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**PASSENGER'S PERCEPTION OF RISK FACTORS IN RELATION
TO ROAD TRAFFIC ACCIDENTS IN KENYA:**

**CASE STUDY OF REGULAR USERS OF PUBLIC TRANSPORT
IN NAIROBI COUNTY.**

BY

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DECLARATION

This research report is my original work and has never been presented for a master's degree or any other award in any other Institution of higher learning.

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DEDICATION

To my family members: Simeon Imboga, Mary Imboga, Mercy Liphede and Winfrey Kwamboka for their support and understanding when I was not there for them working on this study. Also I dedicate this work to my immediate boss – Col (Rtd), Peter Njoroge for the support and encouragement throughout this course. Thank you for your endurance and stepping-in when I was not available during the study.

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I wish to express my sincere gratitude to the Almighty God for His protection I have enjoyed throughout my life, most especially for sailing me through this program successfully.

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LIST OF ABBREVIATIONS AND ACRONYMS.

PSV – Passenger Service Vehicles.

KeNHA – Kenya National Highways Authority.

WHO – World Health Organization.

UK – United Kingdom.

RTA – Road Traffic Accidents.

VMT – Vehicle Mile Travelled.

RHT – Risk Homeostasis Theory.

RCT – Risk Compensation Theory.

OECD – Organization for Economic Co-operation and Development.

SCT – Social Cognitive Theory.

SPSS – Statistical Package for Social Sciences.

NTSA – National Transport and Safety Authority.

TPB - Theory of Planned Behavior.

TRA - Theory of Reasoned Action

CCTV – Close Circuit Television.

US – United States.

ABSTRACT

The study of passenger's perceptions on risk factors in relation to road traffic accidents problem was meant to add knowledge on understanding on how to mitigate the occurrence of road traffic accidents and related injuries in Kenya. There was an assessment on the role of risk perception and other risk related factors in road transport which included investigations of individual and situational factors that predicted the occurrence of traffic accidents of Passenger-carrying vehicles and how they can be measured. The study applied both qualitative and quantitative methodologies within a framework of a case study approach. The study targeted 300 respondents selected within Nairobi County after which stratified random sampling was used to ensure results are proportional and representative of the whole, from which simple random sampling was used to make a sample of 100 respondents. The quantitative data were collected from passengers and analyzed by using a statistical package for social sciences (SPSS) while qualitative was by use of focus group and was analyzed using content analysis.

The study concluded that the following factors were perceived by passengers to be the major contributors of road accidents which included: not following traffic rules and regulations to the later, drivers are the persons to take full responsibility for the road carnages experienced, there were no safety measures adequate to reduce or alleviate road accidents. Driving under influence of alcohol or other drugs likely to impair the driver's ability to judge and control the vehicle, most accidents or collisions are a result of over speeding or overloading leading to loss of control, road signs should be clear not to convey unmistakable message to the driver and traffic laws and regulations are necessary. The measures that have been put in place by the central governments to reduce traffic accidents, which include: enforcing laws to be adhered to by both road users and PSVs, ensuring that PSVs have speed governors, safety belts, use of alcohol blows on the drivers and ensuring curfews are put in place for travelling hours are perceived to be not effective or not enforced by the relevant bodies due to corruption. The study recommends that to improve road transport system within Nairobi, there is need to encourage stakeholders' participation to ensure that their views were put into consideration when the government is drawing of strategic plans and drafting policies necessary to curb road accidents. The study also recommended that roads should be built in a way you can't overlap to prevent illegal turns on roads. Also those who disobey traffic rules should be arrested and punished and also those who give bribes should be arrested. Safety measures should be put in place such as CCTV, car trackers for all PSVs in order to be monitored centrally.

CHAPTER ONE: INTRODUCTION

1.0 Background of the study

Road traffic accidents have become the leading cause of death and disability in many countries across the world, low-income and middle-income countries which have only 48% of the world's vehicles are reported to account for about 90% of these casualties. However, while the casualty rate is decreasing significantly in the developed world as a result of ambitious accident countermeasures put in place, in developing countries like Kenya limited attention has been paid to this growing threat. Hence, while traffic accidents are predicted to further decrease by 27% in the developed countries by 2020, they are estimated to increase by 83% in low income and middle income countries (WHO Report, 2012). The economic and psychosocial consequences of these accidents for the rural and urban poor, majority that make up the vulnerable road users such as pedestrians, cyclists, and occupants of passenger-carrying vehicles, are devastating.

In most cases, the transport industry stakeholders blame the poor state of Kenyan roads as the leading cause of accidents. With the recent improvement of infrastructure in Kenya however, fatal road accidents continue to be reported. This has resulted to a blame game between especially the operators of the Public Service Vehicles (PSV) and The Traffic department of Kenya Police, with the former blaming the corruption among law enforcement agencies while the latter blames PSV operators especially drivers on flouting the laid down regulations. PSV drivers have been blamed for careless driving, incompetence, speeding, drunk driving and a myriad of other vices that render them prone to causing accidents that could have been avoided in the first place.

The Traffic Police on the other hand, while charged with enforcing The Traffic Act, have on numerous occasions been caught on camera receiving bribes, and have featured in various corruption indices reports as leading in the vice. In fact, while the Kenyan Police was reported as

the most corrupt institution in Kenya by the East African Bribery Index Report (2011) it is the traffic arm of this organization that tops the list. According to the Kenya National Highways Authority (KeNHA), there are 160,886 km of public roads with 11,197 km translating to 7% having been tarmacked. This therefore means that most of the roads may not be easily motorable. However, majority of the reported road accidents occur in the motorable sections with the three major highways- Nairobi-Thika roads, Nairobi-Mombasa road, and the Nairobi- Nakuru- Eldoret roads reporting most of the accidents. Thika road (50.4 km) and Mombasa road (470 km) happen to be some of the busiest roads in Kenya. There are approximately 80 documented black spots, with the majority being along these three highways.

Road traffic accidents which are generally unintended and preventable are a common risk every day to life that can happen to almost every one, anywhere. The problem of road traffic accident is increasingly becoming a threat to public health and national development in many developing countries. Road traffic accidents contribute to poverty by causing deaths, injuries, disabilities, grief, lost of productivity and material damages. The British Medical Journal of 11th May 2002 indicated that more people die on the road traffic accident than from malaria worldwide; and that traffic accident cause about 1.2 million deaths and injury 10 to 15 million people a year in the world. Many people do not know that road traffic accidents are preventable. (Krug, 2002).

Road traffic accidents are the most frequent causes of injury-related deaths worldwide (Astrom, et al. 2006). Statistical projections show that during the period between 2000 and 2020, fatalities related to traffic accidents might decrease by about 30% in high income countries. The opposite pattern is expected in developing countries, where traffic accidents are expected to increase at a fast rate in the years to come. World Health Organization (WHO) strategy of 2001 reports that currently road traffic injuries are the leading cause of deaths and injuries, the 10th leading cause

of all deaths and 9th leading contributor to the burden of disease worldwide based on disability adjusted life years. The numbers of deaths resulting from road traffic crashes have been projected to reach 8.4 million in the year 2020.

Worldwide reports reveal the problem of accidents being equally serious. According to research carried out by Pierce and Maunder (1998), under the auspices of Road Research Laboratory in UK, they found out that in the year 1997 around 20 million people were victims of road accidents worldwide where 70% of the victims came from developing countries. The number of accidents per registered vehicles was 10% to 20% higher in developing countries than in the developed world. The more general reasons advanced by these researchers for an increase of accidents in developing countries were as follows;

- 1) Rapid urbanization process in these countries,
- 2) High growth rates of traffic,
- 3) Poor road conditions,
- 4) Reckless driving,
- 5) Non-adherence to the traffic regulations by the drivers and the traffic officers (due to corruption),
- 6) The majority of people in developing countries are dependent on public transport for their daily movement. In developing countries the public transport system such as matatus has a much higher accident risk than in developed countries.

In developing countries the proportion of seriously injured and killed casualties are higher than in the developed countries. An analysis of cross sectional data on road traffic related deaths has shown that the poorest countries have highest road traffic related mortality rates (Söderlund et al 1995). In this analysis, many industrialized countries appear to have introduced interventions that

reduced the incidence of road traffic injuries and improved survival of those injured (Søderlund et al 1995). In developing countries there are some peculiarities regarding the accident profiles. A study done in Calcutta, India, reported that there are some host (human) factors (such as the behavior of drivers, pedestrians and cyclist behaviors) and seasonal factors (weather and time) that contribute to fatal road traffic accidents Zhang et al (1998). Overall, most traffic accidents occurred on main roads (highways) and in the majority of cases pedestrians were found to be at fault during crossing the roads (Majumder et al 1996).

Studies done worldwide have shown that road traffic accidents are the leading causes of death of many adolescents and young adults (Odero et al 1997; Balogun et al 1992). There is evidence that using minimum safety standards, accident worthiness improvement in vehicles, seatbelts use laws and reduced alcohol use can substantially reduce deaths on the road (Leon 1996). In developing countries, including Kenya, the scenario is different from developed countries, road traffic accidents are increasing with time and mortality due to road traffic accidents is also on the rise (Asogwa 1992). When taking the population figures into account, developing countries in Sub-Saharan Africa have the highest frequency of various accidents worldwide (Peden et al 2004). Although an implication of this is that the risky environments in countries need further empirical attention, few studies have investigated how people in these societies perceive risk. In this problem there are many agents, which include (Asogwa 1992):

- (1) The police who are interested in legal enforcement
- (2) The insurance companies and vehicle owners in the monetary cost of road accidents
- (3) The accident victim and their relatives in those of lives or disability and related cost of Medical care

(4) The health care system and medical personnel who are responsible for the emergency treatment and life savings of accident victims.

1.1 Statement of the problem

Public transport systems are generally poorly developed in most countries of Africa. Both conventional buses and other vehicle types (e.g. minibuses, taxis and converted pick-up trucks etc), known by different names (such as *matatus* in Kenya, *donfo* in Nigeria, *trotro* in Ghana) are used widely for passenger transport. These vehicles are often poorly maintained, overloaded, and driven recklessly at high speeds resulting in high accident rates. Unconventional vehicles are often the main means of transport for low-income people both in the cities and rural areas, because of their lower fares, availability and convenient routes (Simon, 1996).

A study in Nairobi, Kenya by (Kapila et al 1982) found that poorest residents without any education were more likely to walk (27%) or use public transport (55%) than those with secondary education or higher level of education who travelled mainly in private cars (81%). The poorer populations who cannot afford to own their vehicles are therefore more likely to walk or ride *matatus* – the more dangerous form of transportation. Several studies have documented pedestrians and passengers as the most vulnerable road-users (Nantulya et al, 2001; Odero et al, 1997). For example, in an analysis of the data recorded for 13,000 road deaths in Kenya for the period 1992-1996, Nantulya and colleagues showed that pedestrians (42%) and passengers (38%) accounted for those killed in accidents.

In Kenya, Odero (1997) conducted 12 key informant interviews and 3 focus group discussions with respondents, representing diverse stakeholders in road safety work, to assess their perceptions and attitudes. Most of the respondents felt that human factors were the most frequent cause of

accidents, which include; drivers not enrolling in driving schools hence lacking in-depth knowledge about driving. Others also just ignore them and as a result end up causing carnage on our roads. Driving for long hours without rest, thus concentration reduces to a level where the driver loses competency to control the vehicle. Also excessive speeding, being under the influence of alcohol or intoxicated substances, reckless driving, using a handheld mobile telephone while the vehicle is moving and over loading of vehicles are behaviors of drivers that cause accidents.

Section 44 of the traffic Act in Kenya states that “*A person who, when driving or attempting to drive, or when in charge of a motor vehicle on a road or other public place, is under the influence of drink or a drug to such an extent as to be incapable of having proper control of the vehicle, commits an offence and shall be liable, upon conviction, to imprisonment for a term not exceeding ten years, or to a fine not exceeding five hundred thousand shillings, or both.*” (Laws of Kenya, cap 403). It neither defines the legal limit of blood alcohol concentration, nor does it specify procedures for detection, resulting in low detection. In addition lack of enough equipment, patrol vehicles, personnel and established procedures for surveillance of drink driving by the traffic police contribute to poor reliability of breathalyzers in providing reliable and valid estimates of blood alcohol concentrations in injured patients attending emergency departments (Odero et al, 1999), the use of breathalyzers by the police has not been sanctioned by law.

There have been other studies done in Kenya on road safety and road accidents. For example Wanjama (2010) studied the influence of the implementation of new traffic rules in reducing of road accidents in Kenya: a case of Nyeri Central District. Another study by Murimi (2013) investigated the determinants of Severity of Road Accidents involving buses along Kenyan Roads: A Case of Nairobi - Kisumu Highway, Kenya. Ogutu (2012) did a study on the Road Traffic

Accidents (RTA) characteristics along the A109 road while Pukose (2007) evaluated the outcome of the effects of the new road traffic rules and regulations on the incidence and severity of passenger service vehicle related injuries presented at Kenyatta National Hospital. From the above studies none focused on the perception passengers to risk factors in relation to road traffic accidents in Nairobi County. It is against this background that, the study was conducted to fill in the gap in knowledge which exists by identifying the perception of road accidents risk factors among passengers as road users in Nairobi County.

1.2 Research questions

The following are the research questions that guided the study:

- a) How is risk perceived in the safe use of public transport vehicles in Nairobi County?
- b) How do individual and situational factors influence perception of risk of accidents in passenger service vehicle drivers in Nairobi County?
- c) What is the perceived level of adequacy of training and reliability of drivers of public transport vehicles?
- d) What is the passenger's perception on safety measures undertaken by local authorities to prevent road traffic accidents in Nairobi County?

1.3 Objectives of the study

1.3.1 General objective:

The general objective of the study was to examine the perceptions and awareness of risk factors underlying the occurrence of traffic accident among PSV commuters in Nairobi County.

1.3.2 Specific objectives

The specific objectives of the study are:

- a) To determine how risk is perceived by passengers in the safe use of public transport vehicles in Nairobi County.

- b) To examine how individual and situational factors influence perception of risk of accidents in passengers in public vehicles in Nairobi County.
- c) To assess perceived adequacy of training and reliability of drivers of public transport vehicles.
- d) To establish the form of safety measures that have been undertaken by local authorities to prevent road traffic accidents in Nairobi County and how they are perceived by passengers.

1.4 Justification of the study

The study adds knowledge on understanding of risk factors of road traffic accidents and related injuries in Kenya hence helping minimize road traffic accidents. The data obtained in this study, may be used by the road safety authorities for planning and evaluating road safety measures. The data may also be utilized by the health authorities in Nairobi County and possibly at the national level for planning health care delivery systems. The recommendations given, if considered, are going to benefit the public at large on prevention of road accidents. The data can also be utilized as baseline data in future related researches.

1.5 Scope and Limitations

1.5.1 Scope of the Study

The study was conducted in Kenya within Nairobi County. The study included road traffic users selected in various in various bus stations and also information was collected from experts who were the key informants. There was an assessment on the role of risk perception and other risk related judgment in road transport which were included in investigations of individual and situational factors that influence increased traffic accident risk among drivers of passenger-carrying commercial vehicles and how they can be measured. There was description of personal

characteristics of the drivers in terms of sex, age, education level, experience, driving license, duration of driving and visual problems while driving.

1.5.2 Limitations of the Study

- i) One major limitation of the study was getting the necessary information from some drivers since some were perpetrators of the crime and thus they may not be willing to open up. The researcher handled the problem by carrying with him an introduction letter from the university and assured them that the information they gave was to be treated with confidentiality and it was to be used purely for academic purposes.
- ii) There was also concern that some public vehicle users didn't fully cooperate to respond to the questions due to pressure on time to provide all the information. The researcher explained to them that the study would be brief, the information collected would be useful to them in future and the information they gave was not meant to victimize them.
- iii) The study was limited in Nairobi County thus the findings of the study and the conclusions made would not necessarily reflect the conditions and accidents risk factors in the entire country. Also the sample still would not reflect the entire condition in the County.

1.6. Definition of terms and concepts.

1. **Perception**; Thought in mind in understanding the existing situation, event or phenomenon by an individual or groups of people influenced by knowledge of thinking or an awareness of one's surroundings that is produced by the operation of the senses.(Slovic, 1987) In this study perception is regarded as opinion or views of an individual on road traffic accidents.

2. **Risk**; can be defined as the subjective assessment of probability for specific occurrence of a negative event, and how concerned individual is with the consequences of this event (Sjorberg, Moen & Rundmo 2004)

3. **Risk Mitigation**; is defined as safety measures put in place to curb or decrease the probability of a traffic accident occurrence.

4. **Risk perception**; is the combination of perceived probability and severity of consequences, relate to how an individual perceives risk. (Sjorberg, Moen & Rundmo 2004)

5. **Road Traffic Accident**; Unexpected and undesirable crash involving two or more vehicles in which at least one is in motion or crash involving a vehicle and other road users; e.g. A pedestrian. In either case, there is casualty where by people getting injured or killed or it results in a material damage.

6. **Traffic risk**; It is used to denote the likelihood or probability of an individual being involved in a traffic accident times the consequences of this unwanted event.

7. **Black spots**; is an engineering term to denote the section of a road network where traffic accidents usually occur.

8. **Health risk**; a term that express the relationship between accidents and population. It is measured as the number of persons killed or injured in a geographical area in a year divided by 100,000 populations in that geographical area.

9. **Injuries**; Number of persons who sustain tissue damage which may be slight or serious in a motor vehicle crash.

10. **System risk**; a term that express the relationship between accidents and motor vehicles. It is measured as the number of persons killed or injured in a geographical area a year divided by 100,000 vehicles in that geographical area in the year

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK.

2.1 Introduction

Accidents are perceived to be caused by many factors, sometimes singly but more frequently in combination. Traffic accidents are caused due to interaction of vehicle, driver, roadway and environmental factors or characteristics, which include the following:

2.1.1 Human Behavior Approaches.

A good control of the vehicles on the road depends very much on the behaviors and skill of the driver (CSA1983). Driving is a complex system in which a large number of variables are interacting with each other but also with varying degree of dependence. Accident may be due to judgment errors, ignorance, incompetence, rule violation, lapses or carelessness, all of which are human errors (Lemming 1969). The human factor contributes to the majority of road traffic accidents. A study done by Odero (1995) in Kenya, reported that human factors were responsible for 85% of all causes (Odero 1995).

a) Driving

Jorgensen and Abane, (1999), Explains that, in regard to road traffic behavior, one can distinguish between driving skills (Knowledge and training) and driving style which reflects attitudes and traffic risk perception, training of drivers improves their driving skills. Study done by Asogwa in Nigeria has revealed that a sizeable proportion of drivers who possesses driving licenses never showed up in any driving school or went through a driving test but simply bought their licenses. Untrained drivers, not unexpectedly, often result in high accident rates (Asogwa 1992). In emergence conditions, stopping distance is also important. However this depends very much on the driver's reaction time, speed of the vehicles, quality of tires, and the condition of the road (Lemming 1969).

Studies done on drivers after being involved in motor accidents reported that although alcohol is the most prevalent source of driver's impairment, other drugs or substance abuse can also contribute to the problem (Violant et al 1996; Kayombo 1995; Broughton 1991; Leon 1996; Shibata 1994). Driving under the influence of alcohol or other drug abuse is known to impair the driver's ability to judge and control the vehicle (CSA-1993, Orsay et al 1994). Other studies have suggested that driver's fatigue is a factor in approximately one in four casualty accidents (NSW 1998). Furthermore, fatigue-related accidents occur more frequently on weekends than weekdays and they typically occur in early morning. Most of the accidents are caused by less experienced and non-professional drivers (Asogwa 1978). Fatigue due to long distance driving is a risk to road accidents. It is advised to plan resting points in advance before starting a long journey (NSW 1998). Fatigue also can be caused by day work (Zhang et al 1998).

Excessive speed is also mentioned as the major contributing factor on road accidents and subsequent injury rates of persons injured. Similarly property damage appears to be linked to the vehicle's speed at impact (Shibata et al 1994). Some medical conditions are also mentioned to be risk factors for driving (Hayes 1972). For example, diabetes and epilepsy have been identified as factors that are associated with increased risk if a person is allowed to drive (Odero 1997, Redelmeier et al 1997 and Lave et al 1993). Violant in 1996 reported that the frequency of road accidents involving epileptics and diabetics is double the normal and for a heart patient it is 60% higher (Kent 1991; Zhang et al 1998). However, a study done by Guibert et al (1998) failed to reveal a significant association between the above medical conditions with motor vehicle accidents (Violant et al 1996).

b) Age

The driver's age is also known to be an important factor contributing to occurrence of accidents. Available literatures shows that adolescents or young drivers are frequently involved in traffic accidents than other age groups (Bjornskau, 2000) Leon et al (1996) have also shown through their various studies that young drivers are more frequently involved in accidents caused by inappropriate speed and loss of control of the vehicle compared to other age group of drivers. The study by Graham (1993) reported that motor accidents were prevalent in certain age group and they occurred at certain hours of the day and week and at certain locations. Some people are more susceptible than others and susceptibility is increased by alcohol and other drug abuse as well as other physiological states such as fatigue (Graham 1993).

Leon et al (1996) observed that reckless driving in adolescents has been associated with increased risk of accidents (Leon 1996). The problem with young drivers is that they like risk taking behavior; also they lack driving skills (Vasconcellos 1999; Zhang et al 1998).The problem of young drivers is also mentioned as an important variable contributing to high fatalities or injuries (Hakims 1991) Massie et al in their study have also reported that old drivers (70 years and over) have the highest rate of fatal accident involvement while young drivers have highest rates of injurious involvement (Massie et al 1995).

2.1.2 Vehicle

It has been established by Dowing et al (1994) and Abane (1993) that the number of road worthy vehicles operating in developing countries is lower than those in developed countries. Worn out vehicles are more likely to be involved in traffic accidents. Vehicles with seatbelts, adequate lights, brakes, steering wheel, tires as well as direction indicators among others and in good condition can help to reduce traffic accident.

a) Vehicle factor approaches

Under the vehicle factors including its design, lighting system, break system and its use are significant contributors to road traffic accidents (Odero 1995). According to Jorgensen and Abane, (1999), a mixture of different types of vehicle including motorcycles and bicycles operating at different speeds is more widespread in urban areas. This influences the system risk due to the risk of accident or collisions between various types of vehicles (Light, heavy or overloaded) with various speed levels and non motorized road users. Increase in income per capita is associated with increased number of vehicles purchased and in turn this may lead to increased accidents (Khair 1990; Leon 1996; Hakims et al 1991). Vehicles mile travelled (VMT) and periodic vehicle inspection are also variables appearing to affect the number of accidents (Jegede 1998). There is some evidence from motorways that accident rate per vehicle mile falls with increasing traffic density up to a certain point and it may rise again after reaching that point.

Vehicle characteristics and vehicle use are frequently cited in the literature as being potentially important factors contributing to high motor vehicle related fatality rates. A study done in Papua New Guinea revealed that vehicles are overloaded and improper vehicles are used to transport passengers (Probox Saloon cars) thus increasing the risk of accidents. Similarly open back vehicles (Pick-ups) have also been reported to be associated with increased risk to passengers (Nelson et al 1991). Design of the vehicle, well breaking system of the vehicle, better tires and extended visibility due to improved lighting of the vehicle reduce risk of accidents. Defects in design or manufacture of vehicle can threaten occupants' safety. Improvement of the interior of the vehicle tends to increase the safety of the occupants (Graham 1993).

2.1.3 Environment

Both the physical and social environments are key risk factors in motor vehicle accidents. They influence road user behavior and motor vehicles. For instance, potholed roads affect driving behavior and condition of vehicles. Poor roadway lighting affects visibility of drivers. The values, cultural and religious beliefs within the social environment such as fatalism, or the belief that accidents are just punishments from the gods for wrong doers indirectly influence road user behavior tremendously.

Concerning the physical environment, various climatic threats and geo hazards like heat, fog, high winds, snow, rain, ice, flooding, tornadoes hurricanes, and avalanches have effects on roads hence on traffic accidents, Moen et al (2005),. The weather (Heavy tropic rainfalls) also threatens surface transportation and impact road way safety, mobility and productivity. It affects roadway safety through increased accident risk as well as exposure to weather related hazards. Weather impacts roadway mobility by increasing travel time delay, reducing traffic volumes and speeds and decreasing roadway capacity Odero et al (1991),. Weather and road conditions in terms of road qualities therefore have a role in the causes of traffic accidents. In the same manner, the situation of areas of residence and working whether in an urban or rural area determines the extent of traffic accident risk in an area. The buildup physical and social environment with regards to road network, the types of roads, and quality of the road like black spots, road segments, lane width, junction layout, potholes and other characteristics of the road, have strong effects on road safety in any place, (Oluwasanmi 1993).

The area planning and land use patterns perspective has also an impact on traffic accidents, the existence of squatter buildings (Which are generally poorly regulated), traffic calming schemes in residential areas, restricted driving areas as well as traffic separation in a place does matter for

road safety, and this is because they have strong bearing on traffic generating activities as well as problems and solution of traffic safety efforts. Shibata et al (1994).

a) Environment Factor approaches

The environment factors including design of road, its geographic location, season, weather, visibility, time of day, and traffic regulations (Lemming 1969, CSA-1983). A clear understanding of the causal factors is of utmost importance in any attempt to design a road safety promotion or preventive program (Sarungi1981). Well-designed roads with separate lines for pedestrians and cyclists are much safer than those without such facilities. Sometimes barriers to discourage pedestrians to motor roads reduce the rate of injuries. Modern roads are safe because they are well designed with all important signs (Graham 1993; Bjornskau et al 2000). The road signs should be clear by themselves and should not convey an unmistakable message to the driver.

The super elevation of highway roads such as tilting the road surface downward towards the inside curve has shown a positive effect in reducing motor accidents. The mechanism behind this is that the slope produces a force tending to push a car inwards and this interacts with some or all of the centrifugal force, which in turn acts outwards on any object moving in a curve path (Leeming 1969). It has also been observed that accidents mostly occur on broader roads than narrower ones (Majumder et al 1996). In Nigeria they regrettably reported that better roads have resulted in excessive speed and reckless driving resulting in an increase rather than decrease in death toll on national roads (Asogwa 1992).

There is a relationship between seasonality; weather and time factor in road traffic accident occurrence (CSA 1983, Jegede 1988, Zhang et al 1998). Fatal accidents mostly occur during winter season. A study done by Kong et al has revealed that most of the accidents occur during the night, weekends and during months of October to December (Kong et al 1996). A study done by Barreto

et al observed that exposure to high intensity noise at work place tends to be associated with occupationally acquired hearing deficits. These deficits increase the risk of motor vehicle injury to pedestrian workers (Barreto et al 1997). Activities along the road side such as petty trading, increases exposure risk to traffic accidents Shibata et al. (1994), at the same time improved road quality may lead to behavioral adjustments in terms of more risk prone driving, Jorgensen and Abane (1999).

2.1.4 System of traffic laws, control and regulations.

Enforcement and traffic laws have to do with government policy regarding road safety issues. The aim of traffic regulation systems and enforcement is to ensure adequate operations in the traffic environment and system maintenance by legislation and controls. Regulations by traffic signaling systems, speed limits and speed controls as well as the existence of police patrols and checkpoints can lead to some reduction of accidents by influencing the road user's behavior. Jorgensen and Abane, (1999) also argued in their study in Ghana that, traffic regulation schemes are not systematically implemented and the police service is generally less well trained, equipped and motivated to enforce moving violations, as are evident in cities in developed countries.

a) System of traffic laws, control and regulations approaches.

Thomson et al found that riders with helmet had an 85% reduction in their risk of head injury compared with those without a helmet (Thomson et al 1989). Rivara has reported the effectiveness of the helmets in pedal cyclists and motor cyclists (Rivara 1985).Mandatory use of helmets in Sweden showed the same good effects (Kent 1991).The effectiveness of helmet use is dependent upon the speed of the motorcyclist. It is more protective at low speed of 50km per hour but less effective at higher speeds. Safety belt use by all seat occupants has been found to reduce motor vehicle related injuries (MMWR 1992; Leon 1996). Broughton in England observed that

compulsory seat belt wearing was beneficial (Broughton 1991). Seat belts for older, children and adults prevent approximately 50% to 60% of all fatalities resulting from motor traffic accidents (Rivara 1985).

It is well documented that the use of child restraints, specifically child safety seats, can reduce morbidity and mortality in young victims of motor vehicle accidents (CSA 1983). Approximate restraints prevent approximately 90% of fatalities in 0 to 4 year old age group (Rivara 1986). Behavioral intervention and tighter regulations are also important measures (Jayasuria 1991; Graham 1993). However legislative and other counter measures proved effective in Nigeria (Asogwa 1992). Promotion of road safety through the use of targeted media campaigns at community level can effectively reduce motor traffic accidents (Tripop 1994).

2.2 Theoretical Framework

The perception of road traffic accidents are believed to have varying causes. These causes may be complex in nature and are often perceived to be impacted by science and politics (Elvik & Vaal, 2004). In attempting to understand how road accidents are perceived and propose guidelines for researching their underlying causes, several theoretical frameworks and models have been put forward. Much of these have to do more with drivers than any other category of road users like the vehicle occupants. While some have placed emphasis on individual characteristics, others have focused on the situational as well as the socio-ecological dimensions.

These theories and models have their strengths and weaknesses and none has complete scientific coverage of the scope of factors implicated in traffic accidents. Though no single theory or model has gained universal acceptance among the traffic research community, they nonetheless have shaped our understanding of the road accident problem in significant ways. Given the above stated

reasons, three theories have been used in this study. In accordance with the research focus and aims of the present study, the following theoretical perspectives and models that seek to explain accident involvement in relation to human factors and structural factors provide a good fit and have been selected to constitute the theoretical framework. They are: systems theory, risk theory, social cognitive theory. They support the case study approach to accident analysis which holds that the actual causes of each accident cannot be fully known when they are studied independent of the context in which they occur.

2.2.1 Risk theory

Human beings take risks on a daily basis. “Risk surrounds us, it envelops us. It is our personal and societal preoccupation and our salvation. Without understanding it we risk everything, and without capitalizing upon it we gain nothing” (Breakwell, 2007, p. xi). It is a concept that defies a single straight forward definition due to its multidisciplinary applicability. For instance, studies involving risk cut across the physical and social sciences by psychologists, sociologists, geographers, economists, nuclear scientists, environmentalists, etc.

Because it is applicable in many domains, the term *risk* is sometimes used interchangeably with *hazard* although there might exist a relationship between them. Technically, risk is defined as probability multiplied by consequence (i.e., probability x consequence) (Drotts-Sjøberg, 1991). Breakwell (2007) defines risk as “the probability of a particular adverse event occurring during a stated period of time”, (p.2). Breakwell sees the word “probability” as the likelihood of some specific adverse events (e.g., road traffic accidents) that might result from being exposed to a hazard. Risk can also be defined as subjective assessment of probability for a specific occurrence of a negative event, and how concerned individual is with the consequences of this event (Sjorberg

1983, Rundmo 2004 & Moen 2005), thus the combination of perceived probability and severity of consequences , relate to how the individual perceive risk.

There is no doubt that human beings are interested in knowing the likelihood or probability of an adverse event happening to them and how bad or worse the effect might be. The search for understanding the nature of risk and how it is perceived by individuals has led to the development of risk theories and models such as the theory of risk homeostasis and risk compensation (Wilde, 1994; 1998), risk thermostat framework, the risk perception, etc. Social scientists have suggested that risk is socially constructed and have set out to investigate how passengers perceive and negotiate daily risks like road traffic accidents. It must be noted that these theories and models have not gone without criticisms.

a) Risk perception

The degree of risk perceived determines the degree of actions to be taken (Adams, 1995). Risk perception (Slovic, 2009) and its relationship with road traffic accidents has been the subject of numerous studies in the traffic literature. It is assumed that there are individual and group differences in risk perception. Personality traits are known to influence risk perception (Vavrik, 1997; Ulleberg & Rundmo, 2003; Rundmo & Iversen, 2004; Oltedal & Rundmo, 2006; Gulliver & Begg, 2007). Douglas (1986) has indicated that risk perception is the result of personal dispositions and socio-cultural factors e.g., religious beliefs. This position has been well illustrated by the cultural theory of risk (Douglas & Wildavsky, 1982). This attribute has made risk perception a multidimensional construct, hence what one driver or passenger might consider being risky behavior on the roadway might be perceived differently by other drivers. The concept of vulnerability is central to risk perception and has been defined by several writers to depict the human shortcomings that make certain individuals and groups prone to threats, risks or hazards.

Indeed, it is seen as a ‘state’ existing within a system (e.g., personal dispositions of road users) before that system comes into contact with a hazard event.

It may therefore not be surprising that personality characteristic such as risk-taking propensity (Iversen & Rundmo, 2002; Oltedal, & Rundmo, 2006; Lund & Rundmo, 2009; Bingham et al., 2006); sensation-seeking (Zuckerman, 1997; Jonah, 1997), and other risky road use attitudes have been reported to play roles in road accidents. Deery (1999) has found that young drivers are more susceptible to impaired risk perception and others feel more invulnerable to traffic risks (Weinstein, 1984). Basically, risk perception is a subjective experience because risks are future events. Risk perception can therefore be described as the process by which individuals mentally represent and assimilate the probability that negative events such as injury or death connected with motor vehicle crashes might occur to them in the future. Moller (2000) has also observed that risk perception has to do with one’s opinion of the likelihood of suffering a health threat associated with either performing a certain activity or choosing a certain lifestyle (e.g., over-speeding, talking on phone while driving, overloading etc). Understanding how individuals perceive and negotiate risk has the potential of forming the basis for planning more effective risk communication strategies. For example, risk willingness, risk tolerance and risk acceptability are important constructs to explore.

b) Risk homeostasis theory (RHT) and risk compensation theory (RCT)

These two theories are generally referred to as theories of behavioral adaptation (Elvik, 2004; OECD, 1990; 1997). They are both related in principle and practice, sometimes both theories and terms are used interchangeably with risk compensation gaining more prominence (Elvik & Vaal, 2004). In effect, RCT is viewed as an extension of RHT. Both theories were popularized by Gerald Wilde (1976; 1982; 1994; 1992; 1998) but RCT was actually propounded by Sam Peltzman (1975).

However, the concepts of compensation and homeostasis are credited to the early works of Claude Bernard (1813-1878) and Cannon (1929, 1932) respectively. The basic postulate of RHT and RCT is that human beings learn to change their behavior as a result of risks perceived. For instance, individuals (public transport road users) are likely to be more cautious when using rainy and snowy or icy roads because of the fear of accidents (high risk perceived). But as soon as these bad weather conditions disappear, humans tend to modify their behavior and use the roadway with less caution (low risk perceived).

Wilde describes this behavioral adaptation as having in-built target level of risk which is constant and is accepted by individuals and operates on the principle of the functioning of the thermostat. That is, in the face of perceived high danger, human cautiousness and alertness rise but as the danger appears to go away the tolerable risk level of humans' falls back to its normal position. Thus, Wilde et al (2002) argue that safety interventions might be meaningless unless they directly affect the amount of risk taking that passenger road users are willing to accept (target level of risk). This is contrary to the expectations of safety engineers and advocates, accident countermeasures put in place may rather have an offsetting effect on users. For example, driving on a first class road makes drivers feel that since the road is good there might not be any risks or even if there were risks they might only be minimal thus they may choose to speed instead. But if they were driving on a potholed gravel road, they might be more careful because of the known risks associated with driving on such roads. So the good condition of the road rather compensates for the risk to be perceived.

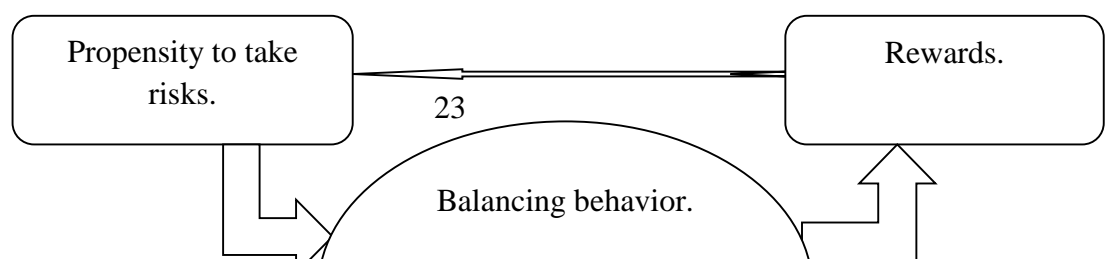
Gerald Wilde concludes that it is this propensity for risk acceptance which determines the actual accidents associated with any behavior engaged in by humans. As a result of this Wilde again postulates that drivers and passengers get the required number of accidents they wish to get unless

the target level of risk is altered. This theory has received extensive debate among researchers. Empirical evidence both confirming and refuting its usefulness has been adduced. The often cited confirmatory examples involve the use of safety belts as well as the unprecedented reduction in accidents emanating from the great caution exhibited by the Swedish people when they changed from left hand drive to right hand traffic in the fall of 1967. On one hand, it has been praised for its contribution to the understanding of road user behavior (Adams, 1983; 1988; Assum et al., 1999; Adams & Hillman, 2001; Hedlund, 2000).

On the other hand, it has also been criticized for lack of validity and for not showing the methodology for measuring the ‘target level of risk’, (Evans, 1986; Haight, 1986; O’Neill & Williams, 1998; McKenna, 1982; Thompson et al., 2000; Dulisse, 1997). The Organization for Economic Co-operation and Development (OECD) (1990) has found evidence confirming a large part of the theory. For the purpose of this research, Adams and Thompson’s (2002) and Adams’ (2003) diagrammatic representation of risk compensation and homeostatic model is presented other than that proposed by Wilde (2002) because it lends itself to easier explanations.

The explanatory constructs of the model are presented below.

Figure 1: Risk thermostat model.



Source: Adams (2003); Adams & Thompson (2002).

The model above shows that each individual has in-built risk-taking propensity but there are individual differences with regard to risk-taking. The arrowheads point to the directional influence. From the diagram, rewards of risk-taking (e.g., sensation seeking, speeding to get to a destination early or for the thrill which comes with it, etc) have a direct influence on the insatiable desire to take risks (propensity to take risks). Also, risk perception is determined by accidents. That is, if you have personally been involved in an accident before or some relatives of yours have been injured or killed in an accident, these negative events directly shape your risk perception. In general, risk-taking could bring both rewards and punishments (accidents). Thus, in perceiving the risk to be taken, a balancing act or in other words, a cost-benefit analysis has to be performed. This balancing act is represented by the box in the middle of the diagram. Though the model may not be comprehensive enough to answer all questions relating to risk perception, it does shed light on some important aspects of the motivations for risk-taking.

2.2.2 Systems theory

The systems theory also known as the systems approach (Reason, 1990; Rasmussen, 1997; Dekker, 2002; Rothe, 2002) is the most predominant framework employed in safety research in recent decades (Salmon et al., 2010). Its advent dates far back to 1940s when Chapanis (1999) in a groundbreaking study in the 1940s on aviation safety and plane crashes found that ‘pilot error’ was essentially ‘designer error’. Since then the theory has engaged the attention of safety researchers over the years and it has received tremendous application in management as well as traffic domains (Johnson, 1999; Reason, 2008; Johansson, 2009).

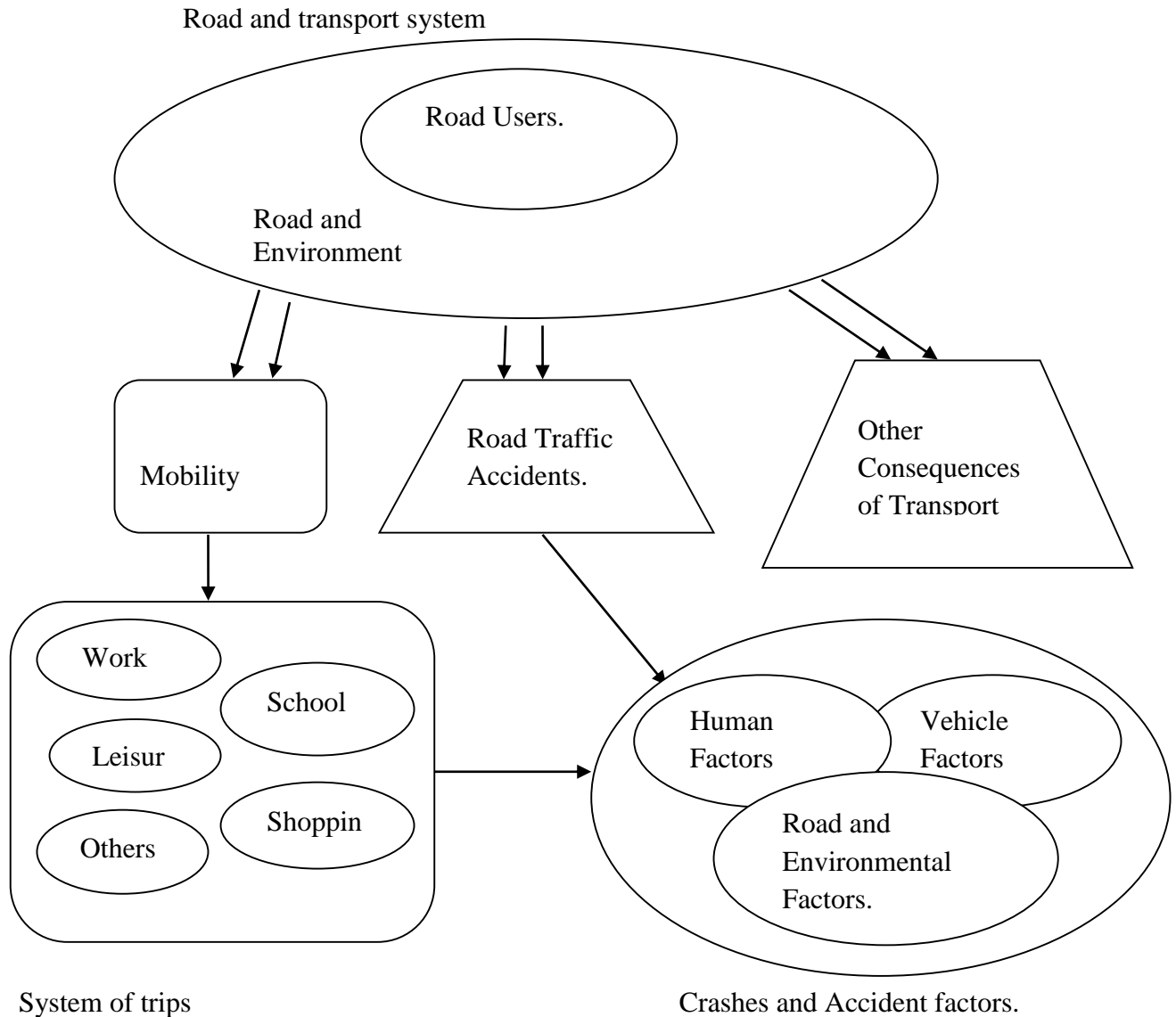
The basic assumption of the systems theory is that road traffic accidents result from the interactional malfunctioning of the components of systems. Its main focus is on the person environment interactional maladjustments (Muhlrad et al., 2005). Hence, human factors and vehicle factors conspire with physical and social environmental factors to bring about road traffic accidents. The interdependence of these factors in relation to accident causation suggests that in trying to investigate the factors leading to motor vehicle accidents all the relevant factors within the system ought to be given equal attention. System theory does not only explain accident causation but also points to the key issues to be considered in planning any accident countermeasures. In other words, blaming the victim such as passengers for passenger-vehicle crashes and suggesting behavior modification strategies alone to deal with the problem may be unsuccessful. However, success comes when behavior modification goes hand in hand with the technical modification of the road infrastructure and equipment. This also means the modification of motor vehicle design becomes a crucial component of the system to consider. Perhaps drivers of passenger-carrying vehicles are over represented in road traffic accidents not because of person

factors only but maybe because of the poor nature of the road infrastructure which combines with the defective used vehicles for motorized transport.

Inherent in this theory is the need for a political commitment in that policy makers, road engineers, vehicle manufacturers, road users, and safety professionals' actions and inactions are perceived to be important and complementary. Research indicates that already not only has the theory aided the understanding of most of the risk factors implicated in accidents, but also it has informed various safety interventions in many countries such as the Vision Zero in Sweden, Norway (Johansson, 2009) and other successful strategies elsewhere like Australia and the Netherlands (Wegman et al, 2008). Evidence suggests that these countries have made significant reductions in their road accidents due to ambitious and holistic strategies that have been adopted.

As other theories which preceded it, systems theory does not account fully for all perception aspects of road traffic accidents. For instance, traffic law enforcement has not been given attention yet it is known to be another key factor in accident research. It is also considered by many safety researchers to be too generic in scope and thus lacks specificity when it comes to particular accident situations. These weaknesses notwithstanding, it stands tall among its counterparts for its universal appeal and interdisciplinary orientation or application.

Figure 2: The systems theory approach.



Source: Road Traffic Injury Prevention Training Manual-WHO and New Delhi.

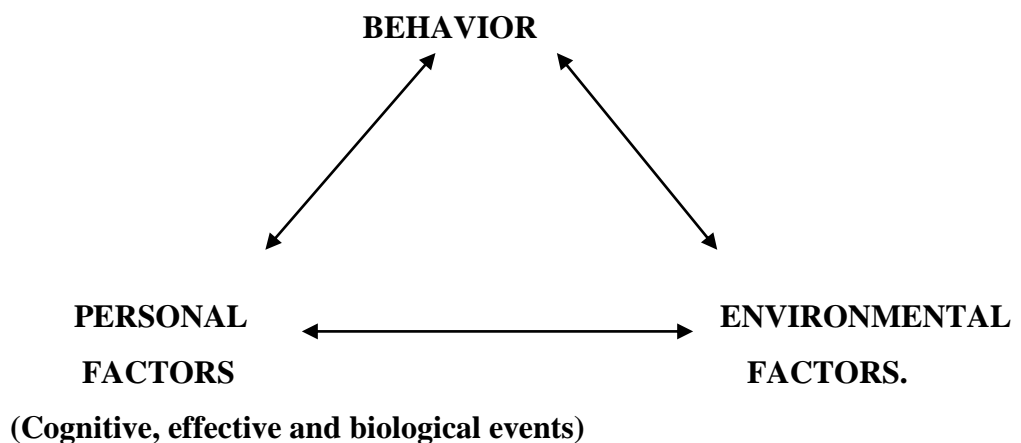
Explanations of the systems theory are based on man-environment adjustments and maladjustments (Muhlrad et al 2005). The components of the theory are the environment, the means of transport (vehicles factors) and the behavior of man (Krug et al 2000). The environment component comprises of the natural and the built environments and transport networks (roads factors). The means of transport component comprises of the volume and quality of vehicles on the modes of transport. The behavior of man component comprises of

demographic characteristic of road users (age, sex, education, socio-economic status, stage in life cycle), people's perceptions of risk and people's general behavior on the streets. Integrated in the systems theory is a system of highway codes and enforcement mechanisms designed to ensure that PSV users adhere to the controls and regulations of traffic flow for maintaining road traffic safety. Comprehensive traffic management should be sufficient to maintain road traffic safety (Haur, 1995:136; Button, 1993:80).

2.2.3 Social cognitive theory (SCT) (Albert Bandura)

Albert Bandura's social cognitive theory provides an important framework for this study. The social cognitive theory (Bandura 1986; 1989; 1997; 2002) has an agentic orientation to human functioning. Its central assumptions are that three broad constructs i.e., personal factors, behavior, and environmental factors are the first determinants of human behavior. Figure 3 shows the constructs of the theory.

Figure 3: Bandura's triadic reciprocal model



Source: Bandura (2001) and Pajares (2002)

The bi-directional arrows in the model show the relationship among them. The triadic reciprocal framework of the theory's constructs demonstrates how they mutually interact with each other and

also points to the fact that all the constructs are relevant when it comes to the explanation of behavioral outcomes. The agentic perspective it assumes shows the importance of the human agency in the scheme of things. Hence, the theory can be compartmentalized into two broad constructs: human agency and structure. Personal factors and behavior can be grouped under human agency category while environment can be put under structure. Put another way, human behavior is determined by internal mechanisms and environmental factors. Inherent in the human agency is the role of self-efficacy in determining what behavior individuals are likely to engage in. The essence of the theory is that it enables us to describe and explain behavior such as road user behavior. It also provides guidelines for designing and implementing interventions (e.g., accident countermeasures, etc) to address the shortcomings of the behaviors described (e.g., over-speeding).

This theory provides a good fit for the present research because it addresses two key constructs (i.e., attitudes and behavior). Under the personal factors, Bandura includes cognitive, affective, and biological events to show that personal agency is influenced by internal dispositions. These behavioral patterns interact with environmental processes and are both influenced by each other. This theory shares similarity with the nature-nurture debate in that while it accepts that both nature and nurture are principal determinants of behavior; it does not suggest which construct is more important than the other. This is foundational because affective beliefs and cognition are integral components of attitudes. Research indicates that cognition and behavior may be inversely related e.g., drivers think that distracted driving is dangerous yet some of them pick calls and text while driving (Lawton et al., 2007). However, the role of affect in risk taking has been documented (Loewenstein et al., 2001; Lawton et al., 2007).

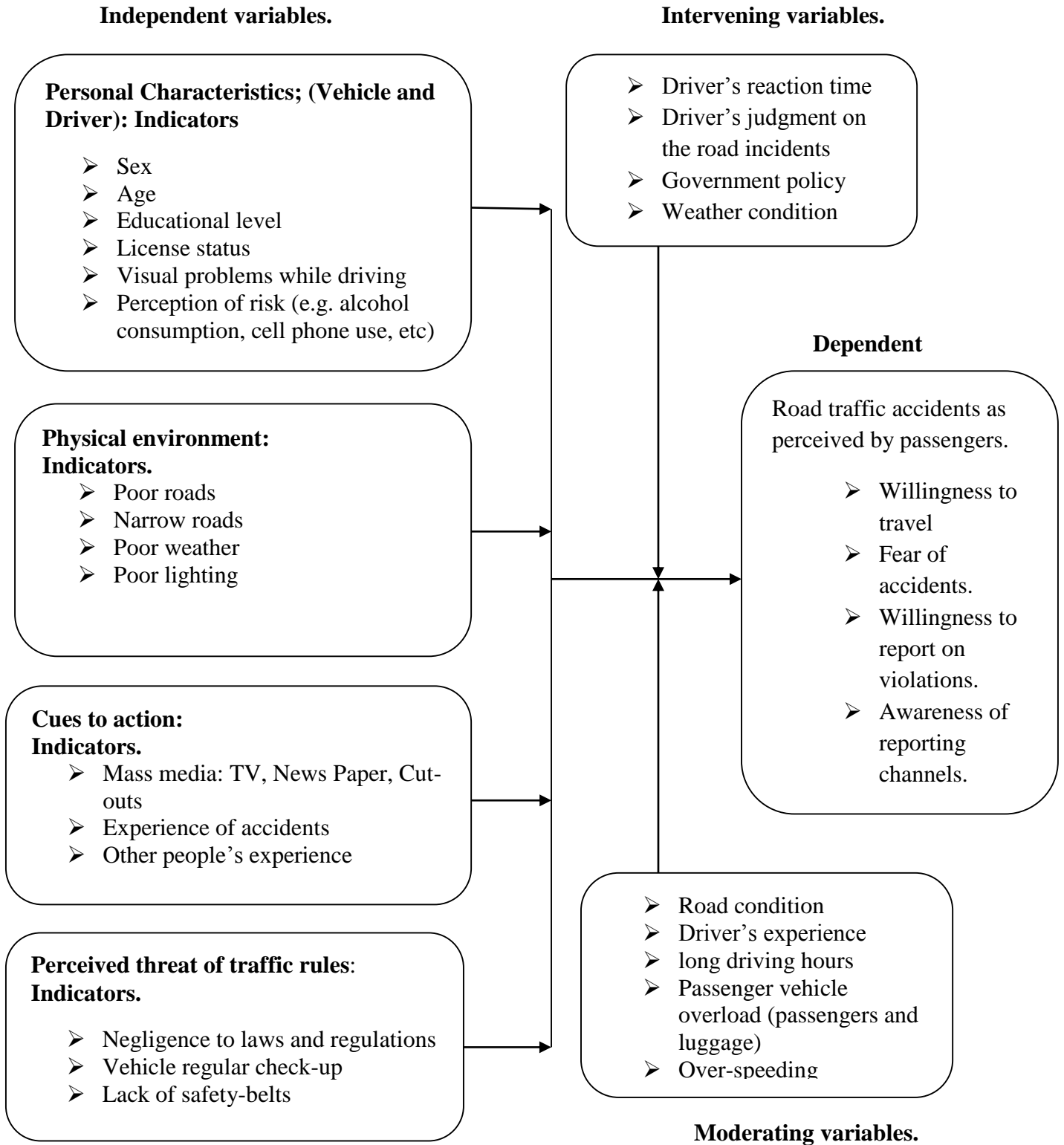
Again, the attitude-behavior relationship has been the subject of intense debate in the social psychology literature. This has given rise to the theory of reasoned action (TRA; Fishbein & Ajzen, 1975; 1980) and its extended version the theory of planned behavior (TPB; Ajzen, 1985; 1991). But what is not in doubt is that attitudes influence behavior and vice versa (Festinger, 1975; Bem, 1972). McCrae and Costa (1995) have reported that an individual's internal dispositions influence how they perceive and appraise the environment. This finding supports Waylen and McKenna's (2008) conclusion that risky road user attitudes are developed before adolescence.

Environmental factors shape behavior and personality characteristics (Bener & Jadaan, 1992). These factors represent both the physical and social aspects of the environment. Via observational and vicarious learning individuals (e.g., drivers) learn to speed because they may have observed similar behavior go unpunished within their social environment. Pedestrians also may decide to cross the road outside of the crosswalk because they may have seen significant others do same. In reality, human development, adaptation and attitudes to change are deeply rooted in social systems within the environment. And thus, this causal structure emphasizes the point that people are both producers and products of their social environment (Bandura, 2001).

The SCT is applicable in many disciplines and can be used to study varying behavior patterns. It provides research methodology and integrates human agency and social structure by way of path lines of influence. However, some researchers have criticized it for placing too much emphasis on the human agency factor.

2.3 Conceptual Framework

Figure 4: Conceptual framework of variables.



The conceptual framework has been adopted from Health Belief Model

The study consisted of four independent variables, intervening variables, moderating variables and one dependent variable. Personal characteristics; (Vehicle and Driver), physical environment, cues to action, and perceived threat of traffic rules were the independent variables, and road traffic accidents as perceived by passengers was the dependent variable. The researcher referred to the works of other authors while establishing the effects of each independent variable to the dependent variable. Data regarding each independent variable was gathered and analyzed in relation to dependent variable – Traffic safety as perceived by passengers.

There are various moderating variables which have significant effect on the perception of an accident in passenger carrying vehicles. Some of them include; road condition, driver's experience, long driving hours and bus overload with passengers and or their luggage. The following variables were rated as intervening variables because they could affect on how passengers perceive road accidents, but it might be difficult to measure or see the nature of their influence taking into account that most accidents happen within a fraction of a second. They include; driver's reaction time and driver's judgment on the road incidents, weather condition and government policy.

2.4 Chapter Two Summary

There had been little research on risk factors in relation to road traffic accidents involving regular users of public transport; this was a gap which had brought curiosity of studying the four objectives in the view of establishing their relationship with perception of road accident. There is no known researcher who has studied how passengers perceive risk factors by contrasting it against road traffic accidents.

CHAPTER THREE: RESEARCH METHODOLOGY.

3.1 Introduction

This chapter describes how this study was conducted, the methods that were applied and techniques in data collection and the reasons as to why they were used according to the research main objectives of the study. According to Webster (1985), to research is to search or investigate exhaustively. It is a carefully or diligent search, studious inquiry or examination especially investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws. It can also be the collection of information about a particular subject. This chapter incorporates a discussion of the research design, the selection of the data sites, sampling methods and justification and sources of data used in the study. There is a discussion on the analytical techniques used in analyzing the data for the study. This chapter concludes the discussion on the reliability and validity of the research.

3.2 The research design

The study used a descriptive survey research design in making a detailed examination on the perceptions and awareness of risk factors underlying the occurrence of traffic accidents among PSV commuters in Nairobi City where by both qualitative and quantitative research techniques were applied. Descriptive research involves gathering data that describe events and then organizes, tabulates, depicts, and describes the data collection (Glass & Hopkins, 2004). The research design involves acquiring information about one or more groups of people perhaps about their characteristics, opinions, attitudes, or previous experiences through asking questions (Glass & Hopkins, 2004). Descriptive research was preferred since the researcher wants to gain better understanding passenger's perception of risk factors underlying the occurrence of traffic accidents among PSV commuters in Nairobi City.

3.3 Unit of analysis and Unit of observation.

The unit of analysis is the major entity that is being analyzed in a study. In social science research, typical units of analysis include individuals (most common), groups, social organizations and social artifacts. The unit of analysis is the object about which generalizations are made based on an analysis. The unit of analysis that was applied in the analysis was passengers (individual), drivers (a group) and the passenger service vehicles (the system which these groups interact). The unit of observation is a basic concept in quantitative research that represents the objects that are observed and about which information is systematically collected. The unit of observation for the study was the passengers that were randomly selected from the 9 bus stations, law enforcers and the drivers that were randomly selected.

3.4 Target Population

The study targeted regular users of public transport in Nairobi County. The regular users were men and women aged 15 years and above. According to Ngechu (2004), a population is a well-defined or set of people, services, elements and events, group of things or households that are being investigated. This definition ensures that population of interest was homogeneous. Population studies also called census are more representative because everyone has equal chance to be included in the final sample (Mugenda and Mugenda, 1999).

3.5 Sample Size and Sampling procedure

The study adopted stratified random sampling to ensure that results are proportional and representative of the whole. The basic idea in stratified random sampling is to divide a heterogeneous population into sub-populations, usually known as strata, each of which is internally homogeneous in which case a precise estimate of any stratum mean can be obtained based on a small sample from that stratum and by combining such estimates, a precise estimate for the whole

population can be obtained. According to Mugenda and Mugenda (2005) a third of the population is an ideal sample. This enabled the researcher to control the sample size in the strata. The respondents were from 9 strata; that included; Khoja (9), Nyamakima (11), OTC (9), Muthurwa (12), Tea Room (12), Bus Station (12), Railway Station (12), Commercial Bus Station (11), and Kencom (12), the bus stations provided a better representation of the population within the County. Simple random sampling was used to select respondents as per their arrival and boarding vehicles from the bus stations by alternating between both sexes to ensure gender representation thus making a sample of 100 respondents. The aim of the study was explained to research participants and they were informed that participation or non-participation would not bring any financial rewards or punishments to them.

3.6 Methods of data collection

The researcher used a questionnaire for data collection. According to Best and Kahn (2004) a questionnaire is easy to administer. Questionnaires also reduce bias since the researchers' own opinions won't influence the respondents to answer questions in a certain manner unlike if it were a telephone or face to face surveys.

3.6.1 Collection of Quantitative Data

Typically quantitative methods are characterized by the use of close ended questions for yes or no answers or set of predefined answers like Likert scale (example strongly agree or strongly disagree) which can be quantified, comparable and measurable to provide numeric results (Flick, 1998).

In this study quantitative data was collected from passengers who were the respondents, a questionnaire was developed to collect individuals' information through filling of the questionnaire. The purpose of collecting this information was to assess how passengers perceive road traffic accidents in Nairobi County. The quantitative data were collected from passengers and

analyzed. The program was extensively used to produce different statistical tables of varying kinds, and in simple statistical computations. Furthermore, the quantitative data was employed to substantiate the descriptive qualitative information obtained from interviews, informal discussions, observations and focus group discussion.

3.6.2 Collection of Qualitative Data

a) Key informants.

A qualitative research methodology covers a number of techniques such as interviews, participant observation and focus group discussions. Qualitative methodology helps to understand life experiences and to reflect on the understandings and shared meaning of peoples' everyday social life and realities (Limb 2001). In this study qualitative approach was used to collect the primary source of data through interviews with the passengers within a period of the field work, officials from the Police office, drivers, and Personal observations in Nairobi County. The aim of collecting information from key informants was to seek the views on how passengers perceive risk factors in relation to road accidents, and what the Central Government and County Governments has done about the road traffic accidents in Nairobi County.

This requires the need to interview them using the in-depth method with the help of an interview guide. Personal observation was used where the researcher observed traffic safety behaviors among drivers and passengers in nine different localities and how vehicles respond to the road signs especially the areas where people cross the road frequently. Habermas (1985), quoted in Flick (1998), argues that qualitative research is of specific relevance to the study of social relations, owing to the fact of pluralizing of life related to accident risk, key expressions for this pluralizing of ways of living and biographical patterns. In this study, the focus was based on passengers and their perception and judgment aspect of the risk of traffic accidents, including the relationship

between environment, human behavior, vehicle and the system of traffic laws, controls and regulations, hence it was relevant to use both qualitative and quantitative methodology because it justifies real situation of changes and its adaptations to social change from traditional to modernity.

b). Focus Group Discussions.

A focus group discussion is an interview with a small group of people usually eight to twelve people participate in the interview for about one to two hours. The interviews are expected to yield higher response rates by using probing questions (Patton, 1990). Patton argues that focus group discussion is the highly efficient qualitative data collection technique, which provides some quality controls on data collection. Participants tend to provide checks and balances on each other and it is fairly easy to assess the extent to which there is a relatively consistently shared view among the participants. The focus group consisted of six managers of various buses Sacco services and five drivers since they are aware of the risk factors related to road accidents and could give credible information in relation to road accidents.

Some respondents started to turn down the request to fill questionnaires for confidentiality reasons. The owners of the Sacco's encouraged them to be open and be willing to share ideas. The researcher used an introduction letter from the University and assured the respondents that the information they give would be treated with confidentiality and it would be used purely for academic purposes. The researcher also encouraged the respondents to participate without holding back the information they might be having as the research instruments would not bear their names.

The respondents also agreed that the meeting should take place in a restaurant so that there would be ample time allowed for discussion. One of the managers of the Sacco who did not form part of the group for this study together with two research assistants assisted in moderation and recording

of information. The meeting took one to two hours, and it was conducted by using both English and Swahili Languages.

3.7 Data Validity and Reliability

Prior to visiting passengers for data collection, researcher had to obtain a letter to permit him proceed in obtaining data. The purpose of the letter was to ensure trust worthiness by the respondents and therefore able to provide quality and reliable information. The content validity and reliability was assured by ensuring that each question in the questionnaire and interview schedule was valid and correctly structured for easy understanding.

Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated tests are done a number of times (Mugenda, & Mugenda, 1999). To ensure reliability the research pre-tested the questionnaire using two Matatu terminals.

The purpose of the pilot of the study was to enable the researcher improve on the reliability of the data collecting instrument and to familiarize with operations. According to Masibo (2005), pre-testing provides a check on the feasibility of the proposed procedure for coding data and shows up flows and ambiguities in the instrument of data collection. The test-retest technique of measuring reliability was used in the study. On the other hand the content validity of the two instruments of data collection were assured by ensuring that each of the items in the questionnaire and interviewee schedule addresses specific content and objective of the study.

3. 8 Data Analysis Techniques

Data analysis refers to the computation of certain measures along with searching for patterns of relationship that exists among data groups. In regard to the research objectives, data analysis process is determined with what validity could be said to indicate any conclusion. After data

collection, data cleaning was done in order to determine inaccurate, incomplete, or unreasonable data and then improve the quality through correction of detected errors and omissions. After data cleaning the data was coded and entered in the computer for analysis. Statistical Package for Social Sciences (SPSS) version 20 for windows was used to analyze quantitative data. SPSS is able to handle large amount of data, given its wide spectrum of statistical procedures purpose fully designed for social sciences.

3. 9 Ethical considerations of the Study

The researcher followed ethical considerations in the course of the data collection process. Respondents participated on their own will without coercion from either the researcher or their bosses. The researcher sought permission from the Matatu owner association, traffic police department before undertaking the study. The researcher guarded the privacy and confidentiality of the research participants' identities and no names were noted or presented in the study.

CHAPTER FOUR: DATA ANALYSIS AND PRESENTATION OF FINDINGS.

4.1 Introduction

This chapter discussed the interpretation and presentation of the findings obtained from the field. The chapter presents the background information of the respondents; findings of the analysis based

on the objective of the study which was to examine the perceptions and awareness of risk factors underlying the occurrence of traffic accidents among PSV commuters in Nairobi City.

4.1.2. Response Rate

The table 4.1 below represents the response rate of the respondents in an aim to examine the perceptions and awareness of risk factors underlying the occurrence of traffic accidents among PSV commuters in Nairobi County. From the table below, it was revealed that the study targeted 100 respondents from which 88 filled in and returned the questionnaires making a response rate of 88%. This response rate was satisfactory to make conclusions on the perceptions and awareness of risk factors underlying the growing traffic accident problem in order to inform the planning of accident countermeasures. According to Mugenda and Mugenda (2003), a response rate of 50% is adequate, 60% is good and a response rate of 70% and over is excellent.

Table 4.1: Response Rate

Response	Frequency	Percentage
Response	88	88
Non response	12	12
Total	100	100

4.2. Social and Demographic Characteristics.

4.2.1 Gender Distribution.

From the table below it is clear that the majority of the respondents as shown by 53.4% indicated that they were males whereas 46.6 % of the respondents indicated that they were females, this is an indication that both genders were involved in the study. The difference in gender was because more male are breadwinners in their families hence using public transport when going to work on a daily basis (Okello, 2010).

Table 4.2: Respondents' Gender

Response	Frequency	Percentage
Male	47	53.4
Female	41	46.6
Total	88	100.0

4.2.2 Age of the respondents

From the table below on the age of the respondents, it is clear that most of the respondents as shown by 29.6% indicated that they were aged above 30 - 39 years, 26.1% of the respondents indicated 20 - 29 years, 20.5% of the respondents were between 40 - 49 years, 14.8% of the respondents were between above 50 years whereas 9% of the respondents indicated they were aged below 20 years, this is an indication that respondents were well distributed in term of their age. According to Kothari (2006), there is need to represent all age in the study to have the view of all generations at work Place

Table 4.3: Age of the respondents

Response	Frequency	Percentage
10 - 19 years	8	9.0
20 - 29 years	23	26.1
30 - 49 years	26	29.6
40 - 49 years	18	20.5
Above 50 years	13	14.8
Total	88	100.0

4.2.3 Education level of the Respondents

From the table below on the age level of education of the respondents, the study requested the respondents to indicate their level of education, from the findings, it is clear that most of the respondents as shown by 36.4% indicated that they had diploma qualification, 28.4% of the respondents indicated they had degrees, 15.9% had post graduate qualification, 12.5% had secondary education qualification whereas 6.8% of the respondents indicated they had primary education, this is an indication that respondents were well educated thus they understood what the study was all about. Kombo ET el (2006) indicates that respondent level of indication determines the credibility of information they give to the study.

Table 4.4: Education level of the Respondents

Response	Frequency	Percentage
Primary Education	6	6.8
Secondary Education	11	12.5
Diploma	32	36.4
Degree	25	28.4
Post Graduate	14	15.9
Total	88	100.0

4.2.4 Years of usage of PSV vehicles

From table 4.5 on the years of usage of the PSVs, the study requested the respondents to indicate their years of usage, from the findings, most of the respondents as shown by 35.2% indicated that had used over 19 years, 28.4% of the respondents indicated 15 to 19 years, 19.3% of the respondents were between 10-14 years, 12.5% of the respondents were between 5 – 9 years whereas 4.6 % of the respondents indicated they had used for less than 5 years, this is an indication that respondents had used PSVs for some time, out of this experience they are rich in information as regards to road accidents. Nzuve (1999) found out that respondent period of use of PSV vehicles is necessary for him or her to have better understanding of the risk factors of road accidents.

Table 4.5: Years of Usage of PSV vehicles

Response	Frequency	Percentage
0-4 years	4	4.6
5-9 years	11	12.5
10-14 years	17	19.3
15-19 years	25	28.4
Above 20 Years	31	35.2
Total	88	100.0

4.3 Risk Perception in Safe use of Public Transport Vehicles

4.3.1 Qualification of road traffic accidents a serious problem in Nairobi County.

On whether road traffic accident is a serious problem in Nairobi County, 73.9 % of the respondents indicated it's a serious problem while 26.1% indicated it's not. This is an indication that road traffic accident is a serious problem in Nairobi County, due to losses incurred from damages, medical

bills as a result of injuries, and death of bread winners. The estimated road traffic death rate is 27.5/100,000 populations per year (WHO, 2011).

Table 4.6: Whether road traffic accident is a serious problem in Nairobi County

Response	Frequency	Percentage
Yes	65	73.86
No	23	26.14
Total	88	100.0

4.3.2. Major contributors to road accidents

The study sought the opinions of law enforcers on the major causes of road accidents. The experts indicated that over-speeding was the major contributor of road accidents, driving while drunk was a cause, and not observing the traffic rules was also a cause and use cell phone while driving. Due to lack of personnel from the government to monitor above vices, violation of traffic rules has been made possible resulting to increase of road traffic accidents. Odero (2003) study in Zimbabwe showed that in 85% of RTIs in Zimbabwe human factors are involved. Reckless driving and violation of traffic laws are the human behaviors that influence RTIs occurrence. Among these human factors over-speeding and drinking and driving are the two key leading contributing factors.

4.3.3 The main victims of road accidents in Nairobi County

The study sought the opinion of the experts who were the law enforcers on who the main victims of road accidents in Nairobi County were. The study found that the main victims were the passengers who board PSV vehicles because they are the key users of road transport, thus exposure

to accidents is higher compared to other road users; others were the pedestrians on the road and also motorbike users.

4.3.4 Commitment of the government in enforcing traffic rules

Majority of the respondents as represented by 64.8% believed that the law enforcers are not fully committed in enforcing the traffic rules while 35.2 indicated they are fully committed. On the focus groups 6 out of 9 constituting 67% of the key informants indicated that the transport authority has played a proactive role to try and curb road accidents but the police could do better in terms of being more ethical and responsible. 7 out of 9 of the respondents constituting 77% indicated that the National Safety and Transport Authority and the police are doing enough by mounting roadblocks to curb drunk driving.

Table 4.7: Commitment of the government in enforcing traffic rules.

Response	Frequency	Percentage
Yes	31	35.2
No	57	64.8
Total	88	100.0

4.3.5 Statements relating to Vehicle risk factors

From the findings on the statements relating to statements relating to vehicle risk factors, majority of the respondents as shown by mean of 4.19 agreed that most accidents or collisions are a result of over-speeding leading to loss of control. Vehicles with seat belts, adequate lights, brakes, good steering wheel as well as indicators help to reduce accidents as shown by a mean of 4.11. Most PSV vehicles exceeding inspection period, thus leading to upsurge of less roadworthy vehicles as shown by a mean of 3.22, defects in design or manufacture of PSV vehicles may threaten safety of occupants as shown by a mean of 2.65. Increase per capital is associated with increased number of vehicle purchases that may in-turn lead to increase of road accidents, as shown by a mean of 2.41. Vehicle characteristics and vehicle use are potentially important factors contributing to high motor accidents as shown by a mean of 2.08.

Table 4.8: Strength of statements relating to Vehicle risk factors.

Statement	Strength of Agreement						Mean	N
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree			
Vehicles with seat belts, adequate lights, brakes, good steering wheel as well as indicators help to reduce accidents.	2	5	7	41	33	4.11	88	
Most accidents or collisions are a result of over-speeding leading to loss of control.	1	2	11	39	35	4.19	88	
Most PSV vehicles exceeding inspection period, thus leading to upsurge of less roadworthy vehicles.	8	13	33	20	14	3.22	88	
Increase per capital is associated with increased number of vehicle purchases that may in-turn lead to increase of road accidents.	18	33	24	9	4	2.41	88	
Defects in design or manufacture of PSV vehicles may threaten safety of occupants.	15	24	32	11	6	2.65	88	
Vehicle characteristics and vehicle use are potentially important factors contributing to high motor accidents.	30	32	18	5	3	2.08	88	

4.3.6 PSV related factors that are perceived to be risky in relation to road accidents

Majority of the respondents indicated that poor condition PSVs, untrained PSV drivers where some are driven by touts, overloading of the vehicles, high speed, poor inspection or totally lack of inspection by the police departments, tampering of speed governors by the drivers, and poor design of the vehicles.

Generally, participants seemed to be unanimous in their perception of the nature and the conditions of commercial vehicles on the road. They said these vehicles which are largely used ones imported into the country from the West contribute in no small measure to the general reckless road use culture among drivers in several forms:

“The vehicles are used ones and everything from tires to engine that are used to repair them when they break down are used imported ‘spare’ car parts from the West. No driver or vehicle owner buys any new vehicle parts. They can’t afford them.” (31 years old driver)

Again, participants perceived the poor vehicle maintenance culture by car owners as a factor in accident causation:

“There is general poor attitude to vehicle maintenance. You’re the driver and know that this or that thing is not functioning well. If you complain and ask that a new one be bought the vehicle owner becomes uncomfortable due to the cost involved. Most of the vehicles we drive are defective in one way or another”. (35 years old driver)

Some participants identified another motivational aspect of aberrant driving which they said indirectly brings about motor vehicle accidents. In their opinion, some drivers especially the young ones who drive slightly used or new vehicles tend to express their masculinity (i.e., superiority over other drivers) on the roadway. Drivers appeared to understand the occupational hazards that

their work entails. Nonetheless, some of them seemed to enjoy the sensation that comes from speeding and overtaking bolstered by the horse power of their vehicles:

“But when your vehicle is very good as a driver you tend to engage in competition on the roadway by overtaking unnecessarily”. (27 years old driver)

“...But if you’re driving a new vehicle, you can go all out you don’t fear anything. If can speed and overtake other vehicles easily, you know your vehicle is good so you’re confident”. (23 years old driver)

4.3.7 Views on Traffic rules and regulations to risk factors

From the findings on the statements relating to traffic rule and regulations to risk factors as shown in table 4.9, majority of the respondents agreed that traffic rules and regulations are necessary for all drivers as shown by a mean of 4.63, while travelling all passengers must fasten their safety belts as shown by mean of 4.59, promotion of road safety through use of targeted media campaigns can effectively reduce accidents as shown by a mean of 4.47. Others agreed that vehicle must undergo regular inspection as shown by a mean of 4.01, traffic regulations are not systematically implemented and police service is not well trained, equipped and motivated to enforce laws as shown by a mean of 3.85 and safety belt use by all seat occupants has reduce road traffic injuries as shown by a mean of 3.64.

Table 4.9: Extent of agreement with statements relating on traffic rules and regulations to road accidents.

Statement	Strength of Agreement.						Mean	N
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree			
While travelling all passengers must fasten their safety belts	0	0	2	32	54	4.59	88	
Traffic rules and regulations are necessary for all drivers.	0	0	3	27	58	4.63	88	
Promotion of road safety through use of targeted media campaigns can effectively reduce accidents.	0	2	6	29	51	4.47	88	
A vehicle must undergo regular inspection	2	6	12	37	31	4.01	88	
Traffic regulations are not systematically implemented and police service is not well trained, equipped and motivated to enforce laws.	3	7	16	36	26	3.85	88	
Safety belt use by all seat occupants reduces road traffic injuries.	5	11	18	31	23	3.64	88	

4.4 Individual and Situational factors that influence perception of risk of accidents among passengers

4.4.1 Relationship of age to road accidents

From the findings on whether age has a relationship on road accidents as shown in table 4.12, the study found out that 37.5% of the respondents aged 15-19 years indicated that age has a relationship on road accidents while 62.5% indicated there is no relationship. 30.4% of the respondents aged 20-30 years indicated there is a relationship between age and road accidents while 69.6% indicated there is no relationship. 34.6% of the respondents aged between 31-40 years indicated there is a relationship between age and road accidents while 65.6% indicated there is no relationship. 33.3% of the respondents aged between 41-50 years indicated there is a relationship between age and road accidents while 67.7% indicated there is no relationship. Finally 61.5% of the respondents indicated there is a relationship between age and road accidents while 39.5%

indicated there is no relationship. Overall 36.4% of the respondents indicated age is related to road accidents while 63.6% indicated there is no relationship.

Table 4.10: Relationship of age to road accidents

Age	Yes	No	Total	N
15-19	37.5	62.5	100	11
20-30	30.4	69.6	100	23
31-40	34.6	65.6	100	26
41-50	33.3	67.7	100	18
Above 50	61.5	39.5	100	10
Total %	36.4	63.6	100	88
N	32	56	88	

From the findings on whether education has a relationship on road accidents as shown in table 4.13, the study found out that 33.3% of the respondents who had primary education indicated that education has a relationship to road accidents while 66.7% indicated there is no relationship. 27.3% of the respondents who had secondary education indicated there is a relationship between education and road accidents while 72.7% indicated there is no relationship. 28.1% of the respondents who had diploma education indicated there is a relationship between education and road accidents while 71.9% indicated there is no relationship. 24% of the respondents who had degrees indicated there is a relationship between education and road accidents while 76% indicated there is no relationship. Finally 21.4% of the respondents who had post graduate indicated there is a relationship between education and road accidents while 78.6% indicated there is no relationship. Overall 26.1% of the respondents indicated education is related to road accidents while 73.9% indicated there is no relationship.

Table 4.11: Relationship of education to road accidents

Education Level	Yes	No	Total	N
Primary Education	33.3	66.7	100	6
Secondary Education	27.3	72.7	100	11
Diploma	28.1	71.9	100	32
Degree	24.0	76	100	25
Post Graduate	21.4	78.6	100	14
Total %	26.1	73.9	100	88
N	23.0	65.0	88	

4.4.2 Main factors associated with road traffic accidents

On the major factors associated with road traffic accidents majority of the respondents indicated that alcohol, ignorance of traffic laws and corruption by the police officers to be the major factors associated with road traffic accidents.

In general, participants described ineffectiveness in traffic law enforcement by the police and perceived it as a major motivation for aspects of aberrant driving:

“The police too are not helping matters.... E.g., the police can do operation for one week during which they arrest some of the recalcitrant drivers. But as soon as the police stop the operation, the drivers start engaging in the same behaviors again. To be effective, the operations must be sustained all the time. However, the police always claim they’re understaffed and have other security matters to attend to”. (NTSA officer)

In their opinion, the police rather seemed to be interested in extorting money from motorists who commit traffic offences and letting them go unpunished:

“They’re the cause of many accidents here, they only know how to collect bribe from drivers. They’re not doing their work. They’ve turned drivers into their ‘cocoa farm’, that’s where they eat”. (25 years old driver)

From their descriptions, drivers, especially the younger ones, perceived a conflict of interest situation and seemed incensed by the practice of police officers also owning and operating commercial minibuses. According to them this situation does not only lead to selective justice on the part of the police but also undermines the fight against unsafe road use behaviors:

“They also own commercial cars now. They don’t arrest drivers to their own vehicles; their drivers just do anything on the roadway, if you complain they tell you the vehicle is owned by a police officer, (27 years old driver).

4.4.3 Association of superstitions with road accidents.

Majority of the respondents indicated that road accidents are not associated with traditional beliefs or road accidents; it’s just the carelessness of the drivers and corruption and laxity of county officials are the main problem facing local authorities.

According to drivers, this spiritual dimension has roots in fatalism and which is why some drivers hardly do anything to control their vehicles when accidents are imminent. Some said those who are destined to die through road traffic accidents might die irrespective of what men do:

“Truly, some people will die irrespective of what men do. For some people it’s accident but for others it could be sleep or anything”. (27 years old driver)

On one hand, they emphasized that since men have little or no control over their destiny and fate, being too cautious on the roadway might not serve any useful purpose:

“When drivers are involved in accidents, some die because of their past actions. E.g., engaging blood money or even dating someone’s wife. So in reality some accidents are not bad, they’re just punishments for wrong doers”. (42 years old driver)

On the other hand, they perceived that if you are not fated to die through motor vehicle accidents, you will not die. However, from their descriptions, a few drivers seemed to hold the belief that lucky charm and amulets could help ward off accidents:

“There are many causes of accidents including spiritual ones. And that is why they say many drivers protect themselves with charms, amulets or talisman against accidents. I know you are aware that when accidents occur and everyone dies some drivers escape unhurt”, (42 years old driver).

4.4.4 Perceived risk factors to driving and age risk factors

From the findings on the statements relating to driving and age risk factors, majority of the respondents as shown by mean of 4.25 agreed, that driving under influence of alcohol or other drugs of known to impair the driver’s ability to judge and control the vehicle. Training of drivers increases their driving skills as shown by a mean of 4.13. Alcohol consumption, cell phone use are perceived as risk factors to the causes of accidents as shown by a mean of 4.09, some medical conditions are said to be risk factors for driving as shown by a mean of 3.94. Driver’s fatigue as one of the factors contributing to road accidents, as shown by a mean of 3.49, adolescents or young drivers are frequently involved in traffic accidents than other groups as shown by a mean of 3.25. Young drivers like risk taking behavior, also lack driving skills, as shown by a mean of 2.57. While majority of the respondents disagreed no accident occurs if there is clear visibility as shown by 1.74 and that it is not likely to get an accident when vehicle’s lights are bad as shown by a mean of 1.45.

Table 4.12: Statements relating to driving and age risk factors**Strength of Agreement**

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	N
No accident occurs if there is clear visibility.	49	29	8	3	2	1.74	88
Driving under influence of alcohol or other drugs of known to impair the driver's ability to judge and control the vehicle.	1	4	8	34	41	4.25	88
Training of drivers increases their driving skills.	2	5	11	32	38	4.13	88
It is not likely to get an accident when vehicle's lights are bad.	59	22	4	2	1	1.45	88
Adolescents or young drivers are frequently involved in traffic accidents than other groups.	9	11	31	23	14	3.25	88
Driver's fatigue is one of the factors contributing to road accidents.	8	12	16	33	10	3.49	88
Young drivers like risk taking behavior, also lack driving skills.	18	23	32	9	6	2.57	88
Alcohol consumption, cell phone use is perceived as risk factors to the causes of accidents.	2	4	9	42	31	4.09	88
Some medical conditions are said to be risk factors for driving.	2	5	19	37	26	3.94	88

4.4.5 How driving and age risk factors contribute to occurrence of accidents in Nairobi County

Majority of the respondents indicated that when driving majority of the young people tend to be reckless hence more prone to road accidents compared to the older people. Other respondents also indicated that; young people want to explore what they don't know by indulging in alcohol resulting to accidents; the young people are associated with risk taking behavior like over speeding thus causing accidents.

From their narration, older drivers also seemed worried about the road rage attitudes and behavior of younger ones on the roadway:

“There is competition for passengers, if you’re not fast and smart you can’t get any passenger to pick. You see we’re friends here but on the roadway we’re enemies”. (25 years old driver)

Some of the young drivers appeared to recognize that they are more aggressive on the roadway because they tend to have feelings of invulnerability to road crashes:

“It’s only natural. I believe in myself than any other driver. I think I’m more careful than others. When I board someone’s car I’m a bit more afraid than when I’m the one driving. I trust my skills better. Though accidents can happen to everyone I don’t think I can be involved in accident On condition that I drive the way I do now”. (25 years old driver)

“Personally I know I will one day die as every human being will do but I don’t think it will be through motor accident. That has never crossed my mind”. (23 years old driver)

4.4.6 Statements on environment risk factors

From the findings on the statements relating to environment risk factors, majority of the respondents strongly agreed, road signs should be clear not to convey unmistakable message to the driver as shown by a mean of 4.50, well designed roads with separate lines for separate lines for pedestrians and cyclists are much safer than those without those facilities as shown by mean of 4.08 agreed, Improved road quality may lead to behavioral adjustments in terms of more risk prone driving as shown by a mean of 3.64. Physical environment factors have effects on roads hence leading to road accidents as shown by a mean of 3.61, area planning and land use patterns have an impact on traffic accidents as shown by a mean of 3.56 and activities along the road side increases exposure risk to traffic accidents as shown by a mean of 3.44.

Table 4.13: Strength of agreements on statements on environment risk factors

Strength of Agreement

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	N
Physical environment factors have effects on roads hence leading to road accidents.	5	11	18	33	21	3.61	88
Area planning and land use patterns have an impact on traffic accidents.	7	13	15	35	19	3.56	88
Well designed roads with separate lines for separate lines for pedestrians and cyclists are much safer than those without those facilities.	2	4	11	39	32	4.08	88
Road signs should be clear not to convey unmistakable message to the driver.	0	0	4	36	48	4.50	88
Activities along the road side increases exposure risk to traffic accidents.	6	13	21	32	16	3.44	88
Improved road quality may lead to behavioral adjustments in terms of more risk prone driving.	5	11	18	31	23	3.64	88

4.4.7 How environmental factors have contributed to the occurrence of road accidents

Most of the respondents indicated that, during rainy periods since most roads are poor they tend to be slippery leading to road accidents, foggy weather lead to poor visibility by drivers leading to road accidents, most Kenyan roads are very narrow such that vehicles cannot have enough spaces to overtake and pass by and erosion on hilly parts of the roads lead to mud deposits on the roads leading to road accidents.

Respondents believe the nearness of residences as well as stores and supermarkets to the main road and streets in the area play significant roles in casualties involving pedestrians. In their opinion, the nearness of residences to the roadway makes people cross the road anywhere in front of their houses.

“Drivers fail to recognize that people will cross the road anytime and anywhere depending on where they’re coming from, what they want and where they’re going. They’ll cross to their homes or to stores to buy items or food” (Adult male pedestrian).

They equally think that trading by the roadside as a result of the nearness of provision stores and cooked food joints force pedestrians to turn their back on traffic as they purchase food or other items.

“Then I buy items from the roadside when I need something or when my parents send me, this means crossing the road or walking along it because the provision stores (supermarkets) are by the roadside” (Adolescent male pedestrian).

A female adolescent student seems to suggest that buying items by the roadside is almost an unavoidable undertaking. *“Yeah, I can’t avoid it because even if I am going to board a car I have to walk to the roadside. Many of the items I use on a daily basis too are sold by the roadside so I walk or cross the road to buy them”* (Adolescent female pedestrian).

They point out that trading by the shoulders of the road makes pedestrian movement more risky. *“The situation is worse on market days because sellers of used clothing and market women also display their wares on the shoulders of the road so there’s nowhere to walk”* (Young adult female pedestrian)

4.5 Perceived adequacy of training & reliability of drivers of public transport vehicles

4.5.1 Training adequacy of drivers for the job

From the findings on whether drivers are adequately trained as shown in table 4.16, the study found out that 62.5% of the respondents aged 15-19 years indicated that drivers are adequately trained for the job while 37.5% indicated they are not. 52.2% of the respondents aged 20-30 years indicated drivers are adequately trained for the job while 47.8% indicated they are not. 46.2% of the respondents aged between 31-40 years indicated drivers are adequately trained for the job while 53.8% indicated they aren’t. 44.4% of the respondents aged between 41-50 years indicated drivers are adequately trained for the job while 55.6% indicated they aren’t. Finally 29.4% of the

respondents aged above 50 years indicated drivers are adequately trained for the job while 70.6% indicated they aren't. Overall 46.5% of the respondents indicated drivers are adequately trained for the job while 53.4% indicated there aren't.

Table 4.14: Relationship of age to training adequacy of drivers for the job

Age	Yes	No	Total%	N
15-19 years	62.5	37.5	100	8
20-30 years	52.2	47.8	100	23
31-40 years	46.2	53.8	100	26
41-50 years	44.4	55.6	100	18
Above 50 years	29.4	70.6	100	13
Total %	46.5	53.4	100	88
N	41	47	88	

From the findings on whether drivers are adequately trained as shown in table 4.17, the study found out that 50% of the respondents who had primary education indicated that drivers are adequately trained while 50% indicated they are not. 45.5% of the respondents who had secondary education indicated drivers are adequately trained while 54.5% indicated they are not adequately trained. 40.6% of the respondents who had diploma education indicated drivers are adequately trained while 59.4% indicated they are not. 40% of the respondents who had degrees indicated drivers are adequately trained while 60% indicated they are not. Finally 35.7% of the respondents who had post graduate indicated drivers are adequately trained while 64.3% indicated they are not. Overall 40.9% of the respondents indicated drivers are adequately trained while 59.1% indicated they are not. Njuguna (2004) indicated that some of the *Matatu* drivers were not adequately trained and those who are trained do not follow the rules resulting to road accidents.

Table 4.15: Relationship of education to drivers' adequacy of training for the job

Education level	Yes	No	Total%	N
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Primary Education	50.0	50.0	100.0	6
Secondary Education	45.5	54.5	100.0	11
Diploma	40.6	59.4	100.0	32
Degree	40.0	60.0	100.0	25
Post Graduate	35.7	64.3	100.0	14
Total %	40.9	59.1	100.0	88
N	36	52	88	

4.5.2 Passengers Involvement in Creating Awareness of Road Safety

From the findings on passengers' involvement in creating awareness of road safety as shown in table 4.18, the study found out that 37.5% of the respondents aged 15-19 years indicated that passengers are involved in creating awareness of road safety while 62.5% indicated they are not. 47.8% of the respondents aged 20-30 years indicated passengers are involved in creating awareness of road safety while 52.2% indicated they are not. 38.5% of the respondents aged between 31-40 years indicated passengers are involved in creating awareness of road safety while 61.5% indicated they aren't. 33.3% of the respondents aged between 41-50 years indicated passengers are involved in creating awareness of road safety while 66.7% indicated they aren't. Finally 29.4% of the respondents aged above 50 years indicated passengers are involved in creating awareness of road safety while 70.6% indicated they aren't. Overall 38.6% of the respondents indicated passengers are involved in creating awareness of road safety while 61.4% indicated there aren't.

Table 4.16: Relationship of age to passenger's involvement in creating awareness of road safety

Age	Yes	No	Total	N
15-19 years	37.5	62.5	100.0	8

20-30 years	47.8	52.2	100.0	23
31-40 years	38.5	61.5	100.0	26
41-50 years	33.3	66.7	100.0	18
Above 50 years	29.4	70.6	100.0	13
Total %	38.6	61.4	100.0	88
N	34	54	88	

From the findings on whether drivers are adequately trained as shown in table 4.19, the study found out that 33.3% of the respondents who had primary education indicated that passengers are involved in creating awareness of road safety while 66.7% indicated they are not. 36.4% of the respondents who had secondary education indicated passengers are involved in creating awareness of road safety while 63.6% indicated they aren't. 40.6% of the respondents who had diploma education indicated passengers are involved in creating awareness of road safety while 59.4% indicated they are not. 36% of the respondents who had degrees indicated passengers are involved in creating awareness of road safety while 64% indicated they are not. Finally 35.7% of the respondents who had post graduate indicated drivers are adequately trained while 64.3% indicated they are not. Overall 37.5% of the respondents indicated drivers are adequately trained while 62.5% indicated they are not.

Table 4.17: Relationship of education to passenger's involvement in creating awareness of road safety.

Education Level	Yes	No	Total	N
Primary Education	33.3	66.7	100.0	6
Secondary Education	36.4	63.6	100.0	11
Diploma	40.6	59.4	100.0	32
Degree	36.0	64.0	100.0	25
Post Graduate	35.7	64.3	100.0	14
Total %	37.5	62.5	100.0	88
N	33	55	88	

4.5.3 Disagreement between passengers and the driver in regard to safety

On whether there had been a disagreement between passengers and the drivers in regard to safety, 69.3% of the respondents indicated they had a disagreement while 30.7% indicated they had no

disagreement. This is an indication that the respondents had a problem with the drivers in regard to safety. Respondents argued that many of the drivers drive carelessly disregarding traffic rules and regulations, their actions include: overlapping, over speeding, overloading and making wrong turns unnecessarily. Peltzer, (2008) indicated that driver fatigue in Zimbabwe is common in commercial and public transport due to long hours of work and long distance travelling. A study done in South Africa showed that about 24% of heavy vehicle road accidents were associated with sleeping while driving.

Respondents pointed out that the behavior of other passengers, whether they are on board the vehicle or they are waiting to board it, poses a lot of danger to the drivers by way of forcing them to make series of intermittent stops often at short notice and sometimes at dangerous spots.

“Other passengers just wait anywhere along the road including flash spots and expect the car to pick each one of them at the spot where they’re waiting. If the driver not ready to make these stops then he will lose them, which means losing money”. (27 years passenger)

They perceived passengers as potential threats to safe driving because passengers, as they described them, cause lots of distractions to them while driving by either asking them (drivers) to speed or engage them (drivers) in arguments over sitting or transport fares:

“Majority of them behaves well but others engage in quarrels with drivers and their mate over transport fares and other things. In fact, some of them don’t respect drivers at all. Some ask drivers whether their vehicles are snails. We’re in a hurry and you’re driving like a snail, step on the gas and let’s go”. (35 years passenger)

Table 4.18: Disagreement between the passengers and driver in regard to safety.

Response	Frequency	Percentage
Yes	61	69.3
No	27	30.7
Total	88	100.0

4.5.4 Person to take full responsibility for the road carnages experienced

On the person to take full responsibility for the road carnages experienced, 48.9 % of the respondents indicated it's the drivers, 31.8 % indicated national transport authority while 19.3 % indicated traffic police department. This is an indication that the drivers are the most responsible persons of road carnages experienced. Odero (2003) showed that in 85% of road accidents in Zimbabwe human factors are involved. Reckless driving and violation of traffic laws are the human behaviors that influence occurrences. Among these human factors speeding and drinking and driving are the two key leading contributing factors hence drivers should take responsibility.

Table 4.19: Person to take full responsibility for the road carnages experienced.

Response	Frequency	Percentage
Traffic police department	17	19.3
Drivers	43	48.9
National transport and safety authority	28	31.8
Total	88	100.0

As drivers do not seem to feel responsible for initiating accidents, pedestrians on the other hand are convinced that dangerous driving plays no mean role in pedestrian casualties. Their descriptions indicate that they hold drivers responsible for about 48.9% of motor vehicle accidents aside from other factors.

“The problem with the drivers is about the right-of-way. Though there're no official sidewalks for pedestrians they know pedestrians use the road all the time. Drivers fail to recognize that people will cross the road anytime and anywhere depending on where they're coming from, what they want and where they're going” (Adult male pedestrian).

Pedestrians specifically cite speeding and dangerous overtaking as the major factors determining pedestrian-vehicular collisions.

“One problem with the drivers is the speeding and overtaking. They do this to get more passengers so they pay more attention to passengers than pedestrians. The competition for passengers brings about double parking and one driver crossing another and this makes crossing the road very difficult for even adults” (Adult male pedestrian).

Another criticism pedestrians level against drivers deals with drivers’ general unwillingness to yield to pedestrians crossing. They criticize some of the drivers for engaging in serious conversations with front seat passengers and sometimes on their mobile handsets while driving to the extent that they lose focus on what other road users are doing on the roadway.

“Some of the drivers don’t like giving way to pedestrians because they think they alone have the right to use the road. Sometimes, they park the car too close to the shoulders of the road so if you’re walking you have to jump the gutter. Others talk too much with passengers in the front seat or their cell phones while driving so they don’t detect people crossing early” (Adolescent female pedestrian).

4.6 Form of safety measures that have been undertaken to prevent road accidents and how they are perceived by drivers and passengers.

4.6.1 Adequacy of safety measures to reduce or alleviate road accidents

On whether safety measures are adequate to reduce or alleviate road accidents, 68.2 % of the respondents indicated there were no safety measures are adequate to reduce or alleviate road accidents while 31.8% indicated there were safety measures adequate to reduce or alleviate road accidents. This is an indication that safety measures are not adequate to reduce or alleviate road accidents. Okello (2008) indicated there is need to enforce there were not adequate safety measures to reduce road accidents in Kenya hence the government should introduce safety measures and rules to reduce road carnage.

Table 4.20: Response to adequacy of safety measures to reduce or alleviate road accidents

Response	Frequency	Percentage
Yes	28	31.8
No	60	68.2
Total	88	100.0

4.6.2 Passenger willingness/ readiness to wear safety belts

On whether passengers wear safety belt while travelling, 59.1% of the respondents indicated they wear safety belt while travelling, while 40.9% indicated they didn't wear. This is an indication that most of the respondents do wear safety. Wearing a seat belt is one of the most effective and proven means of reducing the likelihood of death and serious injury in an accident. Safety belts provide the greatest protection against ejection in an accident, keeps the occupants of the vehicle inside, restrains the strongest parts of the body, spreads out any force from the collision, helps the body to slow down, and protects your brain and spinal cord.

Table 4.21: Response if passengers wear safety belt while travelling

Response	Frequency	Percentage
Yes	52	59.1
No	36	40.9
Total	88	100.0

4.6.3 Perceptions on reliability of the government's efforts in preventing road accidents

On whether government's efforts in dealing with road accidents are effective and reliable, 59.1% of the respondents indicated the government's efforts in dealing with road accidents are not

effective and reliable, while 40.9% indicated they were reliable. This is an indication that government's efforts in dealing with road accidents are effective and reliable.

Table 4.22: Response on if the governments' efforts in reducing road accidents are effective and reliable.

Response	Frequency	Percentage
Yes	36	40.9
No	52	59.1
Total	88	100.0

4.6.4 Availability and safety measures taken by the county Government to reduce accidents

On the availability of safety measures to reduce road accidents majority of the respondents indicated that the safety measures are adequate and reduce the traffic accidents in Nairobi County. They indicated that speed governors, road blocks, use of alcohol blows and curfews on travelling hours are some of the measures put in place to prevent road accidents.

4.6.5 Measures put in place by the central government to reduce traffic accidents

Majority of the respondents indicated that the following measures have been put in place by the central governments to reduce traffic accidents; enforcing laws to be adhered to by both road users and PSVs, ensuring that PSVs have speed governors, safety belts, use of alcohol blows on the drivers and ensuring curfews are put in place for travelling hours.

4.6.6 Contribution to accidents due poor application of traffic laws and regulation within Nairobi County

Majority of the respondents indicated that lack of well trained traffic police officers who are not well motivated leading to demand of bribes for minor traffic offences is a major contributor to poor application of traffic laws and regulation within the county, lack of clear framework to implement traffic rules is another contributor and lack of stiff penalties against the traffic offenders.

4.6.7 Performance of all concerned departments in reduction of road accidents within Nairobi County

Majority of the respondents indicated that the departments lack coordination in the main organs which are involved in maintaining law and order and lack follow up on all traffic irregularities, some of the respondents indicated that the transport authority has played a proactive role to try and curb road accidents but the police could do better in terms of being more ethical and responsible. The respondents also indicated that the National Safety and Transport Authority and the police are doing enough by mounting roadblocks to curb drunk driving.

4.6.8 Recommendations/Opinions on how to improve road transport system within Nairobi County

The respondents recommended that to improve road transport system within Nairobi, there is need to educate the pedestrians and passengers on road safety awareness so as to reduce road accidents like the use of safety belts for passengers and use of traffic bridges and zebra crossings for pedestrians.

The respondents also recommended that roads should be built in a way you can't overlap to prevent illegal turns on roads. Fines should be punitive and bonds should be issued on the spot. Also those who disobey traffic rules should be arrested and punished and also those who give bribes should be arrested.

Safety measures/ controls should be put in place such as CCTV, car trackers for all PSVs in order to be monitored centrally.

**CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND
RECOMMENDATIONS.**

5.0 Introduction

This chapter presented the discussion of key data findings, conclusion drawn from the findings highlighted and recommendation made there-to.

5.1 Summary of Findings

The study found that the major contributors of road accidents, at 65.9 % is not following traffic rules and regulations to the later, at 27.3% it was drunk driving while 6.8 % indicated using cell phone while driving. On the person to take full responsibility for the road carnages experienced, at 48.9 % it's the drivers, at 31.8 % its national transport authority while 19.3 % indicated traffic police department. On whether safety measures are adequate to reduce or alleviate road accidents, at 68.2 % they indicated there were no safety measures adequate to reduce or alleviate road accidents while 31.8% indicated there were safety measures adequate to reduce or alleviate road accidents. On whether age or education level matters have a relationship to road accidents, 62.5 % of the respondents indicated age or education level matters have a relationship to road accidents, while 37.5% indicated there was no relationship.

On whether passengers wear safety belt while travelling, 59.1 % of the respondents indicated they wear safety belt while travelling, while 37.5% indicated they didn't wear. On whether passengers has been Involved in creating awareness as regards to road Safety, 76.1 % of the respondents indicated they had not been involved in creating awareness, while 23.8% indicated they had been involved. On whether government's efforts in dealing with road accidents are effective and reliable, 59.1 % of the respondents indicated the government's efforts in dealing with road accidents are not effective and reliable, while 40.9% indicated they were reliable.

On the main victims of road accidents in Nairobi County, majority of the respondents indicated that the main victims of road accidents in Nairobi County were the passengers; others were the

pedestrians on the road and also motorbike users. Majority of the respondents indicated that the following measures have been put in place by the central governments to reduce traffic accidents; enforcing laws to be adhered to by both road users and PSVs, ensuring that PSVs have speed governors, safety belts, use of alcohol blows on the drivers and ensuring curfews are put in place for travelling hours. Majority of the respondents indicated that road accidents are not associated with traditional beliefs or road accidents. Majority of the respondents indicated that lack of well trained traffic police officers who are not well motivated leading to demand of bribes for minor traffic offences is a major contributor to poor application of traffic laws and regulation within the county. Most of the respondents also indicated that, during rainy periods since most roads are poor they tend to be slippery leading to road accidents, foggy weather lead to poor visibility by drivers leading to road accidents.

On driving and age risk factors, majority of the respondents represented by a mean of 1.75 agreed, stated that driving under influence of alcohol or other drugs of known to impair the driver's ability to judge and control the vehicle. On the statements relating to vehicle risk factors, majority of the respondents represented by a mean of 1.81 agreed, most accidents or collisions are a result of over-speeding or overloading leading to loss of control. On the statements relating to environment risk factors, majority of the respondents agreed, road signs should be clear not to convey unmistakable message to the driver represented by a mean of 1.50. On the statements relating to traffic laws, control and regulations risk factors, majority of the respondents agreed, traffic laws and regulations are necessary for all drivers represented by a mean of 1.38.

5.2 Conclusion

The study concludes that driving under influence of alcohol or other drugs is known to impair the driver's ability to judge and control the vehicle hence it's the major contributor of road accidents.

Driver's fatigue also contributes to road accidents and young drivers risk taking behavior was also a cause. The study concludes that most passengers wear safety belt while travelling, that most people have not been involved in creating awareness in regard to road accidents, that the government's efforts in dealing with road accidents are not effective and reliable. That driving under influence of alcohol or other drugs of known to impair the driver's ability to judge and control the vehicle, most accidents or collisions are a result of over-speeding or overloading leading to loss of control, road signs should be clear not to convey unmistakable message to the driver and traffic laws and regulations are necessary.

The study also concludes that poorly maintained PSVs, untrained PSV drivers where some are driven by touts, overloading of the vehicles, high speed, poor inspection or totally lack of inspection by the police departments, tampering of speed governors by the drivers, and poor design of the vehicles. The study also concludes that the main victims of traffic accidents were the passengers; others were the pedestrians on the road and also motorbike users. That the measures that have been put in place by the central governments to reduce traffic accidents; enforcing laws to be adhered to by both road users and PSVs, ensuring that PSVs have speed governors, safety belts, use of alcohol blows on the drivers and ensuring curfews are put in place for travelling hours.

5.3 Recommendations

The study recommended that to improve road transport system within Nairobi, there is need to encourage stakeholders' participation in the drawing of strategic plans and drafting policies necessary to curb road accidents.

The study also recommended that to curb road transport system there is need to restrain Public service vehicles drivers to observe traffic rules.

The study also recommended that roads should be built in a way you can't overlap to prevent illegal turns on roads. Fines should be punitive and bonds should be issued on the spot. Also those who disobey traffic rules should be arrested and punished and also those who give bribes should be arrested.

Safety measures/ controls should be put in place such as CCTV, car trackers for all PSVs in order to be monitored centrally.

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APPENDIX A:
QUESTIONNAIRES.
PERCEPTION OF RISK FACTORS IN RELATION TO ROAD TRAFFIC
ACCIDENTS IN KENYA:
A CASE STUDY OF REGULAR USERS OF PUBLIC TRANSPORT IN NAIROBI
COUNTY.

My name is Jasper Okeri Imboga, a student at the University of Nairobi pursuing M.A in Advanced Disaster Management. I am carrying out a research study on the perception of risk factors in relation to road traffic accidents in Nairobi County in Kenya. This questionnaire is

designed to gather specific information about the study. I assure you that your identities shall be treated with confidentiality. Hence do not provide your name. Please give the accurate information to the best of your knowledge by writing and ticking on the space provided. You may attach relevant documents if need be or if the space provided is not enough. Your support will be highly appreciated.

PASSENGER'S QUESTIONNAIRE.

I PERSONAL CHARACTERISTICS.

1. Sex Male Female.

1. Age (in years)

2. Education level Illiterate
 Primary school
 Elementary school.
 High School
 Other, Specify.....

3. How long have you been using PSV vehicles? Years.

4. Ever experienced any problem with the driver in regard to safety?

 No Yes

II PASSENGER'S PERCEPTION ABOUT RISK FACTORS LEADING TO ROAD ACCIDENTS.

5. What do you think is the major contributor to road accidents?

 Not following traffic rules and regulation to the later
 Using cell phone while driving.
 Drink driving.

6. Who should take full responsibility for the road carnages experienced within Nairobi County?

Traffic police department.

Drivers.

National transport and safety authority.

7. Do you think drivers are adequately trained for the job?

No Yes

8. Are safety measures adequate to reduce or alleviate road accidents?

No Yes

9. Do you think age or education level matters have a relationship to road accidents?

No Yes

10. Do you wear safety belt while travelling?

No Yes

11. Ever been involved in creating awareness as regards to road safety?

No Yes

12. Do you think government's efforts in dealing with or reduction of road accidents are effective and reliable?

No Yes.

III PERCEIVED RISK FACTORS TO ROAD TRAFFIC ACCIDENTS (RTA).

Please mark (X) in the space provided for each question.

i) Driving and age risk factors.

13. To what extent do you agree with the following statement;

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly disagree

Statement	1	2	3	4	5
No accident occurs if there is clear visibility.					
Driving under influence of alcohol or other drugs of known to impair the driver’s ability to judge and control the vehicle.					
Training of drivers increases their driving skills.					
It is not likely to get an accident when vehicle’s lights are bad.					
Adolescents or young drivers are frequently involved in traffic accidents than other groups.					
Driver’s fatigue is one of the factors contributing to road accidents.					
Young drivers like risk taking behavior, also lack driving skills.					
(Alcohol consumption, cell phone use) are perceived as risk factors to the causes of accidents.					
Some medical conditions are said to be risk factors for driving.					

14. In your own words how do you think driving and age risk factors contribute to occurrence of accidents in Nairobi County.....

.....

.....

ii) Vehicle risk factors.

15. To what extent do you agree with the following statement; Please comment.

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly disagree

Statement	1	2	3	4	5
Vehicles with seat belts, adequate lights, brakes, good steering wheel as well as indicators help to reduce accidents.					
Most accidents or collisions are a result of over-speeding or overloading leading to loss of control.					
Most PSV vehicles exceeding inspection period, thus leading to upsurge of less roadworthy vehicles.					
Increase per capital is associated with increased number of vehicle purchases that may in-turn lead to increase of road accidents.					
Defects in design or manufacture of PSV vehicles may threaten safety of occupants.					
Vehicle characteristics and vehicle use are potentially important factors contributing to high motor accidents.					

16. What do you think are other PSV related factors that are perceived to be risky in relation to road accidents, please list these factors.....

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.....

iii) Environment risk factors.

17. How much do you agree with the following statements?

(1)Very much (2) Much (3) Moderate (4) Little (5) Very little

Statement	1	2	3	4	5
Physical environment factors have effects on roads hence leading to road accidents.					
Area planning and land use patterns have an impact on traffic accidents.					
Well designed roads with separate lines for separate lines for pedestrians and cyclists are much safer than those without those facilities.					
Road signs should be clear not to convey unmistakable message to the driver.					
Activities along the road side increases exposure risk to traffic accidents.					
Improved road quality may lead to behavioral adjustments in terms of more risk prone driving.					

18. Please comment on how you think environmental factors have contributed to the occurrence of road accidents.....

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iv) Traffic laws, control and regulations risk factors.

19. To what extent would you agree with the following statement?

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly disagree.

Statement	1	2	3	4	5
While travelling all passengers must fasten their safety belts					
Traffic laws and regulations are necessary for all drivers.					
Promotion of road safety through use of targeted media campaigns can effectively reduce accidents.					
A vehicle must have regular check-up					
Traffic regulations are not systematically implemented and police service is less well trained, equipped and motivated to enforce laws.					
Safety belt use by all seat occupants has been found to reduce road traffic injuries.					

20. Please comment on what you perceive has contributed to poor application of traffic laws and regulation within Nairobi County.....

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21. How do you view the performance of all concerned departments in reduction of road accidents within Nairobi County.....

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22. What are your recommendations/opinions on how to improve road transport system within Nairobi County.....

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APPENDIX B:

IV. INTERVIEW GUIDE QUESTIONS FOR A FOCUS GROUP DISCUSSION.

1. Is road traffic accident a serious problem in Nairobi County?
2. What are the main factors which are associated to the cause of road traffic accidents in Nairobi County?
3. Who are the main victims of road traffic accidents in Nairobi County?
4. What kinds of safety measures have been taken by the local authority to prevent road traffic accident in Nairobi County?
5. Do available safety measures reduce the traffic accidents in Nairobi County?
6. Do available traffic rules and regulations reduce road traffic accidents in Nairobi County?
7. Who is mostly responsible for the road traffic accidents in Nairobi County?
8. What has been done by the Central government to reduce traffic accidents in Nairobi County?
9. What is the reaction of passengers in relation to frequently occurrences of traffic accident in this area?
10. Does Communities in Nairobi County associate road traffic accidents with their traditional beliefs or superstitions?
11. What are the main problems facing the local authorities in implementing the road safety measures in Nairobi County?