Author: **Dahunsi, Atinuke, A.**
Title: ***An Analysis of Company XYZ's Fleet Losses and Risk Control Practices.***
The accompanying research report is submitted to the **University of Wisconsin-Stout**,

Graduate School in partial completion of the requirements for the

Graduate Degree/ Major: M.S. Risk Control

Research Advisor: Dr. Brian Finder, CIH

Submission Term/Year: Spring, 2014

Number of Pages: 119

Style Manual Used: American Psychological Association, 6th edition

☒ **I understand that this research report must be officially approved by the Graduate School and that an electronic copy of the approved version will be made available through the University Library website**
☒ **I attest that the research report is my original work (that any copyrightable materials have been used with the permission of the original authors), and as such, it is automatically protected by the laws, rules, and regulations of the U.S. Copyright Office.**
☒ **My research advisor has approved the content and quality of this paper.**

STUDENT:

NAME Atinuke Dahunsi **DATE: 3-18-14**

ADVISOR: (Committee Chair if MS Plan A or EdS Thesis or Field Project/Problem):

NAME [redacted] **DATE: 3-18-14**

This section for MS Plan A Thesis or EdS Thesis/Field Project papers only

Committee members (other than your advisor who is listed in the section above)

1. **CMTE MEMBER'S NAME: DATE:**

This section to be completed by the Graduate School
This final research report has been approved by the Graduate School.

Director, Office of Graduate Studies: **DATE:**

Dahunsi, Atinuke, A. ***An Analysis of Company XYZ's Fleet Losses and Risk Control Practices.***

Abstract

The purpose of this study was to evaluate the fleet losses as well as risk control practices that Company XYZ utilizes. A data analysis was performed on loss summary reports for calendar years 2011, 2012 and 2013. A gap analysis was also performed on Company XYZ's policies/ procedures as it relates to the development of appropriate preventive measures commensurate to what the literature review indicated to be industry best practices. The study indicated that the highest number of crashes were recorded during the months of May, June, July. Rear-end accidents were identified as the most common type of crash and represent more than half of the total accidents recorded. Company XYZ's fleet policy touched on meeting necessary regulatory requirements to maintain the organization's fleet vehicle operation. However, key compliance with identified industry best practices was not adequately applied. For example accident reviews and analysis are not carried out in Company XYZ which is contrary to the fleet industry best practice. The conclusions of this study indicate that the implementation of a comprehensive fleet vehicle operating policy which aligns with industry best practices as indicated the literature review likely to assist with reducing the occurrence of accidents for Company XYZ.

Acknowledgments

I thank God Almighty for the strength and courage throughout the duration of this program at the University of Wisconsin Stout. I thank all the risk control staff, Dr. Elbert Sorrell, Dr. Brian Finder, Dr. Bryan Beamer and Mrs. Mary Volk. I appreciate their assistance. I particularly want to express my gratitude to my thesis advisor, Dr. Brian Finder, who gave necessary advice that I needed to successfully complete my research project for my master's degree.

I acknowledge my late dad, Mr. Sunday Dahunsi whose memory is a great source of inspiration, "Rest in peace Daddy". My special thanks to my mum, Grace Dahunsi and brother, Ajibade Dahunsi. I sincerely appreciate your prayers, love and encouraging words of success. I love you both and I say, "Thank you".

My sincere appreciation goes to Dr. and Mrs. Abel Adekola for their full support, love and care during my stay.

I acknowledge Olawale Aluko, The Akinkunmi's, Ayo Dahunsi, The Bankole's, Mary Aderinto, Ronke Gbadebo , Olamide Awosanya ,Lara Lawani, Vera Ighodalo, MacAndrew & Carla Edekor, Joana Esenam Setutsinam , Moses Amoka, Yetunde Oluwatuyi , and many others I cannot remember for their various supports.

Finally I appreciate the multicultural office, graduate school, my classmates and everyone who made my stay in the University of Wisconsin-Stout a memorable one.

Table of Contents

List of Tables

Chapter I: Introduction

The need to transport products and services from one place to another is a fundamental part of numerous industries. Businesses which function in this capacity usually operate fleet vehicles to aid production, promote growth and ease the transportation of products and delivery of services. However, in recent times, a considerably high rate of crashes is occurring among fleet vehicle drivers. An average of 20% of fleet vehicles are involved in accidents each year (Donlen Corporation, 2012). This probably explains why transportation incidents are a major cause of occupational fatalities. In the United States, between the years 2003 and 2008, a total of 8,173 occupational highway transportation fatalities caused an estimated death rate of 0.9 individuals per 100,000 workers (Center for Disease and Control Prevention [CDC], 2011). Transportation crash incidence accounted for more than two out of every five vehicle-related fatalities. In 2012, roadway incidents involving motor vehicles caused approximately 1,044 fatalities out of an estimated 1,789 transportation-related fatal injuries (U.S Department of Labor, Bureau of Labor Statistics [BLS], 2012). A statistic that every U.S employer should find alarming is that someone is injured every 10 seconds in a motor crash and every 12 minutes a person dies (U. S. Department of Labor, Occupational Health and Safety Administration [OSHA]). This indicates that while a traffic crash is being cleaned up, several other vehicular accidents are likely to be occurring at other locations. In addition to the frequency of occurrence, fleet vehicle crashes create costly worker injury claims which may average over $21,000 per incident.

Company XYZ was formed in 1926 as a small insulation contracting division of a mechanical company. By 1964, the organization extended its operations throughout the Midwest region with an increase in revenue of approximately $30 million. In 1980, Company XYZ

launched an initiative to branch into other construction-related industries such as structural steel design, roofing and waterproofing, design and installation of piping systems, metal fabrication for building and structures, garage door installation, scaffold rentals, and fire protection systems. Today Company XYZ owns over 40 small to medium-sized construction companies, with approximately 9,000 active employees in over 100 branch offices located throughout the United States. The nature of Company XYZ's business requires the movement of skilled employees and equipment from one location to another in order to deliver service at various client sites.

Company XYZ operates a fleet of approximately 3,000 vehicles and the corresponding employees typically perform task functions in a certain area of specialization in addition to the critical task of operating a motor vehicle. It is however possible that employee's area of specialization is accorded a higher priority during recruitment, which may be contributing to the continuous increase in the number of motor vehicle accidents (MVA) at Company XYZ.

Between 2012 and 2013, a total of 68 MVAs were recorded by Company XYZ, of which 50 were due to a driver's negligence. It appears that majority of the incidents were rear-end accidents, while a minority were vehicle operators who failed to obey traffic lights. These continuous occurrence of MVA's at Company XYZ signifies that the current fleet-safety programs which have been established to prevent or reduce accident based incidence is not entirely effective and thereby places the company at risk of experiencing continued loss.

Purpose of the Study

The purpose of this study is to evaluate the fleet losses as well as risk control practices that Company XYZ is currently utilizing.

Goals of the Study

- Analyze past motor vehicle crashes to determine the major causal factors which contributed to the occurrence of such losses.
- Analyze Company XYZ's current fleet risk control policies and activities in relation to identified industry best practices.

Background and Significance

Considering the significant increase in the number Company XYZ motor-vehicle crashes (MVC) recorded between 2011and 2013 there is a need to evaluate company's fleet- vehicle operation. The company strictly enforces its fleet policies and senior management as well as employees participate in the established safety programs. Still, the number of crashes continue to increase on a yearly basis. By mid-year 2013, Company XYZ experienced the exact number of accidents which were recorded in the entire 12 calendar months of 2012.

Company XYZ uses a motor vehicle record (MVR) evaluation system as a basis for evaluating driving performance. A MVR is a report which indicates driving history, driver license information, violations, convictions and the individual's license status (LexisNexis, 2013). A MVR review is conducted on prospective applicants as well as during annual reviews for existing employees. However, this approach appears to exhibit little or no impact on the prevention of motor vehicle crashes. (MVC). Asset loss as a result of MVCs may include employee injury, property damage, productivity loss and/or lost revenue and potential third-party liability claims, all of which adversely affect company image and negatively contribute to it profit margin. This research intends to achieve results that will provide guidance for preventing asset losses, thereby contributing to Company XYZ's profits.

The possible consequences of fleet vehicle accidents include a driver fatality, property damage, loss in productivity and /or lost revenue and potential third-party liability claims from at-fault crashes (OSHA, 2005). Company XYZ loses thousands of dollars on property repair /replacement, injury treatment and liability-based settlements. Payments of loss which are less than a specific amount are paid through company's reserves which could be used for other purposes that are beneficial to the growth of the company.

MVA losses might appear simple to control, but a company's negative reputation as a result of such adverse events is probably more difficult to curb. Reputation is as an organizational asset which cannot be controlled (Medeiros, 2011). A company's reputation serves as an advertisement that attracts multiple stakeholders. Organizations with positive reputations appear to be attractive to clients, potential employees and current employees; this attractiveness produces extra recognition, increases revenue and selection advantages, and often persists for long periods of time (Reuber & Fischer 2008).

Limitations of the Study

The limitations of this study include:

- Management's refusal to provide sufficient data for analysis.
- There may be limited in information to determine if employees follow current policies since there is no one-on-one interview with workers.
- Insufficient information from past accident report records might prevent this study from tracing the problem to its root cause.
- The result of this study will only apply to Company XYZ.

Definition of Terms

Fleet vehicle. A group of motor vehicles owned by a company or government agency and used for business purpose (Entrepreneur, 2013).

Motor Vehicle Record (MVR). MVR is a report that indicates driving history, driver license information, violations, convictions and license status (LexisNexis, 2013).

Accident. "An unplanned or unintended event or series of event which may result in death, injury, loss of or damage to a system or service" (American National Standard Institute [ANSI], 2006, p.8).

Best practice. This is a method or technique that, through experience and research produce reliable result, and often used as benchmark (TechTarget, 2013).

Public reputation. This is a general, overall and long term impression of the public on a specific organization (Smith, R. (1948). p.30).

Third party liability. This could involve bodily injury or property damage caused to a third party as a result of wrongful act, and which injury and/or damage must be remedied (Interamerican, 2013).

Casual factors. Element that can lead to an incident or make an incident worse (Taproot, 2012).

Expertise. In-depth skill or knowledge of a particular field acquired through professional training and practical experience (Ericsson, 2000).

Fleet safety program. Procedures set in place to support safe operation and safe work behavior to prevent motor which is vehicle crash (National Safety Council [NSC], n.d.).

Rear-end accident. When a vehicle crashes into another vehicle which is situated in front of it. (Hallock, S. 2013).

Chapter II: Literature Review

The purpose of this study was to evaluate the fleet risk control practice currently utilized in Company XYZ to determine the major causal factors of vehicle crashes that contribute to significant loss of company assets. Loss due to a company's operation may imply adverse effects on an organization's profit margin. This literature review sheds light on the various activities involved in the fleet vehicle operation. It considers the implementation of both active and reactive approaches as essential steps in minimizing profit loss. This review also describes in detail the fleet transportation industry's crash statistics within the continental United States (U.S.), crash analysis and reporting, and critical measures to develop, communicate, and enforce effective fleet policy and motor fleet loss data analysis.

Fleet Transportation Crash Statistics in the United States (U.S.)

It is accepted by companies operating fleet transportation systems that work-related crashes are the leading cause of occupational fatalities in the U.S. Data collected indicates that the death rate from vehicle crashes increased from 0.99 to 1.13 per 100,000 full-time employees between 1992 and 2000. Approximately 11,952 work-related highway fatalities were recorded between 1992 and 2000 (National Institute for Highway Safety [NIOSH], 2003). The researcher acknowledges that the data utilized is fairly old, but this is being presented due to limited availability of recent data on work-related highway fatalities. Between 2003 and 2008, the Morbidity and Mortality Weekly Report (MMWR) developed by the Center for Disease Control (CDC) indicated that a total of 8,173 occupational highway transportation fatalities occurred which therefore represents 24% of all fatal occupational injuries. Recent data by the National Highway Traffic Safety Administration (NHTSA) has indicated a 3% decrease in the number of vehicle crash fatalities between 2009 and 2010 at 33,883 and 32,885 respectively. This crash

fatality decrease is notable, especially when a continuous increase has been observed in the number of licensed drivers between 2008 and 2010 from 208,321 to 210,115. An increase in the number vehicle operators places a driver at heightened risk of being involved in an accident. According to Bob Goos (2011), 90% of accidents are due to human errors which are likely to be attributed to distract driving. Other cause includes drunk driving, drowsy driving, a lack of seat belt usage etc. (Watson, 2013). These factors position an organization at a high risk of experiencing a fatal crash. The data indicates the need for transportation related associations such as public health, highway safety, labor state agencies, and highway designers to unite in an effort to strategize methods for reducing the number of highway transportation deaths in the U.S.

Over the years, numerous forms of data on work-related roadway crashes have been compiled. The trends observed from this information may provide assistance in predicting future events and also aid in the development of policies that will reduce the number of roadway accidents for both the transportation industry and the nation as a whole. The past incidence of loss is a source of information used in efforts to reduce future roadway crashes. Previous accident analyses indicate results that summarize past behavior, which may be used to forecast future action (Dowling, R., 2004). Once identified, the potential risk may either be accepted, reduced, or eliminated. An organization's response to information gathered and used in predicting future accidents is essential in identifying problem areas and taking the appropriate action, through policies and appropriate training techniques, to reduce the occurrence of future roadway mishaps.

Factors That Contribute to the Occurrence of Transportation-Related Fatalities

The Occupational Safety and Health Administration (OSHA) states that employers must provide their employees with a workplace free from recognized hazards likely to cause death or

physical harm. It should also be noted that the Occupational Health & Safety (n.d.) act asserts that employees also have the duty to cooperate with measures that an employer has developed to eliminate or reduce a risk. However, the roadway work environment presents daunting challenges to employers' and employees' risk- reduction efforts due to several factors and events. This section provides an overview of the various factors that contribute to the severity and frequency of work-related roadway crashes with a focus on preventing such loss-based incidents.

Collision type. It could be commonly regarded by the general population that the frequent roadway crashes typically involve collisions between two or more vehicles. However between 1992 and 2000, more than 49% of work-related highway fatalities were due to single-vehicle crashes into a stationary object on the side of the road. Such single-vehicle accidents resulted in 17.6% of deaths of workers on U.S highways. The predominant non-collision incident common among truck drivers is due to loss of control of the cab and trailer which is commonly referred to as a "jackknifed" vehicle, which claimed the lives of over 26.4% of employees in the truck driving profession (NIOSH, 2003). NHTSA reported that in 2010, over 5.4 million vehicle accidents occurred in the U.S. with 28% (1.54 million) of those crashes resulting in an injury and approximately 30,196 involving casualties. Collisions with fixed objects and non-collision crashes in 2010 accounted for 18% of the 5.4 million accidents, but they resulted in 45% of the 30,196 individuals who were killed in roadway crashes.

Understanding the dynamics of a vehicle crash on the human body explains the reason for the high rate of death due to collisions. Ellis (2013) found that when a vehicle travelling at a rate of 35 miles per hour (mph) collides with another vehicle or a stationary object, the human body continues to move forward at similar rate of speed. The body loses its momentum when the

restraint from a seatbelt completely absorbs the force. If no restraint is used, the internal organs will collide with other organs, bones and the skull. The occupant will then strike objects in the path of motion, which may cause the soft tissue of the brain to impact the inner part of the skull or tear as the skull fractures. Between 2003 and 2008, 31% of occupational traumatic brain injury deaths were attributed to a motor vehicle crash in the U.S. (Tiesman, Konda & Bell, 2011). The impact of a crash is extremely harmful to the human anatomy. In a limited number of instances, the effect of a collision on the human body is fairly high at extremely low speeds when compared to the effect on the vehicle. A vehicle collision at 20 mph may cause little motor-vehicle damage. However such speed poses significant impact on the human body (Ellis, 2013). Frequent types of collisions that contribute to highway fatalities include the following:

- A rear-end collision, with a vehicle striking the back end of another, is a common type of accident (Sciencedaily, 2008), and the frequency of such may be attributed to a driver's engagement in distractive activities, following too closely behind another vehicle, and/or driving at a high rate speed (Eby & Kostyniuk, 2003). According to the NHTSA (as cited in National Safety Commission, 2013), of the 6 million crashes that occur yearly in the U.S., over 40% are rear-end collisions. In various cases, minimal speeds as low as 8 mph may cause serious body injury. Therefore, it important to maintain considerable driving distance between vehicles. Maintaining control of the vehicle is an ideal method to prevent a rear-end collision. This may be achieved by a gradual close-in when approaching another vehicle, maintaining a four-second following time, and ensuring visual view of the rear tires touching the road when behind a vehicle (Mottola, 2012).
- A side impact collision is the second common crash (Martinson & Beason, 2013). This occurs as a result of an inappropriate roadway lane change and/or a violation of stop sign

and/or traffic light rules which results in one vehicle striking the side of another. The impact causes the head of an occupant to strike the window. The resulting injuries occur due to the fact that the head, neck, and upper back region are not firmly cushioned against the headrest during crash (Ellis, 2013). Proper intersection design may be effective in preventing side impact collisions, and injury reduction measures may be achieved through side door padding and airbags, improved seat belt system, and improved side glazing (Fildes, Lane, Lenard, & Vulcan 1994).

- Head-on collisions are common in rural areas (NHTSA, 2005) and occur when vehicles which are travelling in the opposite direction collide. This type of high force impact typically leads to serious injuries or even death. The force from colliding vehicles at 20 mph or even lower may result in significant injuries on the human body (Ellis, 2013). The size of the vehicles involved in the crash is also a determinant of the severity of the injury. In 2003, Albright (2003) found that head-on collisions constitute 2% of all crashes in the U.S.; however, they represent 10% of all fatal crashes. In 2010, head-on crashes claimed 2,848 lives and left 66,000 injured (NHTSA, 2010). To prevent head-on collision the following may be considered:
    - Drivers should observe next hill, curve or overpass in order to be aware of the surrounding and other vehicles.
    - Vehicle operator should drive slightly to the right of the center of his/her lane on a two lane road in order to be spotted earlier by oncoming vehicle or closer to the right for an “escape route’.

  Drivers should obey the speed limit as it, it provides sufficient time to react to potential accidents (HometownSource, 2012).

Time of the collision. A high number of work-related crashes in the U.S. was observed to occur during a specific time of day. Considering the years from 1992 through 2000, 51% to 58% of all vehicle collision fatalities were recorded within the 8:00 a.m. and 4:00 p.m. hours ranged from (National Institute for Occupational Safety and Health, 2003). Recent data indicated that in 2010, between 6:00 a.m. and 6:00 p.m., 10,525 fatalities and 841,000 injuries occurred in crashes from early Monday morning to Friday evening (NHTSA, 2010).

The role of specific employees combined with the time of day that they are performing employment duties is a factor with regard to the number of traffic accidents that the applicable company would sustain. Driving responsibilities, which are common with sales, repair-calls, and functions relative to the delivery of services to a client's site places these workers are at a higher risk of being involved in a vehicle crash, especially if their duties involve movement from one place to another during standard daytime work hours (8:00 a.m. to 5:00 p.m.). Lauren Fletcher's (2010) research indicates that, for employee drivers who deliver service to a client's site, the majority of accidents occur between the 2:00 p.m. and 4:00 p.m. time frame, while for sales drivers, a significant number of crashes occur between the hours of 12:00 pm and 2:00 p.m. A trend observed on the Fatality Analysis Reporting System (FARS) indicated that during the calendar year 2008 and 2011, the highest number of recorded fatal crashes occurred between the 3:00 p.m. and 6:00 p.m. time frame. This may be attributed to the rush-hour period when the majority of people leave work to their home. Traffic accidents often occur when significant numbers of people are on the road. It should be noted that in the early 1990s, a larger number fatal crashes occurred between the hours of 10:00 p.m. and 2:00 a.m. The change in the traffic crash occurrence may be attributed to adequate implementation of new fleet vehicle laws,

enforced usage of seat belts, and/or an overall awareness of the dangers of drinking and driving (Minnesota Motor Vehicle Crash Fact, 2010).

Age. Studies indicate that age is a factor which is related to the occurrence of transportation work-related fatalities. Research indicates that between 2003 through 2010, workers aged 65 and older experienced the highest rate of occupational highway transportation deaths (CDC, 2013), and in general, older crash victims are more likely to be involved in collisions between vehicles. This may be a result of an elderly individual's more frail body condition as well as reduced mental alertness for immediate preventive action to avoid a crash (NIOSH, 2003).

A considerably large number of work-related highway fatalities involved workers aged 35 to 44, during the years between 1992 and 2000 (NIOSH, 2003). In 2010, driver fatalities for this age group were at 7,313, while 503,000 injuries were recorded (NHTSA, 2010). Also, workers in this group are usually more experienced or are in the first five years of being employee drivers (Fletcher, 2010). Due to employee's eagerness to perform well, drivers over-schedule and rush their task in order to please management. This may be the cause of vehicle crashes involving 60% of vehicle operators during the first five years on the position. Another issue with this age group may be that experienced drivers are regarded as being professional; therefore, employers may not organize training sessions for such individuals. It is recommended that refresher programs be implemented in every vehicle-operating organization for all employees, regardless of the age group or experience (OSHA, 2005).

Employee age groups between 18 to 25 and 20 to 25 recorded the lowest number of work-related highway fatalities at 326 and 873 respectively between the years 1992 and 2000 (NIOSH, 2003). However, road crashes are the second highest cause of death for 15 to 29 year-

olds worldwide (World Health Organization [WHO], 2002). From this information, it appears that a significant number of workers in this age group lack sufficient experience and possess less ability to analyze potential risks than older drivers. Other studies on this age group have indicated that the cause of a vehicle crash may be due to underdevelopment of a part of brain which allows critical scrutiny of an event before an evasive action is carried out (Organization for Economic Co-operation and Development [OECD], 2006). The extent of work-related highway fatalities within this age group appear surprising considering the nature of younger individuals; however, it is a positive statistic, and further research may lead to the implementation of programs that will further reduce youth fatalities in non-work related traffic accidents. However, in 2010, data indicated that employees between the ages of 16 to 20 and 21 to 24 recorded 4,487 and 4,585 fatalities while the number of injuries were at 353,000 and 331,000 respectively (NHTSA, 2010) . This implies that employees within this age group must be adequately trained.

Gender. Over the years, it appears that women experience lower occupational fatalities and non-fatal injuries across every industry. Despite the fact that women constitute the majority of the workforce in the U.S at 47% while 11.6% are searching for work opportunity, the percentage of work-related accidents still remains significantly low in comparison to men. In 2003, of the 5,575 fatal occupational injuries recorded in the United, 446 involved women while 5,129 involved men. Predominant among incidents that claimed the lives of women were highway vehicle accidents (Hoskins, 2005). Thus, work-related accidents are a long-standing issue that cut across both genders and thus claim the lives of thousands of American workers. A study conducted by NIOSH (2003) indicated that between 1992 and 2000, male work-related fatalities totaled 10,714. Recent data indicates that between 2003 and 2008, highway work-

related crashes involved 10,516 males while 471 were recorded for females (CDC, 2013). The NIOSH research concluded that the continuing increase in the number of vehicle crashes among men may be attributed to the aggressive and higher risk taking nature of their driving (2013). The apparent lack of aggression in women may be due to lower levels of the hormone testosterone, which is associated with aggressiveness in men who possess at least 10 times more than women (Emrich, 2010). Men, in general, exhibit a tendency to overestimate their personal driving skills, which increases the risk of a vehicle crash. (Streff, Kostyniuk, Molnar & Hopp, 1995). Such being the case, employers may consider hiring women as drivers because this gender is adapt at following vehicle operating procedures and communicating effectively with clients (Voie, 2013).

Industry. The length of time that a worker spends on the road determines his/her level of exposure to a work-related crash, although such an exposure may vary across different industries. A transportation company that operates a fleet of vehicles and industries involving sales and delivery of services to client sites by employees are at higher risk to occupational vehicle crash injuries as compared to employees who handle work functions within the premises of the facility. Between 1992 and 2000, the industry divisions with the highest number of fatalities due to work-related crashes included communications, transportation, and public utilities at 3,893 out of 11,952 highway casualties. The construction industry also recorded 1,244 work-related highway fatalities during this time period. Industries such as manufacturing, agriculture, real estate, and mining recorded significantly lower fatalities rate at 987, 860, 240, 208 respectively (NIOSH, 2003). The construction sector is classified as one of the higher-risk industries in the U.S. due to the excessive number of occupational fatalities which are experienced on both the highways and construction sites. The Occupational Safety and Health Administration (OSHA) reported that in 2011, 738 out of 4,188 private industry worker fatalities

occurred in the construction sector. It should be noted that the extent of private industry construction fatalities increased to increase to 775 between the year 2011 and 2012. Roadway incidents involving private construction industry vehicles caused 216 fatalities in 2011, which was the second top cause of construction related employee-based loss (Bureau of Labor Statistics [BLS], 2012). This information requires a need for urgent implementation of an effective motor vehicle safety program that will reduce employee driver's exposure to a variety of highway risks.

The Cost of Crashes

A standard workplace for fleet organizations' employees includes the highways and vehicles that are used to deliver products and services to a client's site. If an employee is injured in a company or personal vehicle while performing an assigned task, the organization is responsible from a workers' compensation liability standpoint (Vermont, Department of Labor, n.d.). Employers typically pay for injuries that employees suffer on the job and they may also pay for the harm caused to non-employees involved in a crash with a vehicle from an employer's business (Zaloshnja & Miller, 2005). According to OSHA (n.d.), motor vehicle crashes cost company owners roughly $60 billion annually in medical care, legal expenses, property damage and lost productivity. An average amount an employer pays for a crash is $16,500 and may exceed $500,000 when a fatality is involved. This data indicates the potential losses which are associated with operating a fleet organization are extremely high. From a cost minimization standpoint in the event of a crash, few organizations prefer an employee to perform company business in a personal vehicle (NHTSA, n.d.). However, in the article, *The Economic Burden of Traffic Crash on Employers (2000)* it was pointed out that in the event of a crash, an employer is responsible for healthcare cost, fringe and non-fringe benefits, and lost wages if the accident occurred while the employee was performing work duties for the employer, regardless of vehicle

ownership. Employers are positioned to pay significant amount on fleet-base loss, which in essence could be used for other purpose to improve organization's procedures. In calendar year 2000, it was estimated that injuries as a result of a vehicle crashes to on-duty employees and crash victims cost employers $41.5 billion. It also required them to pay almost $18.4 billion in insurance premiums. Health care often time costs roughly $7.7 billion, and approximately $8.6 billion is paid for sick leave and life as well as disability insurance claims for accident victims (Miller & Zaloshnja, 2003).

The costs of on-the-job vehicle crashes vary depending on the industry. Industries such as agriculture, forestry, land transportation, mining, and construction pay the highest cost per employee involved in vehicle crash. These industries have an extremely high risk exposure to potential accidents. It is important to know that the brunt of vehicle crash is not only felt by the employer, but also society as a whole, which pays through increased insurance premiums and taxes (NHTSA, 2005).

Crash Reporting and Analysis

Research indicates that the most efficient method of generating qualitative and quantitative crash reports is through the careful collection of accurate information from an accident scene. Crash analysis and reporting is essential in maintaining the integrity of an organization and to track its progress toward achieving established goals involving accident prevention safety (Family Health International, n.d.) Qualitative information is descriptive, and therefore it provides a visible picture of crash scenarios and may be described as a true expression of human behavior and action before and after a crash (Sage, n.d.). Quantitative information is typically presented in the form of statistical data, where numerical trends of past situations may be used to predict the occurrence of future events. This implies that data may

serve as the essential lead in the anticipation, of a crash event. Qualitative and quantitative data may be represented as leading indicators which should demonstrate trends and indicate safety performance (International Council on Mining &Metals [ICMM], 2012). The use of both qualitative and quantitative reporting assists in determining the strength and weakness of an organization's fleet vehicle operation. It is a process of collation, interpretation and presentation, of the information contained in the incidence report which facilitates quality decision-making (Durosaro, 1995).

Crash reporting and analysis is an initiative to build a safe transport system and these activities would likely encourage the immediate notification of a specified authority. OSHA (n.d.) states that crash events must be reported to the employee's supervisor as soon as possible after the incident. The reason for this is that in several cases, the story that is first told is often clear and true. It is also the duty of the safety manager not to apportion blame when the incident is being reported, thus aiding in obtaining accurate details. Irrespective of the magnitude of the incident, it is imperative that the employee reports the incident to the appropriate authority within the organization. This enables management to critically analyze the crash to determine the cause and possibly prevent a reoccurrence of the incident. Regardless of the severity of an accident, a crash must be reviewed to effectively understand the root cause. Determining the root cause forms the basis of possibly eliminating future loss-based occurrences (OSHA, n.d & the American National Standards Institute [ANSI], 2012). It should be noted that crash reports may also be used by an organization in order to decide to accept or deny a claim.

Data gathering. Obtaining data at the scene of accident is critical to completing an effective crash analysis. The driver, if he/she not severely injured, is the first person who would begin this data collection process. Immediately after a crash, drivers may be anxious and a little

confused on the next course of action due to the severity of the incident. Having an appropriate procedure in place prepares a driver to gather pertinent accident data. Establishing a standardized policy that explains necessary operating procedures involved in incident reporting and analysis is essential for a fleet organization. This procedure aids in guiding employees in obtaining pertinent information needed for the eventual analysis and development of corrective measures to prevent future incidents (ANSI, 2012). Employees must pass through a step-by-step training procedure to understand what information needs to be collected and its relevance. Issuing a refresher test to drivers may also serve as an essential tool to ensure the policy is properly understood. An accident report should be obtained from the safety manager or designated person in accordance with the established standard operating procedures, which must be consistent with existing culture within the organization (ICMM, 2012). A planned system of obtaining relevant information pertaining to a fleet accident is necessary to identify accident causes and take appropriate steps to prevent a re-occurrence of similar events (Brodbeck, 1996).

Data gathering is a less complicated process when an incident reporting form is available to vehicle operators (ANSI, 2012). This form, commonly referred to as an “accident reporting kit” (see Appendix A), contains reporting forms with relevant questions sufficient to collect information needed for a proper investigation of a traffic incident. According to the Institutional Laboratory Biosafety Manual (2013), an ideal investigation will reveal factors that contributed to the occurrence of accident. The proper investigation also aids in developing preventive measures. Based on the recommendation of the National Safety Council (2013), a driver should be required to carry out the following steps after an accident:

1. Protect the scene,
2. Request emergency assistance if someone is injured,

3. Notify a company representative,
4. Collect crash information, and identify witnesses.

Drivers must also be aware to not admit to any level of fault at the scene of the accident. It is important that accident information be gathered as soon as possible. Relevant facts collected by the driver at this point include the date, day of the week, time of crash, vehicles/other property damage, drivers/injured names and contact address, witnesses at the scene, police officer's detailed description of the collision, and a detailed diagram of crash scene. (U.S Department Motor Vehicles, 2011). Waiting until emergency responders leave the scene of the crash may alter accurate information collection; therefore, such an approach, is not a viable option regarding the information gathering process. The Montana Department of Labor and Industry (n.d.) suggests that when data collection starts after the emergency response is completed, material evidence is often not at its original location, thus causing difficulty in pinpointing the initial spot of the impact as well as other pertinent crash-related information.

Crash information gathering should not stop with the driver, thus the next step in the investigation process would likely fall on a company representative. The designated person obtains the driver's initial information and checks for verification, then continues to gather more detailed information such as, vehicle condition, specific location of the crash, monitoring system, weather condition, estimated manner of event, photographs of crash scene, the driver's account of the accident, the driver's condition at the time of the crash (including the number of mile driven, activity in previous 24 hours, and trip details), and diagrams indicating various crash factors such as skid marks and debris (Brodbeck, 1996). The Texas Law Enforcement Explorer Advisement Association (n.d.) recommends that the accident sketch must indicate all details at the scene. It may also be utilized to determine the speed of the vehicles and the point of initial

contact. Recommended tools and supplies that need to be used by the company's representative for accurate information gathering include a cellular phone, global positioning system, digital camera, measuring tapes, tire pressure gauge, warning reflectors, auxiliary lighting, lumbar crayons, bright spray paint, reflective safety vest, and cold weather gear (Brodbeck, 1996). The array of crash-based information to be obtained by the company representative should be specified in the organizations established policy, and such must be sufficient to identify the root cause of an incident in order to develop preventive measures and thus avoid reoccurrence of loss producing situations.

Information research and analysis. The thorough analysis of a vehicle crash is essential to identify the causes that led to a particular accident and thus institute preventive measures to reduce or eliminate the probability of a reoccurrence (ANSI, 2012). In recent times, loss causation models have been described as a vital tool used to determine the actual cause of an accident. The models suggest that an accident occurs as a result of prior events. The premise behind a loss causation model is that a chain of reactions involving numerous processes are contributing factors to an accident. According to Erik Hollnagel (as cited in the Safety Institute of Australia, 2012), accidents may result from a combination of interacting variables or factors. Understanding those factors may assist in the prevention of accident reoccurrence. A traditional causation model postulated that a majority of accidents occur due to human error. H.W Heinrich (1931) stated that 88% of accidents are caused by unsafe acts of people, 10% occur due to unsafe conditions and 2% by an act of God. This theory therefore suggests that human factors are the cause of a considerable number of accidents. However, an alternative theory presented by Peterson (2003) implies that an unsafe condition may be as a result of a management system that

enabled the hazard to exist. For every unsafe behavior or unsafe act, there is probably a reason why people engage in such actions (Safety Institute of Australia, 2012).

A simple causation model in Figure 1 below illustrates that an accident may result from various elements which include management, environment, personnel (human factor), task, and material. An incident investigation should therefore consider each of these elements during an analysis in order to determine the root cause of an accident and develop possible measures to prevent re-occurrence of such incidents. These factors are depicted to detail below.

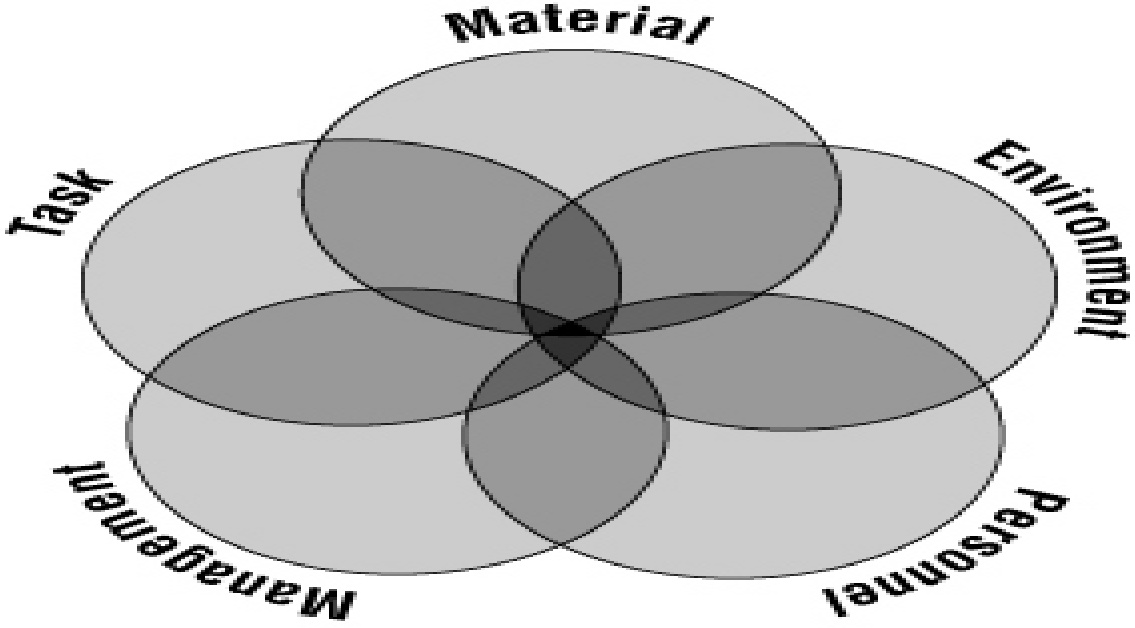


Figure 1.Simple causation model. This attempt to illustrate that the causes of any accident may be grouped into five categories management, environment, personnel (human factor), task, and material: Accident causation model by Canadian Center for Occupational Health & Safety [CCOHS], 2006. Copyright © 1997-2013 by CCOHS.

The focus on identifying the major causes of accidents through the utilization of data represented as material in Figure 1 above greatly assists in the proactive revision of

organizational policies and thus prevents future losses. Through the examination of accident information, organizations are able to identify possible malfunctions in vehicle, identify inadequate circumstances that led to an accident, and carry out necessary adjustments and repairs (CCOHS, 2006). The results obtained from reports provide critical information for an effective system analysis and procedure that may reveal other types of operational problems due to similar causes. Determining the cause and treating it immediately may be regarded as an effective permanent control (Peterson, 2003). It is advisable that since the SOP outlines the succession of activities required to carry out a procedure safely, it is ideal to compare the established standard against actual employee actions that led to the incident.

Management. This element in Figure 1 above considers management factors which could directly or indirectly cause accidents (CCOHS, 2006). Research indicated that prior to analyzing an incident report, it is important to first consider the organization's system of operation. Goetsch (2008) found that, management may contribute significantly to accident causation within a system as a result of the absence of standard procedure, poor enforcement of operating requirements, or pressure to meet deadlines. The root cause of a problem within a management system may be due to inappropriate safety policies and procedures, or inadequate methods of supervision and patterns of training. A supervisor's negligence to remove a defective ladder is an example of an inadequate safety policy to address such a defined task responsibility (Peterson, 2003). Goetsch (2008) recommends that in order for management to be adequately prepared to provide a safe and healthy work environment for its employee, it must develop a standard procedure that addresses the potential risks at hand for a likely accident and improve system operations.

Accident analysis procedure must start with management. The involvement of management and participation of employees is crucial in establishing safety standards. Management must establish a detailed policy that outlines standard operating procedures within the system (CCOHS, n.d.). It is imperative that management considers safety a function, just as every other operating procedure included in the company policy. Employees at every level must possess a specified role of accountability (Peterson, 2003). According to the American Society of Safety Engineers (ASSE) a certain amount of management failure may be due to lack of a cooperative effort between safety professionals and the corresponding supervisors. Supervisors are often the mediator between upper management and the employee; they assist employees to understand established policies and respective roles. Supervisors also play a critical role in ensuring that employees work in a safe and healthy environment because workers are the keys to promoting accident prevention. The responsibilities of a supervisor need to include:

- New employee orientation with significant reference to safety,
- Continuous training for employees,
- Employees performance monitoring,
- Enforcement of standards regulations,
- Assisting in conducting accident investigations,
- Assisting to develop accident reports,
- Maintain an up-to-date policy on safety issues (Peterson, 2003).

Safety programs are significantly effective when it becomes a joint effort between employees at every level in an organization. Any absence of cooperative efforts among workers within an organization should be analyzed in order to determine the reason for performance gaps at non-cohesive operational procedures. The first principle of safety, according to Peterson,

suggests that an unsafe act, an unsafe condition, and an accident are symptoms of an existing process deficiency within an organization's (2003). This simply suggests there are various factors as to why accidents occur, and that a critical analysis of accident may uncover management oversights which may have contributed to a loss-producing accident. Christopher Janicak (as cited in ICMM, 2012) found that integrating safety with management systems assists in identifying the root-causes of an accident, which may lie in another unit of the organization. Correcting the root cause of accidents will not only decrease the chances of reoccurrence, but also will result in more efficient organizational operation (Ferry, 1988). Therefore, it is important that the analysis trace contributory factors to determine the underlining causes of accidents in order to discover the reason why the act was committed and for what purpose the condition existed.

Human factors. It may be stated that organizational standards are established to prompt employees toward achieving set goals. However human behavior at every level of an organization may cause an accident. According to research, both organizational and human factors are the major causes of safety incidents. Identification of such factors in a company's policies will assist in managing and preventing potential harm to employees (Reason, 1995). Goetsch (2008) highlights that the capacity in which an employee functions is the product of his/her natural ability, state of mind, training, and physical condition. Overloading human capability with an exorbitant amount of responsibility may negatively impact human-behavior as a result of fatigue, stress or perceived pressure. The state in which an employee functions is also based his/her on the level of motivation. In certain workplace circumstances, an employee may find it logical to engage in performing an unsafe act. Peterson explains that this may be due to peer pressure, a boss's compulsion to meet a deadline, a mental condition, an employee with an

"it can't happen to me" attitude, and/or other reasons that suggest an unsafe behavior may be preferable (2003). Also, for unknown reasons, an individual may identify a hazard and simply decide not to take action to mitigate or eliminate the associated risk in order to prevent the incident from occurring.

Human factors such as a lack of knowledge and skill to perform assigned tasks may be due to insufficient training. Proper training may provide the knowledge and skills, but it also needs to be periodically updated to improve competency and thus reduce the possibility of human error (Reason, 1995). An accident may appear preventable to a safety expert, but the victim may not envision the degree of risk and proceed based on the misjudgment. This may be termed an inappropriate employee activity due to insufficient training (Goetsch, 2008). Therefore, it is crucial to properly train employees on safe operating procedures in an effort to avoid work-related accidents.

The safety culture within a system may also influence an employee's decision to engage in an inappropriate act. Management creates an organizational culture through its vision, core values, system of appraisal, recognition, and rewards (Peterson, 2003). Christopher Janicak (n.d.) reports that safety culture plays a significant role in determining the success of safety activity within an organization. Dominic Cooper (2002) found that an organization's safety culture is indicated by the level of management's commitment to safety and its visibility in employees' task routines. Culture defines an organization's general mode of operation and safe practices penetrate through all operational processes and activities within a company. An organization embedded with safety as a culture positively affects human factors within its system (Peterson, 2003).

Working environment. Information analysis of the workplace needs to consider external conditions such as a tight work schedule which affords an employee minimal spare time, an increase in demand for a product, and high management expectations as possible contributors to unsafe acts and the presence of high-risk conditions. One of Peterson's (2003) safety principles state that an unsafe behavior may be a result of normal people reacting to their environment. It is therefore management's responsibility to identify and subsequently change the environment that promotes the occurrence of unsafe behaviors. A positive change in the work environment may be achieved by identifying the factors that cause the unwanted behavior, controlling the identified factors, identifying management's role in creating such adverse conditions, and considering previous management decisions (Groeneweg, 2011). Goetsch (2008) found that the overall environment of the workplace is one of the main components of an organization. He explains that a great interaction exists within the workplace and the probability of an accident is determined by extent that various system components (i.e., person, machine, and environment) are adequately controlled. A change in one component of the system may result in a lack of system control and thus increase the probability of an accident. A fleet-related system provided by the Traffic Association Causation in Europe (2009) refers to a driver (person) who operates a vehicle (machine), steers the wheel, changes direction, switches gears, accelerates, declutches, applies the brakes, and observes the mirror (interaction) in an environment (weather conditions, road surface, road signs, light conditions, etc.) as major components in that organization. This signifies that an accident is a result of the failure of multiple factors in an organization, including the work environment.

Task. An organization may set standard operating procedures (SOPs), which describe safe work practices and required procedures to carry out various tasks within the system. A SOP

should clearly state the relevant tools required for each operation as well as the proper maintenance procedures which must be employed (Cooper, 2001). This means that the actual work procedures used at the time of an accident should be compared with the SOP during the crash analysis. Non-utilization of an agreed-upon SOP may be described an unsafe act on an employee's part. Another factor to consider is the physiological effect that a workplace imposes on its employees. There may be unsafe working conditions from the standpoint that the workplace design and task-routine may not align with the capability of an individual. A typical example of a challenging work-task alignment is a nearly full-termed pregnant woman performing a task routine that requires three hours of continuous standing (Goetsch, 2008). The act of gauging the strengths and weaknesses of the human condition in relation to the workplace conditions is crucial to reduce the probability of a workplace accident (Federal Aviation Administration [FAA], n.d.).

Written communications. The formal procedure for documenting loss and communicating needed preventive safety activities within the management system is through written reports. The purpose of developing an incident report from the gathered data and analysis information is to communicate findings and implement accident prevention measures. Communications are crucial for persons with authority to implement necessary changes to prevent loss-base incident from occurring in the future (ANSI, 2012). Written reports must be well-detailed and easy to interpret. Photographs and diagrams may be added for further clarity. If any discrepancy exists in any part of the report, it should be clearly stated. Conclusions and the related strategies to prevent a re-occurrence of an accident should align with recommendations to correct possible organizational policy deficiencies. (CCOHS, 2006).

The literature indicates a fundamental need for a company to examine and revise, if necessary modify it's currently procedures. This strategy is employed to identify and correct likely deficiencies in currently existing organizational practices. Taking corrective measures to reduce major safety issues will also improve an organization's conformance with established operating procedures. Corrective recommendations need to be implemented in a timely manner in an effort to effectively address factors contributing to accident rates (ANSI, 2012). All corrective recommendations should describe specific actions that an organization needs to implement in order to prevent future workplace accidents. For example, rather than suggest an increase in driver competencies to address continued cases of accidents within an organization, it is preferable to state a recommendation such as "training shall be utilized to enhance the drivers' competence" (CCOHS, 2006). All factors contributing to an accident need to be explained in full detail before suggesting any necessary corrective actions. The act of openly apportioning blame to a specific person for a given accident may limit the quality of information which obtained for the development of future crash prevention efforts. According to Kane and Cunningham (as cited in Goetsch, 2008), in order to avoid presenting an accident investigation as a fault-finding procedure, an employee should not be disciplined because of an accident; however, an employee may be chastised for nonconformance with an internal safety regulation/standard. To improve the long-term safety efforts of an organization, recommendations must be explained in a language that both management and the employees can clearly understand.

Development, Communication, and Enforcement of an Effective Fleet Policy

The purpose of establishing a vehicle fleet policy is to promote employee conformance with agreed-upon activities which are needed to ensure consistent operating practices. The success of implementing a safety policy is determined by management's commitment and active

participation in the enforcement of standard procedure. To a significant extent, the manner in which an organization functions is related to the quality of decisions which are made by the associated management. An organization with defined safety practices embedded into its culture will likely practice such activities on a daily basis just as a normal task routine. A safety culture within an organization is defined by how a management system values and perceives risk in the workplace. Commitment and devotion to safety by employees at every level within an organization indicates how effective a safety program will be (Janicak, n.d.). Management's decisions toward safety must be clearly described in the organizational policy. It creates an avenue for top-executives to communicate their desire towards enforcing safety initiatives in order to improve operating procedures.

Policy and procedures. A policy is defined as an expression of management's interest, concerns, and commitment towards achieving organizational goals and processing improvement (Peterson, 2003). An insufficient management effort to develop agreed-upon safety procedures may render a standard fleet vehicle operation less effective. Management's support and enforcement of a fleet policy implies its attitude toward safety. A policy is essentially a clear and forceful statement of management's desires and needs to be clearly communicated to employees, supervisors, and top executives (Brodbeck, 1996), in order to promote the health and well-being of the organization's employees. It also establishes the expectation that vehicle operators comply with established system policies for safety, which are applicable to federal, state, and local laws, and regulations pertaining to standard vehicle operation (ANSI, 2012). According to the International Organization for Standardization 39001 (2012) and OSHA (2005), policies should be clear, comprehensive, and easy to interpret by employees at every level. Copies of policies should be available throughout the workplace and distributed periodically as stickers,

posters, or printed desk mottos, as well as periodically discussed during organizational meetings. Effective safety policies are signed by top management and are clearly communicated throughout the organization. OSHA (n.d.) suggests that employees should also be required to sign an agreement to acknowledge the understanding of the policy and receive consequences for violating it. According to Maine Municipal Association (2005), the following are necessary elements of an ideal vehicle safety policy:

- Assign responsibilities for safety activities and/or results
- Driver selection
- Driver discipline
- Driver training
- Drug and alcohol testing
- Emergency equipment
- Vehicle inspection and maintenance
- Recordkeeping
- Accident reporting and investigation

Assigning responsibilities. A system of assigning responsibility is found to be essential in the development, communication, and enforcement of an effective fleet policy. Assigning responsibilities should be established in an organization in order to promote effective implementation of a vehicle safety program (ANSI, 2012). Management owns the responsibility to delegate supervisors and employees to carry out accident prevention efforts to an established degree. The designation of roles and authority need to be further streamlined in order to assign individuals who are accountable for smaller operating units or departments. It is important that every employee with a designated role understand his/her assigned responsibility and the related

degree of authority. A designated supervisor is expected to exhibit a positive attitude towards fleet vehicle safety initiatives in order to influence driver efficiency. Any semblance of a negative fleet safety-based disposition on management's part may ripple throughout the organization and adversely affect vehicle operators and other workers performance (Brodbeck, 1996). According to Peterson (2003), an organization may assist supervisors to effectively understand assigned safety-based roles by developing a management checklist (see Appendix B). The organization's upper managements would likely be best served to request that supervisors complete and submit the checklist in order to determine how well their responsibilities are understood. While Peterson did not explicitly state in the literature how the checklist may be follow-up on, one may conclude that training will assist supervisors to understand management's expectation of their roles regarding safety and also manage employees effectively (U.S Merit System Protection Board, 2010).

It is easier to hold people accountable for specific tasks if an employee is involved in activities that are designed to positively affect a system. Such a person should be able to explain where the organization is in terms of reaching its goals and how the system is performing (Iannarino, 2013). Top management may make requests for frequent reports on how well the safety program's activities are being carried out. This report must clearly identify all deficiency within the organization and the corrective recommendations required. The immediate review of preventive actions against the re-occurrence of reported incidents is important in order to assist in prompt implementation. ISO 3900 has recommended that the responsibility for monitoring and reporting the performance of a road transport system (RTS) management be placed on top executives. From top management support standpoint, the safety personnel must be knowledgeable, truly interested in managing risk of the operation, have strong administrator

qualities, and be able to sell ideas to new and existing employees as well as top executives (Brodbeck, 1996).

Driver selection. Research indicates that the selection of an ideal candidate to operate a vehicle is a crucial and a significant step toward ensuring legal as well as internal compliance in a motor vehicle safety program. To a reasonable extent, the overall success of a vehicle fleet program may be attributed to proper driver selection. Since a majority of preventable accidents are directly related to driver error, it is essential that the organization hires drivers with an ability to quickly envision a possible roadway hazard and the correct driving decision to avoid a potential mishap. The primary objective of a driver selection process is to hire skillful applicants that are highly qualified for the task description. This objective may be attained by reviewing the driver applicant's past driving experiences and the review of drivers' commercial driver's license (CDL) endorsements. It should also be noted that a highly effective method of assessing the driving knowledge of applicants is to conduct a road test to evaluate their proper skills (Brodbeck, 1996).

According to ANSI (2012), organizations are recommended to implement a system that recruits and selects qualified drivers to ensure the safe operation and management of its motor vehicle safety program. The new driver selection process may consume a significant amount of time; therefore, it is important to streamline the process as much that is practical in order to remove unqualified applicants within a short period of time. It is essential that the selection procedure uncover relevant facts regarding the respective applicant. Management personnel who are responsible for hiring new employees must ensure that an applicant meets both the organization and the DOT requirements. A company may develop its own hiring standards based

on the organizational goals or factors relevant to the mode of operation. Towne Air Freight (2006) established a driver selection procedure which considers the following:

- Complete driver application form for employment
- Commercial driver's license (CDL) with endorsements
- Motor vehicle record (MVR) from every state the applicant has lived in during the past 3years
- A criminal back ground record check
- Commercial driver's license information system (CDLIS) Dac services previous employment record
- DOT recordable accident record
- Investigation on previous employment records from past and present employers for the previous three years.
- Drug and alcohol test information from previous employment during the preceding 2 years
- DOT physical exam and certificate
- Pre-employment drug test
- Driver screening "Road Test" for a minimum of 20 miles in length
- Driver Orientation (Towne Air Freight, 2006).

The DOT requirement with regard to driver selection and hiring procedure is a legal mandate. According to the U.S. DOT (n.d.), employers operating vehicles used as part of business, involved in interstate commerce, weighs 10,000 pounds or above must comply with all the FMSCA requirements. This implies that a qualification file for each potential employee must

contain required documentation as stated in CFR 391.51 of the General Requirements for Driver Qualification Files (GRDQF), which are summarized to include the following:

- A signed and completed application for employment form (see Appendix C)
- Motor vehicle report (MVR) from applicable state agency for the preceding three years
- Driver's road test certificate
- Annual review of driving record
- Annual drivers' certificate of violations
- Medical examiner certification
- A record of inquiries from previous employers for the last three years

(Commercial Truck and Bus Safety Synthesis Program [CTBSSP], 2013).

One-on-one interviews are an effective approach during the driver selection procedure as such presents a chance for the interviewer to ask questions based on an applicant's strong and weak points, which may also be deduced from the employment application form (Brodbeck, 1996). The interview creates an avenue to obtain information regarding gaps in employment time records and to also to determine reasons for inconsistencies in previous documentation (Warczyglowa, 2012). There must be no form of biased judgment, and the interviewer must be objective towards an applicant's disposition. However, the interview should not serve as the only basis of the final applicant selection. Final hiring decisions must be based on overall information obtained (Brodbeck, 1996).

Driver discipline. According to available literature, employee safety should be paramount in an organization. In an effort to reduce the number of high-risk drivers, a fair disciplinary program needs to be established in order to address the occurrence of various driving violations. OSHA (n.d.) suggests that organizations develop a system that recommends

corrective action/discipline based on the number of violations or preventable crashes of the involved vehicle operator. A higher number of violations increase the level of discipline which is enacted on the employee. Utilization of progressive violation system may be in form of two written warnings rather than one suspension, which thus provides employees the chance to correct their unsafe behavior and avoid re-occurrence (Connecticut Business & Industry Association [CBIA], 2013). It therefore can be concluded that driver discipline discourages employees from engaging in organizational misconduct and also provides workers the opportunity to correct unsafe behaviors.

Driver training. The acquisition of driving skills is facilitated through effective training. An ideal driver training program improves skills to a significant level needed to perform an assigned task properly. Tutoring is a prominent tool utilized by management to pass along relevant driving concepts and other standard procedures to drivers (Brodbeck, 1996). ANSI (2012) suggests many topic areas for driver training, among which the following are identified:

- Defensive driving training assists in saving lives, time, and money, regardless of the condition and actions of other road users ANSI (2012). Defensive driving training is one of the surest ways to take advantage of safe vehicle operating approach; it improves skill and address driving dangers and hazards. (National Traffic Safety Institute, n.d). Vehicle operators are prompted to anticipate situations and make well informed decisions based on road and environmental conditions. According to NSC (n.d), the increasing number of new drivers and vehicles on the road creates a continuing need for defensive driving training across all age groups.
- Distracted driving training addresses various distractive issues such as mobile phone usage, eating or drinking, reading, smoking, global positioning system usage, mp3, cd,

and / or dvd players. It is the leading cause of most vehicle incident and near crashes in the United States (California Department of Motor Vehicle, 2011). According to OSHA, 25% to 30 % of all traffic crashes are due to distracted driving. In 2011, 3,331 people were killed in crash involving a distracted driver while 387,000 people were injured (CDC, 2013). ANSI (2012) states that organizations should have a policy regarding potential distraction while driving, it recommends periodic training to inform drivers of the impact of distracted driving on safe vehicle operation.

- Aggressive driving training addresses and identifies aggressive driving issues such as speeding, tailgating, failure to signal a lane change, running red lights and stop signs, yelling at other drivers, and excessive use of the horn. A substantial number of the 6.8 million crashes that occur each year are estimated to be caused by aggressive driving (OSHA, n.d.). It is important for vehicle operators to be courteous and not take actions of other drivers personally. ANSI (2012) suggests that, on a periodic basis drivers should receive information and training regarding the impact of aggressive driving on safe vehicle operation.
- With regard to the effective utilization of vehicle restraint systems, ANSI (2012) suggests that an organization establish policies addressing the use of seat belts with required training on the methods of use. Frontal air bags combined with seat belts offer effective safety protection for passenger vehicle occupants (NHTSA, 2011). According to OSHA (n.d.), a seat belt is a highly effective means of reducing deaths and serious injuries in vehicle crash. This device may reduce the risk of fatal injury by 60% and it should be noted that nearly 12,000 lives are saved and 325,000 serious injuries are prevented on a on a yearly basis in the United States due to its use. In 2011, an estimated of 2,204 lives

was saved by frontal air bags while 11,949 survived vehicle accident due to seat belt usage (NHTSA, 2011).

A highly trained driver will assist in the operation and maintenance of a company vehicle as well as ultimately promote an increase in the quality of the delivered service. Other potential benefits of effective training include a reduction in accidents, a lowering of maintenance costs, a decrease in absenteeism, a less burdened supervisory staff, and improved public image (Brodbeck, 1996). It is discovered that training will not only teach specific skills, but also enhance learning strategies, attitudes and motivation (Mayhew & Simpson, 2009). Three common methods in which training may be achieved are through group session, one-on-one guidance, and self-tutoring. Group training includes lectures and discussion sessions while one-on-one instruction involves mentoring the trainee to learn specific directives. Self-tutoring is accomplished through personal study, which may be through pen and paper or a computer based method (Werner & Desimore 2009). It is essential that a fleet organization considers the utilization of proven successful training procedures as well as effective driving skill maintenance and improvement strategies. A periodic review on a company's training methods should also be performed to determine the overall effectiveness as it relates to the overall success of the organization's safety program. The success of a training program may be noticeable through a reduction in vehicle crashes; therefore, it is important that management consider this educational process as a continuous phase of development for drivers starting from hire through retirement (Brodbeck, 1996). OSHA (n.d.) recommends continuous training because experienced drivers may become complacent and thus begin to develop unacceptable driving habits. Regular training is an ideal reminder for the execution of safe driving practices. It is also relevant that training be carried out right after the applicant is hired (orientation), throughout employment (refresher

training), and after a driver is involved in an accident (remedial training) to establish a predominant safe driving culture (Brodbeck, 1996, Compliance Safety and Accountability, 2013 & Royal Society for Prevention of Accidents, n.d.)

Drug and alcohol testing. Driving under the influence is regarded as one of the most common causes of crashes in the U.S. According to CDC (2013) in 2010, 10,228 people were killed due to alcohol impaired driving, while 18% of all crashes were a result of controlled substance intoxication and alcohol consumption. For a privately owned vehicle, a driver is regarded to be under the influence when the blood alcohol content (BAC) level is at 0.08% or higher (NHTSA, 2008). The Federal Highway Administration (FHA) regulations under the Omnibus Transportation Act of 1991 require that employers establish an alcohol and controlled substance testing programs for employees who operate commercial vehicles. The objective of this act was to prevent work-related accidents as a result of alcohol and / or controlled substance use and thus reduce the risk of injury. Employees are to be tested for alcohol, marijuana, amphetamines, cocaine, opiates and phencyclidine (PCP) usage. Laboratories certified by Health and Human Services under the National Certification Program (NLCP) are the only places where the controlled substance urine samples may be tested. Department of Transportation (DOT) testing methodology approves urine samples for the drug screening procedure, while the alcohol breath testing is used to determine the drivers BAC. For commercial drivers, a positive test for alcohol at a BAC level of less than 0.04% and greater than 0.02% requires minimum penalties that may require a driver to be out of service until the next shift. A positive test result of 0.04% BAC or greater requires the driver to be or out of service until he/she is evaluated by a qualified substance abuse professional (Safety and Health Department, n.d.). Organizations are required to maintain test results on a confidential basis and only discuss such with individuals directly

involved. As indicated in the Omnibus Act requirements, commercial vehicle drivers are subject to the following alcohol and controlled substance- based tests:

- Pre-employment testing. An alcohol as well as controlled substance test is carried out after an applicant is formally offered employment, although the offer is contingent on the results being negative (FMCSA, 2013). A negative result proves an employee is free from illegal use of drugs and is in the right frame of mind to perform the required driving task. A positive result requires an employer to withdraw necessary documentation regarding the employment offer. A positive result due to prescribed medication requires an applicant to provide necessary documentation before or within 24 hours after the positive test result is communicated to the individual (Administrative Regulation, City of Chesapeake, 2005).
- Reasonable suspicion testing. This type of test is carried out when a trained supervisor reasonably believes that a driver may be under the influence of alcohol or a controlled substance (Firstlab, 2002). The driver may not be permitted to perform safety sensitive tasks until the results of an alcohol and controlled substance test are received. A refusal to be tested may be considered as positive result. A negative test should result in immediate reinstatement of the employee's driving privileges, while a positive result confirmed by a medical review officer (MRO) subjects a driver to the organization's disciplinary system (FMCSA,2013).
- Post-accident testing. As soon as practicable following a vehicle crash occurrence, employers shall test for alcohol and controlled substance for its surviving drivers and this procedure is required to be conducted at least within 2 and 32 hours respectively after the incident (FMCSA, 2013). If the test is not conducted within the specified time frame, the

employer should cease any attempt to administer the test and prepare a written report stating the reason why the test was not carried out (Firstlab, 2002). A negative test may result in immediate reinstatement of employee for work, while a positive result confirmed by a medical review officer subjects a driver to the organization's disciplinary system (Federal Motor Carrier Safety Administration [FMCSA], 2013).

- Random testing. Selection of drivers for random testing may also be carried out through a scientifically valid method such as a computer-based arbitrary number generator, which provides workers with an equal chance of being selected. The minimum annual drug and alcohol testing rates are 50% and 10% respectively (FMCSA, 2013). A negative test may result in immediate reinstatement of employee for work, while a positive result confirmed by a medical review officer subjects a driver to the organization's disciplinary system (FMCSA, 2013).
- Return to duty testing. A driver who tests positive due to reasonable cause, post-accident and random testing is required to pass through a return-to-work process as stated in 49CFR40. 281- 313 subpart O. The employee must test negative to drugs and /or prove less than a 0.02 breath alcohol concentration before resuming duty (FMCSA, 2013). The driver's reinstatement back to work is based on the recommendation of a DOT qualified substance abuse professional.
- Follow up testing. This procedure is established by the organization to grant a driver who tests positive with another chance to operate a commercial motor vehicle. The driver must be willing to complete all substance abuse professional recommended rehabilitation requirements. Upon admittance back to work, the driver must be subjected to random testing and an observed controlled substance test. At least six tests must be performed

within the first twelve months of active duty. According to the U.S. DOT (2013), the follow-up test period must not exceed 60 months in length from the date that the driver returns to duty.

Emergency equipment. The ability to prepare for an anticipated risk is a significant step in safety and it may assist in reducing the severity of an incident. ANSI (2012) recommends that vehicles be equipped with appropriate emergency equipment in the event that the driver experiences mechanical difficulty or a crash on the road. The Automobile Association of America (AAA), which is the largest emergency roadside assistance organization in the U.S., claims to handle between 29 and 30 million roadside request for assistance each year from motorists who are stranded on roadways (Griffey, 2013). To effectively prepare a driver for such emergency roadway situations, it is recommended that every vehicle possess an emergency kit, which may increase safety, reduce stress, and assist drivers to recommence his/her trip back on the road within the shortest time frame. The U.S. DOT (2013) & Minnesota DOT (2012) regulations requires at least a fire extinguisher, a spare fuse, and reflector triangles. Other forms of recommended emergency equipment include a flash light with extra batteries, a high visibility vest, first aid kit with nitrile gloves, blanket, spare gloves, a disposable flash camera,and crash reporting kit. It is essential to conduct a periodic inspection of the emergency kit to ensure required components are in proper working order (Brodbeck, 1996).

Vehicle inspection and maintenance. The proper inspection and maintenance of a fleet vehicle involve several entities and it requires the cooperative effort of the organization to establish an effective maintenance culture. ANSI (2012) suggests that an organization should develop a standard procedure that ensures all vehicles are examined and serviced on regular basis in accordance with the minimum recommendation of the vehicle’s manufacturer. Periodic

vehicle inspection is recommended to be conducted by qualified inspector. A file should be assigned for each vehicle to maintain a track record on its maintenance status and repair activities. Standard operating procedure should specify that a driver performs a pre-operation and post-operation visual inspection of the vehicle. At the beginning of the shift, a driver's vehicle inspection report (see Appendix C) as recommended by the DOT, may be used to carry out this inspection within a short time frame. At the end of the work day, a driver's post-inspection written report must at least include a check of the tires, horn, wind-shield wipers, rear-vision mirrors, coupling device, wheels and rims, and steering mechanism. Lighting devices, service brakes, emergency equipment, and parking breaks should also be included in the report (Brodbeck, 1996). Thus, any necessary repairs and/or maintenance are based the daily reports which are submitted by the vehicle operators. According to OSHA (n.d), mechanics should perform a thorough inspection of a vehicle at least annually with documented results placed in the vehicle file. This yearly procedure involve an audit on the braking system, coupling equipment, exhaust and fuel systems, lighting devices, steering mechanism, suspension, frame, tires, wheels and rims, windshield glaze and wipers (see Appendix D). This audit is a minimum requirement that must be met in order to pass the annual inspection. It is carried out every 12 months, counting from the last day of the month in which the procedure was performed (U.S DOT, 2013).

Recordkeeping. A major responsibility in owning a fleet transportation organization is government- required recordkeeping. The purpose of recordkeeping is to retain detailed information regarding accidents which have occurred within the organization in order to determine the cause of incidents and develop measures to prevent a possible reoccurrence. Records of leading and lagging indicators serve as resources of information that summarize

incident data for various levels of management to review. Records also provide an opportunity for management to set goals for system improvement (The Zenith, 2013). Managers are advised to consider expanding their recordkeeping system to include all incidents relating to workplace safety and health due to the benefits that such information may provide in pinpointing causes of unsafe acts and conditions (Behavior Safety Associates, 2011). Desired improvements in recordkeeping should not include providing faster methods to log incidents, but to aid in incorporating an improved and accurate method of carrying out a thorough investigation, gathering relevant information, and correctly filling-out required accident forms (Kellerman, 2013).

Brodbeck (1996) states that the purpose of record keeping is to maintain accurate data. A precise organization ensures consistency and validity of statistical data regarding organizational incidents (Hesselton, 2010). Jordan Barab (as cited in Kellerman, 2013) stated that, “Exact and honest records are essentially important to workers’ health and safety.” OSHA (n.d) requires recordkeeping to determine where industries may need additional safety program assistance. According to Kellerman (2013), it is also an essential tool for employers and workers to identify problems within an organization.

Accident recordkeeping based on DOT recommendation, as stated in 49CFR, Part 390 requires an employer to maintain an accident register for three years after an incident occurs. The incident record should contain a list of accidents with the following information for each:

- Date of accident
- City or town and state in which accident occurred
- Driver name
- Number of injuries

- Number of fatalities (Minnesota Department of Transportation, 2007)

Management involvement and employee participation. Management involvement in an effective safety program sets the pace for an organizational-wide effort in the prevention of workplace accidents. To a considerable degree, safety awareness in industries has contributed notably to the reduction of accident rates in a number of organizations. OSHA discovered that there is a significant relationship between the application of sound management practices in the operation of safety and health programs and a low incidence of occupational injuries and illnesses. A correlation between these elements may not be achieved without the involvement of management and active participation of employee in safety initiatives. As long as top management individuals are highly interested in profitability, they should also be deeply involved in promoting employee's wellbeing and building a positive work climate within the organization (Peterson, 2003).

The success of a safety program to a large extent is dependent on management's willingness to be actively involved. A favorable outcome of safety initiatives serves as a motivating force that draws employee participation. According to OSHA (n.d.), identification, prevention, and control of recognized hazards may effectively be achieved through the joint effort of management and employees. The establishment of a safety policy provides management the opportunity to express its interest, concerns, and commitment toward organizational safety. Management should establish a clear plan on how safety is intended to be carried out in terms of the requirements to achieve expected results. Management involvement may further be enhanced through visible participation, assigning and communicating responsibility, granting authority and resources to responsible parties, and holding those parties accountable. Visible management is explained as top executives carrying out audit procedures, being approachable by every

employee, conducting his/her self as an exemplary leader by following operating procedures as written in the policy, and displaying active involvement during safety committee meetings. Top management must be objective and open to employee participation in expressing constructive opinions. Establishing a safety committee and periodic meeting encourages cooperative effort of both management and employees to work together to identify problems, develop solutions, review incident reports, and assess the effectiveness of safety initiatives. The committee should consist of top designated management and selected employee representatives from each department that exists within that organization (Department of Labor and Industry, n.d.). OSHA (n.d) states that employee participation may be described as a response to management involvement. Top executives are encouraged to be involved in incident investigations, procedure development, safety and health audits or surveys, the development and implementation of safety and health training, performing job safety analysis, safety and health committee/team involvement, providing recommendations for specific actions in response to employee safety suggestions, and being involved in problem-solving techniques to seek solutions to identify safety and health issues. Employee participation encourages workers to communicate with others concerning unsafe actions and conditions (Licensing and Regulatory Affairs [LARA], 2011). Every operational procedure carried out within an organization contributions to the system. As production is important to maximize profit, so is safety is to minimize human, property, and financial loss. Therefore safety should be treated as a management function and adopted as every other operating procedure (Peterson, 2008).

Motor fleet loss data analysis. The effectiveness of a safety program may be measured by the amount loss incurred in an organization as represented by OSHA's recordable incident rates, dollar loss due to accidents, and the cost of insurance (Janicak, n.d.). Measuring

performance provides insight into a system's operational efficiency. A high standard of safety performance is achieved through a well-organized and structured pattern of analysis, which is expected to be proactive and preventive (NSC, 2013). An organization must carefully study its system to assess relevant questions that provide needed insight to determine if goals and objectives are being met. Through data analysis, the effectiveness of an organization's safety program may be optimized by the decrease in injury rates, property damage, and financial losses (Janicak, n.d.).

Loss monitoring .The process of monitoring losses assists management to identify areas of the organization that need to be improved and the ones to be commended and/or rewarded. Loss monitoring creates a basis for performance comparison within an organization and other companies. ANSI (2012) recommends that organizations should collect data to calculate rates for tracking safety performance over time. It also suggests that companies identify the most appropriate rates based on the patterns of vehicle usage and the nature of vehicle operations. An incident rate is used to measure the frequency of loss occurrence. The effectiveness of procedures in an organization may be gauged by monitoring the rates of incidents (Harleysville's Risk Control department, 2008). ANSI (2012) outlined the following formulas as measures to determine organization's safety performance:

- Incident rate based on number of vehicles operated. This rate is determined by multiplying the number of incidents by 100 and dividing by the number of vehicles being operated with the fleet

$$\text{Incidents rate} = \frac{\text{Number of incidents} \times 100}{\text{Number of vehicles}}$$

- Incident rate based on vehicle mileage. This rate is determined by multiplying the number of incidents by 1,000,000 and dividing by the mileage driven.

$$\text{Incidents rate} = \frac{\text{Number of incidents} \times 1{,}00{,}000}{\text{Vehicles mileage}}$$

- Injury incident rate based on vehicle mileage. According to ANSI (2012), this rate is most frequently used to indicate severity of incident. It is useful for tracking events that have the potential to affect financial or operational performance of the operating unit. The injury incident rate is calculated by multiplying the number of incidents that result in an injury by 1,000000 (or other mileage multiplier) and dividing by the actual fleet vehicle mileage:

$$\text{Injury incident rate} = \frac{\text{Number of incidents with injury} \times 1{,}000000}{\text{Vehicle mileage}}$$

- Incident rates based on service activity. Motor vehicle operations that pose injury risks other than those associated with driving should also use the service activity as the basis of a safety performance rate. The number of deliveries, stops, or loads should be considered as appropriate indicator of risk or exposure. These rate are calculated by multiplying the number of incidents by 10.00 (or other appropriate multiplier) and dividing by the number of service activities, such as :

$$\text{Incident per 10,000 deliveries} = \frac{\text{Number of incidents} \times 10{,}000}{\text{Number of deliveries}}$$

$$\text{Incident per 10,000 loads} = \frac{\text{Number of incidents} \times 10{,}000}{\text{Number of loads}}$$

Passenger carriers may also use a passenger-based rate based on vehicle mileage:

$$\text{Passenger injury rate per million miles} = \frac{\text{Number of passenger injuries} \times 1{,}000{,}000}{\text{Vehicle mileage}}$$

For service such as urban transit operations, it is also appropriate to calculate the passenger injury rate based on the number of fares collected, including transfers.

- Motor vehicle injury rate based on work hours. Motor vehicle operations, whose drivers have high levels of exposure to driving, should consider tracking incidents based on hours of exposure. The rate of vehicle incidents per 100 full-time equivalent workers is calculated by multiplying the number of incidents by 200,000 and dividing by the number of hours actually worked:

$$\text{Vehicles incidents per 200,000 hours} = \frac{\text{Number of incidents} \times 200{,}000}{\text{Number of hours worked}}$$

$$\text{Vehicles incidents per 200,000 hours} = \frac{\text{Total worker compensation \$ losses}}{\text{Total \#of person} - \text{hours worked}}$$

The above rates are considered lagging indicators because such are based on post loss data. The incident rate is valued in fleet industries since it may be used as a quality check tool for tracking the progress of the organization with peers in the transportation industry. Loss monitoring data is relatively simple to measure and often produces a tangible outcome such as accident and injury rate and dollar loss (Close, 2010). As limitations, a significant amount of variables are involved due to various factors that contribute to an accident that could be confusing. An incident rate is not contributory to the prevention of an accident until after the loss occurs. However, it still remains a necessary metric that should be regarded as one of the several that exist (Angnew & Daniels, 2011). OSHA and other regulatory agencies have utilized loss-based data to determine if an organization needs assistance in improving its safety program.

Loss benchmarking. Policy development establishes operating procedures with an objective of improving a system's level of performance. Benchmarking is described as a systematic procedure used to determine performance level within the system itself and other similar industries (Wyrick & Storching, 2003). This method for measuring a system's operations against its competitors may initiate an organization's drive toward a projection beyond the

available practice. This may trigger the implementation of proactive measures to improve procedures and thus lead to preferred performance (Janicak, n.d.). Having a standard method for collecting data and underpinning indicators in which a comparison will be achieved is important for organizational improvement. Ideal practices may be determined in the area of leadership, safety performance (rewards and recognition), communication, and training (Peterson, 2003). Active benchmarking may also be considered an indicator used to determine the performance of quality risk control efforts before an incident occurs, data collection based on facts, hazard analysis, employee training, routine inspection, adherence to internal standards, and pre-loss data analysis. A reactive benchmarking approach considers, incident rate, vehicle crash rate, and lost work day. Both procedures provide sufficient data for the benchmarking process (Worksafe-Australia, 1996).

Benchmarking is not only used to compare data with competitors, it is also a continuous learning process that aids in the identification of organization's strengths and weaknesses (Facilities Management Association [FMA], 2013). It also provides management with a shortcut to gauge how a system is performing. Though it may not provide a full description of the situation, benchmarking serves as technique to obtain a quick overview of what is occurring within the organization and reveal any needs for immediate attention (Telogis, 2013). Peterson (2003) also described benchmarking as a process of comparative measurement which is used to identify and monitor improvement in order to identify possible deficiencies within a management system. Similar operation comparison is also a part of benchmarking. A typical example would be comparing Company A and Company B's OSHA recordable rate against one another to determine the organizations' overall level of safety performance. The success of benchmarking procedure is not achieved by directly replicating the optimum practice of other organizations, it

is also important to determine which procedural change will result in the most ideal practices and yield the largest improvement in safety performance. Carefully incorporating the changes may be time consuming, but it remains crucial to the success of the organization. It is necessary that sufficient resources are available for implementation of changes. A follow-up procedure such as monitoring is encouraged to ensure that the implemented changes meet the actual need of the organization (Janicak, n.d).

Summary

This chapter provided a review of fleet transportation crash statistics in the U.S., standard procedures for crash analysis and reporting, ideal methods to develop, communicate, and effectively enforce fleet policy and a motor fleet loss data analysis. It is a common knowledge that roadway crashes are the leading cause of death among American workers. Over 40% of work-related fatalities are caused by transportation related incidents (NHTSA, 2008). This high rate in the number of employee casualties and financial base loss has been of great concern among employers. However, the increasing pace of this rate has generated the development of improved motor fleet safety programs with various proactive measures which are embedded within such. Although OSHA has not provided a standard to guide fleet vehicle operation, employers usually customize safety program to their specific needs (Zurich, 2011).

This chapter analyzed the proactive measures that contribute significantly to the reduction and possible prevention of vehicle crash reoccurrence. Data gathering and information analysis are inextricably linked to the metrics for leading indicators (ICMM, 2012). Effectively incorporating this into organizational procedures will enhance top-level management's ability to analyze reports and effectively make timely decisions regarding safety policy (Ewing, Farah, Kwong, & Santorsola, 2008). Considering causation models has provided the opportunity to

analyze the various components of a system in order to determine possible contributing factors to a safety mishap. This aids the development of appropriate corrective action to prevent reoccurrence of similar accidents.

The establishment of a safety policy also focused on the inclusion of proactive activities such as assigning responsibilities, driver selection, driver discipline, driver training, drug and alcohol testing, emergency equipment, vehicle inspection and maintenance, and accident reporting and investigation (Maine Municipal Association, 2005 & ANSI 2012). A safety program with these elements will assist in setting the path for a more proactive approach to reduce accidents and improve safety, while increasing productivity (Zurich, 2011).

To a sizable extent, this chapter considers the usage of active and reactive measures due to the fact that both are critical to the growth of a system. While leading indicators demonstrate the ability to influence and improve future performance by guiding current actions, lagging indicators will not provide enough information to guide future actions because the corresponding results are based on past incidents (Pojasek, 2009). However, leading indicators possess few limitations (ICMM, 2012). Douglas Wick (2010) suggests that for every one lagging indicator in a system there must be two leading indicators to support it. A mix of both address risk at the source level, measure the system failures, and impact risk exposures (ICMM, 2012). These indicators assist in building on the strength of a system and may also lead to the improvement of unfavorable organizational trends (Society for Maintenance and Reliability Professionals [SMRP], 2009). It is practicable to conclude that an organization constantly seeking improvement in its safety operation should consider both lagging and leading indicators in management decisions regarding improved safety measures. In summary, the above fleet-based activities and loss measurement techniques will be assembled into an audit- based checklist to

assist in determining the extent that Company XYZ is performing the necessary actions to prevent future fleet losses.

Chapter III: Methodology

The ongoing increase in the number of vehicle crashes at Company XYZ is an indication that changes needs to be made to its current loss prevention procedures as well as the implementation of such internal standards. Therefore, the purpose of this study is to evaluate the fleet losses as well as risk control practices at Company XYZ. In order to achieve this purpose, the following goals were established:

- Analyze past motor vehicle crashes to determine the major causal factors which contributed to the occurrence of such losses.
- Analyze Company XYZ's current fleet risk control policies and activities in relation to identified industry best practices.

This chapter will describe the procedure for data source and data collection procedures, data analysis and limitation of the study.

Sample Selection and Description

Human subjects are not involved in this study and the researcher will ensure that all information received from Company XYZ will not contain human based identifiers. The information that will be received from Company XYZ includes its current policies as well as vehicle loss data from calendar years 2011, 2012 and 2013.

Data Collection Procedures

The data source was a loss summary from 2011 to mid-2013. This data maintained by Company XYZ's claims specialist and only authorized personnel of the organization may access or utilize this information for business purposes. As an intern, the researcher formally requested for the report to analyze the respective data and to make recommendations in order to improve

the company's fleet vehicle operation. This information will be maintained in a locked cabinet and destroyed at the completion of this study.

The main objective of this study is to evaluate the fleet losses as well as risk control practices that Company XYZ is currently utilizing. Data collected by comparing what the literature review indicated to be the best practice of the industry and Company XYZ's policies/procedures will be used to perform the gap analysis. Table 1 is a brief description of what will be found in Appendix F which is the actual assessment form utilized to achieve goal two. This information led to the development of the matrix below.

Table 1

Industry Best Practice

ELEMENT	BEST PRATICE
Policy	Policy must be communicated to all employee, supervisor, and top management. Establishes management expectation of employee's compliance to safety programs and all applicable states and federal laws. Policy should be revised annually.
Assign responsibilities	All level of management should be involved in and held accountable for program development, management and implementation.
Drug and alcohol testing	On a periodic basis, drivers should receive training regarding the effect of alcohol and controlled substance on safe vehicle operation. Pre-employment, reasonable suspicion, post-accident, random, return to duty and follow-up test should be implemented as required by

	the Omnibus Act.
Emergency equipment	Vehicle shall be equipped with appropriate emergency equipment in the event that the driver experiences mechanical difficulty or a crash on the road.
	At least, a fire extinguisher, a reflective triangle and spare fuse must always be in a vehicle base U.S. DOT (2013) & Minnesota DOT (2012) regulations.
Vehicle inspection and maintenance	Vehicle must be service and inspected on a regular basis. Pre & post trip Inspection, periodic inspection, and annual inspection.
Driver selection	Well written educational and physical requirement of the position.
	MVR of each state where a driver holds motor vehicle operator's license during the preceding 3years.
	Driver's road test license.
	Annual review of the driver's MVR.
	Road and skill test.
	Acceptance Interview.
	Employee annual disclosure of violation of motor vehicle traffic laws and ordinances.
Driver discipline	Applicable to every level of employee.
	Regularly implemented, and well documented.
Driver training	Initial, refresher, remedial and on-going training.
	Training must be constantly revised in terms of audience reaction, trainee success on the job and the changing needs of fleet.

Recordkeeping	Contain a comprehensive detail of all activities within an organization, such as driver qualification file, training record, driver discipline record, drug and alcohol testing results, vehicle maintenance record, accident reporting and investigation and incident rates. Must be valid, consistent and uniform, capable of producing reliable statistical information. Maintained in a secure location with controlled access.
Accident reporting and investigation	Availability of accident reporting kit in the vehicle at all time. Designated person or office to which the driver must report the incidence. Incident review and analysis by designated person(s) to identify the root cause and any contributing factors. Corrective actions are developed and presented to management.

Data Analysis

The data analysis is based on available information on the loss summary report. Table 2 contains relevant loss analysis information which includes single versus multiple crash injury, crash type, vehicle used for personal business, total number of crashes, crash occurrence and costs by month, and the presence of company versus non-company passengers to achieve goal number one. Variables and measurements are grouped into the following categories/matrix below.

Table 2

Incidence Data

Variables	Measurements
1. Single vs. Multiple Injury Accident - Single - Multiple - Undetermined	Classified by percentage of total accidents
2. Crash collision type - Backing - Rear-end - Intersection - Intersection / w debris - Roll- over - Single vs. Multiple vehicles - Concrete/ Gravel	Classified by percentage of total collisions
3. Vehicle utilized for personal business - Yes - No - Undetermined	Classified by the percentage of total incidences.
4. Crash /Collision cost by month - Jan Feb Mar - Apr May Jun - Jul Aug Sep - Oct Nov Dec	Identified cost incurred on loss for each month
5. Crash /Collision cost by month - Jan Feb Mar - Apr May Jun - Jul Aug Sep - Oct Nov Dec	Identified month with highest number of crash
6. Company vs. non-company passengers in vehicle? Company - Yes - No - Undetermined Non-company - Yes - No	Classified by percentage of total passenger

- Undetermined

7. Total number of crash /collision Identified crashes listed on the incidence report. — Identified crashes listed on the incidence

---

Limitations of the Study

The accident report was not properly detailed. As a result, numerous limitations were identified. Stated below are the foreseeable limitations associated to this study

- This study is limited vehicle loss to data obtained from 2011 to 2013.
- The amount of loss incurred was not indicated for all incidents.
- The number of injuries involved in each crash was not disclosed.
- The number and type of passenger in the vehicle were not clearly stated.
- There is a possibility that not all crashes were reported.
- The type of information obtained for the development of preventive measures was not stated.
- The report does not indicate if an accident investigation was performed.
- The result of this study is limited to Company XYZ and is not generalizable to any other organization.
- Since management and hourly employees were not interviewed during this assessment process, it will not be possible to verify that any/all of Company XYZ's current policies are being followed as stated.

Chapter IV: Results

The purpose of this study was to evaluate the fleet losses as well as risk control practices that Company XYZ utilizes. In order to achieve this purpose, the following goals were established:

- Analyze past motor vehicle crashes to determine the major causal factors which contributed to the occurrence of such losses.
- Analyze Company XYZ's current fleet risk control policies and activities in relation to identified industry best practices.

The methodology utilized for this study involved a gap analysis performed on Company XYZ's policies/ procedures compared to what the literature review indicated to be the best practices of the industry. An analysis was also performed on Company XYZ's loss summary reports for calendar years 2011, 2012 and 2013.

Presentation of Collected Data

Data collected was analyzed according to the two goals of the study. Sub-sections 1.1 to 1.7 represents the first research goal which involves an analysis of past motor vehicle crashes to determine the major causal factors which contributed to the occurrence of such losses. Sub-section 2.1 represents the second research goal which involves analyzing Company XYZ's current fleet risk control policies and activities in relation to identified industry best practices.

Goal 1: Collected Data

Table 3

Goal 1.1 Total number of accident listed on the incidence report between 2011 and mid 2013

Variables	Number of Claims (83)
Company 1	1
Company 2	3
Company 3	4
Company 4	5
Company 5	1
Company 6	3
Company 7	6
Company 8	2
Company 9	4
Company 10	5
Company 11	2
Company 12	2
Company 13	2
Company 14	25
Company 15	2
Company 16	9
Company 17	1
Company 18	3
Company 19	3

Table 4

Goal 1.2 Number of vehicle crash / collision by month between 2011 and mid 2013

Month	Number of vehicle Crash/Collision (80)
January	5
February	6
March	6
April	8
May	15
June	13
July	10
August	2
September	6
October	2
November	6
December	1

The loss summary indicates that between 2011 and mid-2013, a total of 80 vehicle accidents were recorded. The cause of two incidents were not clearly stated in the loss report and the remaining one was due to a hard rock hitting the wind-shield. As indicated in Table 3, a total of 83 claims were settled by the company during this time frame. This signifies that for every vehicle accident there is a potential claim to settle. Companies 5, 7, 10, 14 and 16 experienced the greatest number of vehicle crashes, which is an indication that these segments of the organization are in need of significant risk assessment and control-based measures. As presented in Table 4, the highest number of crashes were recorded during the months of May, June, July,

which is an indicator of heightened vehicle use as well as employees being initially unfamiliar with operating the fleet vehicles.

Table 5

Goal 1.3 Cost of crash / collision by month between 2011 and mid 2013

Month	Cost of Crash/Collision ($)
January	78,858.90
February	90,494.18
March	13,766.18
April	80,867.78
May	149,665.24
June	71,057.74
July	108,046.72
August	17,723.12
September	70,101.39
October	1,231.30
November	11,081.29
December	4,183.92

The highest amount of money which was paid due to vehicle crashes was during the summer seasons as indicated in Table 5. Based on this study, the costs incurred due to vehicle accidents during the month of September, January, and February were substantial. However the frequency at which crashes occurred during the winter season is lower compared to that of the summer season. The high losses which were due to motor vehicle accidents (MVAs) during the month of January, February and September were the result of a limited number of crashes which

involved multiple vehicles hitting each other from behind. The amount of money spent covering the cost of MVAs during the summer season was the result of numerous accidents (a higher frequency).

Table 6

Goal 1.4 Crash /collision type

Type of Crash	Number of Crash (80)	Percentage
Backing	7	9%
Rear-end	49	61%
Intersection	4	5%
Roll-over	1	1%
Hit stationary object / debris	3	4%
Other forms of crashes and / or accidents	16	20%

Rear-end accidents were identified as the most common type of crash as indicated in Table 6 and represent more than half of the total accidents recorded. Nine percent of the recorded incidences were due to an employee backing up from parking area and hitting another vehicle. Other forms of crashes and / or accidents as represented in Table 6 are the result of causes which were not clearly stated in the loss summary report. A significant number of crashes were recorded under this category. As portrayed in Table 7, out of the 83 accidents recorded in the loss summary report, information regarding the number of injuries sustained was mentioned in only four incidents. There were no injuries in two of the accidents while the other two indicated injuries. Ninety-five percent of the accidents did not indicate the number of injuries which were sustained during the calendar years of 2011- 2013.

Table 7

Goal 1.5 Number of injury accidents

Accident Injury	Number (83)	Percentage
Single	2	2%
Multiple	-	0%
Undetermined	79	95%
No injuries	2	2%

Only one of the vehicle crashes indicated that the vehicle was utilized for personal purpose as presented in Table 8. Since workers are only allowed to operate company vehicle to execute organization's duties, data indicates that 95% of vehicle crash/collision incidents occurred while employees were performing company business. As indicated in Table 9, the loss summary report provided limited information regarding the presence or absence of passengers in the vehicles which were involved in recorded crashes between 2011 and mid-2013.

Table 8

Goal 1.6 Vehicle(s) utilized for personal purposes

Vehicle utilized for personal purpose	Number (80)	Percentage
Yes	1	1%
No	3	4%
Undetermined	76	95%

Table 9a

Goal 1.7a Company vs non-company passengers in vehicle

Company Passenger	Number (80)
Yes	-
No	-
Undetermined	80

Table 9b

Goal 1.7b

Company Passenger	Number (80)
Yes	-
No	-
Undetermined	80

Goal 2 Collected Data

Company XYZ's fleet vehicle policy was assessed based on 11 of the industry's best practices which were identified in the literature review (see Table 10). This analysis was carried out by utilizing the previously developed fleet assessment template which is found in Appendix F. Table 10 below compares industry best practices as well as legal requirements with Company XYZ's fleet risk control activities in order to identify possible performance-based gaps.

Table 10

Goal 2.1 Company XYZ's fleet risk control practice compared with industry best practice.

Element	Best Practice and / or Legal Requirement	Company XYZ
Fleet Vehicle Policy	Policy must be communicated to all employees, supervisors, and top management.	Yes
	Safe operating procedures which employees must follow during their designated duties are present	No
	Establishes management expectation of employee's compliance to safety programs and all applicable states and federal laws.	Yes
	Policy is reviewed annually.	Yes
Assign responsibilities	All levels of management should be involved in and held accountable for program development, implementation and management.	No
Drug and alcohol testing	On a periodic basis, drivers receive training regarding the effects of alcohol and controlled substances and safe vehicle operation.	Yes
	Pre-employment, reasonable suspicion, post-accident, random, return to duty and follow-up tests are performed as required by Omnibus Act.	Yes
Emergency equipment	Vehicles are equipped with appropriate emergency equipment	No

	in the event that the driver experiences mechanical difficulty or a crash on the road.	
	At least a fire extinguisher, 3 reflective triangles and spare fuses are present in each vehicle [FMCSA (2013) and Minnesota DOT (2012)].	Yes
Vehicle Inspection and maintenance	Vehicles are inspected pre and post trip on a regular basis	Yes
	Periodic vehicle inspections are to be performed	Yes
	Vehicle servicing is to be performed	Yes
Driver selection	Fleet vehicle policy recommends up-to-date educational and physical requirements for all driver-related positions.	No
	A MVR from each state where a driver holds motor vehicle operator's license during the preceding three years.	Yes
	A driver's road test performed.	Yes
	Annual review of the driver's MVR are to be performed.	Yes
	A road and skill test is to be performed.	Yes
	One-on-one interviews with applicants are to be performed.	Yes
	Employee are to annually disclose violations of motor vehicle traffic laws and ordinances.	Yes

Driver discipline	Applicable to all levels of management and employees.	No
	Implemented as needed	Yes
	Documented in the driver's personnel file.	Yes
Driver training	Initial training performed for new-hires.	Yes
	Refresher training performed on a routine basis.	Yes
	Remedial training is performed for drivers who are involved in crashes or receive moving violations.	No
	On-going training is performed when equipment changes occur.	No
	Training is constantly revised in terms of audience reaction, trainee success on the job and the changing needs of fleet.	No
Recordkeeping	Documentation is maintained of all activities within an organization, such as driver qualification file, training record, driver discipline record, drug and alcohol testing results, vehicle maintenance records, accident reporting analysis and corrective actions.	Yes
	Assigned responsibility for safety activities and/or results to departmental heads or unit supervisors.	No
	Incident rates are maintained	No

	Documentation of all activities within an organization must be valid, consistent and uniform.	Yes
	Capable of producing reliable statistical information.	No
	Maintained in a secure location with controlled access.	Yes
Accident reporting and investigation	Availability of accident reporting kits in all vehicles.	Yes
	Designated person or office to which the driver must report the incident	Yes
	Incident review and analysis is expediently performed by designated person(s) to identify the root cause(s) and any contributing factors.	No
	Corrective actions are developed and presented to management.	No

---

Company XYZ's fleet policy may be described as a general overview of necessary regulatory requirements to maintain the organization's fleet vehicle operation. It touched on appropriate procedures vehicle operators should follow in order to minimize vehicle accidents, reduce personal injury and property loss claims. However key compliance which were identified as industry best practices were not adequately applied. Based on Company's XYZ's policy, following is a summary of observations which stemmed from the completion of assessment template which is located in Appendix F:

- Industry best practices suggest the inclusion of operating procedures in a policy, however, Company XYZ's fleet written policy does not incorporate procedures which

employees must follow during their designated duties. As stated in the literature review, the absence of definite safety procedures may render a standard fleet vehicle operation less effective.

- Company XYZ's drug and alcohol testing policy addresses the necessary testing requirements and thus is in reasonable alignment with the FMCSA regulation, but the post-accident testing process is not performed on all vehicle operators who are involved in crashes with minor injury which does not require medical evaluation. Employees are also not advised of the requirement to remain readily available for a test after an accident and thus not consume alcohol. The FMCSA requires a post-accident alcohol and controlled test as soon as practicable following a vehicle crash incident. Therefore the severity of employee injury should not determine whether or not to carry out a post-accident testing. This procedure may assist to identify the root cause of the accident in order to prevent re-occurrence.
- At least three reflective triangles, a fire extinguisher and spare fuses are required to be in each company vehicle, however the policy does not state all the listed regulatory emergency equipment (indicated in Appendix F) a driver should possess in the company vehicle to assist in the event of mechanical difficulty or a crash on the road. As stated in the literature review, an emergency kit is essential in all company vehicles to effectively prepare a driver for urgent roadway situations. This may assist to increase safety, reduce stress, and assist driver to recommence his/her trip back on the road within the shortest time frame.

- Vehicle operators carry out the pre and post trip inspection on daily basis. Based on Company XYZ's policy, an annual inspection is also carried out in compliance with the DOT's requirements.
- During the driver employment procedure, a road and skill test is performed as a basis for employment. Company XYZ's driver selection process ensures that all the listed documentation in Appendix F are contained in the driver qualification file. A road test is particularly important with the type of vehicle the employee will be operating in order to determine driver's overall skills. This best practice assists to remove problem drivers from the highway and encourages continuous monitoring of driver performance on the road which helps to improve the quality of vehicle operators.
- As stated in the literature review, driver discipline discourages employees from engaging in organizational misconduct and also provides workers the opportunity to correct unsafe behaviors. Therefore, the practice of permitting a level of leniency on various workers such as managers or foreman could be detrimental to maintaining safe driving behaviors and should be avoided. Driver discipline should apply to all levels of employees.
- Company XYZ does not have a remedial training program which addresses the type of accident an employee is involved in. However this guidance is essential in order to discuss techniques which will assist in preventing a re-occurrence of similar incidence. The rear-end collision was identified as the most common type of crash, a remedial training which focuses on the prevention of such accidents will assist to eliminate this type of incident. The refresher training is also carried out once a year. As stated in the literature review, OSHA recommends continuous training because experienced drivers

may become complacent and thus begin to develop unacceptable driving habits. Regular training is an ideal reminder for the execution of safe driving practices.

- Company XYZ's recordkeeping procedure do not include documentation of vehicle crash incident rates. This is an indication that little or no attention is paid to reduce the loss rate within Company XYZ which is detrimental to the growth of the organization. As stated in the literature review, detailed information regarding accidents which have occurred within the organization should be maintained in order to determine the cause of incidents and develop measures to prevent possible re-occurrence vehicle related loss. The loss-summary report utilized for this analysis was not properly detailed. This non-comprehensive level of vehicle accident recordkeeping indicates the need to mentor vehicle operators on how to develop a comprehensive auto incident report.
- The Canadian Center for Occupational Health & Safety (CCOHS) indicates that the identification of the root cause of an accident assists in developing measures that prevent re-occurrence. Thorough analysis of accident information, organizations are able to identify possible malfunctions in vehicles, identify inadequate circumstances that led to an accident, and carry out necessary adjustments and repairs. Company XYZ's policy clearly indicates that accident reviews and analysis are not carried out in the organization. Therefore it is unlikely that corrective measures are developed or presented to the management for implementation.

Chapter V: Discussion

A significant increase in the number of Company XYZ motor-vehicle crashes (MVC) indicates that inadequate risk control practices are occurring in the organization's fleet vehicle operation. Hence, the purpose of this study was to evaluate the fleet losses as well as risk control practices that Company XYZ utilizes. In order to achieve this purpose, the following goals were established:

- Analyze past motor vehicle crashes to determine the major causal factors which contributed to the occurrence of such losses.
- Analyze Company XYZ's current fleet risk control policies and activities in relation to identified industry best practices.

The methodology utilized for this study involved a data analysis on loss summary reports for calendar years 2011, 2012 and 2013. A gap analysis was also performed on Company XYZ's policies/ procedures as it relates to the development of appropriate preventive measures commensurate to what the literature review indicated to be the best practices of the industry. This chapter presents the study's findings, conclusions, recommendations and areas of further research.

Major Findings and Conclusions

This section focuses on the findings obtained in reference to the two research goals. The first research goal involved an analysis of past motor vehicle crashes to determine the major causal factors which contributed to the occurrence of such losses is sub-sectioned into seven categories (Goal 1.1 to Goal 1.7). The second research goal involved analyzing Company XYZ's current fleet risk control policies and activities in relation to identified industry best practices

(Goal 2.1). The following are major findings and conclusions obtained from the performed data and gap analysis:

Goal 1.1 Total number of accident listed on the incidence report between 2011 and mid 2013. A total of 83 incidents were listed in the accident report between 2011 and mid 2013 in which Companies 4, 7, 10, 14 and 16 had significantly high accident rates as compared to other companies. It is quite possible that more than 83 incidents occurred during the calendar years 2011, 2012, 2013. There is only one auto claim specialist handling the MVA cases of Company XYZ's over 40 small to medium-size sub-companies. It may be concluded that not all the incidents are reported or written in the loss summary record. Also, since remedial training is not based on near-misses or minor accidents, the need to report such incidents might be irrelevant to employees. A recordkeeping procedure with no reporting of on incident rates does not inform Company XYZ of the frequency that loss occurs and the probable crucial need for implementation of preventive measures. This is against the recommendation of ANSI (2012) which suggests that organizations should collect data and calculate rates in order to track safety performance over time. The effectiveness of procedures in an organization may be gauged by monitoring the rates of incidents. It may be concluded that essential information required to perform a loss analysis in order to improve fleet vehicle operation is not on record.

Goal 1.2 Number of vehicle crashes / collisions by month between 2011 and mid 2013. A total of 80 vehicle crashes/collisions were recorded between calendar years 2011-2013. Performing task functions in a certain area of specialization in addition to the critical task of operating a motor vehicle may be quite exhausting for workers, and thus this could be a reason for the increased accident rate. Forty-eight percent of the number of vehicle crashes / collisions occurred during the months of May, June and July. A higher number of construction activities

are performed during the summer season and employees tend to be move more frequently from one client site to the other during this period. Also, employees seem to work more hours during summer season due to longer days. It may be essential for the company to consider employing other individuals to perform driving functions rather than have one individual perform two critical functions. Traffic accidents often occur when significant numbers of people are on the road. There are a high number of road users during the summer season due to school holidays. People also tend to move around more often due to the beautiful weather condition. While workers carry on with their day-to-day activities of moving from one client's site to another, a bulk of young non-professional drivers on school holidays are present on the roads during this period. It could be concluded that employees are at a higher risk of accidents during the summer season due to the number of inexperienced drivers on the roads. Defensive driving practices should be proactively utilized by vehicle operators to help anticipate crash situations and make well informed decisions based on environmental conditions and actions of other road users.

Goal 1.3 Cost of crash / collision by month between 2011 and mid 2013. High losses were incurred in the months of January and February due to vehicle crashes. Of the crashes which occurred during the month of February, a single crash that led to multiple vehicles hitting each other from behind incurred significant amount of lost money. A major contributing factor to this and other winter-based crashes might be slippery roads due to adverse weather conditions. Thus, there may be the need for intensive training on defensive driving in order to prepare vehicle operators for against the risk of collisions in adverse road conditions. Substantial amount of money is lost due to vehicle crashes on a monthly basis. Since an accident analysis is not performed after each accident, the organization might not be promptly informed of the significant amount of money being spent on the occurrence of claims. It is also a plausible that

claimants may be demanding compensation for unnecessary cost which could have been denied if information obtained from an incident analysis was available.

Goal 1.4 Crash /collision type. Sixty-one percent of all the collisions were rear-end accidents which are well above half the total number of crashes recorded. This implies that employees lack the required knowledge to avoid the occurrence of this type of incident. The proximate cause of this may be due to employee speeding and following too closely behind another vehicle. The absence of remedial training to correct repeat offenders may also be a factor that contributes to the high rate of rear-end accidents. Training should focus on the importance of maintaining considerable driving distance between vehicles by a gradual close-in when approaching another vehicle, sustaining a four-second following time, and ensuring visual view of the rear tires touching the road when behind a vehicle (Mottola, 2012). Rear-end crashes incur a significant amount of cost on the repair of company vehicles as well as others involved in the incident. In various cases, a rear-end accident at minimal speeds as low as eight miles per hour may cause serious body injury, and therefore, a significant amount of money may also be spent on treating the incident victims. This explains the high cost incurred in the month of January and February due to rear-end accidents. Distracted driving is also a major cause of rear-end accidents. This is attributed to vehicle operators engaging in other activities while driving such as mobile phone usage, eating or drinking, reading, smoking, and operating global positioning system, mp3, CD, and / or DVD players. Based on the recommendation of ANSI (2012), the organization should have a policy regarding the control of potential distractions while driving and perform periodic training to inform drivers of the impact that distracted driving can have on safe vehicle operation. Seven of the crashes occurred while the vehicle was in reverse (backing). Accidents which occur while vehicle operators are reversing or backing out of a parking space

are typically caused by inadequate use of the rear view mirror. Many drivers do not consider a need to utilize this tool effectively due to a sense of overconfidence in their driving skills. Vehicle operators should cultivate the habit of seeking for assistance from others while backing in order to prevent the occurrence of a crash. Twenty percent of the MVAs were due to other forms of crashes which were not properly explained in the loss summary report. The need to state the type of collision in a loss summary report cannot be over emphasized. Preventive measures are typically developed based on the type of accidents which frequently occur. A loss summary report should state all necessary information sufficient to carry out an effective accident analysis.

Goal 1.5 Number of injury accident. The number of injuries sustained was mentioned in only four incidents. It is probable that employees do not report all injuries that occur in various accidents. In the data obtained, information regarding injuries sustained was mentioned in only four incidents. The loss summary report indicates there were no injuries in two of the accidents while the other two incidents recorded wounded victims. Considering the high rate of rear-end accidents, it is not realistic to conclude that only two accidents resulted in injuries. Serious body injury often occurs with rear-end accidents at speeds as low as eight mile per hour. It is important to note that the minimum speed limit on most highways is 40 mph. This is an indication that most accidents occur at speeds well above eight mile per hour. It is also possible that several injuries were not recorded because bodily-harm was not apparent immediately after the accident. While data indicates the frequency of injury as low, the severity of the two injury-related accidents could be described as high because victims involved in the crash were likely transported to the hospital for immediate medical treatment. It was observed that minor injury was not included in the summary report which is an expense covered by Company XYZ. This is

an indication that the amount of money spent on vehicle-based losses may be more than what is recorded. Irrespective of the severity of an injury, employees must be prompted to report all forms of bodily-harm which are caused by vehicle crashes. This will aid in an accurate analysis of accident reports as well as development of proper presentation-based recommendations.

Goal 1.6 Vehicle utilized for personal purpose. The policy states that Company XYZ will not be responsible for accidents on vehicle operated outside the normal business hours or utilized for personal purpose. While only one accident occurred when a company vehicle was not being utilized for business purpose, ninety-five percent of the accidents occurred when company vehicle was utilized for business purpose. It is possible that drivers are less concerned about preferred driving behaviors while performing company activities since the organization will be responsible for any loss incurred. This is an indication that employees may disregard an organization's safe driving procedures, and thus the significant difference in the number of accidents occurring while the company vehicle is being utilized for company duties as compared to non-business activities. It could be concluded that vehicle operators drive more carefully while using a company vehicle for non-official purposes.

Goal 1.7 Company vs non-company passengers in vehicle. The loss summary report did not indicate the involvement of passengers in any of the accidents, and thus appears that more emphasis was placed on the vehicle operators. Detailed information regarding a crash including all the victims will assist to perform an accurate data analysis which will aid to optimize the effectiveness of an organization's safety program. Precise information also provides an opportunity for management to set goals in order to improve its operating procedures. Therefore, vehicle operators should be required to provide details of all the passengers involved in a crash as well as other relevant information.

Goal 2.1 Company XYZ's fleet risk control practices compared with industry best practices. Company XYZ has a written fleet policy, but it does not contain generic safe operating procedures which drivers should follow during their designated duties in order to achieve organizational goals and continuous process improvement. Safety should to be managed like other company function but there is no assigned responsibility for safety activities and/or results to departmental heads or unit supervisors. As indicated in Chapter II of this study, the responsibility for monitoring and reporting the performance of a road transport system (RTS) management requires the participation of all employees. However not all levels of management were involved in or held accountable for program development, implementation and management. It was also observed that the policy does not state if vehicles are to be equipped with appropriate emergency equipment in the event that the driver experiences mechanical difficulty or a crash on the road.

The primary objective of a driver selection process is to hire skillful applicants that are highly qualified for the task description, however, the policy does not enforce educational and physical requirements for all driver-related positions as an employment condition. While a fair corrective program ought to be established in order to address the occurrence of various driving violations, driver discipline is not indicated in the policy to be applicable to all levels of management and employees.

Remedial courses should focus on the type of accidents the drivers have experienced in order to suggest corrective techniques and from such. However, Company XYZ does not perform this type of training for drivers who are involved in crashes or receive excessive moving violations. A periodic review on a company's training methods should be performed to determine the overall effectiveness. However training is not constantly revised in terms of audience reaction,

trainee success on the job and the changing needs of the fleet. On-going training is also not performed when equipment changes occur.

Organizations should collect data to calculate rates for tracking safety performance over time and thus determine the effectiveness of procedures, but for Company XYZ, crash incident rates are not maintained. A precise organization should also ensure consistency and validity of statistical information regarding organizational incidents, however, data which could better assist Company XYZ in the analysis of accidents is not on record. Corrective actions to prevent possible re-occurrence of accidents are not developed or presented to management because incident review and analysis are not expediently performed by designated person(s) to identify the root cause(s) and any contributing factors.

Based on the above results obtained from the comparison of the fleet risk control procedure in Company XYZ and industry best practices, a significant gap in operational approaches was identified. This difference might be due to insufficient knowledge of effective fleet vehicle management practices with regard to vehicle crash follow-up and preventive measures among policy writers at Company XYZ and/or the absence of sufficient data to inform the organization of the need to align its fleet risk control procedures to align with industry best practices. Company XYZ's disposition towards its significant loss rate may be regarded as passive since proactive measures do not appear to be enacted to prevent the re-occurrence of accidents. Rather than concentrating on analyzing accidents in order to develop control measures as well as its implementation, non-proactive organizations accept incident occurrence as a norm. However the collective effort of all levels of management to increase awareness towards performing industry best practices in Company XYZ will likely aid in process improvements and decrease the rates of loss.

Recommendations

This study suggest the implementation of the following recommendations which will likely minimize the occurrence of vehicle crashes and reduce the rates of loss in Company XYZ.

- ❖ Develop of fleet vehicle policy which aligns with industry best practices.
  - Establish agreed-upon safety procedures which renders an effective and efficient fleet vehicle operation.
  - Outline the need to perform a root cause analysis on all vehicle crashes.
- ❖ Develop a comprehensive training program which deals with every aspect of safe driving behavior.
  - Vehicle operators should be trained on defensive, distracted and aggressive driving procedures.
  - Vehicle operators should receive effective training on backing techniques with emphasis on the use of rear-view mirrors.
  - Encourage employees to assist each other while backing or else seek other competent assistance.
  - Perform remedial training with drivers who are involved in a crash.
  - Carry out on-going vehicle specific training for all employees.
  - Evaluate the effectiveness of all training that is performed for all employees.
  - Perform regular updating of training materials based on evaluation reports and other necessary factors.
- ❖ Administer post-accident drug and alcohol testing irrespective of the severity of the injury.
- ❖ Ensure a well written educational and physical requirement for applicable task descriptions.
- ❖ Perform regular accident analysis and necessary follow-up activities

- Develop accurate and detailed loss summary reports for effective incident analysis.
- Report all near miss incidents in the identical manner as accidents.
- Report all accidents irrespective of the severity of injury.
- Include the names of every passenger involved in a crash on the report.
- Develop a proactive attitude by visiting on the scene of the accident rather than depend on the police reports alone for the analysis.
- Designate and train individuals to perform incident review and analysis on accident cases in order to identify the root cause(s) and any contributing factors.
- Develop and present needed corrective actions to management.
- Evaluate the effectiveness of recommended corrective actions.

❖ Recordkeeping should include all incident rate data and statistical information which is required to effectively monitor safety performance and tangible outcome such as the number of accidents and the amount of dollar loss. The following data should be included in the records:

- Incident rate based on the number of vehicles operated
- Incident rate based on total vehicle mileage
- Injury incident rate based on the amount of vehicle mileage
- Incident rates based on the service activity
- Motor vehicle injury rates based on the number of employee work hours

❖ All regulatory required equipment should be in all company vehicles.

❖ Perform a study to determine the feasibility of employing more drivers rather than have employee perform two separate functions (i.e. driving and heavy equipment work) during the summer.

- ❖ Perform a study to determine the feasibility of employing more auto claims specialists to handle Company XYZ's vehicle crash incidents.
- ❖ Establish a shared responsibility of Company XYZ's fleet risk control program among every level of management.

Recommendation for Further Research

Recommendation for further research may be conducted in the following areas:

- Evaluate the level of employees' compliance to Company XYZ's policies
- Compare Company XYZ's fleet risk control procedures with another organization in a similar industry.
- Research the exact time of the day in which the highest number accidents occur.
- Research the rate of substance abuse among Company XYZ's drivers.
- Examine the extent that distracted driving has on the organization's accident rate(s).

References

Agnew, J., & Daniel, A. (2011). *Developing high impact leading indicator for safety*. The performance management magazine, 1-3.

Behavior Safety Associate. (2011). *Safety and health recordingkeeping*. Retrieved from http://www.behaviorsafetyassociates.com/services/safety-health-recordkeeping.asp

Brodbeck, J.E. (1966). *Motor fleet safety manual*. Itasa, IL: National Safety Council.

Canadian Centre for Occupational Health and Safety. (2006). *Accident investigation*. Retrieved from http://www.ccohs.ca/oshanswers/hsprograms/investig.html

Centers for Disease Control and Prevention. (2013). *Impaired driving : Get the facts*. Retrieved from http://www.cdc.gov/motorvehiclesafety/impaired_driving/impaired-drv_factsheet.html

Centers for Disease Control and Prevention. (2013). *Injury prevention & control: Motor vehicle safety*. Distracted driving. Retrieved from http://www.cdc.gov/motorvehiclesafety/distracted_driving/

Centers for Disease Control and Prevention. (2011, April). Occupational highway transportation deaths – United States, 2003–2008. *Morbidity and Mortality Weekly Report*, *60* (16), 1-2.

City of Chesapeake, Administrative Regulation. (2005). *Department of Human Resources substance abuse policy*, 2.44(23.8), 1-18.

Close, B. (2010, March). *Analysis of the safety performance measurement system at Company XYZ*. Retrieved from http://www2.uwstout.edu/content/lib/thesis/2010/2010closeb.pdf

Cooper, D. (2012, June). *Management safety culture: A model for understanding and qualifying a difficult concept*. Retrieved from http://www.asse.org/professionalsafety/pastissues/047/06/012683qe.pdf

Connecticut Business & Industry Association. (2013). *Ten commandment of effective discipline*. Retrieved from http://www5.cbia.com/hr/the-ten-commandments-of-effective-discipline/

Crandall, C., Olson, L., & Sklar, D. (2001). Mortality reduction with air bag and seat belt use in head-on passenger car collisions. *American Journal of Epidemiology, 153(3),* 219-224.

Department of Labor & Industry. (n.d.). *A step by step guide: Your accident prevention program*. Retrieved from http://www.lni.wa.gov/Safety/Basics/Programs/Accident/APPCoreRuleGuide.pdf

Durosaro D.O. (n.d.*). Importance of data collection, analysis and storage in our educational system*. Ilorin, Kwara: University of Ilorin.

Dolen Corporation. (2012). *Accident management cost and prevention; find discount via fleet-web*. Retrieved from http://www.donlen.com/accident-management-costs-and-prevention-find-fuel-discounts-via-fleetweb.aspx

Emrich, L. (2010). MS in men and women: The role of testosterone in men. Retrieved from file:///C:/Users/atinuke/Documents/New%20folder%20(4)/What%20Role%20Does%20Testosterone%20Play%20in%20Multiple%20Sclerosis%20%20-%20Risk%20-%20Multiple%20Sclerosis.htm

Ellis, J. (2000). *Analogies to assist in understanding bodily injuries due to motor vehicle collision*. Retrieved from http://www.ellisclinic.com/lowspeed/

Ewing, M., Farah, L., Kwong, D., & Santorsola, K. (2008). *Using business operations metric a leading indicator to provide better financial forecast*. Retrieved from http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/us_so_consulting_usingBusinessOperations_11082008.pdf

Facilities Management Association. (2013). *Benchmark tool*. Retrieved from http://healthandsafetyfma.org/benchmark-tool/

Family Health International. (n.d.). *Qualitative research methods: A data collector's field guide*. Retrieved from http://www.bcps.org/offices/lis/researchcourse/images/overview1.pdf

Fildes, B., Lane, J., Lenard, J., & Vulcan, A. (1994). *Passenger car and occupant injury: Side impact crashes*. Canberra, Australia: Australia Government Publishing Services.

Firstlab (2002). *Guidelines for reasonable suspicion drug and alcohol testing*. Retrieved from http://www.ppta.net/pdf/ReasonableSuspicionTestingSupervisorManual%20.pdf

Fletcher, L. (n.d.). *Who commits more fleet accident & when do they occur?* Retrieved from http://www.automotive-fleet.com/fc_resources/af1010-safety-04-accidents.pdf

Gilreath & Associates. (2013). *Rear-end collision: The most common type of auto accident in the U.S*. Retrieved from http://www.blog.sidgilreath.com/safety/rear-end-collisions-the-most-common-type-of-auto-accident-in-the-u-s.html

Griffey, E. (2013). *10 things that should always be in your car*. Retrieved from http://editorial.autos.msn.com/listarticle.aspx?cp-documentid=1127706

Groeneweg, J. (2011). *Hazard analysis : The accident causation model*. Retrieved from http://www.ilo.org/oshenc/part-viii/audits-inspections-and-investigations/item/914-hazard-analysis-the-accident-causation-mode

Health and Safety Professional Alliance. (2012). The core body of knowledge for generalist OHS professionals. Tullamarine, Victoria: Safety Institute of Australia.

Hesselton, J. (2013, October 26). *Safety recordkeeping* .Retrieved from http://precast.org/2010/10/safety-recordkeeping/

Hoskins, A. (2005). *Occupational injuries, illnesses and fatalities among women*. Retrieved from

http://www.bls.gov/opub/mlr/2005/10/art4full.pdf

Iannarino, A. (2011). *Accountability and leading indicators*. Retrieved from http://thesalesblog.com/blog/2011/10/11/accountability-and-leading-indicators-a-note-to-the-sales-manager/

Institutional laboratory biosafety manual. (2013). *Incident investigation*. Retrieved from http://ehs.osu.edu/FileStore/Biosafety%20Manual/bmappe.pdf

International Council on Mining & Metal. (2012). *Overview of leading indicators for occupational health and safety in mining*. London. ICMM.

Janicak, C.A. (n.d.). Management of safety engineering work: Benchmarking and performance criteria. Des Plaines, IL: American Society of Safety Engineers.

Kellerman, M. (2013). *The importance of recordkeeping*. Retrieved from http://www.usfsafetyflorida.com/Resources/Consultant-s-Corner/The-Importance-of-Recordkeeping

Kennard, J. (2012). Men, moods & testosterone. Retrieved from file:///C:/Users/atinuke/Documents/New%20folder%20(4)/testosterone.html

Kostyniuk, L., Molnar, L, & Eby, D. (1995). *Are women taking more risk while driving? A look at the Michigan drivers*. Ann Arbor, Michigan: University of Michigan.

LexisNexis (2013, May). *MVR how to read*. Retrieved from https://insurancesolutions.custhelp.com/ci/fattach/get/1774537/0/filename/MVR+H2R+srMay+2013.pdf

Licensing and Regulatory Affairs. (2011).Safety & health system guidelines. Lansing, Michigan: Department of Licensing & Regulatory Affairs.

Martin, P., & Burgett, A. (2001). *Rear-end collision events: Characterization of impending crashes*. Iowa, IA: University of Iowa.

Martinson & Beason. (2013). *Types of car accidents*. Retrieved from http://www.martinsonandbeason.com/practice-areas/car-accidents-huntsville-alabama/types-of-car-accidents/

Medeiros, M. (2011). *Why corporate reputation matters*. Retrieved from http://michellemedeiros.wordpress.com/2011/04/04/why-corporate-reputation-matters/

Mottola, F., Johnson, M., Owen, C., Aurther, A., & Randall, R. (2003). *Drive right*. Upper Saddle River, NJ: Pear Education, Inc. Publishing.

Montana Department of Labor and Industry. (2010*). Accident investigation*. Retrieved from http://erdwebadmin.com/safety-training-material/accident-investigation/accident-investigation-web.pdf

National Highway Traffic Safety Administration. (2005, March). *Trend and pattern analysis of highway crash fatality by month and day*. National Center for Statistics and Analysis. Retrieved from http://www-nrd.nhtsa.dot.gov/Pubs/809855.pdf

National Safety Council. (2013). *Safety management system*. Retrieved from http://www.nsc.org/safety_work/benchmarking_measurement/Pages/benchmarking_measurement.aspx

National Traffic Safety Institute. (2012). *Defensive driving*. Retrieved from http://ntsi.com/defensive-driving/

Occupational Safety Health & Administration. (n.d.). *Construction fatal four*. Retrieved from file:///C:/Users/atinuke/Documents/New%20folder%20(4)/OSHA%20Commonly%20Used%20Statistics.htm

Organization for Economic Co-operation and Development. (2006, October). *Young drivers: The road to safety*. Retrieved from http://www.internationaltransportforum.org/jtrc/safety/YDpolicyBrief.pdf

Peterson, D. (2003). *Techniques of safety management: A system approach*. Des Plaines IL: American society of Safety Engineer.

Pojasek, R. (2009). Quality tool box: Using leading indicators to drive sustainability performance. *Wiley InterScience*. Retrieved from http://isites.harvard.edu/fs/docs/icb.topic746473.files/Supplemental%20Reading%20Folder/Leading%20Indicators%20Final.pdf

Pratt, S. (2003, September). *Work related roadway crashes*. Cincinnati, OH: NIOSH Publication.

Raouf, A. (2011). *Theory of accident cause*. Retrieved from http://www.ilo.org/oshenc/part-viii/accident-prevention/item/894-theory-of-accident-causes

Reason, J. (1995). *Human factors*. Retrieved from http://operatingexperience.doe-hss.wikispaces.net/file/view/Human+factors+-+How+to+Take+the+First+Steps.pdf

Reuber, R., & Fischer, E. (2010). International entrepreneur ship in inter-enable markets. *Journal of Business Venturing, 26*(6), 660-679. doi: 10.1016/j.jbusvent.2011.05.002

Simpson, H.M., & Mayhew, D.R. (2009). *Effectiveness and role of driver education and training in a graduated licensing system*. Retrieved from http://www.drivers.com/article/305#tirfintro

Telogis. (2013). *Resouces*. Retrieved from http://www.telogis.com/resources/how-much-could-benchmarking-save-your-fleet/

Texas Law Enforcement Explorer Advisement Association. (n.d.). *Traffic accident investigation*. Retrieved from http://www.co.wise.tx.us/constable/downloads/traffic%20accident%20investigation.pdf

Tiesman, H.M., Konda, S., & Bell, J.L. (2011). *The epidemiology of fatal occupation traumatic brain injury in the United States*. Morgantown, WV: Elsevier, Inc. Publishing.

Traffic Association Causation in Europe. (2009). *Accident causation and pre-accidental driving situation, 3*. Retrieved from http://www.trace-project.org/publication/archives/trace-wp2-d2-3-v3.pdf

Traffic safety. (2011). *Trucking association calls for retaining current HOS rules. 2* (2). Itasca, IL: National Safety Council.

U.S Department of Transport. National Highway Traffic Safety Administration. (2008). *2008 traffic safety facts: A compliation of motor vehicle crash data from thr fatality analysis reporting system and general estimate system (DOT HS 811 170)*. Retrieved from http://www-nrd.nhtsa.dot.gov/pubs/811170.pdf

U.S Department of Transport. National Highway Traffic Safety Administration. (2013). 2011 *traffic safety facts: Occupant protection*. Retrieved from http://www-nrd.nhtsa.dot.gov/Pubs/811729.pdf

U.S Department of Labor.Occupational Health & Safety Administration. (2008). *Safety & health management system etool: Fact sheets* Retrieved from https://www.osha.gov/SLTC/etools/safetyhealth/mod4_factsheets.html

U.S Department of Labor, Bureau of Labor Statistics. (2013). *National census of fatal occupational injuries in 2012*. Retrieved from http://www.bls.gov/news.release/pdf/cfoi.pdf

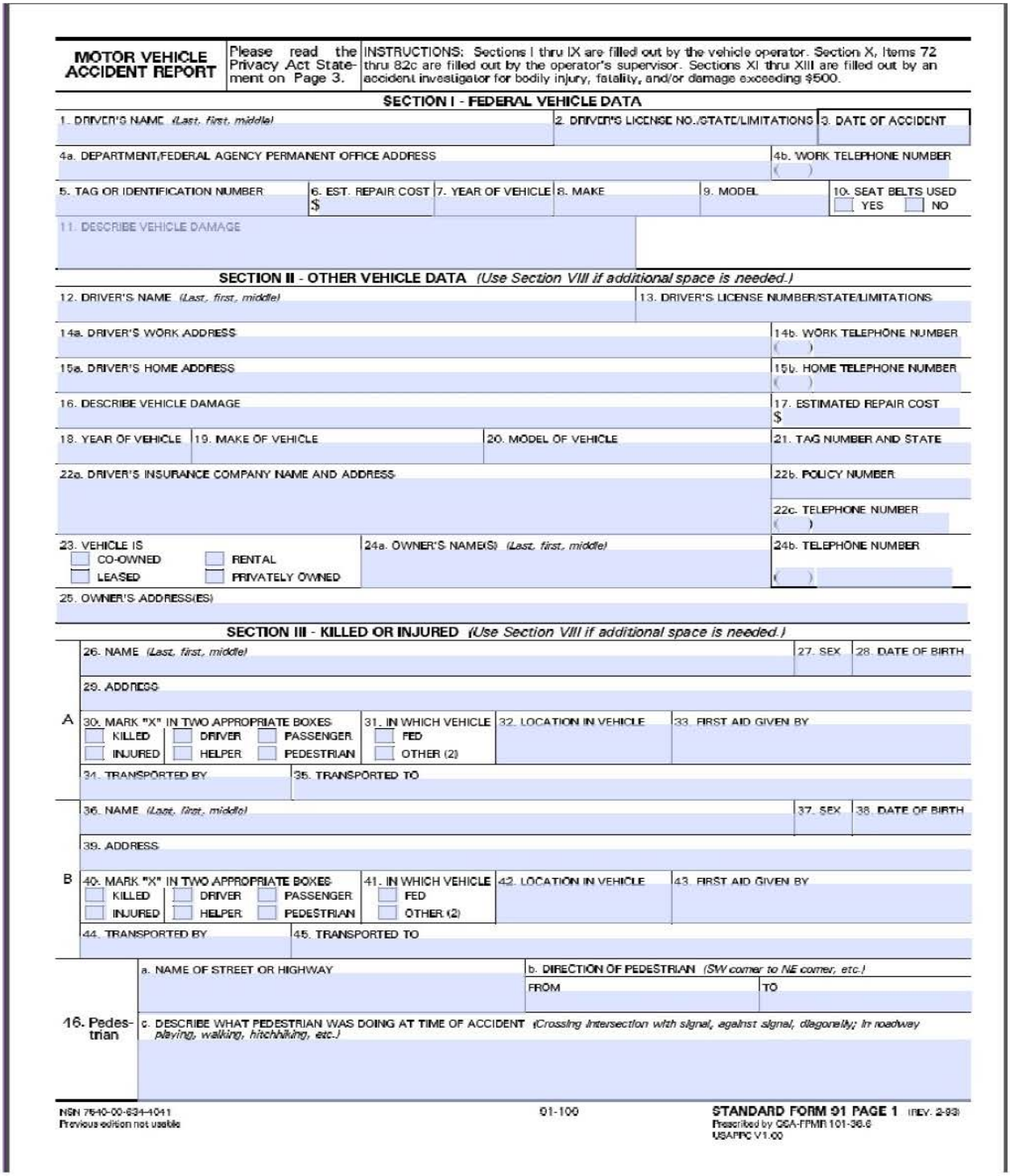
United State Department of Transportation. Federal Motor Carrier Safety Administration. (n.d.). *Driver requirement*. Retrieved from http://www.fmcsa.dot.gov/safety-security/eta/part391.htm

United State Department of Transportation. Federal Motor Carrier Safety Administration. (2013). *Controlled substance and alcohol use and testing*. Retrieved from http://www.fmcsa.dot.gov/rules-regulations/administration/fmcsr/FmcsrGuideDetails.aspx?menukey=382

Wick, D. (2010). *Metrics: Leading and lagging indicators*. Retrieved from http://strategicdiscipline.positioningsystems.com/blog-0/bid/50581/Metrics-Leading-and-Lagging-Indicators

WorkSafe BC. (2012). *Investigation of accident and incidents. Reference guide and work book*. Vancouver, BC: Worker & Employer Service Division

Appendix A: Accident Reporting Form



MOTOR VEHICLE ACCIDENT REPORT | Please read the Privacy Act Statement on Page 3. | INSTRUCTIONS: Sections I thru IX are filled out by the vehicle operator. Section X, Items 72 thru 82c are filled out by the operator's supervisor. Sections XI thru XIII are filled out by an accident investigator for bodily injury, fatality, and/or damage exceeding $500.

SECTION I - FEDERAL VEHICLE DATA

1. DRIVER'S NAME *(Last, first, middle)* | 2. DRIVER'S LICENSE NO./STATE/LIMITATIONS | 3. DATE OF ACCIDENT

4a. DEPARTMENT/FEDERAL AGENCY PERMANENT OFFICE ADDRESS | 4b. WORK TELEPHONE NUMBER ( )

5. TAG OR IDENTIFICATION NUMBER | 6. EST. REPAIR COST $ | 7. YEAR OF VEHICLE | 8. MAKE | 9. MODEL | 10. SEAT BELTS USED ☐ YES ☐ NO

11. DESCRIBE VEHICLE DAMAGE

SECTION II - OTHER VEHICLE DATA *(Use Section VIII if additional space is needed.)*

12. DRIVER'S NAME *(Last, first, middle)* | 13. DRIVER'S LICENSE NUMBER/STATE/LIMITATIONS

14a. DRIVER'S WORK ADDRESS | 14b. WORK TELEPHONE NUMBER ( )

15a. DRIVER'S HOME ADDRESS | 15b. HOME TELEPHONE NUMBER ( )

16. DESCRIBE VEHICLE DAMAGE | 17. ESTIMATED REPAIR COST $

18. YEAR OF VEHICLE | 19. MAKE OF VEHICLE | 20. MODEL OF VEHICLE | 21. TAG NUMBER AND STATE

22a. DRIVER'S INSURANCE COMPANY NAME AND ADDRESS | 22b. POLICY NUMBER | 22c. TELEPHONE NUMBER ( )

23. VEHICLE IS ☐ CO-OWNED ☐ RENTAL ☐ LEASED ☐ PRIVATELY OWNED | 24a. OWNER'S NAME(S) *(Last, first, middle)* | 24b. TELEPHONE NUMBER ( )

25. OWNER'S ADDRESS(ES)

SECTION III - KILLED OR INJURED *(Use Section VIII if additional space is needed.)*

A

26. NAME *(Last, first, middle)* | 27. SEX | 28. DATE OF BIRTH

29. ADDRESS

30. MARK "X" IN TWO APPROPRIATE BOXES: ☐ KILLED ☐ INJURED | ☐ DRIVER ☐ HELPER | ☐ PASSENGER ☐ PEDESTRIAN | 31. IN WHICH VEHICLE ☐ FED ☐ OTHER (2) | 32. LOCATION IN VEHICLE | 33. FIRST AID GIVEN BY

34. TRANSPORTED BY | 35. TRANSPORTED TO

B

36. NAME *(Last, first, middle)* | 37. SEX | 38. DATE OF BIRTH

39. ADDRESS

40. MARK "X" IN TWO APPROPRIATE BOXES: ☐ KILLED ☐ INJURED | ☐ DRIVER ☐ HELPER | ☐ PASSENGER ☐ PEDESTRIAN | 41. IN WHICH VEHICLE ☐ FED ☐ OTHER (2) | 42. LOCATION IN VEHICLE | 43. FIRST AID GIVEN BY

44. TRANSPORTED BY | 45. TRANSPORTED TO

46. Pedestrian

a. NAME OF STREET OR HIGHWAY | b. DIRECTION OF PEDESTRIAN *(SW corner to NE corner, etc.)* FROM | TO

c. DESCRIBE WHAT PEDESTRIAN WAS DOING AT TIME OF ACCIDENT *(Crossing intersection with signal, against signal, diagonally; In roadway playing, walking, hitchhiking, etc.)*

NSN 7540-00-634-4041
Previous edition not usable

01-100

STANDARD FORM 91 PAGE 1 (REV. 2-93)
Prescribed by GSA-FPMR 101-36.6
USAPPC V1.00

SECTION IV - ACCIDENT TIME AND LOCATION *(Use Section VIII if additional space is needed.)*

47. DATE OF ACCIDENT

48. PLACE OF ACCIDENT *(Street address, city, state, ZIP Code; Nearest landmark; Distance nearest intersection; Kind of locality (industrial, business, residential, open country, etc.); Road description).*

49. TIME OF ACCIDENT
AM
PM

50. INDICATE ON THIS DIAGRAM HOW THE ACCIDENT HAPPENED

Use one of these outlines to sketch the scene. Write in street or highway names or numbers.

a. *Number Federal vehicle as 1, other vehicle as 2, additional vehicle as 3 and show direction of travel with arrow.*

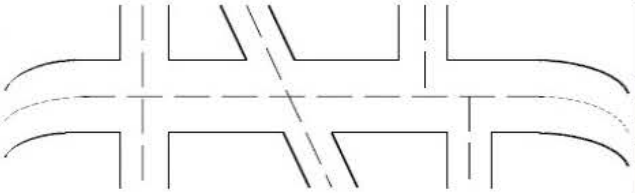
Example: 1 2

b. Use solid line to show path before accident 2 and broken line after the accident 2

c. Show pedestrian by

d. Show railroad by

e. Place arrow in this circle to indicate *NORTH*



51. POINT OF IMPACT *(Check one for each vehicle)*

FED	2	AREA
		a. FRONT
		b. R. FRONT
		c. L. FRONT
		d. REAR
		e. R. REAR
		f. L. REAR
		g. R. SIDE
		h. L. SIDE

52. DESCRIBE WHAT HAPPENED *(Refer to vehicles "Fed", "2", "3", etc. Please include information on posted speed limit, approximate speed of the vehicles, road conditions, weather conditions, driver visibility, condition of accident vehicles, traffic controls (warning light, stop signal, etc.) condition of light (daylight, dusk, night, dawn, artificial light, etc.), and driver actions (making U-turn, passing, stopped in traffic, etc.).*

SECTION V - WITNESS/PASSENGER *(Witness must fill out SF 94, Statement of Witness) (Continue in Section VIII.)*

A

53. NAME *(Last, first, middle)*

54. WORK TELEPHONE NUMBER ( )

55. HOME TELEPHONE NUMBER ( )

56. BUSINESS ADDRESS

57. HOME ADDRESS

B

58. NAME *(Last, first, middle)*

59. WORK TELEPHONE NUMBER ( )

60. HOME TELEPHONE NUMBER ( )

61. BUSINESS ADDRESS

62. HOME ADDRESS

SECTION VI - PROPERTY DAMAGE *(Use Section VIII if additional space is needed.)*

63a. NAME OF OWNER

63b. OFFICE TELEPHONE NUMBER ( )

63c. HOME TELEPHONE NUMBER ( )

63d. BUSINESS ADDRESS

63e. HOME ADDRESS

64a. NAME OF INSURANCE COMPANY

64b. TELEPHONE NUMBER ( )

64c. POLICY NUMBER

65. ITEM DAMAGED

66. LOCATION OF DAMAGED ITEM

67. ESTIMATED COST
$

SECTION VII - POLICE INFORMATION

68a. NAME OF POLICE OFFICER

68b. BADGE NUMBER

68c. TELEPHONE NUMBER ( )

69. PRECINCT OR HEADQUARTERS

70a. PERSON CHARGED WITH ACCIDENT

70b. VIOLATION(S)

SECTION VIII - EXTRA DETAILS

SPACE FOR DETAILED ANSWERS. INDICATE SECTION AND ITEM NUMBER FOR EACH ANSWER. IF MORE SPACE IS NEEDED, CONTINUE ITEMS ON PLAIN BOND PAPER.

SECTION IX - FEDERAL DRIVER CERTIFICATION

In compliance with the Privacy Act of 1974, solicitation of the information requested on this form is authorized by Title 40 U.S.C. Section 491. Disclosure of the information by a Federal employee is mandatory as the first step in the Government's investigation of a motor vehicle accident. The principal purposes for using this information is to provide necessary data for legal counsel in legal actions resulting from the accident and to provide accident information/statistics in analyzing accident causes and developing methods of reducing accidents. Routine use of information may be by Federal, State or local governments, or agencies, when relevant to civil, criminal, or regulatory investigations or prosecutions. An employee of a Federal agency who fails to report accurately a motor vehicle accident involving a Federal vehicle or who refuses to cooperate in the investigation of an accident may be subject to administrative sanctions.

I certify that the information on this form *(Sections I thru VIII)* is correct to the best of my knowledge and belief.

71a. NAME AND TITLE OF DRIVER	71b. DRIVER'S SIGNATURE AND DATE

SECTION X - DETAILS OF TRIP DURING WHICH ACCIDENT OCCURRED

72. ORIGIN	73. DESTINATION

74. EXACT PURPOSE OF TRIP

75. TRIP BEGAN	DATE	TIME *(Circle one)*	76. ACCIDENT OCCURRED	DATE	TIME *(Circle one)*
		a.m. p.m.			a.m. p.m.

77. AUTHORITY FOR THE TRIP WAS GIVEN TO THE OPERATOR	78. WAS THERE ANY DEVIATION FROM DIRECT ROUTE
☐ ORALLY ☐ IN WRITING *(Explain)*	☐ NO ☐ YES *(Explain)*

79. WAS THE TRIP MADE WITHIN ESTABLISHED WORKING HOURS	80. DID THE OPERATOR, WHILE ENROUTE, ENGAGE IN ANY ACTIVITY OTHER THAN THAT FOR WHICH THE TRIP WAS AUTHORIZED.
☐ YES ☐ NO *(Explain)*	☐ NO ☐ YES *(Explain)*

81. COMPLETED BY DRIVER'S SUPERVISOR	a. DID THIS ACCIDENT OCCUR WITHIN THE EMPLOYEE'S SCOPE OF DUTY	b. COMMENTS
	☐ YES ☐ NO	

82a. NAME AND TITLE OF SUPERVISOR	82b. SUPERVISOR'S SIGNATURE AND DATE	82c. TELEPHONE NUMBER
		( )

SECTION XI - ACCIDENT INVESTIGATION DATA

83. DID THE INVESTIGATION DISCLOSE CONFLICTING INFORMATION. ☐ YES ☐ NO *(If "Yes", explain below.)*

84. PERSONS INTERVIEWED

NAME	DATE	NAME	DATE
a.		c.	
b.		d.	

85. ADDITIONAL COMMENTS *(Indicate section and item number for each comment.)*

SECTION XII - ATTACHMENTS

LIST ALL ATTACHMENTS TO THIS REPORT

SECTION XIII - COMMENTS/APPROVALS

86. REVIEWING OFFICIAL'S COMMENTS

87. ACCIDENT INVESTIGATOR	88. ACCIDENT REVIEWING OFFICIAL
a. SIGNATURE AND DATE	a. SIGNATURE AND DATE
b. NAME *(First, middle, last)*	b. NAME *(First, middle, last)*
c. TITLE	c. TITLE
d. OFFICE	d. OFFICE
e. OFFICE TELEPHONE NUMBER ( )	e. OFFICE TELEPHONE NUMBER ( )

Appendix B: Supervisor's Responsibility Checklist

Listed below are 48 tasks and responsibilities. (Some of them may not be a part of your job.) Put a check mark in the column under the head that best indicates your responsibility for the tasks listed at the left.

Usually you will have responses in all three columns. This is normal. Do not be dismayed to find you have a number of check marks in the third column. Everyone does.

	Yes	No	I Don't Know
New Employees			
1. Hire			
2. Accept or reject applicants			
3. Report on probationary employees			
Training Employees			
4. Orient new employees			
5. Explain safe operation/rules			
6. Hold regular production meetings			
7. Hold safety (tool box) meetings			
8. Coach employees on the job			
Production			
9. Control quantity			
10. Control quality			
11. Stop a job in progress			
12. Authorize changes in setup			
13. Requisition supplies			
14. Control scrap			
15. Establish housekeeping standards			
Safety			
16. Take unsafe tools out of production			
17. Investigate accidents			
18. Establish inspection committees			
19. Inspect your own department			
20. Correct unsafe conditions			
21. Correct unsafe acts			
22. Send employees to the doctor			
Discipline			
23. Recommend promotions or demotions			
24. Transfer employees out of your department			
25. Change an employee to a less desirable job			
26. Grant pay raises			
27. Issue warnings			
28. Suspend			
29. Discharge			
Assigning Work			
30. Prepare work schedules			
31. Assign specific work			
32. Delegate authority to leaders			
33. Authorize overtime			
Employee Affairs			
34. Prepare vacation schedules			
35. Grant leaves of absence			
36. Lay off for lack of work			
37. Process grievances			
Coordination			
38. Authorize maintenance and repairs			
39. Make suggestions for improvement			
40. Discuss problems with management			
41. Recommend changes in policy			
42. Improve work methods			
Cost Control			
43. Reduce waste			
44. Keep production records			
45. Budget			
46. Approve expenditures			
Other			
47. Keep up employee morale			
48. Reduce turnover			

Appendix C: Application Form

APPLICATION FOR EMPLOYMENT

COMPANY _____ STREET ADDRESS _____

CITY, STATE AND ZIP CODE _____

NAME _____
(FIRST) (MIDDLE) (Maiden Name, if any) (LAST)

ADDRESS _____ HOW LONG? _____
(STREET) (CITY) (STATE & ZIP CODE)

DATE OF BIRTH _____ SOCIAL SECURITY NO. _____ HIRE DATE _____

TELEPHONE NUMBER _____ E-MAIL ADDRESS _____

PREVIOUS THREE YEARS RESIDENCY

_____ # YEARS _____
(STREET) (CITY) (STATE & ZIP CODE)

_____ # YEARS _____
(STREET) (CITY) (STATE & ZIP CODE)

_____ # YEARS _____
(STREET) (CITY) (STATE & ZIP CODE)

(ATTACH SHEET IF MORE SPACE IS NEEDED)

LICENSE INFORMATION

Section 383.21 FMCSR states "No person who operates a commercial motor vehicle shall at any time have more than one driver's license". I certify that I do not have more than one motor vehicle license, the information for which is listed below.

STATE	LICENSE NO.	TYPE	EXPIRATION DATE

DRIVING EXPERIENCE

CLASS OF EQUIPMENT	TYPE OF EQUIPMENT (VAN, TANK, FLAT, ETC.)	DATES FROM TO	APPROX. NO. OF MILES (TOTAL)
STRAIGHT TRUCK			
TRACTOR AND SEMI-TRAILER			
TRACTOR - TWO TRAILERS			
OTHER			

ACCIDENT RECORD FOR PAST 3 YEARS OR MORE (ATTACH SHEET IF MORE SPACE IS NEEDED)

DATES	NATURE OF ACCIDENT (HEAD-ON, REAR-END, UPSET, ETC.)	NUMBER FATALITIES	NUMBER INJURIES	CHEMICAL SPILLS
				YES NO
				YES NO
				YES NO

TRAFFIC CONVICTIONS AND FORFEITURES FOR THE PAST 3 YEARS (OTHER THAN PARKING VIOLATIONS)

DATE CONVICTED (month/year)	VIOLATION	STATE OF VIOLATION LOCATION	PENALTY (forfeited bond, collateral and/or points)

(ATTACH SHEET IF MORE SPACE IS NEEDED)

A. Have you ever been denied a license, permit or privilege to operate a motor vehicle? YES _____ NO _____

If yes, explain _____

B. Has any license, permit or privilege ever been suspended or revoked? YES _____ NO _____

If yes, explain _____

EMPLOYMENT RECORD
(ATTACH SHEET IF MORE SPACE IS NEEDED)

Applicants that desire to drive in intrastate/interstate commerce must provide the following information on all employers during the previous three years. You must give the same information for all employers you have driven a commercial motor vehicle for the seven years prior to the initial three years (total of ten years employment record).

Must list the complete mailing address: street number and name, city, state and zip code.

LAST EMPLOYER: NAME _____

ADDRESS _____ PHONE _____

POSITION HELD _____ FROM _____ TO _____ SALARY _____

REASONS FOR LEAVING _____

ANY GAPS IN EMPLOYMENT AND/OR UNEMPLOYMENT MUST BE EXPLAINED. INCLUDE DATES (MONTH/YEAR) AND REASON. _____

Were you subject to the Federal Motor Carrier Safety Regulations (FMCSRs) while employed by the previous employer? Yes No

Was the previous job position designated as a safety sensitive function in any DOT regulated mode, subject to alcohol and controlled substances testing requirements as required by 49 CFR Part 40? Yes No

SECOND LAST EMPLOYER: NAME _____

ADDRESS _____ PHONE _____

POSITION HELD _____ FROM _____ TO _____ SALARY _____

REASONS FOR LEAVING _____

ANY GAPS IN EMPLOYMENT AND/OR UNEMPLOYMENT MUST BE EXPLAINED. INCLUDE DATES (MONTH/YEAR) AND REASON. _____

Were you subject to the Federal Motor Carrier Safety Regulations (FMCSRs) while employed by the previous employer? Yes No

Was the previous job position designated as a safety sensitive function in any DOT regulated mode, subject to alcohol and controlled substances testing requirements as required by 49 CFR Part 40? Yes No

THIRD LAST EMPLOYER: NAME _____

ADDRESS _____ PHONE _____

POSITION HELD _____ FROM _____ TO _____ SALARY _____

REASONS FOR LEAVING _____

ANY GAPS IN EMPLOYMENT AND/OR UNEMPLOYMENT MUST BE EXPLAINED. INCLUDE DATES (MONTH/YEAR) AND REASON. _____

Were you subject to the Federal Motor Carrier Safety Regulations (FMCSRs) while employed by the previous employer? Yes No

Was the previous job position designated as a safety sensitive function in any DOT regulated mode, subject to alcohol and controlled substances testing requirements as required by 49 CFR Part 40? Yes No

TO BE READ AND SIGNED BY APPLICANT

I authorize you to make sure investigations and inquiries to my personal, employment, financial or medical history and other related matters as may be necessary in arriving at an employment decision. (Generally, inquiries regarding medical history will be made only if and after a conditional offer of employment has been extended.) I hereby release employers, schools, health care providers and other persons from all liability in responding to inquiries and releasing information in connection with my application.

In the event of employment, I understand that false or misleading information given in my application or interview(s) may result in discharge. I understand, also, that I am required to abide by all rules and regulations of the Company.

"I understand that information I provide regarding current and/or previous employers may be used, and those employer(s) will be contacted, for the purpose of investigating my safety performance history as required by 49 CFR 391.23(d) and (e). I understand that I have the right to:

- Review information provided by current/previous employers;
- Have errors in the information corrected by previous employers and for those previous employers to re-send the corrected information to the prospective employer; and
- Have a rebuttal statement attached to the alleged erroneous information, if the previous employer(s) and I cannot agree on the accuracy of the information."

_____ _____
DATE APPLICANT'S SIGNATURE

This certifies that I completed this application, and that all entries on it and information in it are true and complete to the best of my knowledge.

_____ _____
DATE APPLICANT'S SIGNATURE

Note: A motor carrier may require an applicant to provide information in addition to the information required by the Federal Motor Carrier Safety Regulations.

Appendix D: Pre & Post Vehicle Inspection Report

Driver's Vehicle Inspection Report

Check Any Defective Item and Give Details Under "Remarks."

DATE: _____

TRUCK/TRACTOR NO. _____

- ☐ Air Compressor
- ☐ Air Lines
- ☐ Battery
- ☐ Brake Accessories
- ☐ Brakes
- ☐ Carburetor
- ☐ Clutch
- ☐ Defroster
- ☐ Drive Line
- ☐ Engine
- ☐ Fifth Wheel
- ☐ Front Axle
- ☐ Fuel Tanks
- ☐ Heater
- ☐ Horn
- ☐ Lights
  - Head – Stop
  - Tail – Dash
  - Turn Indicators
- ☐ Mirrors
- ☐ Muffler
- ☐ Oil Pressure
- ☐ On-Board Recorder
- ☐ Radiator
- ☐ Rear End
- ☐ Reflectors
- ☐ Safety Equipment
  - Fire Extinguisher
  - Flags-Flares-Fusees
  - Spare Bulbs & Fuses
  - Spare Seal Beam
- ☐ Springs
- ☐ Starter
- ☐ Steering
- ☐ Tachograph
- ☐ Tires
- ☐ Transmission
- ☐ Wheels
- ☐ Windows
- ☐ Windshield Wipers
- ☐ Other

TRAILER(S) NO.(S) _____

- ☐ Brake Connections
- ☐ Brakes
- ☐ Coupling Chains
- ☐ Coupling (King) Pin
- ☐ Doors
- ☐ Hitch
- ☐ Landing Gear
- ☐ Lights – All
- ☐ Roof
- ☐ Springs
- ☐ Tarpaulin
- ☐ Tires
- ☐ Wheels
- ☐ Other

Remarks: _____

☐ CONDITION OF THE ABOVE VEHICLE IS SATISFACTORY

DRIVER'S SIGNATURE _____

☐ ABOVE DEFECTS CORRECTED

☐ ABOVE DEFECTS NEED NOT BE CORRECTED FOR SAFE OPERATION OF VEHICLE

MECHANIC'S SIGNATURE _____ DATE _____

DRIVER'S SIGNATURE _____ DATE _____

Appendix E: Annual Vehicle Inspection Report

VEHICLE CONDITION REPORT

USE YOUR SEATBELT

DATE

PRINT EXCEPT SIGNATURE, USED PROPERLY THIS CHECKLIST IS PROTECTION

LOCATION (City) | STATE | ORGANIZATION | TRUCK or TRACTOR-TRAILER NUMBERS

DRIVER | DRIVER

INSTRUCTIONS: Drivers will perform necessary inspection. A check (√) indicates satisfactory condition. An "X" indicates unsafe or improper conditions. Items corrected will be circled by management certifier.

INSIDE
- ☐ Parking Brake (Apply)

START ENGINE
- ☐ Oil Pressure (Light or Gauge)
- ☐ Air Pressure or Vacuum (Gauge)
- ☐ Low Air or Vacuum Warning Device (Air pressure below 40 psi check on pressure build-up. Air pressure above 60 psi deplete air until warning device works). Vacuum below 8 inches Hg. check on build-up. Above 8 inches Hg. deplete vacuum until device works.
- ☐ Instrument Panel (Telltale lights or buzzers)
- ☐ Horn
- ☐ Windshield Wiper and Washer
- ☐ Heater-Defroster
- ☐ Mirrors
- ☐ Steering Wheel (Excess Play)
- ☐ Apply Trailer Brakes in EMERGENCY
- ☐ Turn on all lights including 4-way Flasher
- ☐ Starts Properly

ON COMBINATIONS
- ☐ Hoses, Connections
- ☐ Couplings (Fifth Wheel, Tow Bar, Safety Chains, Locking Devices)

EMERGENCY EQUIPMENT
- ☐ Fire Extinguishers
- ☐ Flags, Standards, Warning Lights
- ☐ Fuses
- ☐ Reflectors
- ☐ Spare Bulbs
- ☐ Chains in Season
- ☐ First Aid Kits

FRONT
- ☐ Headlights
- ☐ Clearance Lights
- ☐ Identification Lights
- ☐ Turn Signals and 4-way Flasher
- ☐ Tires and Wheels-Lugs and Serviceability

INSIDE
- ☐ Release Trailer Emergency Brakes
- ☐ Apply Service Brake-air loss should not exceed 3 psi per minute on single vehicles, 4 psi per minute on combinations

SIDE

LEFT	RIGHT	
☐	☐	Fuel Tank and Cap
☐	☐	Sidemarker Lights
☐	☐	Reflectors
☐	☐	Tires and Wheels-Lugs and Serviceability
☐	☐	Cargo Tie-downs/or Doors

REAR
- ☐ Tail Lights
- ☐ Stop Light
- ☐ Turn Signals and 4-way Flasher
- ☐ Clearance Lights
- ☐ Identification Lights
- ☐ Reflectors
- ☐ Tires and Wheels, Lugs and Serviceability
- ☐ Rear End Protection (Bumper)
- ☐ Cargo Tie-downs/Doors

MECHANICAL OPERATION
- ☐ Engine knocks, misses, overheats, etc.
- ☐ Clutch skips, grabs, other
- ☐ Transmission noisy, hard shifting, jumps out of gear, other
- ☐ Axles — noisy, other
- ☐ Steering loose, shimmy, hard, other
- ☐ Air, oil, water, leaks
- ☐ Springs broken, other
- ☐ Brakes noisy, pulls, soft, other
- ☐ Speedometer, Tachometer
- ☐ Tachograph, Speed Control Devices
- ☐ Other _____

OTHER

YES	NO	
☐	☐	Equipment Inspection Enroute
☐	☐	Cargo Securing Devices
☐	☐	_____
☐	☐	_____
☐	☐	_____
☐	☐	_____

START TIME	SPEEDOMETER	END TIME	SPEEDOMETER

REMARKS/OTHER DEFECTS

DRIVER'S SIGNATURE

DEFECTS CORRECTED (Initial)	DEFECT CORRECTION UNNECESSARY (Initial)	CERTIFIED BY	DATE
DEFECTS CORRECTED ☐ Yes ☐ No		DRIVER'S SIGNATURE (If Defects)	DATE

Appendix F: Fleet Risk Assessment Template

The company's policy should indicate	**Y**		**N**	**Comments**
Title- Name of policy				
Background- About the service				
Purpose & scope				
Policy statement				
Operating procedures				
Company XYZ will be in compliance with federal, state and local laws and regulations				
Policy accessibility to employee at all levels				
Approved by being signed and dated by top management				
Acknowledgement by being signed and dated by each employee				
Annual policy review by management				

The company's assign responsibility should indicate	**Y**	**N**	**Comments**
The policy clearly explains a designation of roles, responsibilities and level of authorities			
Management delegates supervisors for various departments within the organization			
Supervisors designate individuals to be accountable within each smaller unit			
Supervisors are trained to understand management's expectations of their roles regarding safety			
Supervisors mentor designated individuals accountable for smaller units on their responsibilities			
The company carries out an evaluation to determine how well supervisors understand their roles			
Supervisors follow-up on			

performance of representatives of smaller units			
Top management request for performance report on safety program activities frequently			

The company drug and alcohol testing should indicate	**Y**	**N**	**Comments**
Organization train drivers of the prohibitions against using of controlled substance or alcohol while on duty			
Company XYZ train drivers of the prohibitions against operating a company fleet vehicle while in the possession of controlled substance or alcohol			
Employees are tested on alcohol, marijuana, amphetamines, cocaine, opiates and phencyclidine (PCP)			
Company informs applicant that employment is contingent on the result being negative			
At least 10% of drivers are randomly tested each year for prohibited alcohol use.			
At least 50% of drivers are randomly tested each year for controlled substances use			
Company prohibits driver who tested positive to controlled substance or BAC of 0.02% or above, or refused to be tested, from performing a safety-sensitive function			
Company conducts required post-accident controlled substances and alcohol tests			
Company advises drivers of the requirement to remain readily available for a post-accident test			
A driver is tested when there is a reasonable suspicion that he or she is under the influence alcohol or			

controlled substances			
There is a measure of penalty for employee who test positive to controlled substance and BAC greater than 0.02%			
A negative test result implies immediate reinstatement of the employee's driving privileges			
Prior to returning to a safety-sensitive function following a positive test result for alcohol or controlled substances, the driver is required to pass a return-to-duty test			
Drivers who engage in prohibited conduct are evaluated by a substance abuse professional to determine what assistance the employee needs in resolving problems associated with alcohol or controlled substances use			
Company ensures that a driver who engaged in prohibited conduct and is returned to performing safety-sensitive functions is subject to unannounced follow-up testing at the direction of a substance abuse professional			
Test results are maintained in a confidential manner			

The company's emergency equipment should include	**Y**	**N**	**Comments**
• Fire extinguisher			
• Spare fuse			
• Reflector triangles			
• Flash light with extra batteries			
• High visibility vest			
• First aid kit with nitrile gloves			
• Space blanket			
• Spare gloves			

• Disposable flash camera			
• Crash reporting kit			

The company's vehicle inspection and maintenance should indicate	**Y**	**N**	**Comments**
The vehicle pre and post trip inspection involves the following: Seat belt			
Service brakes			
Parking brakes			
Steering mechanism			
Horn			
Windshield wiper(s)			
Coupling devices			
Fluid leaks			
Radiator			
Windshield wiper(s)			
Light devices and reflector • Head light			
• Brake light			
• Turn Signal			
• Hazard Lights			
Tires • Proper inflation • Adequate tread • Spare tire			
Mirrors • Rear view mirror • Side view mirror			
Gauges • Fuel • Temperature • Dashboard warning light			
The Periodic check involves the following			
Brake system • Service brake			
• Parking brake			

• Brake drum or rotors			
• Brake Hose			
• Brake tubing			
• Low pressure warning device			
• Tractor protection valve			
• Air compressor			
• Electric brakes			
• Hydraulic brakes			
• Vacuum systems			
Coupling device • Fifth wheel			
• Pintle hook			
• Drawbar/tow bar eye			
• Drawbar/tow bar tongue			
• Safety devices			
• Saddle mounts			
Steering mechanism			
• Steering wheel			
• Steering column			
• Front axle beam			
• Steering gear box			

• Pitman arm			
• Power steering			
• Ball and socket joints			
• Tie rods and drag links			
• Nuts			
• Steering system			
Suspension • U-bolts / axle positioning part			
• Spring assembly			
• Torque, radius, or tracking component			
Frame • Tire & wheel clearance			
• Adjustable axle assemblies			
Wheel and Rims • Lock or side ring			
• Fasteners			
• Welds			
• Wheel and Rims			
Exhaust system			
Fuel system			
Lighting device			

Tires			
Windshield glazing			
Windshield wipers			
Reporting procedure for vehicle defect			
The company keeps maintenance records for all vehicles			
The company keeps a valid annual inspection record for the entire operating vehicle			
Drivers are trained on the proper completion of pre and post-trip inspections			
The company documents the pre and post inspection			
Continuous preventive maintenance procedure			

The company's driver selection documentation should indicate	**Y**	**N**	**Comments**
The company has a written hiring policy for employing drivers			
The driver qualification file contain the following: • Complete employment application			
• Driver's License			
• Information from previous employer during the preceding 3 years			
• 3 years MVR from state agency(ies) where a driver holds			

motor vehicle operator's license • Driver road test examination • Written examination • Medical examination report and medical examiner certificate • Annual review of driving record • Annual driver's certification of violation.			
There is a system to ensure all license and endorsements remain current and valid			
Motor Vehicle Records (MVR's) are obtained on all new drivers and compared to the written hiring criteria			
There is a system that will ensure drivers' medical certificate is current			
The company verifies that the physician is knowledgeable in the completion of the exam forms			
The files will indicate a complete and accurate investigation of past employment history of drivers			
The company can produce a complete and accurate driver qualification file at random/unannounced			

The company's driver discipline should indicate	**Y**	**N**	**Comments**
Written disciplinary action addressing noncompliance			

to organization's standard of operation			
Driver discipline applies to every employees at all level			
Consistency in disciplinary measure			
Company practices regarding verbal warnings			
Company utilizes written warning			
A metric/rubric in which number of violation determines the measure of discipline (i.e. the greater the number of violations the higher the level of discipline)			
Utilization of a progressive violation system			

The company's driver training should indicate	**Y**	**N**	**Comments**
New employees are trained on the skill needed to perform required task properly			
Sufficient training time will be provided			
Employees are provided the opportunity to ask questions during training			
Instructors possess a combination of education and experience that qualify them for their assignments			
Employees are permitted to evaluate the training session			
The training program address • Defensive driving			
• Distracted driving			

• Aggressive driving • Effective use of restraints			
The company utilizes various methods of training • Group session • One-on-one • Self-tutoring			
The company utilizes the most effective method of training			
Company performs refresher training on a routine basis			
Company performs remedial training			
Remedial training focuses on the type of accident employee was involved in			
Instructional materials are appropriate for the ability of the trainee			
Provision of training material for each trainee			
Training focuses on the type and size of vehicle utilized by drivers			
Test are conducted after every training session			
Training materials are regularly reviewed and updated			
Company maintains training records			

The company's accident reporting and investigation should	**Y**	**N**	**Comments**

indicate			
Drivers are trained on carrying out the following steps at the scene of an accident: • Protect the scene • Request emergency assistance if someone is injured. • Notify a company representative. • Collect crash information and identify witnesses.			
Drivers/vehicles are equipped with an accident reporting kit			
Vehicle operators are trained on how to collect data at the scene of a crash			
Drivers know the company representative to be contacted after an accident			
Company representative visits the scene of crash to obtain sufficient data			
The company representatives are well trained on how to collect data at the scene of the incident			
The information collected at the scene of crash includes: • Vehicle condition • Specific location of the crash • Weather condition • Estimated manner of event • Photographs of crash			

scene			
• Driver's account of the accident			
• The driver's condition at the time of the crash (including the number of mile driven, activity in previous 24 hours, and trip details).			
• Diagrams indicating various crash factors such as skid marks and debris.			
The following materials are made available to company representative during the crash data collection process • Cellular phone			
• Global positioning system			
• Digital camera			
• Measuring tapes			
• Tire pressure gauge			
• Warning reflectors			
• Auxiliary lighting			
• Lumbar crayons			
• Bright spray paint			
• Reflective safety vest			

• Cold weather gear			
Data obtained are sufficient for accident analysis			
The company have a designated role for accident review and analysis			
Senior management are notified of crash incident			
The company carries out further analysis to identify the root cause of accident			
Company develops corrective measures for reoccurring accidents			
Corrective measures are presented to senior management			
Corrective action are implemented immediately			

The company's recordkeeping practices should include :	**Y**	**N**	**Comments**
Assign responsibility for safety activities and/or results			
Driver qualification file			
Driver training record			
Drug and alcohol testing results			
Vehicle maintenance record			
Driver discipline record			
Accident reporting and investigation			
Incident rate			
Records kept in secure location			