YOU ANSWERED "NO" OR "NOT APPLICABLE" TO ALL OF THE CATEGORIES ABOVE, SKIP TO QUESTION 29.

Q-26 Would you indicate how frequently your company presents safety awards to the following personnel or organizational units? (Mark an "X" in all appropriate boxes to the right of each personnel or organizational unit..)

<u>Personnel or Organizational Unit</u>	No Awards at All	Weekly Awards	Monthly Awards	Quarterly Awards	Semi-annual Awards	Annual Awards
A. Individual drivers.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Driver teams.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Terminal units.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Other personnel or organizational units (Specify below) _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q-27 Would you indicate whether or not your company uses each of the following types of rewards to encourage safe driving behavior? (Mark an "X" in the appropriate boxes.)

<u>Type of Reward</u>	Uses this type of reward?	
	Yes	No
A. Cash.....	<input type="checkbox"/>	<input type="checkbox"/>
B. Certificates of merit.....	<input type="checkbox"/>	<input type="checkbox"/>
C. Congratulatory letters from management.....	<input type="checkbox"/>	<input type="checkbox"/>
D. Extra holidays.....	<input type="checkbox"/>	<input type="checkbox"/>
E. Favorable consideration for promotion.....	<input type="checkbox"/>	<input type="checkbox"/>
F. Free CDL renewal.....	<input type="checkbox"/>	<input type="checkbox"/>
G. Free meals.....	<input type="checkbox"/>	<input type="checkbox"/>
H. Insurance rebates.....	<input type="checkbox"/>	<input type="checkbox"/>
I. Lottery tickets.....	<input type="checkbox"/>	<input type="checkbox"/>
J. Merchandise.....	<input type="checkbox"/>	<input type="checkbox"/>
K. Public recognition.....	<input type="checkbox"/>	<input type="checkbox"/>
L. Safety banquets.....	<input type="checkbox"/>	<input type="checkbox"/>
M. Safety decorations (e.g., badges, patches).....	<input type="checkbox"/>	<input type="checkbox"/>
N. Savings bonds.....	<input type="checkbox"/>	<input type="checkbox"/>
O. Travel packages.....	<input type="checkbox"/>	<input type="checkbox"/>
P. Upgraded vehicle options.....	<input type="checkbox"/>	<input type="checkbox"/>
Q. Verbal praise.....	<input type="checkbox"/>	<input type="checkbox"/>
R. Other rewards (Please specify)		
_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>

Q-28 Are the standards your company uses for driver safety awards based on the following criteria or ones similar to them? For example, if your company gives safety awards to drivers who are crash-free for a year, you would mark the "Yes" box to the right of "Crashes during a specified time period." (Mark an "X" in the appropriate boxes.)

<u>Criterion</u>	Based on this or a similar criterion?	Not based on this or a similar criterion?
1. Crashes during a specified time period.....	<input type="checkbox"/>	<input type="checkbox"/>
3. Crashes over a specified number of miles.....	<input type="checkbox"/>	<input type="checkbox"/>
2. Traffic convictions during a specified time period.....	<input type="checkbox"/>	<input type="checkbox"/>
0. Traffic convictions over a specified number of miles.....	<input type="checkbox"/>	<input type="checkbox"/>
3. FMCSR violations during a specified time period.....	<input type="checkbox"/>	<input type="checkbox"/>
2. FMCSR violations over a specified number of miles.....	<input type="checkbox"/>	<input type="checkbox"/>
3. Public complaints during a specified time period.....		
1. Other standards (Please specify below)		

Q-29 Does your company discipline its drivers for each of the following? (Mark an "X" in the appropriate boxes.)

	Yes	No
A. Violations of Federal Motor Carrier Safety Regulations....	<input type="checkbox"/>	<input type="checkbox"/>
B. Violating company safety policies.....	<input type="checkbox"/>	<input type="checkbox"/>
C. Unsafe driving performance in general.....		

IF YOU ANSWERED “NO” TO PARTS (A.), (B.), AND (C.), SKIP TO QUESTION 32.

Q-30 Would you rate how effective or ineffective the following actions are at helping your firm discipline drivers for unsafe driving behavior? (Circle the appropriate number on the scale to the right of each action.)

Action	Very Ineffective	Ineffective	Somewhat Ineffective	Neither Effective nor Ineffective	Somewhat Effective	Effective	Very Effective
A. Suspension from service.....	1	2	3	4	5	6	7
B. Termination of employment.....	1	2	3	4	5	6	7
C. Verbal warning.....	1	2	3	4	5	6	7
D. Written warning.....	1	2	3	4	5	6	7
E. Other action (Specify below)							
_____	1	2	3	4	5	6	7
_____	1	2	3	4	5	6	7

Q-31 Would you say that safety rewards have greater impact than disciplinary actions, that disciplinary actions have greater impact than safety rewards, or that both have equal impact on your company’s highway safety performance? (Mark an “X” in the appropriate box.)

- Safety rewards have more impact than disciplinary actions
- Disciplinary actions have more impact than safety rewards
- Safety rewards and disciplinary actions have equal impact

Q-32 Would you indicate how much you agree or disagree with the following four statements about reinforcing driver safety at your company? (Circle the appropriate number on the scale to the right of each source.)

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
A. Disciplining drivers does little to impact on our company’s highway safety	1	2	3	4	5	6	7
B. Only safe drivers get promoted at our company.....	1	2	3	4	5	6	7
C. Rewards are the best way to get drivers to drive safely.....	1	2	3	4	5	6	7
D. Safety training without incentives to reinforce the training is useless.....	1	2	3	4	5	6	7

SECTION 5

QUESTIONS 33 THROUGH QUESTION 37 SEEK INFORMATION ABOUT THE PRACTICES YOUR COMPANY USES TO MANAGE THE CONDITIONS ITS DRIVERS FACE WHILE IN SERVICE. PLEASE CONTINUE BY ANSWERING QUESTION 33 BELOW.

Q-33 What is the average length-of-haul for your company’s over-the-road drivers?

- 0-250 miles
- 251-500 miles
- 501-750 miles
- 750-1000 miles
- More than 1000 miles

Q-34 Approximately what percent of your company's annual vehicle miles occur in local operations?

- Zero percent
- 1-25 percent
- 26-50 percent
- 51-75 percent
- 75-100 percent

Q-35 Approximately what percent of your company's drivers work in local operations?

- Zero percent
- 1-25 percent
- 26-50 percent
- 51-75 percent
- 75-100 percent

Q-36 Would you indicate whether or not your company use each of the following technologies to monitor driver performance? (Mark an "X" in the appropriate boxes.)

Technology	Used by your company?	
	Yes	No
A. Engine diagnostics.....	<input type="checkbox"/>	<input type="checkbox"/>
B. Real-time vehicle routing software.....	<input type="checkbox"/>	<input type="checkbox"/>
C. Satellite-tracking/global positioning system.....	<input type="checkbox"/>	<input type="checkbox"/>
D. Speed regulators on vehicles.....	<input type="checkbox"/>	<input type="checkbox"/>
E. Two-way radios.....	<input type="checkbox"/>	<input type="checkbox"/>
F. Wireless messaging systems.....	<input type="checkbox"/>	<input type="checkbox"/>
G. Other technologies (Please specify below.)	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>

Q-37 Would you indicate how much you agree or disagree with each of the following statements about how your company manages driver fatigue? (Circle the appropriate number on the scale to the right of each statement.)

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
A. Our drivers refuse dispatches if they do not feel alert enough to handle the drive.....	1	2	3	4	5	6	7
B. Our drivers never suffer from sleep deprivation.....	1	2	3	4	5	6	7
C. We equip our trucks so they are easier to handle...	1	2	3	4	5	6	7
D. We strongly restrict drivers' break times.....	1	2	3	4	5	6	7
E. We urge drivers to talk on radios while driving.....	1	2	3	4	5	6	7

SECTION 6

QUESTIONS 38- 53 SEEK INFORMATION ABOUT PRACTICES YOUR COMPANY USES TO MANAGE THE AMOUNT OF WEAR AND TEAR THAT ITS VEHICLES ARE EXPOSED TO.

PLEASE CONTINUE BY ANSWERING QUESTION 38 BELOW.

Q-38 Does your company currently use a computerized equipment maintenance management program?

- No
- Yes

IF NO. SKIP TO QUESTION 40.

Q-39 Would you indicate whether or not the data collected from your company's computerized equipment maintenance (CEM) management program is used to support the following activities? (Mark an "X" in the appropriate boxes.)

Activity	Supported by CEM data?	
	Yes	No
1. Developing proper equipment specifications.....	<input type="checkbox"/>	<input type="checkbox"/>
3. Developing equipment maintenance procedures....	<input type="checkbox"/>	<input type="checkbox"/>
2. Monitoring equipment maintenance activities.....	<input type="checkbox"/>	<input type="checkbox"/>
0. Determining mechanic training needs.....	<input type="checkbox"/>	<input type="checkbox"/>
3. Performing part failure analysis.....	<input type="checkbox"/>	<input type="checkbox"/>
3. Scheduling equipment repairs.....	<input type="checkbox"/>	<input type="checkbox"/>

Q-40 Does your company outsource one or more of its fleet maintenance activities?

- No
 Yes

IF NO. SKIP TO QUESTION 42.

Q-41 Would you please indicate whether or not your company outsources each of the following maintenance activities? (Mark an "X" in the appropriate boxes.)

Activity	Outsourced by your company?	
	Yes	No
A. Brake system repairs.....	<input type="checkbox"/>	<input type="checkbox"/>
B. Electrical/light system repairs.....	<input type="checkbox"/>	<input type="checkbox"/>
C. In-chassis engine repairs.....	<input type="checkbox"/>	<input type="checkbox"/>
D. Major drive train repairs.....	<input type="checkbox"/>	<input type="checkbox"/>
E. Minor drive train repairs.....	<input type="checkbox"/>	<input type="checkbox"/>
F. Out-of-chassis engine repairs.....	<input type="checkbox"/>	<input type="checkbox"/>
G. Preventive maintenance.....	<input type="checkbox"/>	<input type="checkbox"/>
H. Tire repairs.....	<input type="checkbox"/>	<input type="checkbox"/>
I. Tire replacement.....	<input type="checkbox"/>	<input type="checkbox"/>
J. Truck washing.....	<input type="checkbox"/>	<input type="checkbox"/>

Q-42 Approximately what percent of your company's power unit service and repairs do company employees perform?

- Zero percent
 1-25 percent
 26-50 percent
 51-75 percent
 76-100 percent

Q-43 About how many mechanics does your company employ to service its fleet?

- 1-10 mechanics
- 11-20 mechanics
- 21-30 mechanics
- 31-40 mechanics
- 41-50 mechanics
- 51-100 mechanics
- 101-250 mechanics
- 251-500 mechanics
- 500-1000 mechanics
- 1001 or more mechanics

Q-44 Approximately what percentage of your company's mechanics have had formal mechanic's training, either prior to or during service with the company?

- 0-25 percent
- 26-50 percent
- 51-75 percent
- 76-100 percent

Q-45 Approximately how many weeks of formal training has the average mechanic at your company received?

- 0 weeks
- 1-6 weeks
- 7-12 weeks
- 12-24 weeks
- 24 or more weeks

Q-46 Which of the following ranges best describes the number of power units in your company's fleet?

- 1-10 power units
- 11-20 power units
- 21-30 power units
- 31-40 power units
- 41-50 power units
- 51-100 power units
- 101-250 power units
- 251-500 power units
- 501-1000 power units
- 1001 or more power units

Q-47 On average, how many years does your company operate a new power unit before replacing it?

- 3 years or less
- 4 years
- 5 years
- 6 years
- 7 years
- 8 or more years

Q-48 Which of the following ranges best describes the total vehicle miles that your company's fleet travels in a year?

- 10 million miles or less
- More than 10 million, but less than 50 million miles
- More than 50 million, but less than 100 million miles
- More than 100 million, but less than 150 million miles
- More than 150 million miles

Q-49 Roughly how many miles do your company power units travel between Schedule A, Schedule B, and Schedule C preventive maintenance (PM) inspections? (Mark an "X" in the appropriate boxes.)

	Schedule A	Schedule B	Schedule C
A. Less than 10,000miles.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. 10,001-20,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. 20,001-30,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. 30,001-40,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. 40,001-50,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. 50,001 or more miles.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q-50 On average, how many miles do your company's new power units travel before needing an (a) in-frame engine overhaul and (b) in-frame drive train overhaul?

	(a) In-frame engine overhaul	(b) In-frame drive train overhaul
A. Less than 300,000miles.....	<input type="checkbox"/>	<input type="checkbox"/>
B. 300,001-400,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>
C. 400,001-500,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>
D. 500,001-600,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>
E. 600,001-700,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>
F. 700,001 or more miles.....	<input type="checkbox"/>	<input type="checkbox"/>

Q-51 Roughly how many miles do your company's new power units travel before needing an (a) out-of-chassis engine overhaul and (b) out-of-chassis drive train overhaul?

	(a) Out-of-chassis engine overhaul	(b) Out-of-chassis drive train overhaul
A. Less than 500,000miles.....	<input type="checkbox"/>	<input type="checkbox"/>
B. 500,001-600,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>
C. 600,001-700,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>
D. 700,001-800,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>
E. 800,001 or more miles.....	<input type="checkbox"/>	<input type="checkbox"/>

Q-52 Roughly how many miles do your company trailers travel between (a) inspections of the trailer's general condition and (b) routine servicing of it brake systems? (Mark an "X" in the appropriate boxes.)

	(a) Inspection of trailer general condition	(b) Routine service of trailer brake system
A. Less than 10,000miles.....	<input type="checkbox"/>	<input type="checkbox"/>
B. 10,001-20,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>
C. 20,001-30,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>
D. 30,001-40,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>
E. 40,001-50,000 miles.....	<input type="checkbox"/>	<input type="checkbox"/>
F. 50,001 or more miles.....	<input type="checkbox"/>	<input type="checkbox"/>

Q-53 Would you indicate how much you agree or disagree with following three statements about your company's overall vehicle management? (Circle the appropriate number on the scale to the right of each statement.)

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1. Cost is no issue when it comes to keeping our vehicles defect-free.....	1	2	3	4	5	6	7
3. Deploying a defect-free fleet is the most important thing we do to ensure highway safety.....	1	2	3	4	5	6	7
2. Our vehicles rarely need unscheduled repairs.....	1	2	3	4	5	6	7

SECTION 1: GENERAL INFORMATION

Questions 1 & 2 seek information about the importance of safety management and of communication about safety issues at your company.

Row %

		1a) Complying with public safety regulations completely satisfies our highway safety objectives						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		8.1%	18.9%	8.1%	2.7%	16.2%	20.3%	25.7%
Liquid Gas		6.7%	6.7%	11.1%	4.4%	11.1%	26.7%	33.3%
Chemical		6.8%	11.4%	6.8%	4.5%	13.6%	20.5%	36.4%
Paper Products		7.1%	14.3%	9.5%		7.1%	33.3%	28.6%
Dry Bulk		2.9%	11.8%	11.8%	2.9%	14.7%	26.5%	29.4%
Size	Small	8.7%	8.7%	6.5%	6.5%	19.6%	26.1%	23.9%
	Medium	7.7%	21.2%	7.7%	3.8%	13.5%	26.9%	19.2%
	Large	4.4%	15.6%	8.9%	2.2%	11.1%	24.4%	33.3%
Total		7.0%	15.4%	7.7%	4.2%	14.7%	25.9%	25.2%

Responses (#): Gen. Frt,74; Liq. Gas,45; Chem, 44; Paper, 42; Dry Blk,34; Small,46; Med,52; Lrg,45; Tot Size, 143

Row %

		Q(1b) Cost is no issue when it comes to highway safety decisions at our company						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		2.7%	10.8%	6.8%	2.7%	17.6%	31.1%	28.4%
Liquid Gas		2.2%	6.7%	6.7%	6.7%	15.6%	28.9%	33.3%
Chemical		4.5%	6.8%	9.1%		13.6%	34.1%	31.8%
Paper Products		2.4%	2.4%	11.9%		9.5%	45.2%	28.6%
Dry Bulk		2.9%	5.9%	14.7%		11.8%	38.2%	26.5%
Size	Small	2.2%	2.2%	17.4%	6.5%	19.6%	21.7%	30.4%
	Medium		5.9%	9.8%	3.9%	19.6%	31.4%	29.4%
	Large	2.2%	13.0%	6.5%	2.2%	15.2%	34.8%	26.1%
Total		1.4%	7.0%	11.2%	4.2%	18.2%	29.4%	28.7%

Responses (#): Gen. Frt,74; Liq. Gas,45; Chem, 44; Paper, 42; Dry Blk,34; Small,46; Med,51; Lrg,46; Tot Size, 143

Row %

		Q(1c) Customer service and highway safety performance go hand-in-hand at our company						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		1.3%		1.3%	1.3%	2.7%	33.3%	60.0%
Liquid Gas			2.2%	2.2%	4.4%	13.3%	20.0%	57.8%
Chemical		2.3%	2.3%	4.5%	4.5%	9.1%	22.7%	54.5%
Paper Products		2.4%		2.4%		7.1%	26.2%	61.9%
Dry Bulk				2.9%		5.9%	23.5%	67.6%
Size	Small		2.2%	2.2%	2.2%	8.7%	37.0%	47.8%
	Medium			1.9%	1.9%	3.8%	25.0%	67.3%
	Large	2.2%		2.2%	2.2%	6.5%	32.6%	54.3%
Total		.7%	.7%	2.1%	2.1%	6.3%	31.3%	56.9%

Responses (#): Gen. Frt,75; Liq. Gas,45; Chem, 44; Paper, 42; Dry Blk,34; Small,46; Med,52; Lrg,46; Tot Size, 144

Questions 1 & 2 (cont.)

Row %

		Q(1d) Employee relations go hand-in-hand with highway safety performance at our company				
		Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		1.3%		6.7%	33.3%	58.7%
Liquid Gas		2.2%	4.4%	11.1%	17.8%	64.4%
Chemical		2.3%	2.3%	6.8%	27.3%	61.4%
Paper Products		2.4%	2.4%	4.8%	28.6%	61.9%
Dry Bulk		2.9%	2.9%	2.9%	20.6%	70.6%
Size	Small		4.3%	8.7%	34.8%	52.2%
	Medium			11.5%	34.6%	53.8%
	Large	2.2%	2.2%	2.2%	23.9%	69.6%
Total		.7%	2.1%	7.6%	31.3%	58.3%

Responses (#): Gen. Frt,75; Liq. Gas,45; Chem, 44; Paper, 42; Dry Blk,34; Small,46; Med,52; Lrg,46; Tot Size, 144

Row %

		Q(2a) Our Employees feel comfortable discussing highway safety issues with their supervisors			
		Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		2.7%	5.3%	50.7%	41.3%
Liquid Gas		4.4%	11.1%	40.0%	44.4%
Chemical		4.5%	4.5%	50.0%	40.9%
Paper Products			2.4%	52.4%	45.2%
Dry Bulk		5.9%	5.9%	50.0%	38.2%
Size	Small	2.2%	13.0%	52.2%	32.6%
	Medium		3.8%	44.2%	51.9%
	Large	6.5%	4.3%	47.8%	41.3%
Total		2.8%	6.9%	47.9%	42.4%

Responses (#): Gen. Frt,75; Liq. Gas,45; Chem, 44; Paper, 42; Dry Blk,34; Small,46; Med,52; Lrg,46; Tot Size, 144

Row %

		Q(2b) Many ideas about improving the firm's highway safety come from our employees					
		Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight			1.3%	6.7%	14.7%	52.0%	25.3%
Liquid Gas				6.7%	22.2%	40.0%	31.1%
Chemical				4.5%	20.5%	45.5%	29.5%
Paper Products				2.4%	21.4%	35.7%	40.5%
Dry Bulk		2.9%		5.9%	26.5%	32.4%	32.4%
Size	Small	2.2%	2.2%	15.2%	21.7%	47.8%	10.9%
	Medium			3.8%	19.2%	48.1%	28.8%
	Large		2.2%	2.2%	19.6%	43.5%	32.6%
Total		.7%	1.4%	6.9%	20.1%	46.5%	24.3%

Responses (#): Gen. Frt,75; Liq. Gas,45; Chem, 44; Paper, 42; Dry Blk,34; Small,46; Med,52; Lrg,46; Tot Size, 144

Questions 1 & 2 (cont.)

Row %

		Q(2c) Management's highway safety concerns are greatly publicized among our employees			
		Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		1.3%		45.3%	53.3%
Liquid Gas		4.4%	2.2%	44.4%	48.9%
Chemical		2.3%	2.3%	38.6%	56.8%
Paper Products		2.4%	2.4%	28.6%	66.7%
Dry Bulk			5.9%	29.4%	64.7%
Size	Small	4.3%	6.5%	47.8%	41.3%
	Medium	7.7%	3.8%	40.4%	48.1%
	Large			41.3%	58.7%
Total		4.2%	3.5%	43.1%	49.3%

Responses (#): Gen. Frt,75 ; Liq. Gas,45 ; Chem, 44 ; Paper, 42 ; Dry Blk,34 ; Small,46 ; Med,52 ; Lrg,46 ; Tot Size, 144

Row %

		Q(2d) Our employees frequently voice highway safety concerns to their immediate supervisors				
		Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight			4.0%	18.7%	50.7%	26.7%
Liquid Gas			4.4%	13.3%	53.3%	28.9%
Chemical		2.3%	2.3%	11.4%	59.1%	25.0%
Paper Products				11.9%	52.4%	35.7%
Dry Bulk		2.9%	5.9%	14.7%	47.1%	29.4%
Size	Small	4.3%	6.5%	19.6%	43.5%	26.1%
	Medium		3.8%	9.6%	59.6%	26.9%
	Large		6.5%	17.4%	47.8%	28.3%
Total		1.4%	5.6%	15.3%	50.7%	27.1%

Responses (#): Gen. Frt,75 ; Liq. Gas,45 ; Chem, 44 ; Paper, 42 ; Dry Blk,34 ; Small,46 ; Med,52 ; Lrg,46 ; Tot Size, 144

SECTION 2: DRIVER HIRING PRACTICES

Question 3 inquires about the number of drivers hired each year. Question 4 is about the importance of a number of driver characteristics when hiring a company driver.

Row %

		Q(3) Approximately how many drivers does your company hire each year									
		1-10	11-20	21-30	31-40	41-50	51-100	101-150	151-200	200-250	250+
General Freight		40.0%	10.7%	8.0%	4.0%	6.7%	10.7%	4.0%	1.3%	6.7%	8.0%
Liquid Gas		37.8%	13.3%	8.9%	4.4%	6.7%	22.2%	4.4%		2.2%	
Chemical		38.6%	6.8%	9.1%	4.5%	9.1%	18.2%	4.5%		6.8%	2.3%
Paper Products		52.4%	9.5%	7.1%	4.8%	4.8%	9.5%	2.4%		4.8%	4.8%
Dry Bulk		44.1%	8.8%	8.8%		8.8%	11.8%	5.9%		8.8%	2.9%
Size	Small	80.0%	11.1%	4.4%	2.2%					2.2%	
	Medium	44.2%	15.4%	13.5%	7.7%	5.8%	9.6%				3.8%
	Large	17.4%	8.7%	10.9%	6.5%	10.9%	15.2%	8.7%	2.2%	8.7%	10.9%
Total		46.9%	11.9%	9.8%	5.6%	5.6%	8.4%	2.8%	.7%	3.5%	4.9%

Responses (#): Gen. Frt,75 ; Liq. Gas,45 ; Chem, 44 ; Paper, 42 ; Dry Blk,34 ; Small,45 ; Med,52 ; Lrg,46 ; Tot Size, 143

Row %

		Q(4a) Applicant is 21-25 years of age						
		Very Unimportant	Unimportant	Slightly Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		4.1%	12.2%	2.7%	16.2%	8.1%	25.7%	31.1%
Liquid Gas		9.3%	14.0%	4.7%	7.0%	14.0%	30.2%	20.9%
Chemical		4.8%	7.1%	7.1%	19.0%	7.1%	26.2%	28.6%
Paper Products			9.8%	2.4%	24.4%	12.2%	29.3%	22.0%
Dry Bulk		6.3%	12.5%	3.1%	18.8%	9.4%	25.0%	25.0%
Size	Small	6.5%	15.2%	4.3%	23.9%	8.7%	26.1%	15.2%
	Medium	5.9%	9.8%	3.9%	17.6%	17.6%	19.6%	25.5%
	Large	4.5%	9.1%		18.2%	6.8%	31.8%	29.5%
Total		5.7%	11.3%	2.8%	19.9%	11.3%	25.5%	23.4%

Responses (#): Gen. Frt,74 ; Liq. Gas,43 ; Chem, 42 ; Paper, 41 ; Dry Blk,32 ; Small,46 ; Med,51 ; Lrg,44 ; Tot Size, 141

Row %

		Q(4b) Applicant is over 25 years of age					
		Unimportant	Slightly Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		3.9%	1.3%	18.2%	16.9%	33.8%	26.0%
Liquid Gas			2.2%	17.8%	11.1%	40.0%	28.9%
Chemical			2.3%	20.5%	13.6%	36.4%	27.3%
Paper Products		4.7%		25.6%	9.3%	44.2%	16.3%
Dry Bulk		2.9%	2.9%	20.0%	8.6%	42.9%	22.9%
Size	Small	2.1%	4.2%	27.1%	18.8%	20.8%	27.1%
	Medium			20.4%	16.7%	37.0%	25.9%
	Large	4.3%	2.2%	17.4%	10.9%	41.3%	23.9%
Total		2.0%	2.0%	21.6%	15.5%	33.1%	25.7%

Responses (#): Gen. Frt,77 ; Liq. Gas,45 ; Chem, 44 ; Paper, 43 ; Dry Blk,35 ; Small,48 ; Med,54 ; Lrg,46 ; Tot Size, 148

Questions 3 & 4 (cont.)

Row %

		Q(4c) Completed a Professional Truck Driver Institute - certified training program						
		Very Unimportant	Unimportant	Slightly Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		6.6%	10.5%	2.6%	21.1%	21.1%	23.7%	14.5%
Liquid Gas		9.5%	11.9%	4.8%	23.8%	16.7%	26.2%	7.1%
Chemical		2.4%	12.2%	7.3%	17.1%	14.6%	36.6%	9.8%
Paper Products		4.7%	4.7%		27.9%	20.9%	30.2%	11.6%
Dry Bulk		8.6%	11.4%	2.9%	22.9%	17.1%	28.6%	8.6%
Size	Small	4.3%	8.5%	8.5%	31.9%	21.3%	19.1%	6.4%
	Medium	3.8%	9.4%		28.3%	26.4%	20.8%	11.3%
	Large	6.8%	13.6%	2.3%	22.7%	20.5%	25.0%	9.1%
Total		4.9%	10.4%	3.5%	27.8%	22.9%	21.5%	9.0%

Responses (#): Gen. Frt,76; Liq. Gas,42; Chem, 41; Paper, 43; Dry Blk,35; Small,47; Med,53; Lrg,44; Tot Size, 144

Row %

		Q(4d) Driving experience with other carriers				
		Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		1.3%	3.9%	6.5%	32.5%	55.8%
Liquid Gas		2.2%	4.4%	8.9%	37.8%	46.7%
Chemical		2.3%	2.3%	9.1%	38.6%	47.7%
Paper Products			4.7%	9.3%	32.6%	53.5%
Dry Bulk			5.7%	11.4%	42.9%	40.0%
Size	Small		8.5%	10.6%	31.9%	48.9%
	Medium	1.9%	3.7%	11.1%	37.0%	46.3%
	Large		2.2%	6.5%	34.8%	56.5%
Total		.7%	4.8%	9.5%	34.7%	50.3%

Responses (#): Gen. Frt,77; Liq. Gas,45; Chem, 44; Paper, 43; Dry Blk,35; Small,47; Med,54; Lrg,46; Tot Size, 147

Row %

		Q(4e) No chargeable crashes				
		Slightly Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight				5.2%	27.3%	67.5%
Liquid Gas				6.7%	26.7%	66.7%
Chemical				6.8%	27.3%	65.9%
Paper Products				2.3%	18.6%	79.1%
Dry Bulk				2.9%	37.1%	60.0%
Size	Small		2.1%	10.4%	25.0%	62.5%
	Medium	1.9%		3.7%	24.1%	70.4%
	Large			4.3%	26.1%	69.6%
Total		.7%	.7%	6.1%	25.0%	67.6%

Responses (#): Gen. Frt,77; Liq. Gas,45; Chem, 44; Paper, 43; Dry Blk,35; Small,48; Med,54; Lrg,46; Tot Size, 148

Questions 3 & 4 (cont.)

Row %

		Q(4f) No prior dismissals for alcohol or drug-related violations			
		Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight			2.6%	6.5%	90.9%
Liquid Gas		2.2%	2.2%	11.1%	84.4%
Chemical		2.3%	2.3%	11.4%	84.1%
Paper Products			2.3%	11.6%	86.0%
Dry Bulk				11.4%	88.6%
Size	Small	2.1%	6.3%	8.3%	83.3%
	Medium	1.9%	1.9%	9.3%	87.0%
	Large			8.7%	91.3%
Total		1.4%	2.7%	8.8%	87.2%

Responses (#): Gen. Frt,77 ; Liq. Gas,45 ; Chem, 44 ; Paper, 43 ; Dry Blk,35 ; Small,48 ; Med,54 ; Lrg,46 ; Tot Size, 148

Row %

		Q(4g) No prior speeding tickets			
		Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		3.9%	22.1%	42.9%	31.2%
Liquid Gas		2.2%	15.6%	42.2%	40.0%
Chemical		4.5%	15.9%	43.2%	36.4%
Paper Products		2.3%	18.6%	48.8%	30.2%
Dry Bulk		5.7%	17.1%	48.6%	28.6%
Size	Small	10.4%	27.1%	35.4%	27.1%
	Medium	3.7%	14.8%	46.3%	35.2%
	Large		21.7%	45.7%	32.6%
Total		4.7%	20.9%	42.6%	31.8%

Responses (#): Gen. Frt,77 ; Liq. Gas,45 ; Chem, 44 ; Paper, 43 ; Dry Blk,35 ; Small,48 ; Med,54 ; Lrg,46 ; Tot Size, 148

Row %

		Q(4h) No prior traffic violation convictions			
		Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		3.9%	23.4%	41.6%	31.2%
Liquid Gas			20.0%	42.2%	37.8%
Chemical			22.7%	40.9%	36.4%
Paper Products		2.3%	20.9%	44.2%	32.6%
Dry Bulk		2.9%	25.7%	40.0%	31.4%
Size	Small	10.4%	29.2%	39.6%	20.8%
	Medium		20.4%	42.6%	37.0%
	Large		21.7%	43.5%	34.8%
Total		3.4%	23.6%	41.9%	31.1%

Responses (#): Gen. Frt,77 ; Liq. Gas,45 ; Chem, 44 ; Paper, 43 ; Dry Blk,35 ; Small,48 ; Med,54 ; Lrg,46 ; Tot Size, 148

Questions 3 & 4 (cont.)

Row %

		Q(4i) Recommended from other carrier(s)				
		Slightly Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight			15.6%	16.9%	40.3%	27.3%
Liquid Gas			11.6%	25.6%	32.6%	30.2%
Chemical			11.9%	21.4%	35.7%	31.0%
Paper Products			18.6%	18.6%	34.9%	27.9%
Dry Bulk			20.0%	22.9%	31.4%	25.7%
Size	Small		19.1%	17.0%	36.2%	27.7%
	Medium	1.9%	14.8%	16.7%	35.2%	31.5%
	Large		11.1%	22.2%	40.0%	26.7%
Total		.7%	15.1%	18.5%	37.0%	28.8%

Responses (#): Gen. Frt,77; Liq. Gas,43; Chem, 42; Paper, 43; Dry Blk,35; Small,47; Med,54; Lrg,45; Tot Size, 146

Row %

		Q(4j) Solo driving experience					
		Unimportant	Slightly Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight				10.4%	13.0%	39.0%	36.4%
Liquid Gas		1.3%		11.1%	20.0%	28.9%	40.0%
Chemical				11.4%	18.2%	40.9%	29.5%
Paper Products				14.0%	14.0%	37.2%	34.9%
Dry Bulk				17.1%	17.1%	28.6%	37.1%
Size	Small	2.1%	2.1%	19.1%	6.4%	40.4%	29.8%
	Medium			17.0%	11.3%	34.0%	37.7%
	Large			6.5%	19.6%	39.1%	34.8%
Total		.7%	.7%	14.4%	12.3%	37.7%	34.2%

Responses (#): Gen. Frt,77; Liq. Gas,45; Chem, 44; Paper, 43; Dry Blk,35; Small,47; Med,53; Lrg,46; Tot Size, 146

Row %

		Q(4k) Other qualifications				
		Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight					32.5%	67.5%
Liquid Gas		3.3%	3.3%	3.3%	30.0%	60.0%
Chemical		4.2%			33.3%	62.5%
Paper Products					36.0%	64.0%
Dry Bulk			4.8%	9.5%	33.3%	52.4%
Size	Small				26.1%	73.9%
	Medium		3.2%	3.2%	32.3%	61.3%
	Large	3.6%		3.6%	35.7%	57.1%
Total		1.2%	1.2%	2.4%	31.7%	63.4%

Responses (#): Gen. Frt,40; Liq. Gas,30; Chem, 24; Paper, 25; Dry Blk,21; Small,23; Med,31; Lrg,28; Tot Size, 82

Questions 5 – 7 are questions for companies that have drivers that are owner-operators. Question 7 asks about the importance of driver characteristics for driver applicants who are owner operators.

Row %

		Q(5) Does your company have a policy that does not allow it to hire owner operators	
		yes	no
General Freight		37.3%	62.7%
Liquid Gas		45.5%	54.5%
Chemical		39.5%	60.5%
Paper Products		43.6%	56.4%
Dry Bulk		42.4%	57.6%
Size	Small	47.7%	52.3%
	Medium	51.9%	48.1%
	Large	37.8%	62.2%
Total		46.1%	53.9%

Responses (#): Gen. Frt,75; Liq. Gas,44; Chem, 43; Paper, 39; Dry Blk,33; Small,44; Med,52; Lrg,45; Tot Size, 141

Row %

		(6) Approx what percent of the drivers that your company hires each year are owner-operators					
		zero	1-10	11-20	31-40	41-50	50+
General Freight		30.0%	30.0%	10.0%	2.0%	10.0%	18.0%
Liquid Gas		27.3%	45.5%	9.1%		4.5%	13.6%
Chemical		37.5%	29.2%	12.5%	4.2%	4.2%	12.5%
Paper Products		22.7%	36.4%	9.1%	4.5%	9.1%	18.2%
Dry Bulk		21.1%	42.1%	5.3%	5.3%	5.3%	21.1%
Size	Small	44.0%	28.0%	12.0%			16.0%
	Medium	33.3%	41.7%	4.2%		12.5%	8.3%
	Large	22.6%	35.5%	6.5%	3.2%	16.1%	16.1%
Total		32.5%	35.0%	7.5%	1.3%	10.0%	13.8%

Responses (#): Gen. Frt,50; Liq. Gas,22; Chem, 24; Paper, 22; Dry Blk,19; Small,25; Med,24; Lrg,31; Tot Size, 80

Row %

		Q(7a) Applicant is 21-25 years of age				
		Very Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		7.5%	15.0%	5.0%	35.0%	37.5%
Liquid Gas		18.8%	12.5%	12.5%	18.8%	37.5%
Chemical		10.0%	10.0%	10.0%	25.0%	45.0%
Paper Products			15.8%	10.5%	31.6%	42.1%
Dry Bulk		12.5%	18.8%	18.8%	12.5%	37.5%
Size	Small	10.5%	31.6%	5.3%	21.1%	31.6%
	Medium	15.8%	15.8%	15.8%	10.5%	42.1%
	Large	7.7%	11.5%	7.7%	38.5%	34.6%
Total		10.9%	18.8%	9.4%	25.0%	35.9%

Responses (#): Gen. Frt,40; Liq. Gas,16; Chem, 20; Paper, 19; Dry Blk,16; Small,19; Med,19; Lrg,26; Tot Size, 64

Questions 5 – 7 (cont.)

Row %

		Q(7b) Applicant is over 25 years of age				
		Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		2.3%	11.6%	16.3%	25.6%	44.2%
Liquid Gas				16.7%	27.8%	55.6%
Chemical			4.8%	14.3%	28.6%	52.4%
Paper Products		5.0%	10.0%	5.0%	40.0%	40.0%
Dry Bulk			11.1%	22.2%	27.8%	38.9%
Size	Small	5.0%	10.0%	30.0%	15.0%	40.0%
	Medium		14.3%	19.0%	14.3%	52.4%
	Large		11.1%	7.4%	40.7%	40.7%
Total		1.5%	11.8%	17.6%	25.0%	44.1%

Responses (#): Gen. Frt,43; Liq. Gas,18; Chem, 21; Paper, 20; Dry Blk,18; Small,20; Med,21; Lrg,27; Tot Size, 68

Row %

		Q(7c) Completed a Professional Truck Driver Inst-certified training program						
		Very Unimportant	Unimportant	Slightly Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		4.9%	7.3%		19.5%	12.2%	36.6%	19.5%
Liquid Gas		12.5%	12.5%	6.3%	18.8%	12.5%	25.0%	12.5%
Chemical		5.6%	5.6%	5.6%	5.6%	16.7%	50.0%	11.1%
Paper Products			5.3%		15.8%	15.8%	47.4%	15.8%
Dry Bulk		11.8%	5.9%		23.5%	17.6%	29.4%	11.8%
Size	Small		5.0%	5.0%	35.0%	20.0%	20.0%	15.0%
	Medium	5.0%	5.0%		10.0%	40.0%	25.0%	15.0%
	Large	8.0%	12.0%		16.0%	12.0%	36.0%	16.0%
Total		4.6%	7.7%	1.5%	20.0%	23.1%	27.7%	15.4%

Responses (#): Gen. Frt,41; Liq. Gas,16; Chem, 18; Paper, 19; Dry Blk,17; Small,20; Med,20; Lrg,25; Tot Size, 65

Row %

		Q(7d) Driving experience with other carriers			
		Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		7.1%	4.8%	31.0%	57.1%
Liquid Gas				23.5%	76.5%
Chemical				30.0%	70.0%
Paper Products		5.0%	5.0%	30.0%	60.0%
Dry Bulk		5.6%	5.6%	61.1%	27.8%
Size	Small	15.0%	10.0%	30.0%	45.0%
	Medium		4.8%	33.3%	61.9%
	Large	3.8%		30.8%	65.4%
Total		6.0%	4.5%	31.3%	58.2%

Responses (#): Gen. Frt,42; Liq. Gas,17; Chem, 20; Paper, 20; Dry Blk,18; Small,20; Med,21; Lrg,26; Tot Size, 67

Questions 5 – 7 (cont.)

Row %

		Q(7e) No chargeable crashes				
		Slightly Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight			4.7%		30.2%	65.1%
Liquid Gas					27.8%	72.2%
Chemical					33.3%	66.7%
Paper Products			5.0%		30.0%	65.0%
Dry Bulk			5.6%		44.4%	50.0%
Size	Small		10.0%		20.0%	70.0%
	Medium	4.8%		4.8%	28.6%	61.9%
	Large		3.7%		33.3%	63.0%
Total		1.5%	4.4%	1.5%	27.9%	64.7%

Responses (#): Gen. Frt,43; Liq. Gas,18; Chem, 21; Paper, 20; Dry Blk,18; Small,20; Med,21; Lrg,27; Tot Size, 68

Row %

		Q(7f) No prior dismissals for alcohol or drug-related violations		
		Neither Important nor Unimportant	Important	Very Important
General Freight		2.3%	4.7%	93.0%
Liquid Gas				100.0%
Chemical			4.8%	95.2%
Paper Products			5.0%	95.0%
Dry Bulk			5.6%	94.4%
Size	Small	5.0%	5.0%	90.0%
	Medium			100.0%
	Large	3.7%	7.4%	88.9%
Total		2.9%	4.4%	92.6%

Responses (#): Gen. Frt,43; Liq. Gas,18; Chem, 21; Paper, 20; Dry Blk,18; Small,20; Med,21; Lrg,27; Tot Size, 68

Row %

		Q(7g) No prior speeding tickets			
		Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		4.7%	27.9%	32.6%	34.9%
Liquid Gas			11.1%	44.4%	44.4%
Chemical			19.0%	47.6%	33.3%
Paper Products		5.0%	35.0%	40.0%	20.0%
Dry Bulk		5.6%	27.8%	44.4%	22.2%
Size	Small	10.0%	35.0%	20.0%	35.0%
	Medium	4.8%	19.0%	38.1%	38.1%
	Large	3.7%	22.2%	40.7%	33.3%
Total		5.9%	25.0%	33.8%	35.3%

Responses (#): Gen. Frt,43; Liq. Gas,18; Chem, 21; Paper, 20; Dry Blk,18; Small,20; Med,21; Lrg,27; Tot Size, 68

Questions 5 – 7 (cont.)

Row %

		Q(7h) No prior traffic violation convictions			
		Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		7.0%	25.6%	37.2%	30.2%
Liquid Gas			5.6%	55.6%	38.9%
Chemical			14.3%	52.4%	33.3%
Paper Products		5.0%	35.0%	50.0%	10.0%
Dry Bulk		5.6%	22.2%	50.0%	22.2%
Size	Small	15.0%	25.0%	30.0%	30.0%
	Medium	4.8%	23.8%	42.9%	28.6%
	Large	3.7%	22.2%	44.4%	29.6%
Total		7.4%	23.5%	39.7%	29.4%

Responses (#): Gen. Frt,43; Liq. Gas,18; Chem, 21; Paper, 20; Dry Blk,18; Small,20; Med,21; Lrg,27; Tot Size, 68

Row %

		Q(7i) Recommended from other carrier(s)				
		Slightly Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight			19.0%	9.5%	40.5%	31.0%
Liquid Gas			11.8%	11.8%	41.2%	35.3%
Chemical			5.0%	10.0%	55.0%	30.0%
Paper Products			20.0%	5.0%	55.0%	20.0%
Dry Bulk			27.8%	22.2%	33.3%	16.7%
Size	Small		20.0%	25.0%	35.0%	20.0%
	Medium	4.8%	23.8%	14.3%	33.3%	23.8%
	Large		15.4%	7.7%	46.2%	30.8%
Total		1.5%	19.4%	14.9%	38.8%	25.4%

Responses (#): Gen. Frt,42; Liq. Gas,17; Chem, 20; Paper, 20; Dry Blk,18; Small,20; Med,21; Lrg,26; Tot Size, 67

Row %

		Q(7j) Solo driving experience				
		Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		4.8%	14.3%	7.1%	31.0%	42.9%
Liquid Gas			11.8%	11.8%	29.4%	47.1%
Chemical			10.0%	15.0%	30.0%	45.0%
Paper Products			20.0%	10.0%	30.0%	40.0%
Dry Bulk			27.8%	16.7%	33.3%	22.2%
Size	Small	10.0%	15.0%	10.0%	25.0%	40.0%
	Medium		23.8%	4.8%	19.0%	52.4%
	Large		11.5%	7.7%	42.3%	38.5%
Total		3.0%	16.4%	7.5%	29.9%	43.3%

Responses (#): Gen. Frt,42; Liq. Gas,17; Chem, 20; Paper, 20; Dry Blk,18; Small,20; Med,21; Lrg,26; Tot Size, 67

Questions 5 – 7 (cont.)

Row %

		Q(7k) Other qualifications			
		Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		10.0%		25.0%	65.0%
Liquid Gas			9.1%	45.5%	45.5%
Chemical		9.1%		54.5%	36.4%
Paper Products				18.2%	81.8%
Dry Bulk			11.1%	55.6%	33.3%
Size	Small	14.3%		14.3%	71.4%
	Medium	10.0%		30.0%	60.0%
	Large	6.3%	6.3%	31.3%	56.3%
Total		9.1%	3.0%	27.3%	60.6%

Responses (#): Gen. Frt,20; Liq. Gas,11; Chem, 11; Paper, 11; Dry Blk,9; Small,7; Med,10; Lrg, 16; Tot Size, 33

**Question 8 is about the importance of driver personality traits for driver applicants.
Question 9 is about the effectiveness of hiring practices for assessing safety risk of driver applicants.**

Row %

		Q(8a) Importance of personality trait: Honest		
		Slightly Important	Important	Very Important
General Freight			14.3%	85.7%
Liquid Gas		2.2%	13.3%	84.4%
Chemical		2.3%	9.1%	88.6%
Paper Products			9.3%	90.7%
Dry Bulk			20.0%	80.0%
Size	Small	2.1%	20.8%	77.1%
	Medium		7.4%	92.6%
	Large		15.2%	84.8%
Total		.7%	14.2%	85.1%

Responses (#): Gen. Frt,77 ; Liq. Gas,45 ; Chem, 44 ; Paper, 43 ; Dry Blk,35 ; Small,48 ; Med,54 ; Lrg,46 ; Tot Size, 148

Row %

		Q(8b) Importance of personality trait: Patient			
		Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		2.6%	9.2%	34.2%	53.9%
Liquid Gas		2.3%	11.4%	29.5%	56.8%
Chemical		2.3%	9.3%	30.2%	58.1%
Paper Products		2.3%	7.0%	32.6%	58.1%
Dry Bulk		2.9%	5.9%	38.2%	52.9%
Size	Small		14.9%	42.6%	42.6%
	Medium	1.9%	9.3%	40.7%	48.1%
	Large	4.4%	4.4%	40.0%	51.1%
Total		2.1%	9.6%	41.1%	47.3%

Responses (#): Gen. Frt,76 ; Liq. Gas,44 ; Chem, 43 ; Paper, 43 ; Dry Blk,34 ; Small,47 ; Med,54 ; Lrg,45 ; Tot Size, 146

Row %

		Q(8c) Importance of personality trait: Reliable		
		Neither Important nor Unimportant	Important	Very Important
General Freight			18.2%	81.8%
Liquid Gas		2.2%	11.1%	86.7%
Chemical			13.6%	86.4%
Paper Products			7.0%	93.0%
Dry Bulk			14.3%	85.7%
Size	Small		20.8%	79.2%
	Medium	1.9%	5.6%	92.6%
	Large		23.9%	76.1%
Total		.7%	16.2%	83.1%

Responses (#): Gen. Frt,77 ; Liq. Gas,45 ; Chem, 44 ; Paper, 43 ; Dry Blk,35 ; Small,48 ; Med,54 ; Lrg,46 ; Tot Size, 148

Questions 8 & 9 (cont.)

Row %

		Q(8d) Importance of personality trait: Self-disciplined			
		Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight			3.9%	35.1%	61.0%
Liquid Gas		2.2%	6.7%	42.2%	48.9%
Chemical			9.1%	40.9%	50.0%
Paper Products			7.0%	32.6%	60.5%
Dry Bulk			5.7%	31.4%	62.9%
Size	Small		10.4%	37.5%	52.1%
	Medium	1.9%	3.7%	51.9%	42.6%
	Large		2.2%	41.3%	56.5%
Total		.7%	5.4%	43.9%	50.0%

Responses (#): Gen. Frt,77 ; Liq. Gas,45 ; Chem, 44 ; Paper, 43 ; Dry Blk,35 ; Small,48 ; Med,54 ; Lrg,46 ; Tot Size, 148

Row %

		Q(8e) Importance of personality trait: Self-motivated			
		Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		1.3%	9.1%	33.8%	55.8%
Liquid Gas		4.4%	4.4%	37.8%	53.3%
Chemical			9.1%	38.6%	52.3%
Paper Products			7.0%	30.2%	62.8%
Dry Bulk			2.9%	34.3%	62.9%
Size	Small	4.2%	8.3%	33.3%	54.2%
	Medium	1.9%	5.6%	50.0%	42.6%
	Large		8.7%	37.0%	54.3%
Total		2.0%	7.4%	40.5%	50.0%

Responses (#): Gen. Frt,77 ; Liq. Gas,45 ; Chem, 44 ; Paper, 43 ; Dry Blk,35 ; Small,48 ; Med,54 ; Lrg,46 ; Tot Size, 148

Row %

		Q(8f) Importance of personality trait: Sociable						
		Very Unimportant	Unimportant	Slightly Unimportant	Neither Important nor Unimportant	Slightly Important	Important	Very Important
General Freight		1.3%	1.3%		10.4%	28.6%	35.1%	23.4%
Liquid Gas				2.2%	6.7%	31.1%	44.4%	15.6%
Chemical		2.3%		2.3%	6.8%	25.0%	43.2%	20.5%
Paper Products		2.3%			2.3%	30.2%	30.2%	34.9%
Dry Bulk					2.9%	25.7%	34.3%	37.1%
Size	Small		2.1%		16.7%	31.3%	29.2%	20.8%
	Medium		1.9%		7.4%	33.3%	35.2%	22.2%
	Large	2.2%		2.2%	8.7%	19.6%	50.0%	17.4%
Total		.7%	1.4%	.7%	10.8%	28.4%	37.8%	20.3%

Responses (#): Gen. Frt,77 ; Liq. Gas,45 ; Chem, 44 ; Paper, 43 ; Dry Blk,35 ; Small,48 ; Med,54 ; Lrg,46 ; Tot Size, 148

Questions 8 & 9 (cont.)

Row %

		Q(9a) Hiring practice: DOT/Fit for work physical					Very Effective
		Ineffective	Somewhat Ineffective	Neither Effective nor Ineffective	Somewhat Effective	Effective	
General Freight			2.6%	7.8%	19.5%	23.4%	46.8%
Liquid Gas			2.2%	4.4%	17.8%	24.4%	51.1%
Chemical		2.3%	4.5%	2.3%	20.5%	20.5%	50.0%
Paper Products		2.3%	4.7%		20.9%	20.9%	51.2%
Dry Bulk			5.7%	5.7%	14.3%	22.9%	51.4%
Size	Small	2.1%		10.4%	22.9%	18.8%	45.8%
	Medium	3.7%	3.7%	1.9%	14.8%	22.2%	53.7%
	Large			4.3%	15.2%	30.4%	50.0%
Total		2.0%	1.4%	5.4%	17.6%	23.6%	50.0%

Responses (#): Gen. Frt,77; Liq. Gas,45; Chem, 44; Paper, 43; Dry Blk,35; Small,48; Med,54; Lrg,46; Tot Size, 148

Row %

		Q(9b) Hiring practice: Drug Testing				Very Effective
		Somewhat Ineffective	Neither Effective nor Ineffective	Somewhat Effective	Effective	
General Freight		1.3%	2.6%	2.6%	18.4%	75.0%
Liquid Gas			4.5%	2.3%	15.9%	77.3%
Chemical		2.3%	4.7%	4.7%	16.3%	72.1%
Paper Products		2.3%	2.3%	7.0%	18.6%	69.8%
Dry Bulk		2.9%	2.9%	5.9%	14.7%	73.5%
Size	Small		4.2%	8.3%	20.8%	66.7%
	Medium	1.9%	1.9%	1.9%	9.3%	85.2%
	Large		2.2%	2.2%	24.4%	71.1%
Total		.7%	2.7%	4.1%	17.7%	74.8%

Responses (#): Gen. Frt,76; Liq. Gas,44; Chem, 43; Paper, 43; Dry Blk,34; Small,48; Med,54; Lrg,45; Tot Size, 147

Row %

		Q(9c) Hiring practice: Follow up on previous employment						
		Very Ineffective	Ineffective	Somewhat Ineffective	Neither Effective nor Ineffective	Somewhat Effective	Effective	Very Effective
General Freight		1.3%	2.6%	2.6%	2.6%	22.1%	29.9%	39.0%
Liquid Gas		4.4%	2.2%	4.4%	4.4%	24.4%	26.7%	33.3%
Chemical		2.3%	6.8%	6.8%		20.5%	25.0%	38.6%
Paper Products		2.3%	4.7%	9.3%	2.3%	25.6%	20.9%	34.9%
Dry Bulk			5.7%	11.4%	5.7%	34.3%	20.0%	22.9%
Size	Small	2.1%	2.1%	4.2%	4.2%	22.9%	33.3%	31.3%
	Medium		5.6%	9.3%	3.7%	24.1%	31.5%	25.9%
	Large	2.2%	2.2%		2.2%	17.4%	32.6%	43.5%
Total		1.4%	3.4%	4.7%	3.4%	21.6%	32.4%	33.1%

Responses (#): Gen. Frt,77; Liq. Gas,45; Chem, 44; Paper, 43; Dry Blk,35; Small,48; Med,54; Lrg,46; Tot Size, 148

Questions 8 & 9 (cont.)

Row %

		Q(9d) Hiring practice: Job interview				
		Somewhat Ineffective	Neither Effective nor Ineffective	Somewhat Effective	Effective	Very Effective
General Freight		1.3%		15.8%	42.1%	40.8%
Liquid Gas		2.2%		8.9%	46.7%	42.2%
Chemical		2.3%		13.6%	43.2%	40.9%
Paper Products		2.3%		14.0%	32.6%	51.2%
Dry Bulk				8.6%	45.7%	45.7%
Size	Small	2.1%	2.1%	8.3%	54.2%	33.3%
	Medium			9.4%	43.4%	47.2%
	Large			15.6%	35.6%	48.9%
Total		.7%	.7%	11.0%	44.5%	43.2%

Responses (#): Gen. Frt,76; Liq. Gas,45; Chem, 44; Paper, 43; Dry Blk,35; Small,48; Med,53; Lrg,45; Tot Size, 146

Row %

		Q(9e) Hiring practice: License qualification check				
		Somewhat Ineffective	Neither Effective nor Ineffective	Somewhat Effective	Effective	Very Effective
General Freight		2.6%	5.2%	7.8%	36.4%	48.1%
Liquid Gas		2.2%	4.4%		33.3%	60.0%
Chemical		2.3%	6.8%	4.5%	31.8%	54.5%
Paper Products		2.3%	4.7%	9.3%	25.6%	58.1%
Dry Bulk			5.7%	14.3%	28.6%	51.4%
Size	Small	2.1%	4.2%	14.6%	43.8%	35.4%
	Medium	1.9%		5.7%	37.7%	54.7%
	Large		4.3%	2.2%	32.6%	60.9%
Total		1.4%	2.7%	7.5%	38.1%	50.3%

Responses (#): Gen. Frt,77; Liq. Gas,45; Chem, 44; Paper, 43; Dry Blk,35; Small,48; Med,53; Lrg,46; Tot Size, 147

Row %

		Q(9f) Hiring practice: Reference check						
		Very Ineffective	Ineffective	Somewhat Ineffective	Neither Effective nor Ineffective	Somewhat Effective	Effective	Very Effective
General Freight			2.6%	2.6%	7.8%	24.7%	29.9%	32.5%
Liquid Gas			4.4%	4.4%	4.4%	20.0%	31.1%	35.6%
Chemical			4.5%	4.5%	11.4%	18.2%	25.0%	36.4%
Paper Products			11.6%	4.7%	4.7%	18.6%	18.6%	41.9%
Dry Bulk			8.6%	5.7%	5.7%	25.7%	22.9%	31.4%
Size	Small	2.1%		4.2%	4.2%	29.2%	33.3%	27.1%
	Medium		7.4%	5.6%	5.6%	20.4%	29.6%	31.5%
	Large		2.2%		4.3%	28.3%	28.3%	37.0%
Total		.7%	3.4%	3.4%	4.7%	25.7%	30.4%	31.8%

Responses (#): Gen. Frt,77; Liq. Gas,45; Chem, 44; Paper, 43; Dry Blk,35; Small,48; Med,54; Lrg,46; Tot Size, 148

Questions 8 & 9 (cont.)

Row %

		Q(9g) Hiring practice: Test drive to observe applicant's on-the-road behavior				
		Ineffective	Neither Effective nor Ineffective	Somewhat Effective	Effective	Very Effective
General Freight		1.3%		7.8%	24.7%	66.2%
Liquid Gas			2.2%	4.4%	35.6%	57.8%
Chemical		2.3%	2.3%	4.5%	40.9%	50.0%
Paper Products			4.7%	7.0%	27.9%	60.5%
Dry Bulk			5.7%	8.6%	34.3%	51.4%
Size	Small	2.1%	4.2%	16.7%	39.6%	37.5%
	Medium				25.9%	74.1%
	Large		2.2%	4.3%	28.3%	65.2%
Total		.7%	2.0%	6.8%	31.1%	59.5%

Responses (#): Gen. Frt,77 ; Liq. Gas,45 ; Chem, 44 ; Paper, 43 ; Dry Blk,35 ; Small,48 ; Med,54 ; Lrg,46 ; Tot Size, 148

Row %

		Q(9h) Hiring practice: Traffic record check			
		Neither Effective nor Ineffective	Somewhat Effective	Effective	Very Effective
General Freight		1.3%	6.5%	31.2%	61.0%
Liquid Gas			4.4%	28.9%	66.7%
Chemical			9.1%	25.0%	65.9%
Paper Products			4.7%	27.9%	67.4%
Dry Bulk			8.6%	25.7%	65.7%
Size	Small	2.1%	8.3%	43.8%	45.8%
	Medium		3.7%	33.3%	63.0%
	Large		4.3%	26.1%	69.6%
Total		.7%	5.4%	34.5%	59.5%

Responses (#): Gen. Frt,77 ; Liq. Gas,45 ; Chem, 44 ; Paper, 43 ; Dry Blk,35 ; Small,48 ; Med,54 ; Lrg,46 ; Tot Size, 148

Questions 10 & 11 are questions about written hiring policies. Question 11 is about how clearly safety-related criteria are stated in company's written hiring policies.

Row %

		Q(10) Does your company have a written hiring policy that contains safety-related criteria for applicants seeking driver positions with the company?	
		yes	no
General Freight		72.90%	27.10%
Liquid Gas		72.10%	27.90%
Chemical		80.00%	20.00%
Paper Products		69.20%	30.80%
Dry Bulk		67.60%	32.40%
Size	Small	45.70%	54.30%
	Medium	74.50%	25.50%
	Large	90.70%	9.30%
Total		70.00%	30.00%

Responses (#): Gen. Frt,70; Liq. Gas,43; Chem, 40; Paper, 39; Dry Blk,34; Small,46; Med,51; Lrg,43; Tot Size, 140

Row %

		Q(11a) Criterion for driver safety: # of crashes that disqualify an applicant as a candidate for employment						
		Very Unclearly	Unclearly	Neither Clearly nor Unclearly	Slightly Clearly	Clearly	Very Clearly	N/A (not in hiring policy)
General Freight		1.9%		11.1%	3.7%	13.0%	64.8%	5.6%
Liquid Gas			3.2%	9.7%	9.7%	9.7%	61.3%	6.5%
Chemical		3.0%	3.0%	12.1%	6.1%	6.1%	60.6%	9.1%
Paper Products		3.7%	3.7%	11.1%	3.7%	14.8%	55.6%	7.4%
Dry Bulk		4.5%		9.1%	9.1%	18.2%	50.0%	9.1%
Size	Small			14.3%	19.0%	9.5%	28.6%	28.6%
	Medium	2.7%	5.4%	2.7%	8.1%	18.9%	59.5%	2.7%
	Large		2.5%	12.5%		10.0%	70.0%	5.0%
Total		1.0%	3.1%	9.2%	7.1%	13.3%	57.1%	9.2%

Responses (#): Gen. Frt,54; Liq. Gas,31; Chem, 33; Paper, 27; Dry Blk,22; Small,21; Med,37; Lrg,40; Tot Size, 98

Row %

		1b) Criterion for driver safety: # of moving violations that disqualifies applicant as a candidate for employment						
		Very Unclearly	Unclearly	Neither Clearly nor Unclearly	Slightly Clearly	Clearly	Very Clearly	N/A (not in hiring policy)
General Freight		1.8%		5.5%	7.3%	10.9%	69.1%	5.5%
Liquid Gas					9.7%	6.5%	74.2%	9.7%
Chemical		3.0%		3.0%	12.1%	6.1%	66.7%	9.1%
Paper Products		3.7%		7.4%	7.4%	14.8%	59.3%	7.4%
Dry Bulk		4.5%		4.5%	9.1%	18.2%	63.6%	
Size	Small			9.1%	18.2%	13.6%	36.4%	22.7%
	Medium	2.6%	2.6%		10.5%	23.7%	57.9%	2.6%
	Large			5.0%	2.5%	5.0%	82.5%	5.0%
Total		1.0%	1.0%	4.0%	9.0%	14.0%	63.0%	8.0%

Responses (#): Gen. Frt,55; Liq. Gas,31; Chem, 33; Paper, 27; Dry Blk,22; Small,22; Med,38; Lrg,40; Tot Size, 100

Questions 10 & 11 (cont.)

Row %

		Q(11c) Criterion for driver safety: Required review of applicant's driving record before being considered for hire				
		Very Unclearly	Slightly Unclearly	Neither Clearly nor Unclearly	Clearly	Very Clearly
General Freight		1.8%		1.8%	7.3%	89.1%
Liquid Gas					6.5%	93.5%
Chemical		2.9%			8.8%	88.2%
Paper Products		3.6%			7.1%	89.3%
Dry Bulk		4.3%			21.7%	73.9%
Size	Small			4.3%	13.0%	82.6%
	Medium	2.5%	2.5%		12.5%	82.5%
	Large				5.0%	95.0%
Total		1.0%	1.0%	1.0%	9.7%	87.4%

Responses (#): Gen. Frt,55; Liq. Gas,31; Chem, 34; Paper, 28; Dry Blk,23; Small,23; Med,40; Lrg,40; Tot Size, 103

Row %

		11d) Criterion for driver safety: Requirement that applicant complete an approved safety training program before being considered for hire						N/A (not in hiring policy)
		Very Unclearly	Unclearly	Neither Clearly nor Unclearly	Slightly Clearly	Clearly	Very Clearly	
General Freight		2.0%	2.0%	21.6%	3.9%	7.8%	27.5%	35.3%
Liquid Gas			7.4%	14.8%		18.5%	29.6%	29.6%
Chemical		3.3%	6.7%	16.7%		13.3%	26.7%	33.3%
Paper Products		4.3%	4.3%	26.1%		8.7%	26.1%	30.4%
Dry Bulk		5.0%		30.0%	5.0%	10.0%	20.0%	30.0%
Size	Small			10.5%	5.3%	10.5%	21.1%	52.6%
	Medium	6.1%		12.1%	9.1%	18.2%	21.2%	33.3%
	Large		8.1%	27.0%	2.7%	5.4%	24.3%	32.4%
Total		2.2%	3.4%	18.0%	5.6%	11.2%	22.5%	37.1%

Responses (#): Gen. Frt,51; Liq. Gas,27; Chem, 30; Paper, 23; Dry Blk,20; Small,19; Med,33; Lrg,37; Tot Size, 89

Row %

		1e) Criterion for driver safety: Requirement that applicant participate in driver training after being hired						N/A (not in hiring policy)
		Unclearly	Slightly Unclearly	Neither Clearly nor Unclearly	Slightly Clearly	Clearly	Very Clearly	
General Freight				10.9%	7.3%	12.7%	50.9%	18.2%
Liquid Gas		3.4%	3.4%	6.9%	6.9%	10.3%	58.6%	10.3%
Chemical		3.1%	3.1%	9.4%	3.1%	12.5%	56.3%	12.5%
Paper Products		3.8%		19.2%		15.4%	46.2%	15.4%
Dry Bulk			4.8%	9.5%	4.8%	19.0%	47.6%	14.3%
Size	Small			14.3%	9.5%	14.3%	33.3%	28.6%
	Medium		2.6%	2.6%	5.3%	23.7%	52.6%	13.2%
	Large	2.6%		10.3%	7.7%	10.3%	56.4%	12.8%
Total		1.0%	1.0%	8.2%	7.1%	16.3%	50.0%	16.3%

Responses (#): Gen. Frt,55; Liq. Gas,29; Chem, 32; Paper, 26; Dry Blk,21; Small,21; Med,38; Lrg,39; Tot Size, 98

SECTION 3: DRIVER TRAINING PRACTICES

Questions 12 – 14 are about general information for companies that require driver pre- and in-service training.

Row %

		Q(12a) Company requires pre-service training for drivers who are company employees?		
		yes	no	N/A
General Freight		84.4%	11.7%	3.9%
Liquid Gas		88.9%	4.4%	6.7%
Chemical		88.6%	9.1%	2.3%
Paper Products		83.7%	9.3%	7.0%
Dry Bulk		80.0%	14.3%	5.7%
Size	Small	70.8%	20.8%	8.3%
	Medium	90.7%	7.4%	1.9%
	Large	87.0%	6.5%	6.5%
Total		83.1%	11.5%	5.4%

Responses (#): Gen. Frt,77; Liq. Gas,45; Chem, 44; Paper, 43; Dry Blk,35; Small,48; Med,54; Lrg,46; Tot Size, 148

Row %

		Q(12b) Company requires pre-service training for drivers who are owner-operators?		
		yes	no	N/A
General Freight		40.6%	14.5%	44.9%
Liquid Gas		35.7%	7.1%	57.1%
Chemical		39.0%	7.3%	53.7%
Paper Products		28.6%	7.1%	64.3%
Dry Bulk		31.4%	8.6%	60.0%
Size	Small	19.0%	26.2%	54.8%
	Medium	28.0%	4.0%	68.0%
	Large	48.8%	7.0%	44.2%
Total		31.9%	11.9%	56.3%

Responses (#): Gen. Frt,69; Liq. Gas,42; Chem, 41; Paper, 42; Dry Blk,35; Small,42; Med,50; Lrg,43; Tot Size, 135

Row %

		13a) # of weeks of pre-service training required? Drivers who are company employed						
		0	0	1-2	3-4	5-6	7-8	over 8
General Freight			24.2%	50.0%	16.7%	6.1%	1.5%	1.5%
Liquid Gas		2.5%	12.5%	62.5%	20.0%			2.5%
Chemical			18.4%	55.3%	18.4%	5.3%		2.6%
Paper Products			21.6%	48.6%	18.9%	8.1%		2.7%
Dry Bulk			25.0%	60.7%	7.1%	3.6%		3.6%
Size	Small	2.8%	22.2%	55.6%	11.1%	8.3%		
	Medium		24.5%	44.9%	16.3%	10.2%	2.0%	2.0%
	Large		17.9%	61.5%	20.5%			
Total		.8%	21.8%	53.2%	16.1%	6.5%	.8%	.8%

Responses (#): Gen. Frt,66; Liq. Gas,40; Chem, 38; Paper, 37; Dry Blk,28; Small,36; Med,49; Lrg,39; Tot Size, 124

Questions 12 - 14 (cont.)

Row %

		Q(13b) # of weeks of pre-service training required? Owner-operators who drive for the company			
		0	1-2	3-4	over 8
General Freight		48.6%	45.7%	2.9%	2.9%
Liquid Gas		35.3%	47.1%	17.6%	
Chemical		38.9%	50.0%	11.1%	
Paper Products		47.1%	41.2%	5.9%	5.9%
Dry Bulk		46.7%	53.3%		
Size	Small	66.7%	11.1%	16.7%	5.6%
	Medium	45.0%	55.0%		
	Large	43.5%	52.2%	4.3%	
Total		50.8%	41.0%	6.6%	1.6%

Responses (#): Gen. Frt,35; Liq. Gas,17; Chem, 18; Paper, 17; Dry Blk,15; Small,18; Med,20; Lrg,23; Tot Size, 61

Row %

		Q(14a) In-service training required of these individuals? Drivers who are company employees		
		yes	no	N/A
General Freight		88.2%	9.2%	2.6%
Liquid Gas		93.3%	2.2%	4.4%
Chemical		95.5%	2.3%	2.3%
Paper Products		86.0%	7.0%	7.0%
Dry Bulk		85.7%	8.6%	5.7%
Size	Small	74.5%	21.3%	4.3%
	Medium	94.4%	1.9%	3.7%
	Large	91.3%	4.3%	4.3%
Total		87.1%	8.8%	4.1%

Responses (#): Gen. Frt,76; Liq. Gas,45; Chem, 44; Paper, 43; Dry Blk,35; Small,47; Med,54; Lrg,46; Tot Size, 147

Row %

		Q(14b) In-service training required of these individuals? Owner-operators who drive for the company		
		yes	no	N/A
General Freight		48.4%	9.7%	41.9%
Liquid Gas		43.2%	5.4%	51.4%
Chemical		52.8%	2.8%	44.4%
Paper Products		33.3%	11.1%	55.6%
Dry Bulk		51.7%	6.9%	41.4%
Size	Small	29.7%	16.2%	54.1%
	Medium	34.1%	9.1%	56.8%
	Large	55.0%	5.0%	40.0%
Total		39.7%	9.9%	50.4%

Responses (#): Gen. Frt,62; Liq. Gas,37; Chem, 36; Paper, 36; Dry Blk,29; Small,37; Med,44; Lrg,40; Tot Size, 121

Question 15 is about specific subjects covered in pre - and in-service training programs.

Row %

		Q(15a.a) Accident Notification		
		yes	no	N/A
General Freight		96.9%	1.5%	1.5%
Liquid Gas		100.0%		
Chemical		100.0%		
Paper Products		97.1%	2.9%	
Dry Bulk		100.0%		
Size	Small	93.9%	3.0%	3.0%
	Medium	93.6%	6.4%	
	Large	97.6%	2.4%	
Total		95.0%	4.1%	.8%

Row %

		Q(15b.a) Accident Notification		
		yes	no	N/A
General Freight		87.3%	11.1%	1.6%
Liquid Gas		91.7%	5.6%	2.8%
Chemical		88.9%	8.3%	2.8%
Paper Products		88.6%	8.6%	2.9%
Dry Bulk		88.5%	7.7%	3.8%
Size	Small	88.2%	2.9%	8.8%
	Medium	92.9%	7.1%	
	Large	92.7%	7.3%	
Total		91.5%	6.0%	2.6%

Responses (#):

- a)Pre-service: Gen. Frt, 65 ; Liq. Gas,38; Chem, 36; Paper, 35; Dry Blk,27; Small,33; Med,47; Lrg,41; Tot Size, 121
 b)In-service: Gen. Frt, 63; Liq. Gas,36; Chem, 36; Paper, 35; Dry Blk,26; Small,34; Med,42; Lrg,41; Tot Size, 117

Row %

		Q(15a.b) CPR training		
		yes	no	N/A
General Freight		4.8%	93.7%	1.6%
Liquid Gas		2.6%	97.4%	
Chemical		2.8%	97.2%	
Paper Products			100.0%	
Dry Bulk			100.0%	
Size	Small	6.3%	90.6%	3.1%
	Medium		100.0%	
	Large	4.9%	95.1%	
Total		3.4%	95.7%	.9%

Row %

		Q(15b.b) CPR training		
		yes	no	N/A
General Freight		12.7%	87.3%	
Liquid Gas		13.5%	86.5%	
Chemical		16.2%	83.8%	
Paper Products		2.8%	97.2%	
Dry Bulk		14.8%	81.5%	3.7%
Size	Small	14.7%	79.4%	5.9%
	Medium	6.7%	93.3%	
	Large	12.8%	87.2%	
Total		11.0%	87.3%	1.7%

Responses (#):

- a)Pre-service: Gen. Frt, 63; Liq. Gas,38; Chem, 36; Paper, 34; Dry Blk,26; Small,32; Med,43; Lrg,41; Tot Size, 116
 b)In-service: Gen. Frt, 63; Liq. Gas,37; Chem, 37; Paper, 36; Dry Blk,27; Small,34; Med,45; Lrg,39; Tot Size, 118

Row %

		Q(15a.c) Defensive driving		
		yes	no	N/A
General Freight		79.0%	19.4%	1.6%
Liquid Gas		97.4%	2.6%	
Chemical		91.7%	8.3%	
Paper Products		76.5%	23.5%	
Dry Bulk		80.8%	19.2%	
Size	Small	77.4%	19.4%	3.2%
	Medium	77.8%	22.2%	
	Large	85.0%	15.0%	
Total		80.2%	19.0%	.9%

Row %

		Q(15b.c) Defensive driving		
		yes	no	N/A
General Freight		82.8%	17.2%	
Liquid Gas		88.9%	11.1%	
Chemical		83.3%	16.7%	
Paper Products		80.0%	20.0%	
Dry Bulk		82.1%	14.3%	3.6%
Size	Small	73.5%	20.6%	5.9%
	Medium	93.3%	6.7%	
	Large	92.5%	7.5%	
Total		87.4%	10.9%	1.7%

Responses (#):

- a)Pre-service: Gen. Frt, 62; Liq. Gas,38; Chem, 36; Paper, 34; Dry Blk,26; Small,31; Med,45; Lrg,40; Tot Size, 116
 b)In-service: Gen. Frt, 64; Liq. Gas,36; Chem, 36; Paper, 35; Dry Blk,28; Small,34; Med,45; Lrg,40; Tot Size, 119

Questions 15 (cont.)

Row %

		Q(15a.d) Dispatch procedures		
		yes	no	N/A
General Freight		87.7%	10.8%	1.5%
Liquid Gas		94.9%	5.1%	
Chemical		94.4%	5.6%	
Paper Products		91.4%	8.6%	
Dry Bulk		96.3%	3.7%	
Size	Small	84.8%	12.1%	3.0%
	Medium	95.7%	4.3%	
	Large	92.7%	7.3%	
Total		91.7%	7.5%	.8%

Row %

		Q(15b.d) Dispatch procedures		
		yes	no	N/A
General Freight		77.8%	19.0%	3.2%
Liquid Gas		77.1%	20.0%	2.9%
Chemical		78.4%	18.9%	2.7%
Paper Products		82.9%	14.3%	2.9%
Dry Bulk		78.6%	17.9%	3.6%
Size	Small	83.9%	6.5%	9.7%
	Medium	81.8%	18.2%	
	Large	80.0%	17.5%	2.5%
Total		81.7%	14.8%	3.5%

Responses (#):

- a)Pre-service: Gen. Frt,65 ; Liq. Gas,39 ; Chem, 36 ; Paper, 35 ; Dry Blk,27 ; Small,33 ; Med,46 ; Lrg,41 ; Tot Size, 120
 b)In-service: Gen. Frt,63 ; Liq. Gas,35 ; Chem, 37 ; Paper, 35 ; Dry Blk,28 ; Small,31 ; Med,44 ; Lrg,40 ; Tot Size, 115

Row %

		Q(15a.e) Driver disciplinary policies		
		yes	no	N/A
General Freight		89.2%	7.7%	3.1%
Liquid Gas		94.9%	2.6%	2.6%
Chemical		94.4%	2.8%	2.8%
Paper Products		91.7%	5.6%	2.8%
Dry Bulk		100.0%		
Size	Small	84.8%	9.1%	6.1%
	Medium	93.6%	6.4%	
	Large	95.1%	4.9%	
Total		91.7%	6.6%	1.7%

Row %

		Q(15b.e) Driver disciplinary policies		
		yes	no	N/A
General Freight		82.5%	17.5%	
Liquid Gas		82.9%	17.1%	
Chemical		81.1%	18.9%	
Paper Products		82.9%	17.1%	
Dry Bulk		85.7%	10.7%	3.6%
Size	Small	80.6%	12.9%	6.5%
	Medium	88.6%	11.4%	
	Large	82.9%	17.1%	
Total		84.5%	13.8%	1.7%

Responses (#):

- a)Pre-service: Gen. Frt,65 ; Liq. Gas,39 ; Chem, 36 ; Paper, 36 ; Dry Blk,27 ; Small,33 ; Med,47 ; Lrg,41 ; Tot Size, 121
 b)In-service: Gen. Frt,63 ; Liq. Gas,35 ; Chem, 37 ; Paper, 35 ; Dry Blk,28 ; Small,31 ; Med,44 ; Lrg,41 ; Tot Size, 116

Row %

		Q(15a.f) Federal safety regulations		
		yes	no	N/A
General Freight		92.4%	4.5%	3.0%
Liquid Gas		94.7%	2.6%	2.6%
Chemical		94.4%	2.8%	2.8%
Paper Products		97.2%		2.8%
Dry Bulk		96.3%	3.7%	
Size	Small	88.2%	5.9%	5.9%
	Medium	97.8%	2.2%	
	Large	97.6%	2.4%	
Total		95.0%	3.3%	1.7%

Row %

		Q(15b.f) Federal safety regulations		
		yes	no	N/A
General Freight		91.9%	8.1%	
Liquid Gas		100.0%		
Chemical		97.3%	2.7%	
Paper Products		94.3%	5.7%	
Dry Bulk		96.4%		3.6%
Size	Small	87.1%	6.5%	6.5%
	Medium	93.2%	6.8%	
	Large	97.6%	2.4%	
Total		93.1%	5.2%	1.7%

Responses (#):

- a)Pre-service: Gen. Frt,66 ; Liq. Gas,38 ; Chem, 36 ; Paper, 36 ; Dry Blk,27 ; Small,34 ; Med,46 ; Lrg,41 ; Tot Size, 121
 b)In-service: Gen. Frt,62 ; Liq. Gas,35 ; Chem, 37 ; Paper, 35 ; Dry Blk,28 ; Small,31 ; Med,44 ; Lrg,41 ; Tot Size, 116

Questions 15 (cont.)

Row %

		Q(15a.g) First-aid training		
		yes	no	N/A
General Freight		10.9%	87.5%	1.6%
Liquid Gas		12.8%	87.2%	
Chemical		11.1%	88.9%	
Paper Products		2.9%	97.1%	
Dry Bulk		7.7%	92.3%	
Size	Small	14.3%	82.9%	2.9%
	Medium	4.5%	95.5%	
	Large	9.8%	90.2%	
Total		9.2%	90.0%	.8%

Row %

		Q(15b.g) First-aid training		
		yes	no	N/A
General Freight		20.6%	79.4%	
Liquid Gas		28.6%	71.4%	
Chemical		30.6%	69.4%	
Paper Products		20.0%	80.0%	
Dry Bulk		25.0%	71.4%	3.6%
Size	Small	21.9%	71.9%	6.3%
	Medium	23.9%	76.1%	
	Large	17.5%	82.5%	
Total		21.2%	77.1%	1.7%

Responses (#):

- a)Pre-service: Gen. Frt,64 ; Liq. Gas,39 ; Chem, 36 ; Paper, 35 ; Dry Blk,26 ; Small,35 ; Med,44 ; Lrg,41 ; Tot Size, 120
 b)In-service: Gen. Frt,63 ; Liq. Gas,35 ; Chem, 36 ; Paper, 35 ; Dry Blk,28 ; Small,32 ; Med,46 ; Lrg,40 ; Tot Size, 118

Row %

		Q(15a.h) Hazardous materials handling		
		yes	no	N/A
General Freight		65.6%	31.3%	3.1%
Liquid Gas		84.6%	12.8%	2.6%
Chemical		86.1%	11.1%	2.8%
Paper Products		55.6%	41.7%	2.8%
Dry Bulk		55.6%	40.7%	3.7%
Size	Small	47.1%	44.1%	8.8%
	Medium	64.4%	35.6%	
	Large	68.3%	31.7%	
Total		60.8%	36.7%	2.5%

Row %

		Q(15b.h) Hazardous materials handling		
		yes	no	N/A
General Freight		73.8%	26.2%	
Liquid Gas		97.1%	2.9%	
Chemical		97.3%	2.7%	
Paper Products		70.6%	29.4%	
Dry Bulk		74.1%	22.2%	3.7%
Size	Small	48.3%	44.8%	6.9%
	Medium	70.5%	29.5%	
	Large	78.0%	22.0%	
Total		67.5%	30.7%	1.8%

Responses (#):

- a)Pre-service: Gen. Frt,64 ; Liq. Gas,39 ; Chem, 36 ; Paper, 36 ; Dry Blk,27 ; Small,34 ; Med,45 ; Lrg,41 ; Tot Size, 120
 b)In-service: Gen. Frt,61 ; Liq. Gas,35 ; Chem, 37 ; Paper, 34 ; Dry Blk,27 ; Small,29 ; Med,44 ; Lrg,41 ; Tot Size, 114

Row %

		Q(15.i) Hours-of-service regulations		
		yes	no	N/A
General Freight		95.4%	3.1%	1.5%
Liquid Gas		95.0%	5.0%	
Chemical		97.3%	2.7%	
Paper Products		100.0%		
Dry Bulk		96.3%	3.7%	
Size	Small	91.2%	5.9%	2.9%
	Medium	95.7%	4.3%	
	Large	97.6%	2.4%	
Total		95.1%	4.1%	.8%

Row %

		Q(15b.i) Hours-of-service regulations		
		yes	no	N/A
General Freight		93.8%	6.3%	
Liquid Gas		94.3%	5.7%	
Chemical		94.6%	5.4%	
Paper Products		94.4%	5.6%	
Dry Bulk		92.9%	3.6%	3.6%
Size	Small	83.9%	9.7%	6.5%
	Medium	95.5%	4.5%	
	Large	95.1%	4.9%	
Total		92.2%	6.0%	1.7%

Responses (#):

- a)Pre-service: Gen. Frt,65 ; Liq. Gas,40 ; Chem, 37 ; Paper, 35 ; Dry Blk,27 ; Small,34 ; Med,46 ; Lrg,42 ; Tot Size, 122
 b)In-service: Gen. Frt,64 ; Liq. Gas,35 ; Chem, 37 ; Paper, 36 ; Dry Blk,28 ; Small,31 ; Med,44 ; Lrg,41 ; Tot Size, 116

Questions 15 (cont.)

Row %

		Q(15a.j) Injury prevention		
		yes	no	N/A
General Freight		72.7%	25.8%	1.5%
Liquid Gas		92.1%	7.9%	
Chemical		88.9%	11.1%	
Paper Products		66.7%	33.3%	
Dry Bulk		81.5%	18.5%	
Size	Small	69.7%	27.3%	3.0%
	Medium	80.9%	19.1%	
	Large	80.5%	19.5%	
Total		77.7%	21.5%	.8%

Row %

		Q(15b.j) Injury prevention		
		yes	no	N/A
General Freight		79.4%	19.0%	1.6%
Liquid Gas		94.1%	5.9%	
Chemical		86.1%	13.9%	
Paper Products		80.0%	17.1%	2.9%
Dry Bulk		78.6%	17.9%	3.6%
Size	Small	77.4%	16.1%	6.5%
	Medium	91.1%	8.9%	
	Large	80.0%	17.5%	2.5%
Total		83.6%	13.8%	2.6%

Responses (#):

- a)Pre-service: Gen. Frt,66; Liq. Gas,38; Chem, 36; Paper, 36; Dry Blk,27; Small,33; Med,47; Lrg,41; Tot Size, 121
 b)In-service: Gen. Frt,63; Liq. Gas,34; Chem, 36; Paper, 35; Dry Blk,28; Small,31; Med,45; Lrg,40; Tot Size, 116

Row %

		Q(15a.k) Post-trip inspections		
		yes	no	N/A
General Freight		95.5%	3.0%	1.5%
Liquid Gas		95.0%	5.0%	
Chemical		97.3%	2.7%	
Paper Products		97.2%	2.8%	
Dry Bulk		96.2%	3.8%	
Size	Small	87.9%	9.1%	3.0%
	Medium	95.7%	4.3%	
	Large	95.2%	4.8%	
Total		93.4%	5.7%	.8%

Row %

		Q(15b.k) Post-trip inspections		
		yes	no	N/A
General Freight		92.1%	7.9%	
Liquid Gas		94.3%	5.7%	
Chemical		91.7%	8.3%	
Paper Products		94.3%	5.7%	
Dry Bulk		96.4%		3.6%
Size	Small	90.6%	3.1%	6.3%
	Medium	95.6%	4.4%	
	Large	90.0%	10.0%	
Total		92.3%	6.0%	1.7%

Responses (#):

- a)Pre-service: Gen. Frt,66; Liq. Gas,40; Chem, 37; Paper, 36; Dry Blk,26; Small,33; Med,47; Lrg,42; Tot Size, 122
 b)In-service: Gen. Frt,63; Liq. Gas,35; Chem, 36; Paper, 35; Dry Blk,28; Small,32; Med,45; Lrg,40; Tot Size, 117

Row %

		Q(15a.l) Pre-trip inspections		
		yes	no	N/A
General Freight		97.0%	1.5%	1.5%
Liquid Gas		97.5%	2.5%	
Chemical		100.0%		
Paper Products		100.0%		
Dry Bulk		96.2%	3.8%	
Size	Small	90.9%	6.1%	3.0%
	Medium	95.7%	4.3%	
	Large	97.6%	2.4%	
Total		95.1%	4.1%	.8%

Row %

		Q(15b.l) Pre-trip inspections		
		yes	no	N/A
General Freight		93.5%	6.5%	
Liquid Gas		91.4%	8.6%	
Chemical		91.4%	8.6%	
Paper Products		91.2%	8.8%	
Dry Bulk		92.6%	3.7%	3.7%
Size	Small	90.6%	3.1%	6.3%
	Medium	93.2%	6.8%	
	Large	95.0%	5.0%	
Total		93.1%	5.2%	1.7%

Responses (#):

- a)Pre-service: Gen. Frt,66; Liq. Gas,40; Chem, 37; Paper, 36; Dry Blk,26; Small,33; Med,47; Lrg,42; Tot Size, 122
 b)In-service: Gen. Frt,62; Liq. Gas,35; Chem, 35; Paper, 34; Dry Blk,27; Small,32; Med,44; Lrg,40; Tot Size, 116

Questions 15 (cont.)

Row %		Q(15a.m) Team driving training		
		yes	no	N/A
General Freight		24.2%	72.6%	3.2%
Liquid Gas		21.6%	78.4%	
Chemical		22.9%	77.1%	
Paper Products		17.1%	80.0%	2.9%
Dry Bulk		19.2%	73.1%	7.7%
Size	Small	25.0%	68.8%	6.3%
	Medium	25.6%	72.1%	2.3%
	Large	20.0%	80.0%	
Total		23.5%	73.9%	2.6%

Row %		Q(15b.m) Team driving training		
		yes	no	N/A
General Freight		35.0%	63.3%	1.7%
Liquid Gas		27.8%	72.2%	
Chemical		30.6%	69.4%	
Paper Products		24.2%	75.8%	
Dry Bulk		24.0%	72.0%	4.0%
Size	Small	34.5%	55.2%	10.3%
	Medium	28.6%	71.4%	
	Large	27.5%	72.5%	
Total		29.7%	67.6%	2.7%

Responses (#):

a)Pre-service: Gen. Frt,62; Liq. Gas,37; Chem, 35; Paper, 35; Dry Blk,26; Small,32; Med,43; Lrg,40; Tot Size, 115

b)In-service: Gen. Frt,60; Liq. Gas,36; Chem, 36; Paper, 33; Dry Blk,25; Small,29; Med,42; Lrg,40; Tot Size, 111

Row %		Q(15a.n) Truck maintenance		
		yes	no	N/A
General Freight		69.2%	27.7%	3.1%
Liquid Gas		71.1%	26.3%	2.6%
Chemical		63.9%	33.3%	2.8%
Paper Products		68.6%	28.6%	2.9%
Dry Bulk		66.7%	33.3%	
Size	Small	66.7%	27.3%	6.1%
	Medium	67.4%	32.6%	
	Large	72.5%	27.5%	
Total		68.9%	29.4%	1.7%

Row %		Q(15b.n) Truck maintenance		
		yes	no	N/A
General Freight		72.1%	27.9%	
Liquid Gas		74.3%	25.7%	
Chemical		66.7%	33.3%	
Paper Products		65.7%	34.3%	
Dry Bulk		64.3%	32.1%	3.6%
Size	Small	66.7%	26.7%	6.7%
	Medium	71.1%	28.9%	
	Large	71.8%	28.2%	
Total		70.2%	28.1%	1.8%

Responses (#):

a)Pre-service: Gen. Frt,65; Liq. Gas,38; Chem, 36; Paper, 35; Dry Blk,27; Small,33; Med,46; Lrg,40; Tot Size, 119

b)In-service: Gen. Frt,61; Liq. Gas,35; Chem, 36; Paper, 35; Dry Blk,28; Small,30; Med,45; Lrg,39; Tot Size, 114

Row %		Q(15a.o) Other subjects		
		yes	no	N/A
General Freight		80.0%	6.7%	13.3%
Liquid Gas		88.9%	5.6%	5.6%
Chemical		87.5%		12.5%
Paper Products		83.3%	8.3%	8.3%
Dry Bulk		88.9%		11.1%
Size	Small	66.7%	8.3%	25.0%
	Medium	80.0%	5.0%	15.0%
	Large	81.0%	14.3%	4.8%
Total		77.4%	9.4%	13.2%

Row %		Q(15b.o) Other subjects		
		yes	no	N/A
General Freight		72.7%	3.0%	24.2%
Liquid Gas		77.8%	5.6%	16.7%
Chemical		77.8%	5.6%	16.7%
Paper Products		76.9%		23.1%
Dry Bulk		70.0%	10.0%	20.0%
Size	Small	66.7%	8.3%	25.0%
	Medium	68.4%		31.6%
	Large	80.0%		20.0%
Total		73.2%	1.8%	25.0%

Responses (#):

a)Pre-service: Gen. Frt,30; Liq. Gas,18; Chem, 16; Paper, 12; Dry Blk,9 ; Small,12; Med,20; Lrg,21; Tot Size, 53

b)In-service: Gen. Frt,33; Liq. Gas,18; Chem, 18; Paper, 13; Dry Blk,10; Small,12; Med,19; Lrg,25; Tot Size, 56

Questions 16-18 are about training venues and evaluation methods used for pre- and in-service training programs.

Row %

		Q(16a.a) Classroom training	
		yes	no
General Freight		83.3%	16.7%
Liquid Gas		89.7%	10.3%
Chemical		91.9%	8.1%
Paper Products		66.7%	33.3%
Dry Bulk		69.2%	30.8%
Size	Small	58.8%	41.2%
	Medium	78.7%	21.3%
	Large	90.2%	9.8%
Total		77.0%	23.0%

Row %

		Q(16b.a) Classroom training	
		yes	no
General Freight		84.1%	15.9%
Liquid Gas		86.5%	13.5%
Chemical		89.2%	10.8%
Paper Products		77.1%	22.9%
Dry Bulk		73.1%	26.9%
Size	Small	60.0%	40.0%
	Medium	85.1%	14.9%
	Large	92.5%	7.5%
Total		81.2%	18.8%

Responses (#):

a)Pre-service: Gen. Frt,66; Liq. Gas,39; Chem, 37; Paper, 36; Dry Blk,26; Small,34; Med,47; Lrg,41; Tot Size, 122

b)In-service: Gen. Frt,63; Liq. Gas,37; Chem, 37; Paper, 35; Dry Blk,26; Small,30; Med,47; Lrg,40; Tot Size, 117

Row %

		Q(16a.b) In-vehicle, off-road training	
		yes	no
General Freight	1.00	69.4%	30.6%
Liquid Gas	1.00	70.3%	29.7%
Chemical	1.00	73.5%	26.5%
Paper Products	1.00	67.6%	32.4%
Dry Bulk	1.00	72.0%	28.0%
Size	Small	56.3%	43.8%
	Medium	68.1%	31.9%
	Large	79.5%	20.5%
Total		68.6%	31.4%

Row %

		Q(16b.b) In-vehicle, off-road training	
		yes	no
General Freight	1.00	62.7%	37.3%
Liquid Gas	1.00	72.7%	27.3%
Chemical	1.00	71.0%	29.0%
Paper Products	1.00	68.8%	31.3%
Dry Bulk	1.00	69.2%	30.8%
Size	Small	71.9%	28.1%
	Medium	57.1%	42.9%
	Large	74.3%	25.7%
Total		67.0%	33.0%

Responses (#):

a)Pre-service: Gen. Frt,62; Liq. Gas,37; Chem, 34; Paper, 34; Dry Blk,25; Small,32; Med,47; Lrg,39; Tot Size, 118

b)In-service: Gen. Frt,59; Liq. Gas,33; Chem, 31; Paper, 32; Dry Blk,26; Small,32; Med,42; Lrg,35; Tot Size, 109

Row %

		Q(16a.c) In-vehicle, on-road training	
		yes	no
General Freight		89.4%	10.6%
Liquid Gas		89.5%	10.5%
Chemical		91.7%	8.3%
Paper Products		88.9%	11.1%
Dry Bulk		92.0%	8.0%
Size	Small	81.3%	18.8%
	Medium	89.6%	10.4%
	Large	92.7%	7.3%
Total		88.4%	11.6%

Row %

		Q(16b.c) In-vehicle, on-road training	
		yes	no
General Freight		81.8%	18.2%
Liquid Gas		92.3%	7.7%
Chemical		89.5%	10.5%
Paper Products		86.1%	13.9%
Dry Bulk		88.9%	11.1%
Size	Small	91.2%	8.8%
	Medium	80.0%	20.0%
	Large	87.5%	12.5%
Total		85.7%	14.3%

Responses (#):

a)Pre-service: Gen. Frt,66; Liq. Gas,38; Chem, 36; Paper, 36; Dry Blk,25; Small,32; Med,48; Lrg,41; Tot Size, 121

b)In-service: Gen. Frt,66; Liq. Gas,39; Chem, 38; Paper, 36; Dry Blk,27; Small,34; Med,45; Lrg,40; Tot Size, 119

Questions 16 – 18 (cont.)

Row %

		Q(16a.d) Other venues	
		yes	no
General Freight		85.7%	14.3%
Liquid Gas		66.7%	33.3%
Chemical		50.0%	50.0%
Paper Products		20.0%	80.0%
Dry Bulk		85.7%	14.3%
Size	Small	60.0%	40.0%
	Medium	77.8%	22.2%
	Large	60.0%	40.0%
Total		68.4%	31.6%

Row %

		Q(16b.d) Other venues	
		yes	no
General Freight		100.0%	
Liquid Gas		100.0%	
Chemical		100.0%	
Paper Products		100.0%	
Dry Bulk		100.0%	
Size	Small	80.0%	20.0%
	Medium	100.0%	
	Large	100.0%	
Total		94.7%	5.3%

Responses (#):

- a)Pre-service: Gen. Frt, 7 ; Liq. Gas,6 ; Chem, 4 ; Paper, 5 ; Dry Blk,7 ; Small,5 ; Med,9 ; Lrg,5 ; Tot Size, 19
 b)In-service: Gen. Frt, 7 ; Liq. Gas,6 ; Chem, 4 ; Paper, 6 ; Dry Blk,6 ; Small,5 ; Med,8 ; Lrg,6 ; Tot Size, 19

Row %

		Q(17a) Classroom training		
		0	1-2	3-4
General Freight		43.9%	54.5%	1.5%
Liquid Gas		28.9%	68.4%	2.6%
Chemical		31.6%	65.8%	2.6%
Paper Products		47.2%	52.8%	
Dry Bulk		40.0%	60.0%	
Size	Small	58.8%	38.2%	2.9%
	Medium	37.8%	60.0%	2.2%
	Large	40.5%	59.5%	
Total		44.6%	53.7%	1.7%

Responses (#): Gen. Frt,66; Liq. Gas,38; Chem, 38; Paper, 36; Dry Blk,25; Small,34; Med,45; Lrg,42; Tot Size, 121

Questions 16 – 18 (cont.)

Row %

		Q(17b) In-vehicle, off-road training			
		0	1-2	3-4	5-6
General Freight		53.1%	39.1%	4.7%	3.1%
Liquid Gas		36.8%	57.9%	5.3%	
Chemical		44.7%	50.0%	5.3%	
Paper Products		52.6%	39.5%	5.3%	2.6%
Dry Bulk		42.3%	57.7%		
Size	Small	38.2%	55.9%	2.9%	2.9%
	Medium	43.5%	45.7%	8.7%	2.2%
	Large	52.5%	42.5%	5.0%	
Total		45.0%	47.5%	5.8%	1.7%

Responses (#): Gen. Frt,64; Liq. Gas,38; Chem, 38; Paper, 38; Dry Blk,26; Small,34; Med,46; Lrg,40; Tot Size, 120

Row %

		Q(17c) In-vehicle, on-road training				
		0	1-2	3-4	5-6	over 8
General Freight		28.8%	53.0%	15.2%	1.5%	1.5%
Liquid Gas		7.9%	73.7%	18.4%		
Chemical		18.4%	60.5%	18.4%	2.6%	
Paper Products		21.6%	54.1%	18.9%	2.7%	2.7%
Dry Bulk		18.5%	74.1%	7.4%		
Size	Small	20.6%	64.7%	11.8%		2.9%
	Medium	21.7%	47.8%	19.6%	8.7%	2.2%
	Large	21.4%	64.3%	14.3%		
Total		21.3%	58.2%	15.6%	3.3%	1.6%

Responses (#): Gen. Frt,66; Liq. Gas,38; Chem, 38; Paper, 37; Dry Blk,27; Small,34; Med,46; Lrg,42; Tot Size, 122

Row %

		Q(17d) Other venues		
		0	1-2	over 8
General Freight		33.3%	50.0%	16.7%
Liquid Gas			100.0%	
Chemical			100.0%	
Paper Products		66.7%	33.3%	
Dry Bulk		50.0%	50.0%	
Size	Small	50.0%	50.0%	
	Medium	40.0%	40.0%	20.0%
	Large		50.0%	50.0%
Total		36.4%	45.5%	18.2%

Responses (#): Gen. Frt,6 ; Liq. Gas,1 ; Chem, 2 ; Paper, 3 ; Dry Blk,4 ; Small,4 ; Med,5 ; Lrg,2 ; Tot Size, 11

Questions 16 – 18 (cont.)

Row %		Q(18a.a) Used during Pre-service training? Computer-assisted examination	
		yes	no
General Freight		12.3%	87.7%
Liquid Gas		12.5%	87.5%
Chemical		13.5%	86.5%
Paper Products		5.7%	94.3%
Dry Bulk		3.8%	96.2%
Size	Small		100.0%
	Medium	11.1%	88.9%
	Large	16.7%	83.3%
Total		9.9%	90.1%

Row %		Q(18b.a) Used during In-service training? Computer-assisted examination	
		yes	no
General Freight		15.2%	84.8%
Liquid Gas		17.9%	82.1%
Chemical		16.2%	83.8%
Paper Products		11.1%	88.9%
Dry Bulk		7.1%	92.9%
Size	Small	3.0%	97.0%
	Medium	10.6%	89.4%
	Large	22.5%	77.5%
Total		12.5%	87.5%

Responses (#):

- a)Pre-service: Gen. Frt,65; Liq. Gas,40; Chem, 37; Paper, 35; Dry Blk,26; Small,34; Med,45; Lrg,42; Tot Size, 121
 b)In-service: Gen. Frt,66; Liq. Gas,39; Chem, 37; Paper, 36; Dry Blk,28; Small,33; Med,47; Lrg,40; Tot Size, 120

Row %		Q(18a.b) Used during Pre-service training? Internet-based examination	
		yes	no
General Freight		1.6%	98.4%
Liquid Gas		2.5%	97.5%
Chemical		2.7%	97.3%
Paper Products			100.0%
Dry Bulk			100.0%
Size	Small	3.0%	97.0%
	Medium	4.4%	95.6%
	Large	2.4%	97.6%
Total		3.3%	96.7%

Row %		Q(18b.b) Used during In-service training? Internet-based examination	
		yes	no
General Freight		4.6%	95.4%
Liquid Gas		5.3%	94.7%
Chemical		5.6%	94.4%
Paper Products		5.6%	94.4%
Dry Bulk		3.6%	96.4%
Size	Small	3.1%	96.9%
	Medium	8.7%	91.3%
	Large	2.5%	97.5%
Total		5.1%	94.9%

Responses (#):

- a)Pre-service: Gen. Frt,64; Liq. Gas,40; Chem, 37; Paper, 35; Dry Blk,26; Small,33; Med,45; Lrg,42; Tot Size, 120
 b)In-service: Gen. Frt,65; Liq. Gas,38; Chem, 36; Paper, 36; Dry Blk,28; Small,32; Med,46; Lrg,40; Tot Size, 118

Row %		Q(18a.c) Used during Pre-service training? In-vehicle, off-road training examinations	
		yes	no
General Freight		64.1%	35.9%
Liquid Gas		56.4%	43.6%
Chemical		55.6%	44.4%
Paper Products		61.8%	38.2%
Dry Bulk		64.0%	36.0%
Size	Small	44.1%	55.9%
	Medium	58.7%	41.3%
	Large	68.3%	31.7%
Total		57.9%	42.1%

Row %		Q(18b.c) Used during In-service training? In-vehicle, off-road training examinations	
		yes	no
General Freight		46.2%	53.8%
Liquid Gas		52.6%	47.4%
Chemical		51.4%	48.6%
Paper Products		45.7%	54.3%
Dry Bulk		57.1%	42.9%
Size	Small	50.0%	50.0%
	Medium	47.9%	52.1%
	Large	50.0%	50.0%
Total		49.2%	50.8%

Responses (#):

- a)Pre-service: Gen. Frt,64; Liq. Gas,39; Chem, 36; Paper, 34; Dry Blk,25; Small,34; Med,46; Lrg,41; Tot Size, 121
 b)In-service: Gen. Frt,65; Liq. Gas,38; Chem, 37; Paper, 35; Dry Blk,28; Small,32; Med,48; Lrg,40; Tot Size, 120

Questions 16 – 18 (cont.)

Row %		Q(18a.d) Used during Pre-service training? In-vehicle, on-road training examinations	
		yes	no
General Freight		84.8%	15.2%
Liquid Gas		92.1%	7.9%
Chemical		88.9%	11.1%
Paper Products		88.2%	11.8%
Dry Bulk		84.6%	15.4%
Size	Small	79.4%	20.6%
	Medium	85.1%	14.9%
	Large	82.9%	17.1%
Total		82.8%	17.2%

Row %		Q(18b.d) Used during In-service training? In-vehicle, on-road training examinations	
		yes	no
General Freight		70.8%	29.2%
Liquid Gas		87.2%	12.8%
Chemical		82.1%	17.9%
Paper Products		70.3%	29.7%
Dry Bulk		76.7%	23.3%
Size	Small	81.8%	18.2%
	Medium	69.4%	30.6%
	Large	73.2%	26.8%
Total		74.0%	26.0%

Responses (#):

- a)Pre-service: Gen. Frt,66; Liq. Gas,38; Chem, 36; Paper, 34; Dry Blk,26; Small,34; Med,47; Lrg,41; Tot Size, 122
 b)In-service: Gen. Frt,65; Liq. Gas,39; Chem, 39; Paper, 37; Dry Blk,30; Small,33; Med,49; Lrg,41; Tot Size, 123

Row %		Q(18a.e) Used during Pre-service training? Oral classroom examination	
		yes	no
General Freight		69.4%	30.6%
Liquid Gas		81.1%	18.9%
Chemical		82.9%	17.1%
Paper Products		58.1%	41.9%
Dry Bulk		56.0%	44.0%
Size	Small	50.0%	50.0%
	Medium	59.1%	40.9%
	Large	77.5%	22.5%
Total		62.9%	37.1%

Row %		Q(18b.e) Used during In-service training? Oral classroom examination	
		yes	no
General Freight		64.1%	35.9%
Liquid Gas		70.0%	30.0%
Chemical		71.1%	28.9%
Paper Products		65.7%	34.3%
Dry Bulk		57.1%	42.9%
Size	Small	50.0%	50.0%
	Medium	57.1%	42.9%
	Large	73.2%	26.8%
Total		60.7%	39.3%

Responses (#):

- a)Pre-service: Gen. Frt,62; Liq. Gas,37; Chem, 35; Paper, 31; Dry Blk,25; Small,32; Med,44; Lrg,40; Tot Size, 116
 b)In-service: Gen. Frt,64; Liq. Gas,40; Chem, 38; Paper, 35; Dry Blk,28; Small,32; Med,49; Lrg,41; Tot Size, 122

Row %		Q(18a.f) Used during Pre-service training? Questionnaire	
		yes	no
General Freight		65.1%	34.9%
Liquid Gas		75.7%	24.3%
Chemical		74.3%	25.7%
Paper Products		51.5%	48.5%
Dry Bulk		57.7%	42.3%
Size	Small	43.8%	56.3%
	Medium	42.2%	57.8%
	Large	73.2%	26.8%
Total		53.4%	46.6%

Row %		Q(18b.f) Used during In-service training? Questionnaire	
		yes	no
General Freight		57.8%	42.2%
Liquid Gas		74.4%	25.6%
Chemical		70.3%	29.7%
Paper Products		57.1%	42.9%
Dry Bulk		53.6%	46.4%
Size	Small	40.6%	59.4%
	Medium	50.0%	50.0%
	Large	65.0%	35.0%
Total		52.5%	47.5%

Responses (#):

- a)Pre-service: Gen. Frt, 63; Liq. Gas,37; Chem, 35; Paper, 33; Dry Blk,26; Small,32; Med,45; Lrg,41; Tot Size, 118
 b)In-service: Gen. Frt,64; Liq. Gas,39; Chem, 37; Paper, 35; Dry Blk,28; Small,32; Med,48; Lrg,40; Tot Size, 120

Questions 16 – 18 (cont.)

Row %		Q(18a.g) Used during Pre-service training? Written classroom examination	
		yes	no
General Freight		70.5%	29.5%
Liquid Gas		79.5%	20.5%
Chemical		80.6%	19.4%
Paper Products		61.3%	38.7%
Dry Bulk		53.8%	46.2%
Size	Small	41.9%	58.1%
	Medium	60.0%	40.0%
	Large	75.6%	24.4%
Total		60.7%	39.3%

Row %		Q(18b.g) Used during In-service training? Written classroom examination	
		yes	no
General Freight		63.5%	36.5%
Liquid Gas		68.4%	31.6%
Chemical		70.3%	29.7%
Paper Products		64.7%	35.3%
Dry Bulk		53.6%	46.4%
Size	Small	33.3%	66.7%
	Medium	58.3%	41.7%
	Large	77.5%	22.5%
Total		58.5%	41.5%

Responses (#):

- a)Pre-service: Gen. Frt,61 ; Liq. Gas,39 ; Chem, 36 ; Paper, 31 ; Dry Blk,26 ; Small,31 ; Med,45 ; Lrg,41 ; Tot Size, 117
 b)In-service: Gen. Frt,63 ; Liq. Gas,38 ; Chem, 37 ; Paper, 34 ; Dry Blk,28 ; Small,30 ; Med,48 ; Lrg,40 ; Tot Size, 118

Row %		Q(18a.h) Used during Pre-service training? Other methods	
		yes	no
General Freight		100.0%	
Liquid Gas		100.0%	
Chemical		100.0%	
Paper Products		100.0%	
Dry Bulk		100.0%	
Size	Small	75.0%	25.0%
	Medium	100.0%	
	Large	100.0%	
Total		92.0%	8.0%

Row %		Q(18b.h) Used during In-service training? Other methods	
		yes	
General Freight			100.00%
Liquid Gas			100.00%
Chemical			100.00%
Paper Products			100.00%
Dry Bulk			100.00%
Size	Small		100.00%
	Medium		100.00%
	Large		100.00%
Total			100.00%

Responses (#):

- a)Pre-service: Gen. Frt, 14 ; Liq. Gas,4 ; Chem, 5 ; Paper, 5 ; Dry Blk,6 ; Small,8 ; Med,10 ; Lrg,7 ; Tot Size, 25
 b)In-service: Gen. Frt,15 ; Liq. Gas,6 ; Chem, 6 ; Paper, 6 ; Dry Blk,8 ; Small,7 ; Med,10 ; Lrg,9 ; Tot Size, 26

Questions 19 & 20 are about companies who use outside sources for pre- and in-service training programs.

Row %		Q(19a) Run entirely by your company's personnel? Pre-service training programs	
		yes	no
General Freight		89.7%	10.3%
Liquid Gas		90.2%	9.8%
Chemical		82.5%	17.5%
Paper Products		89.5%	10.5%
Dry Bulk		82.8%	17.2%
Size	Small	91.4%	8.6%
	Medium	85.7%	14.3%
	Large	88.4%	11.6%
Total		88.2%	11.8%

Row %		Q(19b) Run entirely by your company's personnel? In-service training programs	
		yes	no
General Freight		77.5%	22.5%
Liquid Gas		76.7%	23.3%
Chemical		70.7%	29.3%
Paper Products		72.5%	27.5%
Dry Bulk		75.0%	25.0%
Size	Small	77.8%	22.2%
	Medium	74.5%	25.5%
	Large	77.3%	22.7%
Total		76.3%	23.7%

Responses (#):

19a: Gen. Frt, 68; Liq. Gas, 41; Chem, 40; Paper, 38; Dry Blk, 29; Small, 35; Med, 49; Lrg, 43; Tot Size, 127

19b: Gen. Frt, 71; Liq. Gas, 43; Chem, 41; Paper, 40; Dry Blk, 32; Small, 36; Med, 51; Lrg, 44; Tot Size, 131

Row %		Q(20a.a) Pre-service training? Insurance companies		
		provides all	provides some but not all	provides none
General Freight			33.3%	66.7%
Liquid Gas		5.3%	26.3%	68.4%
Chemical			13.3%	86.7%
Paper Products			31.3%	68.8%
Dry Bulk			30.8%	69.2%
Size	Small	7.1%	35.7%	57.1%
	Medium		32.1%	67.9%
	Large		23.8%	76.2%
Total		1.6%	30.2%	68.3%

Row %		Q(20b.a) In-service training? Insurance companies		
		provides all	provides some but not all	provides none
General Freight			46.7%	53.3%
Liquid Gas		4.3%	56.5%	39.1%
Chemical			50.0%	50.0%
Paper Products			72.2%	27.8%
Dry Bulk			57.1%	42.9%
Size	Small	6.3%	62.5%	31.3%
	Medium		58.6%	41.4%
	Large		45.5%	54.5%
Total		1.5%	55.2%	43.3%

Responses (#):

20a.a: Gen. Frt, 27; Liq. Gas, 19; Chem, 15; Paper, 16; Dry Blk, 13; Small, 14; Med, 28; Lrg, 21; Tot Size, 63

20b.a: Gen. Frt, 30; Liq. Gas, 23; Chem, 18; Paper, 18; Dry Blk, 14; Small, 16; Med, 29; Lrg, 22; Tot Size, 67

Row %		Q(20a.b) Pre-service training? Professional training schools		
		provides all	provides some but not all	provides none
General Freight		3.7%	25.9%	70.4%
Liquid Gas		10.0%	20.0%	70.0%
Chemical		6.3%	43.8%	50.0%
Paper Products			21.4%	78.6%
Dry Bulk			27.3%	72.7%
Size	Small	7.7%	38.5%	53.8%
	Medium	3.7%	11.1%	85.2%
	Large		23.8%	76.2%
Total		3.3%	21.3%	75.4%

Row %		Q(20b.b) In-service training? Professional training schools		
		provides all	provides some but not all	provides none
General Freight		3.3%	23.3%	73.3%
Liquid Gas		8.3%	12.5%	79.2%
Chemical		5.3%	26.3%	68.4%
Paper Products			22.2%	77.8%
Dry Bulk			21.4%	78.6%
Size	Small	6.7%	33.3%	60.0%
	Medium	3.3%	20.0%	76.7%
	Large		18.2%	81.8%
Total		3.0%	22.4%	74.6%

Responses (#):

20a.b: Gen. Frt, 27; Liq. Gas, 20; Chem, 16; Paper, 14; Dry Blk, 11; Small, 13; Med, 27; Lrg, 21; Tot Size, 61

20b.b: Gen. Frt, 30; Liq. Gas, 24; Chem, 19; Paper, 18; Dry Blk, 14; Small, 15; Med, 30; Lrg, 22; Tot Size, 67

Questions 19 & 20 (cont.)

Row %

		Q(20a.c) Pre-service training? Training consultants		
		provides all	provides some but not all	provides none
General Freight		3.7%	44.4%	51.9%
Liquid Gas		5.3%	36.8%	57.9%
Chemical		6.7%	40.0%	53.3%
Paper Products		6.3%	50.0%	43.8%
Dry Bulk			38.5%	61.5%
Size	Small	7.7%	46.2%	46.2%
	Medium		28.6%	71.4%
	Large	4.8%	42.9%	52.4%
Total		3.2%	37.1%	59.7%

Row %

		Q(20b.c) In-service training? Training consultants		
		provides all	provides some but not all	provides none
General Freight			53.3%	46.7%
Liquid Gas		8.7%	56.5%	34.8%
Chemical		5.6%	55.6%	38.9%
Paper Products		5.6%	72.2%	22.2%
Dry Bulk		7.1%	50.0%	42.9%
Size	Small	6.7%	60.0%	33.3%
	Medium	3.4%	51.7%	44.8%
	Large		59.1%	40.9%
Total		3.0%	56.1%	40.9%

Responses (#):

20a.c: Gen. Frt, 27; Liq. Gas, 19; Chem, 15; Paper, 16; Dry Blk, 13; Small, 13; Med, 28; Lrg, 21; Tot Size, 62

20b.c: Gen. Frt, 30; Liq. Gas, 23; Chem, 18; Paper, 18; Dry Blk, 14; Small, 15; Med, 29; Lrg, 22; Tot Size, 66

Row %

		Q(20a.d) Pre-service training? Other sources		
		provides all	provides some but not all	provides none
General Freight		42.9%	57.1%	
Liquid Gas		25.0%	75.0%	
Chemical		25.0%	75.0%	
Paper Products			100.0%	
Dry Bulk		33.3%	66.7%	
Size	Small	33.3%	33.3%	33.3%
	Medium	14.3%	71.4%	14.3%
	Large	33.3%	66.7%	
Total		25.0%	62.5%	12.5%

Row %

		Q(20b.d) In-service training? Other sources		
		provides all	provides some but not all	provides none
General Freight		25.0%	75.0%	
Liquid Gas		16.7%	83.3%	
Chemical		20.0%	80.0%	
Paper Products			100.0%	
Dry Bulk		33.3%	66.7%	
Size	Small		100.0%	
	Medium	12.5%	75.0%	12.5%
	Large	28.6%	71.4%	
Total		17.6%	76.5%	5.9%

Responses (#):

20a.d: Gen. Frt, 7; Liq. Gas, 4; Chem, 4; Paper, 4; Dry Blk, 3; Small, 3; Med, 7; Lrg, 6; Tot Size, 16

20b.d: Gen. Frt, 8; Liq. Gas, 6; Chem, 5; Paper, 5; Dry Blk, 3; Small, 2; Med, 8; Lrg, 7; Tot Size, 17

Questions 21 – 24 are other general questions about the importance of pre - and in-service training programs.

Row %

		Q(21a) Our company considers pre-service driver training a strategic safety investment						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		2.9%	1.4%	1.4%	4.3%	1.4%	38.6%	50.0%
Liquid Gas							36.6%	63.4%
Chemical			2.5%		2.5%		42.5%	52.5%
Paper Products			2.6%	2.6%	2.6%		46.2%	46.2%
Dry Bulk			3.3%	3.3%	3.3%	6.7%	43.3%	40.0%
Size	Small		2.8%	2.8%	5.6%	11.1%	30.6%	47.2%
	Medium	4.1%	4.1%				36.7%	55.1%
	Large				7.0%	2.3%	39.5%	51.2%
Total		1.6%	2.3%	.8%	3.9%	3.9%	35.9%	51.6%

Responses (#): Gen. Frt,70; Liq. Gas,41; Chem, 40; Paper, 39; Dry Blk,30; Small,36; Med,49; Lrg,43; Tot Size, 128

Row %

		Q(21b) Our company spends more on pre-service driving training than do most carriers						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		2.9%	10.1%	2.9%	42.0%	10.1%	18.8%	13.0%
Liquid Gas			2.5%		35.0%	12.5%	30.0%	20.0%
Chemical					38.5%	12.8%	30.8%	17.9%
Paper Products			10.3%	5.1%	46.2%	15.4%	17.9%	5.1%
Dry Bulk			6.9%	3.4%	44.8%	17.2%	20.7%	6.9%
Size	Small		8.6%	5.7%	54.3%	14.3%	8.6%	8.6%
	Medium	4.1%	6.1%		36.7%	18.4%	20.4%	14.3%
	Large	2.4%	7.1%		40.5%	9.5%	23.8%	16.7%
Total		2.4%	7.1%	1.6%	42.9%	14.3%	18.3%	13.5%

Responses (#): Gen. Frt,69; Liq. Gas,40; Chem, 39; Paper, 39; Dry Blk,29; Small,35; Med,49; Lrg,42; Tot Size, 126

Row %

		Q(21c) Our company closely monitors pre-service driver-training expenses						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		1.4%	12.9%	2.9%	34.3%	12.9%	24.3%	11.4%
Liquid Gas		2.4%	7.3%	4.9%	31.7%	9.8%	31.7%	12.2%
Chemical			12.5%	5.0%	30.0%	15.0%	30.0%	7.5%
Paper Products			10.3%	2.6%	43.6%	12.8%	30.8%	
Dry Bulk		3.3%	10.0%	3.3%	43.3%	6.7%	30.0%	3.3%
Size	Small		22.2%		50.0%	5.6%	19.4%	2.8%
	Medium	4.1%	20.4%	8.2%	22.4%	10.2%	26.5%	8.2%
	Large	2.3%	2.3%	4.7%	27.9%	16.3%	30.2%	16.3%
Total		2.3%	14.8%	4.7%	32.0%	10.9%	25.8%	9.4%

Responses (#): Gen. Frt,70; Liq. Gas,41; Chem, 40; Paper, 39; Dry Blk,30; Small,36; Med,49; Lrg,43; Tot Size, 128

Questions 21 – 24(cont.)

Row %

		Q(22a) Our company considers in-service driver training a strategic safety investment				
		Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		1.4%	1.4%	4.2%	29.6%	63.4%
Liquid Gas				7.1%	21.4%	71.4%
Chemical			2.5%	10.0%	22.5%	65.0%
Paper Products			5.0%	10.0%	22.5%	62.5%
Dry Bulk			3.1%	12.5%	25.0%	59.4%
Size	Small		2.9%	17.1%	34.3%	45.7%
	Medium	2.0%	2.0%	2.0%	17.6%	76.5%
	Large		2.3%	4.5%	25.0%	68.2%
Total		.8%	2.3%	6.9%	24.6%	65.4%

Responses (#): Gen. Frt,71 ; Liq. Gas,42 ; Chem, 40 ; Paper, 40 ; Dry Blk,32 ; Small,35 ; Med,51 ; Lrg,44 ; Tot Size, 130

Row %

		Q(22b) Our company spends more on in-service driving training than do most carriers						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight			2.9%	4.3%	41.4%	7.1%	25.7%	18.6%
Liquid Gas				2.4%	26.2%	14.3%	26.2%	31.0%
Chemical				2.5%	27.5%	7.5%	27.5%	35.0%
Paper Products			2.5%	5.0%	37.5%	10.0%	22.5%	22.5%
Dry Bulk				6.5%	41.9%	6.5%	25.8%	19.4%
Size	Small	2.8%	2.8%	5.6%	44.4%	19.4%	19.4%	5.6%
	Medium		3.9%	2.0%	33.3%	9.8%	21.6%	29.4%
	Large			2.3%	32.6%	7.0%	30.2%	27.9%
Total		.8%	2.3%	3.1%	36.2%	11.5%	23.8%	22.3%

Responses (#): Gen. Frt,70 ; Liq. Gas,42 ; Chem, 40 ; Paper, 40 ; Dry Blk,31 ; Small,36 ; Med,51 ; Lrg,43 ; Tot Size, 130

Row %

		Q(22c) Our company closely monitors in-service driver-training expenses						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight			11.3%	2.8%	31.0%	19.7%	18.3%	16.9%
Liquid Gas		2.3%	7.0%	9.3%	30.2%	11.6%	27.9%	11.6%
Chemical			12.2%	7.3%	29.3%	14.6%	22.0%	14.6%
Paper Products			5.0%	10.0%	40.0%	17.5%	17.5%	10.0%
Dry Bulk			3.1%	9.4%	46.9%	6.3%	18.8%	12.5%
Size	Small		16.7%		41.7%	16.7%	16.7%	8.3%
	Medium	2.0%	13.7%	15.7%	21.6%	13.7%	19.6%	13.7%
	Large		2.3%	2.3%	29.5%	20.5%	20.5%	25.0%
Total		.8%	10.7%	6.9%	29.8%	16.8%	19.1%	16.0%

Responses (#): Gen. Frt,71 ; Liq. Gas,43 ; Chem, 41 ; Paper, 40 ; Dry Blk,32 ; Small,36 ; Med,51 ; Lrg,44 ; Tot Size, 131

Questions 21 – 24(cont.)

Row %

		Q(23) Impact on highway safety performance		
		pre-service has more impact	in-service has more impact	equal impact
General Freight		12.9%	28.6%	58.6%
Liquid Gas		11.9%	21.4%	66.7%
Chemical		15.0%	22.5%	62.5%
Paper Products		12.5%	30.0%	57.5%
Dry Bulk		12.5%	37.5%	50.0%
Size	Small	18.9%	37.8%	43.2%
	Medium	10.0%	32.0%	58.0%
	Large	9.1%	22.7%	68.2%
Total		12.2%	30.5%	57.3%

Responses (#): Gen. Frt,70; Liq. Gas,42; Chem, 40; Paper, 40; Dry Blk,32; Small,37; Med,50; Lrg,44; Tot Size, 131

Row %

		Q(24a) Training directors strongly influence our safety management decisions						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		1.4%		2.8%	8.5%	8.5%	40.8%	38.0%
Liquid Gas			2.3%	4.7%	4.7%	11.6%	32.6%	44.2%
Chemical		2.4%	2.4%	7.3%	4.9%	12.2%	41.5%	29.3%
Paper Products				7.5%	2.5%	10.0%	45.0%	35.0%
Dry Bulk				9.4%	15.6%	6.3%	31.3%	37.5%
Size	Small			5.6%	16.7%	11.1%	36.1%	30.6%
	Medium	2.0%	2.0%	2.0%	7.8%	3.9%	41.2%	41.2%
	Large		2.3%	2.3%	2.3%	9.1%	50.0%	34.1%
Total		.8%	1.5%	3.1%	8.4%	7.6%	42.7%	35.9%

Responses (#): Gen. Frt,71; Liq. Gas,43; Chem, 41; Paper, 40; Dry Blk,32; Small,36; Med,51; Lrg,44; Tot Size, 131

Row %

		Q(24b) Our trainers enjoy high prestige among company employees					
		Strongly Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		1.4%		16.9%	22.5%	40.8%	18.3%
Liquid Gas				14.0%	20.9%	34.9%	30.2%
Chemical			2.4%	12.2%	34.1%	29.3%	22.0%
Paper Products			2.5%	12.5%	30.0%	40.0%	15.0%
Dry Bulk			3.1%	12.5%	28.1%	34.4%	21.9%
Size	Small	2.8%	2.8%	38.9%	13.9%	30.6%	11.1%
	Medium			19.6%	27.5%	33.3%	19.6%
	Large			4.5%	31.8%	40.9%	22.7%
Total		.8%	.8%	19.8%	25.2%	35.1%	18.3%

Responses (#): Gen. Frt,71; Liq. Gas,43; Chem, 41; Paper, 40; Dry Blk,32; Small,36; Med,51; Lrg,44; Tot Size, 131

Questions 21 – 24(cont.)

Row %

		Q(24c) Peer-to-peer training is a vital element of our driver safety program					
		Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		1.4%		7.0%	9.9%	40.8%	40.8%
Liquid Gas				4.7%	7.0%	32.6%	55.8%
Chemical			2.4%	2.4%	9.8%	41.5%	43.9%
Paper Products				5.0%	15.0%	45.0%	35.0%
Dry Bulk				6.3%	15.6%	34.4%	43.8%
Size	Small	2.7%	5.4%		13.5%	45.9%	32.4%
	Medium			3.9%	5.9%	33.3%	56.9%
	Large			9.1%	9.1%	43.2%	38.6%
Total		.8%	1.5%	4.5%	9.1%	40.2%	43.9%

Responses (#): Gen. Frt,71 ; Liq. Gas,43 ; Chem, 41 ; Paper, 40 ; Dry Blk,32 ; Small,37 ; Med,51 ; Lrg,44 ; Tot Size, 132

**SECTION 4: COMPANY PRACTICES FOR ENCOURAGING AND REINFORCING
SAVE DRIVING BEHAVIOR**

Questions 25 – 26 are about safety award programs for various personnel categories or organizational units.

Row %

		Q(25a) Have a safety award program for them? Individual drivers		
		yes	no	N/A
General Freight		81.1%	14.9%	4.1%
Liquid Gas		81.4%	16.3%	2.3%
Chemical		81.0%	16.7%	2.4%
Paper Products		82.5%	12.5%	5.0%
Dry Bulk		81.3%	12.5%	6.3%
Size	Small	47.9%	45.8%	6.3%
	Medium	90.4%	7.7%	1.9%
	Large	91.1%	6.7%	2.2%
Total		76.6%	20.0%	3.4%

Row %

		Q(25b) Have a safety award program for them? Driver teams		
		yes	no	N/A
General Freight		24.7%	24.7%	50.7%
Liquid Gas		15.9%	29.5%	54.5%
Chemical		23.3%	32.6%	44.2%
Paper Products		29.3%	12.2%	58.5%
Dry Bulk		25.0%	28.1%	46.9%
Size	Small	4.8%	31.0%	64.3%
	Medium	18.9%	24.5%	56.6%
	Large	28.9%	24.4%	46.7%
Total		17.9%	26.4%	55.7%

25a: Gen. Frt, 76; Liq. Gas,45; Chem, 43; Paper, 42; Dry Blk,34; Small,48; Med,53; Lrg,46; Tot Size, 147

25b: Gen. Frt, 73; Liq. Gas,44; Chem, 43; Paper, 41; Dry Blk,32; Small,42; Med,53; Lrg,45; Tot Size, 140

Row %

		Q(25c) Have a safety award program for them? Terminals or hubs		
		yes	no	N/A
General Freight		31.5%	24.7%	43.8%
Liquid Gas		29.5%	40.9%	29.5%
Chemical		32.6%	37.2%	30.2%
Paper Products		20.0%	27.5%	52.5%
Dry Bulk		22.6%	35.5%	41.9%
Size	Small	6.8%	38.6%	54.5%
	Medium	25.5%	31.4%	43.1%
	Large	45.7%	23.9%	30.4%
Total		26.2%	31.2%	42.6%

Row %

		Q(25d) Have a safety award program for them? Other personnel or organizational units		
		yes	no	N/A
General Freight		44.4%	7.4%	48.1%
Liquid Gas		62.5%	6.3%	31.3%
Chemical		47.4%	10.5%	42.1%
Paper Products		40.0%	6.7%	53.3%
Dry Bulk		58.3%	8.3%	33.3%
Size	Small	29.4%	17.6%	52.9%
	Medium	75.0%	4.2%	20.8%
	Large	58.8%	5.9%	35.3%
Total		56.9%	8.6%	34.5%

25c: Gen. Frt, 73; Liq. Gas,44; Chem, 43; Paper, 40; Dry Blk,31; Small,44; Med,51; Lrg,46; Tot Size, 141

25d: Gen. Frt, 27; Liq. Gas,16; Chem, 19; Paper, 15; Dry Blk,12; Small,17; Med,24; Lrg,17; Tot Size, 58

Row %

		Q(26a) Frequency that your company presents safety awards: individual drivers						346
		No awards at all	weekly awards	monthly awards	quarterly awards	semi-annual awards	Annual awards	
General Freight		7.5%	3.0%	11.9%	20.9%	6.0%	50.7%	
Liquid Gas		12.5%	5.0%	12.5%	17.5%	7.5%	42.5%	2.5%
Chemical		7.9%	2.6%	15.8%	21.1%	7.9%	42.1%	2.6%
Paper Products		5.1%		12.8%	25.6%	5.1%	51.3%	
Dry Bulk		3.2%	3.2%	12.9%	12.9%	12.9%	51.6%	3.2%
Size	Small	17.9%	3.6%	7.1%	21.4%	10.7%	39.3%	
	Medium	5.9%	2.0%	9.8%	15.7%	7.8%	56.9%	2.0%
	Large	6.8%	4.5%	15.9%	15.9%	2.3%	54.5%	
Total		8.9%	3.3%	11.4%	17.1%	6.5%	52.0%	.8%

Responses (#): Gen. Frt,67; Liq. Gas,40; Chem, 38; Paper, 39; Dry Blk,31; Small,28; Med,51; Lrg,44; Tot Size, 123

Questions 25 – 26 (cont.)

Row %

		Q(26b) Frequency that your company presents safety awards: driver teams					
		No awards at all	weekly awards	monthly awards	quarterly awards	semi-annual awards	Annual awards
General Freight		57.1%	2.4%	9.5%	11.9%		19.0%
Liquid Gas		82.1%	3.6%	3.6%	7.1%		3.6%
Chemical		65.5%	3.4%	10.3%	17.2%		3.4%
Paper Products		64.3%		10.7%	17.9%		7.1%
Dry Bulk		68.2%		9.1%	13.6%		9.1%
Size	Small	87.5%				6.3%	6.3%
	Medium	69.0%		6.9%	10.3%		13.8%
	Large	60.0%	2.9%	11.4%	8.6%		17.1%
Total		68.8%	1.3%	7.5%	7.5%	1.3%	13.8%

Responses (#): Gen. Frt,42; Liq. Gas,28; Chem, 29; Paper, 28; Dry Blk,22; Small,16; Med,29; Lrg,35; Tot Size, 80

Row %

		Q(26c) Frequency that your company presents safety awards: terminal units				
		No awards at all	monthly awards	quarterly awards	semi-annual awards	Annual awards
General Freight		51.2%	7.0%	7.0%	9.3%	25.6%
Liquid Gas		51.7%	3.4%	10.3%	6.9%	27.6%
Chemical		46.2%	7.7%	11.5%	7.7%	26.9%
Paper Products		66.7%	4.2%	12.5%	4.2%	12.5%
Dry Bulk		61.9%	4.8%	4.8%	9.5%	19.0%
Size	Small	88.2%				11.8%
	Medium	57.1%	3.6%	17.9%	3.6%	17.9%
	Large	43.2%	10.8%	5.4%	8.1%	32.4%
Total		57.3%	6.1%	8.5%	4.9%	23.2%

Responses (#): Gen. Frt,43; Liq. Gas,29; Chem, 26; Paper, 24; Dry Blk,21; Small,17; Med,28; Lrg,37; Tot Size, 82

Row %

		Q(26d) Frequency that your company presents safety awards: other personnel org units					
		No awards at all	weekly awards	monthly awards	quarterly awards	semi-annual awards	Annual awards
General Freight		23.1%				7.7%	69.2%
Liquid Gas		23.1%		7.7%	30.8%	7.7%	30.8%
Chemical		18.2%		9.1%	9.1%	9.1%	54.5%
Paper Products		33.3%		16.7%	16.7%	16.7%	16.7%
Dry Bulk		28.6%				14.3%	57.1%
Size	Small	42.9%		14.3%	28.6%		14.3%
	Medium	5.9%	11.8%		17.6%		64.7%
	Large	18.2%		9.1%	9.1%	9.1%	54.5%
Total		17.1%	5.7%	5.7%	17.1%	2.9%	51.4%

Responses (#): Gen. Frt,13; Liq. Gas,13; Chem, 11; Paper, 6 ; Dry Blk,7 ; Small,7 ; Med,17; Lrg,11; Tot Size, 35

Question 27 is about types of rewards used to encourage safe driving behavior.

Row %

		Q(27a) Cash	
		yes	no
General Freight		67.7%	32.3%
Liquid Gas		72.5%	27.5%
Chemical		71.1%	28.9%
Paper Products		60.0%	40.0%
Dry Bulk		72.4%	27.6%
Size	Small	73.1%	26.9%
	Medium	66.0%	34.0%
	Large	62.8%	37.2%
Total		66.4%	33.6%

Row %

		Q(27b) Certificates of merit	
		yes	no
General Freight		71.2%	28.8%
Liquid Gas		59.0%	41.0%
Chemical		63.2%	36.8%
Paper Products		65.7%	34.3%
Dry Bulk		58.6%	41.4%
Size	Small	29.2%	70.8%
	Medium	68.0%	32.0%
	Large	77.3%	22.7%
Total		63.6%	36.4%

Responses (#):

27a: Gen. Frt, 65 ; Liq. Gas, 40 ; Chem, 38 ; Paper, 35 ; Dry Blk, 29 ; Small, 26 ; Med, 50 ; Lrg, 43 ; Tot Size, 119

27b: Gen. Frt, 66 ; Liq. Gas, 39 ; Chem, 38 ; Paper, 35 ; Dry Blk, 29 ; Small, 24 ; Med, 50 ; Lrg, 44 ; Tot Size, 118

Row %

		Q(27c) Congratulatory letters from management	
		yes	no
General Freight		73.4%	26.6%
Liquid Gas		72.5%	27.5%
Chemical		81.1%	18.9%
Paper Products		80.0%	20.0%
Dry Bulk		64.3%	35.7%
Size	Small	52.0%	48.0%
	Medium	65.3%	34.7%
	Large	85.7%	14.3%
Total		69.8%	30.2%

Row %

		Q(27d) Extra holidays	
		yes	no
General Freight		7.9%	92.1%
Liquid Gas		7.7%	92.3%
Chemical		5.6%	94.4%
Paper Products		2.9%	97.1%
Dry Bulk		7.1%	92.9%
Size	Small	16.7%	83.3%
	Medium	8.2%	91.8%
	Large	2.4%	97.6%
Total		7.8%	92.2%

Responses (#):

27c: Gen. Frt, 64 ; Liq. Gas, 40 ; Chem, 37 ; Paper, 35 ; Dry Blk, 28 ; Small, 25 ; Med, 49 ; Lrg, 42 ; Tot Size, 116

27d: Gen. Frt, 63 ; Liq. Gas, 39 ; Chem, 36 ; Paper, 34 ; Dry Blk, 28 ; Small, 24 ; Med, 49 ; Lrg, 42 ; Tot Size, 115

Row %

		Q(27e) Favorable consideration for promotion	
		yes	no
General Freight		31.3%	68.8%
Liquid Gas		27.5%	72.5%
Chemical		27.8%	72.2%
Paper Products		28.6%	71.4%
Dry Bulk		39.3%	60.7%
Size	Small	42.3%	57.7%
	Medium	42.9%	57.1%
	Large	23.8%	76.2%
Total		35.9%	64.1%

Row %

		Q(27f) Free CDL renewal	
		yes	no
General Freight		3.2%	96.8%
Liquid Gas		5.3%	94.7%
Chemical		5.7%	94.3%
Paper Products		12.1%	87.9%
Dry Bulk		15.4%	84.6%
Size	Small	14.3%	85.7%
	Medium	10.4%	89.6%
	Large	4.7%	95.3%
Total		8.9%	91.1%

Responses (#):

27e: Gen. Frt, 64 ; Liq. Gas, 40 ; Chem, 36 ; Paper, 35 ; Dry Blk, 28 ; Small, 26 ; Med, 49 ; Lrg, 42 ; Tot Size, 117

27f: Gen. Frt, 63 ; Liq. Gas, 38 ; Chem, 35 ; Paper, 33 ; Dry Blk, 26 ; Small, 21 ; Med, 48 ; Lrg, 43 ; Tot Size, 112

Question 27 (cont.)

Row %

		Q(27g) Free meals	
		yes	no
General Freight		50.0%	50.0%
Liquid Gas		28.9%	71.1%
Chemical		37.1%	62.9%
Paper Products		40.0%	60.0%
Dry Bulk		39.3%	60.7%
Size	Small	37.5%	62.5%
	Medium	32.7%	67.3%
	Large	52.4%	47.6%
Total		40.9%	59.1%

Row %

		Q(27h) Insurance rebates	
		yes	no
General Freight		4.8%	95.2%
Liquid Gas		2.6%	97.4%
Chemical		2.9%	97.1%
Paper Products			100.0%
Dry Bulk			100.0%
Size	Small		100.0%
	Medium		100.0%
	Large	7.3%	92.7%
Total		2.7%	97.3%

Responses (#):

27g: Gen. Frt,64 ; Liq. Gas,38 ; Chem, 35 ; Paper,35 ; Dry Blk,28 ; Small,24 ; Med,49 ; Lrg,42 ; Tot Size, 115

27h: Gen. Frt,62 ; Liq. Gas,38 ; Chem, 35 ; Paper,34 ; Dry Blk,27 ; Small,23 ; Med,49 ; Lrg,41 ; Tot Size, 113

Row %

		Q(27i) Lottery tickets	
		yes	no
General Freight		4.8%	95.2%
Liquid Gas		5.1%	94.9%
Chemical		2.8%	97.2%
Paper Products		5.9%	94.1%
Dry Bulk		3.7%	96.3%
Size	Small	4.3%	95.7%
	Medium	2.0%	98.0%
	Large	4.8%	95.2%
Total		3.5%	96.5%

Row %

		Q(27j) Merchandise	
		yes	no
General Freight		68.8%	31.3%
Liquid Gas		66.7%	33.3%
Chemical		72.2%	27.8%
Paper Products		63.6%	36.4%
Dry Bulk		67.9%	32.1%
Size	Small	45.8%	54.2%
	Medium	61.2%	38.8%
	Large	79.1%	20.9%
Total		64.7%	35.3%

Responses (#):

27i: Gen. Frt,63 ; Liq. Gas,39 ; Chem, 36 ; Paper,34 ; Dry Blk,27 ; Small,23 ; Med,49 ; Lrg, 42 ; Tot Size, 114

27j: Gen. Frt,64 ; Liq. Gas,39 ; Chem, 36 ; Paper,33 ; Dry Blk,28 ; Small,24 ; Med,49 ; Lrg, 43 ; Tot Size, 116

Row %

		Q(27k) Public recognition	
		yes	no
General Freight		82.5%	17.5%
Liquid Gas		67.5%	32.5%
Chemical		77.8%	22.2%
Paper Products		73.5%	26.5%
Dry Bulk		70.4%	29.6%
Size	Small	50.0%	50.0%
	Medium	71.4%	28.6%
	Large	85.7%	14.3%
Total		72.2%	27.8%

Row %

		Q(27l) Safety banquets	
		yes	no
General Freight		75.8%	24.2%
Liquid Gas		61.5%	38.5%
Chemical		69.4%	30.6%
Paper Products		68.6%	31.4%
Dry Bulk		74.1%	25.9%
Size	Small	41.7%	58.3%
	Medium	67.3%	32.7%
	Large	77.3%	22.7%
Total		65.8%	34.2%

Responses (#):

27k: Gen. Frt,63 ; Liq. Gas,40 ; Chem, 36 ; Paper,34 ; Dry Blk,27 ; Small,24 ; Med,49 ; Lrg,42 ; Tot Size, 115

27l: Gen. Frt,66 ; Liq. Gas,39 ; Chem, 36 ; Paper,35 ; Dry Blk,27 ; Small,24 ; Med,49 ; Lrg,44 ; Tot Size, 117

Question 27(cont.)

Row %

		Q(27m) Safety decorations	
		yes	no
General Freight		81.5%	18.5%
Liquid Gas		61.5%	38.5%
Chemical		75.7%	24.3%
Paper Products		79.4%	20.6%
Dry Bulk		70.4%	29.6%
Size	Small	39.1%	60.9%
	Medium	71.4%	28.6%
	Large	81.8%	18.2%
Total		69.0%	31.0%

Row %

		Q(27n) Savings bonds	
		yes	no
General Freight		14.3%	85.7%
Liquid Gas		10.3%	89.7%
Chemical		8.3%	91.7%
Paper Products		5.9%	94.1%
Dry Bulk		7.4%	92.6%
Size	Small	4.3%	95.7%
	Medium	8.2%	91.8%
	Large	16.7%	83.3%
Total		10.5%	89.5%

Responses (#):

27m: Gen. Frt,65 ; Liq. Gas,39 ; Chem, 37 ; Paper,34 ; Dry Blk,27 ; Small,23 ; Med,49 ; Lrg,44 ; Tot Size, 116

27n: Gen. Frt, 63 ; Liq. Gas,39 ; Chem, 36 ; Paper,34 ; Dry Blk,27 ; Small,23 ; Med,49 ; Lrg,42 ; Tot Size, 114

Row %

		Q(27o) Travel packages	
		yes	no
General Freight		23.4%	76.6%
Liquid Gas		12.8%	87.2%
Chemical		18.4%	81.6%
Paper Products		20.6%	79.4%
Dry Bulk		14.3%	85.7%
Size	Small	8.7%	91.3%
	Medium	16.3%	83.7%
	Large	23.3%	76.7%
Total		17.4%	82.6%

Row %

		Q(27p) Upgraded vehicle options	
		yes	no
General Freight		21.0%	79.0%
Liquid Gas		22.5%	77.5%
Chemical		13.9%	86.1%
Paper Products		20.6%	79.4%
Dry Bulk		14.8%	85.2%
Size	Small	16.7%	83.3%
	Medium	18.8%	81.3%
	Large	21.4%	78.6%
Total		19.3%	80.7%

Responses (#):

27o: Gen. Frt, 64 ; Liq. Gas,39 ; Chem, 38 ; Paper,34 ; Dry Blk,28 ; Small,23 ; Med,49 ; Lrg,43 ; Tot Size, 115

27p: Gen. Frt, 62 ; Liq. Gas,40 ; Chem, 36 ; Paper,34 ; Dry Blk,27 ; Small,24 ; Med,48 ; Lrg,42 ; Tot Size, 114

Row %

		Q(27q) Verbal praise	
		yes	no
General Freight		93.9%	6.1%
Liquid Gas		90.0%	10.0%
Chemical		94.7%	5.3%
Paper Products		91.7%	8.3%
Dry Bulk		93.1%	6.9%
Size	Small	92.0%	8.0%
	Medium	91.8%	8.2%
	Large	95.5%	4.5%
Total		93.2%	6.8%

Row %

		Q(27r) Other rewards	
		yes	no
General Freight		100.0%	
Liquid Gas		93.3%	6.7%
Chemical		91.7%	8.3%
Paper Products		100.0%	
Dry Bulk		100.0%	
Size	Small	100.0%	
	Medium	100.0%	
	Large	88.9%	11.1%
Total		96.3%	3.7%

Responses (#):

27q: Gen. Frt, 66 ; Liq. Gas,40 ; Chem, 38 ; Paper,36 ; Dry Blk,29 ; Small,25 ; Med,49 ; Lrg,44 ; Tot Size, 118

27r: Gen. Frt, 11 ; Liq. Gas,15 ; Chem, 12 ; Paper,6 ; Dry Blk,8 ; Small,7 ; Med,11 ; Lrg,9 ; Tot Size, 27

Question 28 is about standards/criteria used for driver safety awards.

Row %		Q(28a) Crashes during a specified time period	
		based on this or a similar criterion	Not based on this or a similar criterion
General Freight		95.3%	4.7%
Liquid Gas		92.1%	7.9%
Chemical		89.2%	10.8%
Paper Products		86.5%	13.5%
Dry Bulk		86.2%	13.8%
Size	Small	79.2%	20.8%
	Medium	95.9%	4.1%
	Large	97.6%	2.4%
Total		93.0%	7.0%

Row %		Q(28b) Crashes over a specified number of miles	
		based on this or a similar criterion	Not based on this or a similar criterion
General Freight		36.1%	63.9%
Liquid Gas		28.9%	71.1%
Chemical		29.7%	70.3%
Paper Products		30.6%	69.4%
Dry Bulk		21.4%	78.6%
Size	Small	17.4%	82.6%
	Medium	27.7%	72.3%
	Large	46.3%	53.7%
Total		32.4%	67.6%

Responses (#):

28a: Gen. Frt, 64; Liq. Gas,38; Chem, 37; Paper, 37; Dry Blk,29; Small,24; Med,49; Lrg,42; Tot Size, 115

28b: Gen. Frt,61; Liq. Gas,38; Chem, 37; Paper, 36; Dry Blk,28; Small,23; Med,47; Lrg,41; Tot Size, 111

Row %		Q(28c) Traffic convictions during a specified time period	
		based on this or a similar criterion	Not based on this or a similar criterion
General Freight		53.2%	46.8%
Liquid Gas		59.5%	40.5%
Chemical		52.8%	47.2%
Paper Products		58.3%	41.7%
Dry Bulk		53.6%	46.4%
Size	Small	56.5%	43.5%
	Medium	68.1%	31.9%
	Large	43.9%	56.1%
Total		56.8%	43.2%

Row %		Q(28d) Traffic convictions over a specified number of miles	
		based on this or a similar criterion	Not based on this or a similar criterion
General Freight		14.8%	85.2%
Liquid Gas		10.5%	89.5%
Chemical		10.8%	89.2%
Paper Products		16.7%	83.3%
Dry Bulk		3.6%	96.4%
Size	Small	4.3%	95.7%
	Medium	13.3%	86.7%
	Large	15.0%	85.0%
Total		12.0%	88.0%

Responses (#):

28c: Gen. Frt, 62; Liq. Gas,37; Chem, 36; Paper, 36; Dry Blk,28; Small,23; Med,47; Lrg,41; Tot Size, 111

28d: Gen. Frt,61; Liq. Gas,38; Chem, 37; Paper, 36; Dry Blk,28; Small,23; Med,45; Lrg,40; Tot Size, 108

Row %		Q(28e) FMCSR violations during a specified time period	
		based on this or a similar criterion	Not based on this or a similar criterion
General Freight		61.3%	38.7%
Liquid Gas		70.3%	29.7%
Chemical		63.9%	36.1%
Paper Products		61.1%	38.9%
Dry Bulk		64.3%	35.7%
Size	Small	69.6%	30.4%
	Medium	64.6%	35.4%
	Large	56.1%	43.9%
Total		62.5%	37.5%

Row %		Q(28f) FMCSR violations over a specified number of miles	
		based on this or a similar criterion	Not based on this or a similar criterion
General Freight		16.4%	83.6%
Liquid Gas		10.5%	89.5%
Chemical		10.8%	89.2%
Paper Products		19.4%	80.6%
Dry Bulk		7.1%	92.9%
Size	Small	17.4%	82.6%
	Medium	12.8%	87.2%
	Large	15.0%	85.0%
Total		14.5%	85.5%

Responses (#):

28e: Gen. Frt, 62; Liq. Gas,37; Chem, 36; Paper, 36; Dry Blk,28; Small,23; Med,48; Lrg,41; Tot Size, 112

28f: Gen. Frt, 61; Liq. Gas,38; Chem, 37; Paper, 36; Dry Blk,28; Small,23; Med,47; Lrg,40; Tot Size, 110

Question 28 (cont.)

Row %

	Q(28g) Public complaints during a specified time period	
	based on this or a similar criterion	Not based on this or a similar criterion
General Freight	40.0%	60.0%
Liquid Gas	58.3%	41.7%
Chemical	45.7%	54.3%
Paper Products	41.2%	58.8%
Dry Bulk	48.1%	51.9%
Size		
Small	43.5%	56.5%
Medium	54.5%	45.5%
Large	43.9%	56.1%
Total	48.1%	51.9%

Responses (#): Gen. Frt,60; Liq. Gas,36; Chem, 35; Paper, 34; Dry Blk,27; Small,23; Med,44; Lrg,41; Tot Size, 108

Row %

	Q(28h) Other standards	
	based on this or a similar criterion	Not based on this or a similar criterion
General Freight	90.9%	9.1%
Liquid Gas	87.5%	12.5%
Chemical	100.0%	
Paper Products	100.0%	
Dry Bulk	85.7%	14.3%
Size		
Small	100.0%	
Medium	100.0%	
Large	66.7%	33.3%
Total	90.0%	10.0%

Responses (#): Gen. Frt,11; Liq. Gas,8 ; Chem, 6 ; Paper, 3 ; Dry Blk,7 ; Small,3 ; Med,11; Lrg,6 ; Tot Size, 20

Question 29 is about reasons for disciplining drivers.

Row %

		Q(29a) Violations of Federal Motor Carrier Safety Regulations	
		yes	no
General Freight		98.7%	1.3%
Liquid Gas		97.8%	2.2%
Chemical		97.7%	2.3%
Paper Products		97.6%	2.4%
Dry Bulk		93.9%	6.1%
Size	Small	93.2%	6.8%
	Medium	96.2%	3.8%
	Large	100.0%	
Total		96.5%	3.5%

Responses (#): Gen. Frt,75 ; Liq. Gas,45 ; Chem, 43 ; Paper, 41 ; Dry Blk,33 ; Small,44 ; Med,53 ; Lrg,45 ; Tot Size, 142

Row %

		Q(29b) Violating company safety policies	
		yes	no
General Freight		100.0%	
Liquid Gas		100.0%	
Chemical		100.0%	
Paper Products		97.6%	2.4%
Dry Bulk		97.0%	3.0%
Size	Small	95.5%	4.5%
	Medium	98.1%	1.9%
	Large	100.0%	
Total		97.9%	2.1%

Responses (#): Gen. Frt,75 ; Liq. Gas,45 ; Chem, 43 ; Paper, 41 ; Dry Blk,33 ; Small,44 ; Med,53 ; Lrg,45 ; Tot Size, 142

Row %

		Q(29c) Unsafe driving performance in general	
		yes	no
General Freight		100.0%	
Liquid Gas		100.0%	
Chemical		100.0%	
Paper Products		100.0%	
Dry Bulk		100.0%	
Size	Small	100.0%	
	Medium	98.1%	1.9%
	Large	100.0%	
Total		99.3%	.7%

Responses (#): Gen. Frt,75 ; Liq. Gas,45 ; Chem, 43 ; Paper, 41 ; Dry Blk,33 ; Small,44 ; Med,53 ; Lrg,45 ; Tot Size, 142

Question 30 is about the effectiveness of specific actins at helping discipline drivers.

Row %

		Q(30a) Suspension from service						
		Very ineffective	Ineffective	Somewhat ineffective	Neither effective nor ineffective	Somewhat effective	Effective	Very effective
General Freight		2.8%	2.8%	1.4%	6.9%	9.7%	27.8%	48.6%
Liquid Gas		2.3%	2.3%		2.3%	6.8%	27.3%	59.1%
Chemical		2.4%	2.4%		2.4%	11.9%	31.0%	50.0%
Paper Products		2.4%	4.9%	2.4%	9.8%	14.6%	19.5%	46.3%
Dry Bulk		3.0%	6.1%		3.0%	15.2%	24.2%	48.5%
Size	Small	2.3%	2.3%	2.3%	11.6%	20.9%	27.9%	32.6%
	Medium	3.8%	3.8%		1.9%	3.8%	23.1%	63.5%
	Large			2.3%	4.5%	4.5%	38.6%	50.0%
Total		2.2%	2.2%	1.4%	5.8%	9.4%	29.5%	49.6%

Responses (#): Gen. Frt,72; Liq. Gas,44; Chem, 42; Paper, 41; Dry Blk,33; Small,43; Med,52; Lrg,44; Tot Size, 139

Row %

		Q(30b) Termination of employment				
		Very ineffective	Neither effective nor ineffective	Somewhat effective	Effective	Very effective
General Freight		4.2%	4.2%	1.4%	12.5%	77.8%
Liquid Gas			2.3%	6.8%	18.2%	72.7%
Chemical			7.1%	4.8%	14.3%	73.8%
Paper Products		2.4%	2.4%	4.9%	22.0%	68.3%
Dry Bulk			3.0%	3.0%	24.2%	69.7%
Size	Small	7.0%	7.0%	4.7%	30.2%	51.2%
	Medium	1.9%	1.9%	1.9%	13.5%	80.8%
	Large		2.3%	2.3%	13.6%	81.8%
Total		2.9%	3.6%	2.9%	18.7%	71.9%

Responses (#): Gen. Frt,72; Liq. Gas,44; Chem, 42; Paper, 41; Dry Blk,33; Small,43; Med,52; Lrg,44; Tot Size, 139

Row %

		Q(30c) Verbal warning						
		Very ineffective	Ineffective	Somewhat ineffective	Neither effective nor ineffective	Somewhat effective	Effective	Very effective
General Freight		1.4%	2.8%	1.4%		45.8%	37.5%	11.1%
Liquid Gas		2.3%	2.3%	6.8%	4.5%	34.1%	31.8%	18.2%
Chemical		2.4%	2.4%	7.1%	4.8%	45.2%	23.8%	14.3%
Paper Products		2.5%	2.5%	5.0%		47.5%	32.5%	10.0%
Dry Bulk		3.1%	3.1%	9.4%	3.1%	43.8%	31.3%	6.3%
Size	Small	2.3%	2.3%	4.7%	4.7%	39.5%	39.5%	7.0%
	Medium	1.9%	3.8%	7.7%		38.5%	36.5%	11.5%
	Large				2.3%	43.2%	38.6%	15.9%
Total		1.4%	2.2%	4.3%	2.2%	40.3%	38.1%	11.5%

Responses (#): Gen. Frt,72; Liq. Gas,44; Chem, 42; Paper, 40; Dry Blk,32; Small,43; Med,52; Lrg,44; Tot Size, 139

Question 30 (cont.)

Question 31 compares the impact that disciplinary actions and rewards have on company highway safety performance.

Row %

		Q(30d) Written warning						
		Very ineffective	Ineffective	Somewhat ineffective	Neither effective nor ineffective	Somewhat effective	Effective	Very effective
General Freight		1.4%	2.8%	2.8%	1.4%	6.9%	61.1%	23.6%
Liquid Gas			2.3%	4.7%		9.3%	53.5%	30.2%
Chemical			2.4%	4.8%		16.7%	52.4%	23.8%
Paper Products			2.5%	2.5%		22.5%	50.0%	22.5%
Dry Bulk			3.1%	6.3%		21.9%	50.0%	18.8%
Size	Small	2.4%	2.4%	4.9%	2.4%	26.8%	46.3%	14.6%
	Medium		3.8%	1.9%		11.5%	57.7%	25.0%
	Large						9.1%	29.5%
Total		.7%	2.2%	2.2%	.7%	15.3%	55.5%	23.4%

Responses (#): Gen. Frt,72 ; Liq. Gas,43 ; Chem, 42 ; Paper, 40 ; Dry Blk,32 ; Small,41 ; Med,52 ; Lrg,44 ; Tot Size, 137

Row %

		Q(30e) Other action		
		Very ineffective	Effective	Very effective
General Freight		8.3%	25.0%	66.7%
Liquid Gas			20.0%	80.0%
Chemical			16.7%	83.3%
Paper Products			12.5%	87.5%
Dry Bulk			20.0%	80.0%
Size	Small			100.0%
	Medium	14.3%	14.3%	71.4%
	Large		37.5%	62.5%
Total		5.3%	21.1%	73.7%

Responses (#): Gen. Frt,12 ; Liq. Gas,5 ; Chem, 6 ; Paper, 8 ; Dry Blk,5 ; Small,4 ; Med,7 ; Lrg,8 ; Tot Size, 19

Row %

		Q(31) Impact of safety rewards and/or disciplinary actions		
		safety rewards have more impact	disciplinary actions have more impact	equal impact
General Freight		36.0%	17.3%	46.7%
Liquid Gas		41.9%	25.6%	32.6%
Chemical		42.9%	19.0%	38.1%
Paper Products		35.7%	16.7%	47.6%
Dry Bulk		38.2%	14.7%	47.1%
Size	Small	29.8%	34.0%	36.2%
	Medium	28.8%	15.4%	55.8%
	Large	42.2%	17.8%	40.0%
Total		33.3%	22.2%	44.4%

Responses (#): Gen. Frt,75 ; Liq. Gas,43 ; Chem, 42 ; Paper, 42 ; Dry Blk,34 ; Small,47 ; Med,52 ; Lrg,45 ; Tot Size, 144

Question 32 is about the impact of disciplinary actions and rewards.

Row %

		Q(32a) Disciplining drivers does little to impact on our company's highway safety						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		34.2%	46.1%	1.3%	2.6%	5.3%	7.9%	2.6%
Liquid Gas		37.2%	37.2%	2.3%		7.0%	14.0%	2.3%
Chemical		33.3%	42.9%	2.4%		11.9%	7.1%	2.4%
Paper Products		20.9%	53.5%	4.7%	2.3%	2.3%	14.0%	2.3%
Dry Bulk		34.3%	34.3%	2.9%		5.7%	20.0%	2.9%
Size	Small	25.0%	29.2%	8.3%	8.3%	10.4%	16.7%	2.1%
	Medium	40.7%	50.0%				7.4%	1.9%
	Large	38.6%	43.2%	2.3%	2.3%	2.3%	9.1%	2.3%
Total		34.9%	41.1%	3.4%	3.4%	4.1%	11.0%	2.1%

Responses (#): Gen. Frt,76; Liq. Gas,43; Chem, 42; Paper, 43; Dry Blk,35; Small,48; Med,54; Lrg,44; Tot Size, 146

Row %

		Q(32b) Only safe drivers get promoted at our company					
		Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		6.9%	1.4%	23.6%	13.9%	34.7%	19.4%
Liquid Gas		7.1%		28.6%	11.9%	40.5%	11.9%
Chemical		7.1%		33.3%	11.9%	35.7%	11.9%
Paper Products		9.3%		27.9%	16.3%	30.2%	16.3%
Dry Bulk		9.1%	3.0%	30.3%	15.2%	33.3%	9.1%
Size	Small	4.7%	2.3%	30.2%	14.0%	39.5%	9.3%
	Medium	11.1%	3.7%	18.5%	3.7%	37.0%	25.9%
	Large	9.3%		30.2%	18.6%	32.6%	9.3%
Total		8.6%	2.1%	25.7%	11.4%	36.4%	15.7%

Responses (#): Gen. Frt,72; Liq. Gas,42; Chem, 42; Paper, 43; Dry Blk,33; Small,43; Med,54; Lrg,43; Tot Size, 140

Row %

		Q(32c) Rewards are the best way to get drivers to drive safely						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		2.6%	19.7%	15.8%	11.8%	21.1%	23.7%	5.3%
Liquid Gas		4.7%	11.6%	16.3%	7.0%	16.3%	30.2%	14.0%
Chemical		4.7%	11.6%	16.3%		23.3%	34.9%	9.3%
Paper Products			25.6%	11.6%	9.3%	25.6%	18.6%	9.3%
Dry Bulk		5.7%	20.0%	11.4%	5.7%	20.0%	28.6%	8.6%
Size	Small	4.3%	14.9%	17.0%	17.0%	21.3%	17.0%	8.5%
	Medium		16.7%	13.0%	16.7%	25.9%	20.4%	7.4%
	Large	6.7%	20.0%	13.3%	6.7%	15.6%	33.3%	4.4%
Total		3.4%	17.1%	14.4%	13.7%	21.2%	23.3%	6.8%

Responses (#): Gen. Frt,76; Liq. Gas,43; Chem, 43; Paper, 43; Dry Blk,35; Small,47; Med,54; Lrg,45; Tot Size, 146

Question 32 (cont.)

Row %

		Q(32d) Safety training without incentives to reinforce the training is useless						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		11.8%	30.3%	6.6%	7.9%	22.4%	15.8%	5.3%
Liquid Gas		7.0%	32.6%	11.6%	7.0%	14.0%	16.3%	11.6%
Chemical		9.3%	30.2%	7.0%	11.6%	20.9%	11.6%	9.3%
Paper Products		4.7%	34.9%	4.7%	11.6%	27.9%	14.0%	2.3%
Dry Bulk		8.6%	28.6%	14.3%	11.4%	14.3%	17.1%	5.7%
Size	Small	12.8%	10.6%	14.9%	21.3%	19.1%	14.9%	6.4%
	Medium	5.6%	42.6%	11.1%	7.4%	16.7%	9.3%	7.4%
	Large	13.3%	31.1%	6.7%	11.1%	15.6%	15.6%	6.7%
Total		10.3%	28.8%	11.0%	13.0%	17.1%	13.0%	6.8%

Responses (#): Gen. Frt,76; Liq. Gas,43; Chem, 43; Paper, 43; Dry Blk,35; Small,47; Med,54; Lrg,45; Tot Size, 146

SECTION 5: MANAGING SERVICE CONDITIONS FOR DRIVERS

Questions 33 – 37.

Row %

		Q(33) What is the average length-of-haul for your company's over-the-road drivers				
		0-250 miles	251-500 miles	501-750 miles	750-1000 miles	More than 1000 miles
General Freight		28.4%	40.5%	14.9%	8.1%	8.1%
Liquid Gas		36.4%	38.6%	18.2%	2.3%	4.5%
Chemical		28.6%	40.5%	19.0%	7.1%	4.8%
Paper Products		23.8%	42.9%	23.8%	2.4%	7.1%
Dry Bulk		23.5%	50.0%	17.6%	2.9%	5.9%
Size	Small	47.9%	22.9%	6.3%	8.3%	14.6%
	Medium	34.6%	38.5%	17.3%	1.9%	7.7%
	Large	26.7%	40.0%	20.0%	8.9%	4.4%
Total		36.6%	33.8%	14.5%	6.2%	9.0%

Responses (#): Gen. Frt,74; Liq. Gas,44; Chem, 42; Paper, 42; Dry Blk,34; Small,48; Med,52; Lrg,45; Tot Size, 145

Row %

		34) Approx what percent of your company's annual vehicle miles occur local operations				
		Zero percent	1-25 percent	26-50 percent	51-75 percent	75-100 percent
General Freight		10.5%	36.8%	18.4%	15.8%	18.4%
Liquid Gas		4.5%	11.4%	27.3%	15.9%	40.9%
Chemical		7.0%	25.6%	25.6%	16.3%	25.6%
Paper Products		7.0%	30.2%	18.6%	14.0%	30.2%
Dry Bulk		11.4%	25.7%	25.7%	8.6%	28.6%
Size	Small	8.3%	25.0%	4.2%	25.0%	37.5%
	Medium	9.4%	34.0%	17.0%	13.2%	26.4%
	Large	6.7%	28.9%	26.7%	8.9%	28.9%
Total		8.2%	29.5%	15.8%	15.8%	30.8%

Responses (#): Gen. Frt,76; Liq. Gas,44; Chem, 43; Paper, 43; Dry Blk,35; Small,48; Med,53; Lrg,45; Tot Size, 146

Row %

		35) Approx what percent of your company's drivers work in local operations				
		Zero percent	1-25 percent	26-50 percent	51-75 percent	75-100 percent
General Freight		10.5%	38.2%	3.9%	21.1%	26.3%
Liquid Gas		6.8%	18.2%	9.1%	25.0%	40.9%
Chemical		11.6%	30.2%	7.0%	20.9%	30.2%
Paper Products		9.3%	34.9%	2.3%	16.3%	37.2%
Dry Bulk		11.4%	28.6%	8.6%	14.3%	37.1%
Size	Small	8.3%	25.0%		20.8%	45.8%
	Medium	11.3%	34.0%	9.4%	15.1%	30.2%
	Large	8.9%	31.1%	6.7%	22.2%	31.1%
Total		9.6%	30.1%	5.5%	19.2%	35.6%

Responses (#): Gen. Frt,76; Liq. Gas,44; Chem, 43; Paper, 43; Dry Blk,35; Small,48; Med,53; Lrg,45; Tot Size, 146

Question 36 is about technologies used to monitor driver performance.

Row %

		Q(36a) Engine diagnostics	
		yes	no
General Freight		72.6%	27.4%
Liquid Gas		63.6%	36.4%
Chemical		64.3%	35.7%
Paper Products		67.5%	32.5%
Dry Bulk		73.5%	26.5%
Size	Small	54.5%	45.5%
	Medium	66.7%	33.3%
	Large	70.5%	29.5%
Total		64.0%	36.0%

Row %

		Q(36b) Real-time vehicle routing software	
		yes	no
General Freight		27.4%	72.6%
Liquid Gas		31.8%	68.2%
Chemical		28.6%	71.4%
Paper Products		25.0%	75.0%
Dry Bulk		20.6%	79.4%
Size	Small	13.6%	86.4%
	Medium	27.5%	72.5%
	Large	40.9%	59.1%
Total		27.3%	72.7%

Responses (#):

36a: Gen. Frt, 73 ; Liq. Gas,44 ; Chem, 42 ; Paper, 40 ; Dry Blk,34 ; Small,44 ; Med,51 ; Lrg,44 ; Tot Size, 139
 36b: Gen. Frt, 73 ; Liq. Gas,44 ; Chem, 42 ; Paper, 40 ; Dry Blk,34 ; Small,44 ; Med,51 ; Lrg,44 ; Tot Size, 139

Row %

		Q(36c) Satellite-tracking/global positioning system	
		yes	no
General Freight	1.00	31.1%	68.9%
Liquid Gas	1.00	34.1%	65.9%
Chemical	1.00	38.1%	61.9%
Paper Products	1.00	34.1%	65.9%
Dry Bulk	1.00	17.6%	82.4%
Size	Small	13.6%	86.4%
	Medium	29.4%	70.6%
	Large	44.4%	55.6%
Total		29.3%	70.7%

Row %

		Q(36d) Speed regulators on vehicles	
		yes	no
General Freight		78.1%	21.9%
Liquid Gas		73.3%	26.7%
Chemical		79.1%	20.9%
Paper Products		73.2%	26.8%
Dry Bulk		80.0%	20.0%
Size	Small	53.5%	46.5%
	Medium	76.9%	23.1%
	Large	81.8%	18.2%
Total		71.2%	28.8%

Responses (#):

36c: Gen. Frt, 74 ; Liq. Gas,44 ; Chem, 42 ; Paper, 41 ; Dry Blk,34 ; Small,44 ; Med,51 ; Lrg,45 ; Tot Size, 140
 36d: Gen. Frt,73 ; Liq. Gas,45 ; Chem, 43 ; Paper, 41 ; Dry Blk,35 ; Small,43 ; Med,52 ; Lrg,44 ; Tot Size, 139

Row %

		Q(36e) Two-way radios	
		yes	no
General Freight		43.7%	56.3%
Liquid Gas		53.3%	46.7%
Chemical		46.3%	53.7%
Paper Products		46.2%	53.8%
Dry Bulk		54.5%	45.5%
Size	Small	50.0%	50.0%
	Medium	40.8%	59.2%
	Large	37.2%	62.8%
Total		42.5%	57.5%

Row %

		Q(36f) Wireless messaging systems	
		yes	no
General Freight		44.4%	55.6%
Liquid Gas		37.2%	62.8%
Chemical		35.0%	65.0%
Paper Products		43.6%	56.4%
Dry Bulk		45.5%	54.5%
Size	Small	41.9%	58.1%
	Medium	37.5%	62.5%
	Large	51.2%	48.8%
Total		43.3%	56.7%

Responses (#):

36e: Gen. Frt, 71 ; Liq. Gas,45 ; Chem, 41 ; Paper, 39 ; Dry Blk,33 ; Small,42 ; Med,49 ; Lrg,43 ; Tot Size, 134
 36f: Gen. Frt, 72 ; Liq. Gas,43 ; Chem, 40 ; Paper, 39 ; Dry Blk,33 ; Small,43 ; Med,48 ; Lrg,43 ; Tot Size, 134

Question 36(cont.)

Question 37 is about ways companies manage driver fatigue.

Row %

		Q(36g) Other technologies	
		yes	no
General Freight		90.5%	9.5%
Liquid Gas		100.0%	
Chemical		85.7%	14.3%
Paper Products		80.0%	20.0%
Dry Bulk		85.7%	14.3%
Size	Small	90.0%	10.0%
	Medium	90.9%	9.1%
	Large	90.9%	9.1%
Total		90.6%	9.4%

Responses (#): Gen. Frt,22; Liq. Gas,8 ; Chem, 8 ; Paper, 11 ; Dry Blk,8 ; Small,10; Med,12; Lrg,12; Tot Size, 34

Row %

		Q(37a) Our drivers refuse dispatches if they do not feel alert enough to handle the drive						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight			2.7%	2.7%	6.7%	17.3%	40.0%	30.7%
Liquid Gas			4.4%	2.2%	15.6%	11.1%	40.0%	26.7%
Chemical		2.3%	4.7%	4.7%	11.6%	16.3%	39.5%	20.9%
Paper Products		2.4%	4.8%		9.5%	16.7%	42.9%	23.8%
Dry Bulk		2.9%	2.9%		8.6%	22.9%	34.3%	28.6%
Size	Small	2.3%		2.3%	7.0%	11.6%	44.2%	32.6%
	Medium		5.8%	1.9%	15.4%	7.7%	50.0%	19.2%
	Large		4.4%	2.2%	8.9%	20.0%	37.8%	26.7%
Total		.7%	3.6%	2.1%	10.7%	12.9%	44.3%	25.7%

Responses (#): Gen. Frt,75; Liq. Gas,45; Chem, 43; Paper, 42; Dry Blk,35; Small,43; Med,52; Lrg,45; Tot Size, 140

Row %

		Q(37b) Our drivers never suffer from sleep deprivation						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		5.3%	14.7%	13.3%	25.3%	17.3%	18.7%	5.3%
Liquid Gas		4.4%	17.8%	13.3%	28.9%	13.3%	13.3%	8.9%
Chemical		4.7%	20.9%	16.3%	27.9%	9.3%	14.0%	7.0%
Paper Products		4.8%	14.3%	11.9%	23.8%	21.4%	19.0%	4.8%
Dry Bulk			17.1%	17.1%	25.7%	14.3%	22.9%	2.9%
Size	Small	2.3%	6.8%	11.4%	29.5%	18.2%	29.5%	2.3%
	Medium	9.4%	15.1%	9.4%	28.3%	11.3%	20.8%	5.7%
	Large	4.4%	20.0%	15.6%	22.2%	13.3%	17.8%	6.7%
Total		5.6%	14.1%	12.0%	26.8%	14.1%	22.5%	4.9%

Responses (#): Gen. Frt,75; Liq. Gas,45; Chem, 43; Paper, 42; Dry Blk,35; Small,44; Med,53; Lrg,45; Tot Size, 142

Questions 33 – 37 (cont.)

Row %

		Q(37c) We equip our trucks so they are easier to handle				
		Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		1.4%	12.3%	8.2%	52.1%	26.0%
Liquid Gas		4.4%	6.7%	13.3%	46.7%	28.9%
Chemical		4.7%	11.6%	9.3%	46.5%	27.9%
Paper Products		2.4%	14.3%	9.5%	45.2%	28.6%
Dry Bulk		2.9%	20.0%	8.6%	42.9%	25.7%
Size	Small	2.3%	23.3%	9.3%	34.9%	30.2%
	Medium	1.9%	7.7%	9.6%	51.9%	28.8%
	Large	2.3%	15.9%	6.8%	54.5%	20.5%
Total		2.2%	15.1%	8.6%	47.5%	26.6%

Responses (#): Gen. Frt,73 ; Liq. Gas,45 ; Chem, 43 ; Paper, 42 ; Dry Blk,35 ; Small,43 ; Med,52 ; Lrg,44 ; Tot Size, 139

Row %

		Q(37d) We strongly restrict drivers' break times						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		29.3%	37.3%	6.7%	10.7%	5.3%	5.3%	5.3%
Liquid Gas		24.4%	31.1%	8.9%	15.6%	8.9%	8.9%	2.2%
Chemical		34.9%	32.6%	7.0%	9.3%	4.7%	9.3%	2.3%
Paper Products		28.6%	40.5%	2.4%	7.1%	4.8%	9.5%	7.1%
Dry Bulk		20.0%	34.3%	2.9%	17.1%	5.7%	11.4%	8.6%
Size	Small	25.0%	29.5%	6.8%	18.2%	4.5%	9.1%	6.8%
	Medium	24.5%	32.1%	5.7%	17.0%	7.5%	11.3%	1.9%
	Large	28.9%	40.0%	6.7%	15.6%	2.2%	2.2%	4.4%
Total		26.1%	33.8%	6.3%	16.9%	4.9%	7.7%	4.2%

Responses (#): Gen. Frt,75 ; Liq. Gas,45 ; Chem, 43 ; Paper, 42 ; Dry Blk,35 ; Small,44 ; Med,53 ; Lrg,45 ; Tot Size, 142

Row %

		Q(37e) We urge drivers to talk on radios while driving					
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree
General Freight		22.7%	37.3%	9.3%	25.3%	2.7%	2.7%
Liquid Gas		28.9%	26.7%	6.7%	31.1%	2.2%	4.4%
Chemical		27.9%	23.3%	9.3%	34.9%	2.3%	2.3%
Paper Products		23.8%	31.0%	9.5%	31.0%	4.8%	
Dry Bulk		17.1%	31.4%	11.4%	31.4%	8.6%	
Size	Small	25.0%	34.1%	2.3%	38.6%		
	Medium	22.6%	28.3%	3.8%	37.7%	3.8%	3.8%
	Large	31.1%	28.9%	8.9%	22.2%	4.4%	4.4%
Total		26.1%	30.3%	4.9%	33.1%	2.8%	2.8%

Responses (#): Gen. Frt,75 ; Liq. Gas,45 ; Chem, 43 ; Paper, 42 ; Dry Blk,35 ; Small,44 ; Med,53 ; Lrg,45 ; Tot Size, 142

SECTION 6: MANAGING VEHICLE MAINTENANCE

**Questions 38 and 39 are about computerized equipment maintenance management.
Question 39 is about the use of collected data to support specific activities.**

Row %		Q(38) Does your company currently use a computerized equipment maintenance management program	
		no	yes
General Freight		41.30%	58.70%
Liquid Gas		27.30%	72.70%
Chemical		33.30%	66.70%
Paper Products		45.20%	54.80%
Dry Bulk		41.20%	58.80%
Size	Small	77.30%	22.70%
	Medium	32.70%	67.30%
	Large	22.20%	77.80%
Total		43.30%	56.70%

Responses (#): Gen. Frt,75; Liq. Gas,44; Chem, 42; Paper, 42; Dry Blk,34; Small,44; Med,52; Lrg,45; Tot Size, 141

Row %		Q(39a) Developing proper equipment specifications	
		yes	no
General Freight		84.4%	15.6%
Liquid Gas		83.3%	16.7%
Chemical		84.6%	15.4%
Paper Products		81.8%	18.2%
Dry Bulk		78.9%	21.1%
Size	Small	70.0%	30.0%
	Medium	78.8%	21.2%
	Large	91.4%	8.6%
Total		83.3%	16.7%

Row %		Q(39b) Developing equipment maintenance procedures	
		yes	no
General Freight		97.8%	2.2%
Liquid Gas		93.3%	6.7%
Chemical		96.2%	3.8%
Paper Products		95.5%	4.5%
Dry Bulk		84.2%	15.8%
Size	Small	90.0%	10.0%
	Medium	90.9%	9.1%
	Large	97.1%	2.9%
Total		93.6%	6.4%

Responses (#):

39a: Gen. Frt, 45; Liq. Gas,30; Chem, 26; Paper, 22; Dry Blk, 19; Small,10; Med,33; Lrg,35; Tot Size, 78

39b: Gen. Frt, 45; Liq. Gas,30; Chem, 26; Paper, 22; Dry Blk,19; Small,10; Med,33; Lrg,35; Tot Size, 78

Row %		Q(39c) Monitoring equipment maintenance activities	
		yes	no
General Freight		100.0%	
Liquid Gas		100.0%	
Chemical		96.2%	3.8%
Paper Products		95.5%	4.5%
Dry Bulk		94.7%	5.3%
Size	Small	80.0%	20.0%
	Medium	100.0%	
	Large	100.0%	
Total		97.4%	2.6%

Row %		Q(39d) Determining mechanic training needs	
		yes	no
General Freight		57.8%	42.2%
Liquid Gas		58.6%	41.4%
Chemical		50.0%	50.0%
Paper Products		59.1%	40.9%
Dry Bulk		61.1%	38.9%
Size	Small	44.4%	55.6%
	Medium	56.3%	43.8%
	Large	60.0%	40.0%
Total		56.6%	43.4%

Responses (#):

39c: Gen. Frt, 45; Liq. Gas,30; Chem, 26; Paper, 22; Dry Blk,19; Small,10; Med,33; Lrg,35; Tot Size, 78

39d: Gen. Frt, 45; Liq. Gas,29; Chem, 26; Paper, 22; Dry Blk,18; Small,9 ; Med,32; Lrg,35; Tot Size, 76

Question 39 (cont.) Questions 40 and 41 are about whether companies outsource specific fleet maintenance activities.

Row %

		Q(39e) Performing part failure analysis	
		yes	no
General Freight		66.7%	33.3%
Liquid Gas		46.7%	53.3%
Chemical		53.8%	46.2%
Paper Products		54.5%	45.5%
Dry Bulk		63.2%	36.8%
Size	Small	30.0%	70.0%
	Medium	62.5%	37.5%
	Large	68.6%	31.4%
Total		61.0%	39.0%

Row %

		Q(39f) Scheduling equipment repairs	
		yes	no
General Freight		93.2%	6.8%
Liquid Gas		100.0%	
Chemical		100.0%	
Paper Products		95.2%	4.8%
Dry Bulk		89.5%	10.5%
Size	Small	100.0%	
	Medium	87.9%	12.1%
	Large	97.1%	2.9%
Total		93.5%	6.5%

Responses (#):

39e: Gen. Frt, 45; Liq. Gas,30; Chem, 26; Paper, 22; Dry Blk,19; Small,10; Med,32; Lrg,35; Tot Size, 77

39f: Gen. Frt,44; Liq. Gas,29; Chem, 26; Paper, 21; Dry Blk,19; Small,10; Med,33; Lrg,34; Tot Size, 77

Row %

		Q(40) Does your company outsource one or more of its fleet maintenance activities	
		no	yes
General Freight		24.3%	75.7%
Liquid Gas		27.3%	72.7%
Chemical		26.2%	73.8%
Paper Products		22.0%	78.0%
Dry Bulk		20.6%	79.4%
Size	Small	23.3%	76.7%
	Medium	23.1%	76.9%
	Large	24.4%	75.6%
Total		23.6%	76.4%

Responses (#): Gen. Frt,74; Liq. Gas,44; Chem, 42; Paper, 41; Dry Blk,34; Small,43; Med,52; Lrg,45; Tot Size, 140

Row %

		Q(41a) Brake system repairs	
		yes	no
General Freight		40.0%	60.0%
Liquid Gas		40.6%	59.4%
Chemical		46.9%	53.1%
Paper Products		42.4%	57.6%
Dry Bulk		55.6%	44.4%
Size	Small	68.6%	31.4%
	Medium	31.6%	68.4%
	Large	40.0%	60.0%
Total		46.3%	53.7%

Row %

		Q(41b) Electrical/light system repairs	
		yes	no
General Freight		29.6%	70.4%
Liquid Gas		40.6%	59.4%
Chemical		46.9%	53.1%
Paper Products		45.5%	54.5%
Dry Bulk		53.8%	46.2%
Size	Small	58.8%	41.2%
	Medium	32.4%	67.6%
	Large	37.1%	62.9%
Total		42.5%	57.5%

Responses (#):

41a: Gen. Frt, 55; Liq. Gas,32; Chem, 32; Paper, 33; Dry Blk,27; Small,35; Med,38; Lrg,35; Tot Size, 108

41b: Gen. Frt, 54; Liq. Gas,32; Chem, 32; Paper, 33; Dry Blk,26; Small,34; Med,37; Lrg,35; Tot Size, 106

Questions 40 – 41 (cont.)

Row %		Q(41c) In-chassis engine repairs	
		yes	no
General Freight		65.5%	34.5%
Liquid Gas		71.9%	28.1%
Chemical		74.2%	25.8%
Paper Products		62.5%	37.5%
Dry Bulk		84.6%	15.4%
Size	Small	94.3%	5.7%
	Medium	61.1%	38.9%
	Large	60.0%	40.0%
Total		71.7%	28.3%

Row %		Q(41d) Major drive train repairs	
		yes	no
General Freight		73.2%	26.8%
Liquid Gas		81.8%	18.2%
Chemical		81.8%	18.2%
Paper Products		76.5%	23.5%
Dry Bulk		81.5%	18.5%
Size	Small	94.3%	5.7%
	Medium	72.5%	27.5%
	Large	68.6%	31.4%
Total		78.2%	21.8%

Responses (#):

41c: Gen. Frt, 55; Liq. Gas, 32; Chem, 31; Paper, 32; Dry Blk, 26; Small, 35; Med, 36; Lrg, 35; Tot Size, 106

41d: Gen. Frt, 56; Liq. Gas, 33; Chem, 33; Paper, 34; Dry Blk, 27; Small, 35; Med, 40; Lrg, 35; Tot Size, 110

Row %		Q(41e) Minor drive train repairs	
		yes	no
General Freight		43.6%	56.4%
Liquid Gas		37.5%	62.5%
Chemical		45.2%	54.8%
Paper Products		50.0%	50.0%
Dry Bulk		55.6%	44.4%
Size	Small	71.4%	28.6%
	Medium	35.1%	64.9%
	Large	45.7%	54.3%
Total		50.5%	49.5%

Row %		Q(41f) Out-of-chassis engine repairs	
		yes	no
General Freight		76.4%	23.6%
Liquid Gas		90.6%	9.4%
Chemical		81.3%	18.8%
Paper Products		73.5%	26.5%
Dry Bulk		88.5%	11.5%
Size	Small	97.1%	2.9%
	Medium	85.0%	15.0%
	Large	70.6%	29.4%
Total		84.4%	15.6%

Responses (#):

41e: Gen. Frt, 55; Liq. Gas, 32; Chem, 31; Paper, 32; Dry Blk, 27; Small, 35; Med, 37; Lrg, 35; Tot Size, 107

41f: Gen. Frt, 55; Liq. Gas, 32; Chem, 32; Paper, 34; Dry Blk, 26; Small, 35; Med, 40; Lrg, 34; Tot Size, 109

Row %		Q(41g) Preventive maintenance	
		yes	no
General Freight		32.7%	67.3%
Liquid Gas		42.4%	57.6%
Chemical		48.5%	51.5%
Paper Products		45.5%	54.5%
Dry Bulk		55.6%	44.4%
Size	Small	67.6%	32.4%
	Medium	27.5%	72.5%
	Large	41.2%	58.8%
Total		44.4%	55.6%

Row %		Q(41h) Tire repairs	
		yes	no
General Freight		67.9%	32.1%
Liquid Gas		72.7%	27.3%
Chemical		75.8%	24.2%
Paper Products		73.5%	26.5%
Dry Bulk		70.4%	29.6%
Size	Small	85.7%	14.3%
	Medium	52.5%	47.5%
	Large	74.3%	25.7%
Total		70.0%	30.0%

Responses (#):

41g: Gen. Frt, 55; Liq. Gas, 33; Chem, 33; Paper, 33; Dry Blk, 27; Small, 34; Med, 40; Lrg, 34; Tot Size, 108

41h: Gen. Frt, 56; Liq. Gas, 33; Chem, 33; Paper, 34; Dry Blk, 27; Small, 35; Med, 40; Lrg, 35; Tot Size, 110

Questions 40 – 41 (cont.)

Row %

		Q(41i) Tire replacement	
		yes	no
General Freight		57.1%	42.9%
Liquid Gas		63.6%	36.4%
Chemical		63.6%	36.4%
Paper Products		61.8%	38.2%
Dry Bulk		63.0%	37.0%
Size	Small	77.1%	22.9%
	Medium	55.0%	45.0%
	Large	57.1%	42.9%
Total		62.7%	37.3%

Row %

		Q(41j) Truck washing	
		yes	no
General Freight		59.3%	40.7%
Liquid Gas		68.8%	31.3%
Chemical		68.8%	31.3%
Paper Products		63.6%	36.4%
Dry Bulk		66.7%	33.3%
Size	Small	68.6%	31.4%
	Medium	61.5%	38.5%
	Large	67.6%	32.4%
Total		65.7%	34.3%

Responses (#):

41i: Gen. Frt,56; Liq. Gas,33; Chem, 33; Paper,34; Dry Blk,27; Small,35; Med,40; Lrg, 35; Tot Size, 110

41j: Gen. Frt,54; Liq. Gas,32; Chem, 32; Paper,33; Dry Blk,27; Small,35; Med,39; Lrg, 34; Tot Size, 108

Questions 42 – 53 are general questions about managing vehicle maintenance.

Row %

		42) Approx what percent of your company's power unit service and repair do company employees perform				
		Zero percent	1-25 percent	26-50 percent	51-75 percent	76-100 percent
General Freight		14.7%	10.7%	9.3%	22.7%	42.7%
Liquid Gas		8.9%	8.9%	15.6%	20.0%	46.7%
Chemical		11.4%	9.1%	15.9%	18.2%	45.5%
Paper Products		23.8%	11.9%	9.5%	9.5%	45.2%
Dry Bulk		23.5%	8.8%	11.8%	23.5%	32.4%
Size	Small	38.6%	22.7%	6.8%	6.8%	25.0%
	Medium	11.1%	13.0%	9.3%	20.4%	46.3%
	Large	13.0%	2.2%	13.0%	21.7%	50.0%
Total		20.1%	12.5%	9.7%	16.7%	41.0%

Responses (#): Gen. Frt,75 ; Liq. Gas,45 ; Chem, 44 ; Paper, 42 ; Dry Blk,34 ; Small,44 ; Med,54 ; Lrg,46 ; Tot Size, 144

Row %

		Q(43) About how many mechanics does your company employ to service its fleet							
		1-10 mechanics	11-20 mechanics	21-30 mechanics	31-40 mechanics	41-50 mechanics	51-100 mechanics	101-250 mechanics	251-500 mechanics
General Freight		62.9%	15.7%	2.9%	4.3%	2.9%	5.7%	4.3%	1.4%
Liquid Gas		56.1%	12.2%	17.1%	2.4%	4.9%	7.3%		
Chemical		48.7%	15.4%	17.9%	2.6%	5.1%	7.7%	2.6%	
Paper Products		61.8%	26.5%	5.9%	2.9%		2.9%		
Dry Bulk		53.8%	23.1%	7.7%		7.7%	3.8%	3.8%	
Size	Small	100.0%							
	Medium	70.8%	20.8%	4.2%	2.1%			2.1%	
	Large	31.0%	23.8%	14.3%	4.8%	7.1%	9.5%	7.1%	2.4%
Total		64.8%	16.4%	6.6%	2.5%	2.5%	3.3%	3.3%	.8%

Responses (#): Gen. Frt,70 ; Liq. Gas,41 ; Chem, 39 ; Paper, 34 ; Dry Blk,26 ; Small,32 ; Med,48 ; Lrg,42 ; Tot Size, 122

Row %

		(44) Approx what percentage of your company's mechanic have had formal mechanic's training, either prior to or during service with the company			
		0-25 percent	26-50 percent	51-75 percent	76-100 percent
General Freight		12.7%	7.0%	14.1%	66.2%
Liquid Gas		12.2%	14.6%	12.2%	61.0%
Chemical		7.7%	10.3%	10.3%	71.8%
Paper Products		17.1%	8.6%	11.4%	62.9%
Dry Bulk		15.4%	11.5%	19.2%	53.8%
Size	Small	48.5%	3.0%	6.1%	42.4%
	Medium	10.4%	18.8%	10.4%	60.4%
	Large	6.8%	6.8%	18.2%	68.2%
Total		19.2%	10.4%	12.0%	58.4%

Responses (#): Gen. Frt,71 ; Liq. Gas,41 ; Chem, 39 ; Paper, 35 ; Dry Blk,26 ; Small,33 ; Med,48 ; Lrg,44 ; Tot Size, 125

Questions 42 – 53 (cont.)

Row %

		Q(45) Approx how many weeks of formal training has the average mechanic at your company received				
		0 weeks	1-6 weeks	7-12 weeks	12-24 weeks	24 or more weeks
General Freight		7.1%	38.6%	7.1%	22.9%	24.3%
Liquid Gas		7.5%	47.5%	7.5%	12.5%	25.0%
Chemical		7.7%	41.0%	7.7%	17.9%	25.6%
Paper Products		5.7%	48.6%	8.6%	14.3%	22.9%
Dry Bulk		8.0%	44.0%	8.0%	20.0%	20.0%
Size	Small	34.4%	34.4%	6.3%		25.0%
	Medium	2.1%	45.8%	14.6%	16.7%	20.8%
	Large	4.7%	44.2%	4.7%	23.3%	23.3%
Total		11.4%	42.3%	8.9%	14.6%	22.8%

Responses (#): Gen. Frt,70; Liq. Gas,40; Chem, 39; Paper, 35; Dry Blk,25; Small,32; Med,48; Lrg,43; Tot Size, 123

Row %

		Q(46) Which of the following ranges best describes the number of power units in your company's fleet									
		1-10 power units	11-20 power units	21-30 power units	31-40 power units	41-50 power units	51-100 power units	101-250 power units	251-500 power units	500-1000 power units	1001 or more power units
General Freight		13.0%	3.9%	9.1%		10.4%	18.2%	18.2%	13.0%	6.5%	7.8%
Liquid Gas		11.1%	6.7%	4.4%	6.7%	6.7%	22.2%	17.8%	20.0%	4.4%	
Chemical		6.8%	4.5%	6.8%	6.8%	4.5%	22.7%	18.2%	18.2%	9.1%	2.3%
Paper Products		18.6%	2.3%	7.0%	2.3%	7.0%	25.6%	18.6%	16.3%	2.3%	
Dry Bulk		17.1%		17.1%	5.7%	14.3%	17.1%	8.6%	11.4%	5.7%	2.9%
Size	Small	47.9%	20.8%	20.8%	4.2%		4.2%	2.1%			
	Medium	1.9%		3.8%	13.2%	22.6%	47.2%	5.7%	1.9%	1.9%	1.9%
	Large					2.2%	15.6%	35.6%	24.4%	11.1%	11.1%
Total		16.4%	6.8%	8.2%	6.2%	8.9%	23.3%	13.7%	8.2%	4.1%	4.1%

Responses (#): Gen. Frt,77; Liq. Gas,45; Chem, 44; Paper, 43; Dry Blk,35; Small,48; Med,53; Lrg,45; Tot Size, 146

Row %

		Q(47) On average, how many years does your company operate a new power unit before replacing it					
		3 years or less	4 years	5 years	6 years	7 years	8 or more years
General Freight		7.8%	22.1%	28.6%	7.8%	9.1%	24.7%
Liquid Gas		6.7%	20.0%	24.4%	8.9%	11.1%	28.9%
Chemical		2.3%	20.5%	31.8%	6.8%	11.4%	27.3%
Paper Products		4.7%	20.9%	30.2%	16.3%	9.3%	18.6%
Dry Bulk		2.9%	20.6%	32.4%	14.7%	8.8%	20.6%
Size	Small	14.9%	19.1%	31.9%	6.4%	4.3%	23.4%
	Medium	3.8%	21.2%	23.1%	15.4%	9.6%	26.9%
	Large	2.2%	19.6%	30.4%	8.7%	13.0%	26.1%
Total		6.9%	20.0%	28.3%	10.3%	9.0%	25.5%

Responses (#): Gen. Frt,77; Liq. Gas,45; Chem, 44; Paper, 43; Dry Blk,34; Small,47; Med,52; Lrg,46; Tot Size, 145

Questions 42 – 53 (cont.) Question 49 is about how many miles company’s power units travel between Schedules Maintenance inspections.

Row %

		48) Which of the following ranges best describes the total vehicle miles that your company's fleet travels in a year				
		10 million miles or less	More than 10 million, but less than 50 million miles	More than 50 million, but less than 100 million miles	More than 100 million, but less than 150 million miles	More than 150 million miles
General Freight		56.6%	31.6%	3.9%	5.3%	2.6%
Liquid Gas		57.8%	37.8%	2.2%	2.2%	
Chemical		62.8%	32.6%		2.3%	2.3%
Paper Products		69.0%	28.6%		2.4%	
Dry Bulk		67.6%	26.5%		2.9%	2.9%
Size	Small	100.0%				
	Medium	81.5%	11.1%	3.7%	3.7%	
	Large	28.9%	55.6%	4.4%	6.7%	4.4%
Total		71.4%	21.1%	2.7%	3.4%	1.4%

Responses (#): Gen. Frt,76; Liq. Gas,45; Chem, 43; Paper, 42; Dry Blk,34; Small,48; Med,54; Lrg,45; Tot Size, 147

Row %

		Q(49a) Schedule A			
		Less than 10,000 miles	10,001-20,000	20,001-30,000	30,001-40,000
General Freight		47.9%	40.8%	9.9%	1.4%
Liquid Gas		51.2%	39.5%	9.3%	
Chemical		53.7%	41.5%	4.9%	
Paper Products		51.3%	38.5%	10.3%	
Dry Bulk		45.2%	41.9%	12.9%	
Size	Small	69.8%	25.6%	4.7%	
	Medium	51.1%	42.6%	6.4%	
	Large	41.9%	44.2%	11.6%	2.3%
Total		54.1%	37.6%	7.5%	.8%

Responses (#): Gen. Frt,71; Liq. Gas,43; Chem, 41; Paper, 39; Dry Blk,31; Small,43; Med,47; Lrg,43; Tot Size, 133

Row %

		Q(49b) Schedule B					
		Less than 10,000 miles	10,001-20,000	20,001-30,000	30,001-40,000	40,001-50,000	50,001 or more
General Freight		12.5%	48.4%	29.7%	1.6%		7.8%
Liquid Gas		14.6%	46.3%	31.7%	2.4%	2.4%	2.4%
Chemical		13.5%	43.2%	37.8%	2.7%	2.7%	
Paper Products		20.0%	40.0%	25.7%	2.9%	2.9%	8.6%
Dry Bulk		23.3%	30.0%	26.7%	3.3%	10.0%	6.7%
Size	Small	32.4%	38.2%	23.5%		2.9%	2.9%
	Medium	15.6%	44.4%	24.4%	8.9%	4.4%	2.2%
	Large	14.3%	40.5%	31.0%	4.8%	2.4%	7.1%
Total		19.8%	41.3%	26.4%	5.0%	3.3%	4.1%

Responses (#): Gen. Frt,64; Liq. Gas,41; Chem, 37; Paper, 35; Dry Blk,30; Small,34; Med,45; Lrg,42; Tot Size, 121

Questions 42 – 53 (cont.) Question 50 is about how many miles company’s new power units travel before needing an a) in-frame engine overhaul and b) in-frame train overhaul.

Row %

		Q(49c) Schedule C					
		Less than 10,000 miles	10,001-20,000	20,001-30,000	30,001-40,000	40,001-50,000	50,001 or more
General Freight		17.6%	17.6%	19.6%	3.9%	15.7%	25.5%
Liquid Gas		15.2%	15.2%	12.1%	9.1%	18.2%	30.3%
Chemical		16.7%	6.7%	13.3%	6.7%	23.3%	33.3%
Paper Products		29.6%	11.1%	11.1%		11.1%	37.0%
Dry Bulk		32.0%	4.0%		4.0%	16.0%	44.0%
Size	Small	29.0%	22.6%	9.7%	6.5%	12.9%	19.4%
	Medium	17.1%	17.1%	11.4%	11.4%	8.6%	34.3%
	Large	20.0%	6.7%	16.7%	3.3%	13.3%	40.0%
Total		21.9%	15.6%	12.5%	7.3%	11.5%	31.3%

Responses (#): Gen. Frt,51 ; Liq. Gas,33 ; Chem, 30 ; Paper, 27 ; Dry Blk,25 ; Small,31 ; Med,35 ; Lrg,30 ; Tot Size, 96

Row %

		Q(50a) In-frame engine overhaul					
		Less than 300,000 miles	300,001-400,000	400,001-500,000	500,001-600,000	600,001-700,000	700,001 or more
General Freight		2.9%	7.2%	14.5%	13.0%	13.0%	49.3%
Liquid Gas		4.9%	7.3%	26.8%	12.2%	17.1%	31.7%
Chemical		5.3%	7.9%	15.8%	13.2%	13.2%	44.7%
Paper Products		5.6%	8.3%	13.9%	19.4%	8.3%	44.4%
Dry Bulk		7.1%		14.3%	10.7%	17.9%	50.0%
Size	Small	22.0%	12.2%	19.5%	7.3%	14.6%	24.4%
	Medium	2.1%	6.4%	23.4%	21.3%	12.8%	34.0%
	Large	2.5%		7.5%	10.0%	12.5%	67.5%
Total		8.6%	6.3%	17.2%	13.3%	13.3%	41.4%

Responses (#): Gen. Frt,69 ; Liq. Gas,41 ; Chem, 38 ; Paper, 36 ; Dry Blk,28 ; Small,41 ; Med,47 ; Lrg,40 ; Tot Size, 128

Row %

		Q(50b) In-frame drive train overhaul					
		Less than 300,000 miles	300,001-400,000	400,001-500,000	500,001-600,000	600,001-700,000	700,001 or more
General Freight		1.6%	3.1%	7.8%	9.4%	14.1%	64.1%
Liquid Gas		8.3%	8.3%	13.9%	13.9%	16.7%	38.9%
Chemical		9.1%	9.1%	3.0%	12.1%	12.1%	54.5%
Paper Products		3.1%	9.4%	6.3%	12.5%	6.3%	62.5%
Dry Bulk		11.1%		18.5%		11.1%	59.3%
Size	Small	15.2%	9.1%	15.2%	12.1%	9.1%	39.4%
	Medium	4.4%	2.2%	20.0%	17.8%	8.9%	46.7%
	Large	2.7%	5.4%			13.5%	78.4%
Total		7.0%	5.2%	12.2%	10.4%	10.4%	54.8%

Responses (#): Gen. Frt,64 ; Liq. Gas,36 ; Chem, 33 ; Paper, 32 ; Dry Blk,27 ; Small,33 ; Med,45 ; Lrg,37 ; Tot Size, 115

Question 51 is about how many miles company's new power units travel before needing an a) out-of-chassis engine overhaul and b) out-of-chassis drive train overhaul.

Row %

		Q(51a) Out-of-chassis engine overhaul				
		Less than 500,000 miles	500,001-600,000	600,001-700,000	700,001-800,000	800,001 or more miles
General Freight		5.2%	8.6%	1.7%	13.8%	70.7%
Liquid Gas		8.8%	5.9%	5.9%	20.6%	58.8%
Chemical		3.1%	6.3%	6.3%	15.6%	68.8%
Paper Products		7.4%	11.1%		11.1%	70.4%
Dry Bulk		5.6%	5.6%		11.1%	77.8%
Size	Small	23.3%	6.7%	3.3%	6.7%	60.0%
	Medium	11.1%	8.3%	2.8%	25.0%	52.8%
	Large	2.9%	5.9%	2.9%	8.8%	79.4%
Total		12.0%	7.0%	3.0%	14.0%	64.0%

Responses (#): Gen. Frt,58; Liq. Gas,34; Chem, 32; Paper, 27; Dry Blk,18; Small,30; Med,36; Lrg,34; Tot Size, 100

Row %

		Q(51b) Out-of-chassis drive train overhaul				
		Less than 500,000 miles	500,001-600,000	600,001-700,000	700,001-800,000	800,001 or more miles
General Freight		3.6%	5.5%	7.3%	12.7%	70.9%
Liquid Gas		13.3%	3.3%	3.3%	26.7%	53.3%
Chemical		7.1%	3.6%	3.6%	21.4%	64.3%
Paper Products		4.2%	8.3%	4.2%	20.8%	62.5%
Dry Bulk		5.6%	11.1%		11.1%	72.2%
Size	Small	12.5%	8.3%	8.3%	12.5%	58.3%
	Medium	17.1%	5.7%	2.9%	28.6%	45.7%
	Large	3.0%	3.0%	6.1%	12.1%	75.8%
Total		10.9%	5.4%	5.4%	18.5%	59.8%

Responses (#): Gen. Frt,55; Liq. Gas,30; Chem, 28; Paper, 24; Dry Blk,18; Small,24; Med,35; Lrg,33; Tot Size, 92

Row %

		Q(52a) Inspection of trailer general			
		Less than 10,000 miles	10,001-20,000	20,001-30,000	30,001-40,000
General Freight		63.2%	17.6%	16.2%	2.9%
Liquid Gas		65.9%	20.5%	13.6%	
Chemical		58.5%	17.1%	19.5%	4.9%
Paper Products		65.7%	14.3%	17.1%	2.9%
Dry Bulk		50.0%	30.0%	10.0%	10.0%
Size	Small	75.0%	19.4%	5.6%	
	Medium	70.2%	21.3%	4.3%	4.3%
	Large	52.4%	21.4%	21.4%	4.8%
Total		65.6%	20.8%	10.4%	3.2%

Responses (#): Gen. Frt,68; Liq. Gas,44; Chem, 41; Paper, 35; Dry Blk,30; Small,36; Med,47; Lrg,42; Tot Size, 125

Question 52 is about the number of miles between inspections and servicing for company trailers. Question 53 is about general maintenance questions.

Row %

		Q(52b) Routine service of trailer brake system					
		Less than 10,000 miles	10,001-20,000	20,001-30,000	30,001-40,000	40,001-50,000	50,001 or more
General Freight		47.7%	18.5%	13.8%	7.7%	6.2%	6.2%
Liquid Gas		58.1%	23.3%	9.3%	2.3%	4.7%	2.3%
Chemical		48.7%	25.6%	10.3%	7.7%	5.1%	2.6%
Paper Products		58.8%	14.7%	11.8%	5.9%	5.9%	2.9%
Dry Bulk		41.4%	24.1%	10.3%	13.8%	10.3%	
Size	Small	58.3%	22.2%	5.6%	8.3%	5.6%	
	Medium	60.9%	21.7%	4.3%	4.3%	2.2%	6.5%
	Large	40.0%	22.5%	20.0%	5.0%	5.0%	7.5%
Total		53.3%	22.1%	9.8%	5.7%	4.1%	4.9%

Responses (#): Gen. Frt,65 ; Liq. Gas,43 ; Chem, 39 ; Paper, 34 ; Dry Blk,29 ; Small,36 ; Med,46 ; Lrg,40 ; Tot Size, 122

Row %

		Q(53a) Cost is no issue when it comes to keeping our vehicles defect-free						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		2.7%	5.4%	1.4%	2.7%	12.2%	35.1%	40.5%
Liquid Gas		2.2%	2.2%	4.4%	2.2%	15.6%	46.7%	26.7%
Chemical			2.3%	2.3%	2.3%	16.3%	46.5%	30.2%
Paper Products		2.4%			4.9%	29.3%	29.3%	34.1%
Dry Bulk			3.0%		3.0%	15.2%	48.5%	30.3%
Size	Small		4.8%	4.8%	4.8%	19.0%	26.2%	40.5%
	Medium		3.8%	1.9%	1.9%	7.5%	43.4%	41.5%
	Large	4.4%	2.2%	2.2%	4.4%	13.3%	35.6%	37.8%
Total		1.4%	3.6%	2.9%	3.6%	12.9%	35.7%	40.0%

Responses (#): Gen. Frt,74 ; Liq. Gas,45 ; Chem, 43 ; Paper, 41 ; Dry Blk,33 ; Small,42 ; Med,53 ; Lrg,45 ; Tot Size, 140

Row %

		Q(53b) Deploying a defect-free fleet is the most important thing we do to ensure highway safety					
		Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		2.7%	1.4%	4.1%	12.2%	31.1%	48.6%
Liquid Gas		2.2%	4.4%	2.2%	8.9%	31.1%	51.1%
Chemical			2.3%	4.7%	11.6%	27.9%	53.5%
Paper Products		4.9%		4.9%	14.6%	22.0%	53.7%
Dry Bulk		3.0%		3.0%	9.1%	30.3%	54.5%
Size	Small	2.4%	2.4%	7.1%	16.7%	28.6%	42.9%
	Medium	3.8%	1.9%	1.9%	7.7%	28.8%	55.8%
	Large	2.2%	2.2%	4.4%	8.9%	33.3%	48.9%
Total		2.9%	2.2%	4.3%	10.8%	30.2%	49.6%

Responses (#): Gen. Frt,74 ; Liq. Gas,45 ; Chem, 43 ; Paper, 41 ; Dry Blk,33 ; Small,42 ; Med,52 ; Lrg,45 ; Tot Size, 139

Question 53 (cont.)

Row %

		Q(53c) Our vehicles rarely need unscheduled repairs						
		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
General Freight		1.4%	9.5%	6.8%	4.1%	17.6%	45.9%	14.9%
Liquid Gas		2.2%	13.3%	13.3%	2.2%	17.8%	40.0%	11.1%
Chemical		2.3%	18.6%	9.3%		18.6%	39.5%	11.6%
Paper Products			19.5%	2.4%	4.9%	24.4%	34.1%	14.6%
Dry Bulk		3.0%	12.1%	9.1%	3.0%	15.2%	42.4%	15.2%
Size	Small		7.1%	9.5%	7.1%	16.7%	40.5%	19.0%
	Medium	3.8%	7.5%	9.4%	3.8%	22.6%	41.5%	11.3%
	Large	2.2%	13.3%	4.4%	2.2%	15.6%	51.1%	11.1%
Total		2.1%	9.3%	7.9%	4.3%	18.6%	44.3%	13.6%

Responses (#): Gen. Frt,74; Liq. Gas,45; Chem, 43; Paper, 41; Dry Blk,33; Small,42; Med,53; Lrg,45; Tot Size, 140